The National Objectives and Students´ Choices: a Comparison Between Brazil and Cuba

H. Svab* and G. S. Olguin*
* Polytechnic School of University of São Paulo, São Paulo, Brazil

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Currently, in Europe, people discuss what there is in common among Colleges and Universities. The main objective is to increase the student exchange programs and even exchange of professionals between European countries.

Going even further than this process, as depicted by the Declaration of Bologna, some issues remain: is there anything that is inherent from a certain career? Anything common among all countries? How much this definition and the students´ choices are not induced, if not determined, by social, cultural and political conditions of their location?

Comparing European countries would be an option if it were not for their geopolitical situation: the dissolving of administration borders is already in gear and, consequently, inevitable homogenization. Therefore a parallel between nations which are not in this context must be done, between nations that set themselves in the global sociopolitical scene in different ways. To do so, in this article, Brazil and Cuba have been chosen, the first inserted in the outskirts of capitalism and the latter with it's still surviving socialism.

From here the article analyzes how the course of Engineering, which is deeply connected to technological development and the productive system, is inserted in two different socioeconomically excluded scenarios.

In the comparison of these two countries, a study about educational legislation was made, emphasizing Engineering courses. Furthermore, this study analyzed a bibliographical production that discusses why students choose the courses they do.

This article also presents the results of the study mentioned above, the similarities and antagonisms among the Engineering courses in Cuba and Brazil, which expose the universities national objectives. Finally, evidences show that the students´ career choice is strongly influenced by their social context and that homogeneity among courses of different countries may bring more harms than benefits.

INTRODUCTION

The purpose of this article is to analyze the influence of national goals in students´ choice for the engineering career. Making such a comparison among very similar countries might hide possible differences in social, cultural or political background. So two countries were chosen for their difference in the current geopolitical position: Brazil, on the periphery of capitalism classified as a "developing country", and Cuba, a socialist country.

Try to establish the national goals is quite impossible, especially when specific focus is given to a certain sector , without considering the history of two different national realities.

TWO COUNTRIES – TWO HISTORIES

Brazil is a continental country, with around 8.514.877km^2, situated on South America, and divided in 26 states and one Federal District.

According to the colonial mercantilist logic, Brazil had the function of supplying raw material to the *metropolis*, the exclusive commercial partner. The Portuguese America colonization characteristics were: the territorial occupation with *plantations* in big properties and slavery production mode. Many characteristics of the colonial Brazil differ from its Latin American neighbors, that were colonized by Spain, with special attention to the territorial occupation (it can be noticed by the difference between the size of the Spanish speaking country in comparison to the Brazilian one). The economy in the colonial period was marked by cycles: the sugar in the XVI century, the gold in the XVII century and the coffee in the XIX century.

Brazil became Portugal United Kingdom in 1808, when its ports were opened to England. In 1822 was proclaimed its independence, by Pedro Álvares Cabral, Portugal King’s son. In spite of the independence movements, the fact itself happened without conflicts or changes in socio political structures

[1] E-mail: haydee.svab@poli.usp.br
[2] E-mail: giuliano.olguin@poli.usp.br

From 1870 the growing republican movements associated to the abolition causes began, so in 1888 the slavery abolition was declared, and on the following year the Federative Republic was proclaimed, not by the citizens, but by the militaries. After the military domination, the power passed to the civilians.

In 1930, Getúlio Vargas took office and closed the Congress in 1937, keep in power until 1945. Another coup d'Etat is promoted by militaries in March of 1964, which lasted until 1985, when, by popular pressure, direct elections finally happened. The first elected president in the last democratic period suffered impeachment and the vice president took office again.

Only in 1998, almost one decade after the end of the military dictatorship, the elected president finished his term. Currently, it seems that Brazil is searching for economic stability, with the *Real* currency, and politics– reelecting the two last presidents.

Unlike Brazil, Cuba is an insular country, situated in the Caribbean Sea, with approximately 110.861km^2 of extension and 14 provinces.

From 1492 to 1898, Cuba was dominated by Spain that caused the genocide of natives and divided its population by race, class and ethnic origin. In that period, according to Richard Gott , "conquest, resistance, piracy, slave rebellions, invasions of pillaging, frustrated wars of independence and aborted revolutions succeeded with a space between them that was breathless.". It is relevant to mention that in 1886 slavery was abolished, almost contemporaneously in Brazil.

Playing its role as colony in the mercantilist system, Cuba, as well as Brazil provided raw materials to Europe. Such economic mode has marked both nations until the present day. Despite the distinct form of territorial occupation of from the Portuguese one, the *plantations* were also utilized in the Caribbean Island, with predominance in slavery labor.

On December 1898, three years after the independence war in 1895, Spain was expelled from Cuba and the Paris Treaty was signed with the United States. The following January, the United States established a military government in the island.

After 4 years of military government, the Republic in Cuba was proclaimed in 1902, but its constitution - through the Platt Amendment [1] - guarantee the United States right to intervene in the island internal affairs, limiting their sovereignty and independence for 57 years.

In 1952 Fulgêncio Batista established a coup d'Etat and, on January 1959, the Rebel Army led by Fidel Castro defeated the dictator government and proclaimed the Socialist Republic of Cuba, regardless Americans. After the socialist revolution, Fidel Castro as head of government aligns Cuba to the Soviet Union. The United States attempted to take over Cuba in 1961 with the Bay of Pigs invasion, but do not succeed, and with the establishment of a socialist system, there was lot of exodus from the island. In 1965, especially Fulgêncio's supporters and richer liberal middle class left the island taking their resources.

Since the colonial period, the core product for Cuban trade relations was the sugar. Firstly with Spain, then with the United States guaranteed quota, but after the 1959 Revolution, sugar had lost a little of its brightness. However the Soviet subsidies leveraged sugar sales again that were responsible for ¾ of Cuban reserves in foreign currency during the 1970s

From 1975 to 1985 Cuban economic growth was increasing (in the range of 4.1%), especially when compared to Latin America (in the range of 1.2%). The Cuban crisis has already been announced in 1985 by the Soviet policy reform with Gorbachev and its *glasnost* and *perestroika*. Facing the main economic partner loss, the island economy collapsed rapidly between 1989 and 1993.

In the 90's, sugar no longer guaranteed the necessary currency for the country, then it was replaced by tourism – the economy sector led by Raul Castro, Fidel's brother and current president of the Cuban Socialist Republic.

The beginning of 1990s is marked by Cuban economic strangulation: the United States impediment laws ratified by the Torricelli (1992) and Helms-Burton Acts (1996) [2] associated to Soviet support withdrawal - the USSR was the major supplier of oil and the main buyer of Cuban products (95% of citrus, 73% of nickel and 63% of sugar).

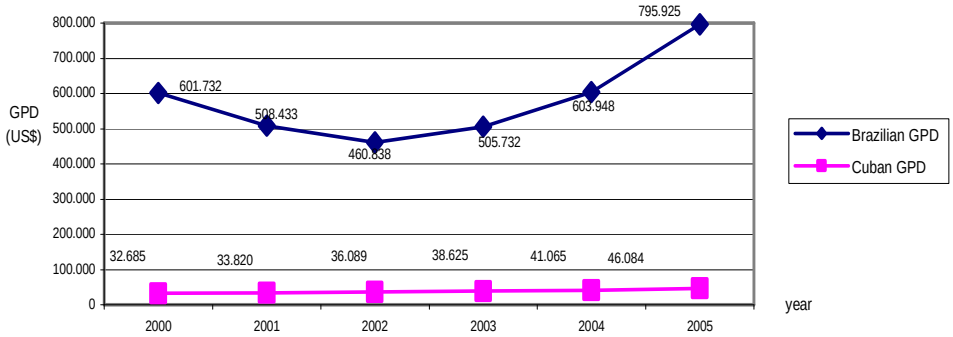
Upon the opening of tourism to foreign capital and the popular mobilization to produce for their own consumption, in 1996, Cuba starts to grow - a trend that continues until the present day.

CUBA AND BRAZIL: THE CURRENT GEOPOLITICS AND THEIR NATIONAL GOALS

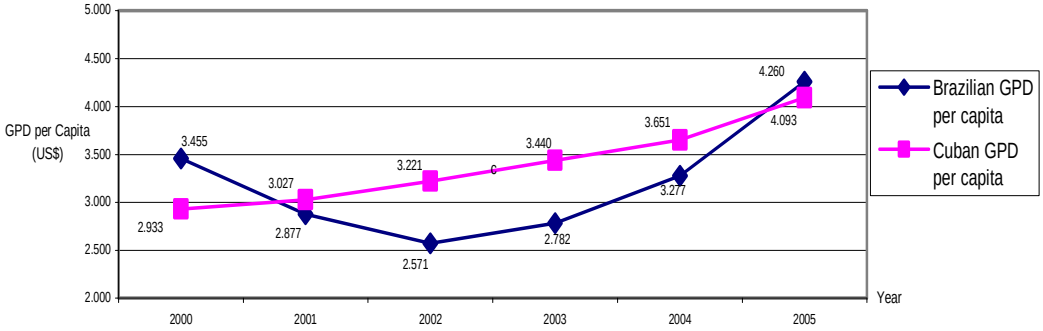
Cuba was and is constantly marked by a quest for internal security and the threat of external attack. The long periods of domination and/or dependence on other nations dictate domestic policy. In Brazil, it occurs(ed) in much greater degree the introduction of dominator politics by the domineering, without many traces of major conflicts.

Nowadays Cuba is the only socialist country of the West, and Brazil the most expressive Latin American country in economy and policy. In the past decade both countries live a desire for political stability. Cuba had only met a peace period after the Socialist Revolution, and genuine sovereignty after the fall of the Soviet Union. Brazil, in turn, lives the longest period of its democratic history after military in power. Both were starting new page of their history at the same time: end of the 1980 / beginning of the 1990 decade.

From an economic perspective, the Cuban economy main product is the tourism, that guarantees foreign exchange and there is already 24 joint ventures, including partnerships with commercial firms from countries like France, Spain and Jamaica. On the other hand, Brazilian economy is heavily marked by the agro-export and, unlike the Caribbean country which depends on Venezuelan oil, has already reached its energy self-sufficiency. Both countries have been experiencing a growing economy over the last 5 years as can be seen by their Gross Domestic Product (GPD) in the Graphs 1 and 2.



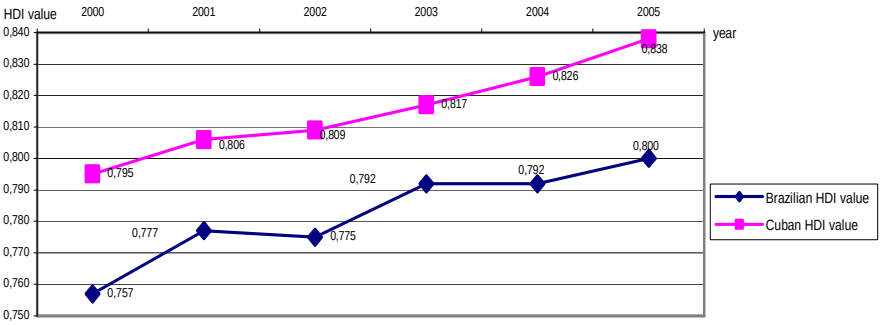
Graph 1. Comparison between the economic performance by GPD



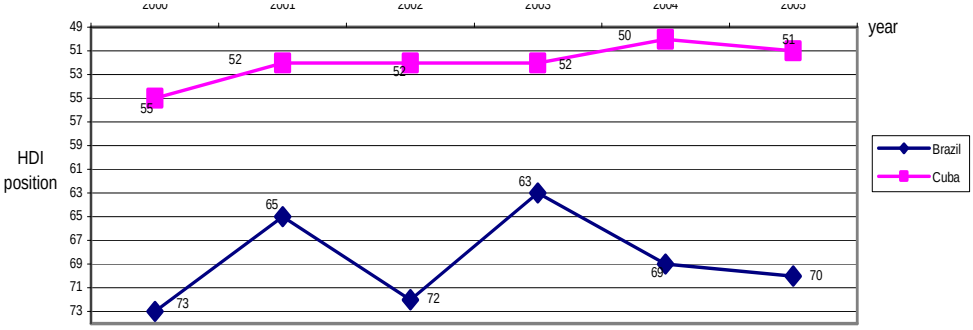
Graph 2.Comparison between the economic performance by GPD per capita

The two countries increase their wealth, but how does the population as a whole enjoy it? From the viewpoint of social equity, both nations contrast. Brazil is one of the most unequal countries in the world, as can be seen by the Gini coefficient (index used to measure the inequality of income or wealth), while Cuba, due to the socialist principle is one of more equitable.

Furthermore, the analysis of Human Development Index (HDI) gives evidence of how the wealth is turned into real benefits to the people. Both countries are increasing their HDI, index that expresses the achievements of a country in terms of life expectancy, educational level and adjusted real income. Brazil, however, seems to increase it biannually (in election years) and lose positions in relation to the others much easily, as can be seen in the Graphs 3 and 4.



Graph 3. Comparison of quality of life by the HDI value



Graph 4. Position on World HDI Rank

Comparing different index of both countries in the 2007 United Nation report [3], referred to 2005, some shown in the Table 1, it is possible to realize that the abundance of products offered and free competition are not sufficient to achieve greater economic growth, or greater expectation of life, much less the best rates linked to education. Factors that cause great concern are the Brazilian public investment which, in theory, not regulated by the free market, could seek inequalities, but in education and health they are far from necessary.

Table 1. Comparison of various indicators considered by ONU

Indicators	**Brazil**	**Cuba**
Human development index value, 2005	0,800	0,838
Education index	0,883	0,952
Life expectancy index	71,7	77,7
Adult literacy rate (% aged 15 and older), 1995-2005	88,6	99,8
Population, total (thousands), 2004	186.831.000	11.260.000
Human Poverty Index (HPI-1) value (%)	9,70%	4,70%
Unemployment rate Total (% of labour force), 1996-2005	8,90%	1,90%
Public expenditure on health (% of GDP), 2004	4,80%	5,50%
Public expenditure on education (% of GDP), 2002-05	4,40%	9,80%
High-technology exports (% of manufactured exports), 2005	12,80%	29,10%
GDP per capita, annual growth rate (%), 1990-2005	1,10%	3,50%
Internet users (per 1,000 people), 2005	195	17

The Constitution of the Federative Republic of Brazil [4] clarifies as their fundamental objectives: “to build a free, fair and caring society; to ensure national development; to eradicate poverty and marginalization; to reduce social and regional inequalities; and to promote the good for all people, without prejudice of origin, race, sex, color, age and any other forms of discrimination.".

The Constitution of the Republic of Cuba [5] expressed as a principle to be "a socialist state of workers, independent and sovereign, organized with all and for the good of all, as united and democratic Republic, to enjoy: political freedom; social justice; individual and collective welfare; and human solidarity.".

According to data presented so far, it seems that Cuba much more than Brazil is approaching achievement of its national goals expressed in law. That is because the fundamental objectives of the Brazilian Constitution are quite built on the principle of equality, not only of birth, but also of living conditions. Such

goals differ from the global economic system the country is facing, since one of the foundations of capitalism is the capital accumulation that creates inevitable inequalities. This incoherence is worsened by the position of Brazil in the world geopolitics: periphery of capitalism, where the capital is not concentrated. So, what would be the national goals of Brazil? It seems that free initiative ensured in Article 1 of the Brazilian Constitution goes ahead of other fundaments of the Republic.

COMPARATIVE PANORAMA OF EDUCATIONAL SYSTEM

In both countries, the elementary school account for 9 years, followed by high school, with 3 years. In High School in Cuba, it is possible to choose between the technical-vocational education or pre-university. Choosing for pre-university training the student becomes a *bachiller* [6]. The Brazilian High School is built on a different way, it aims to give a general training on Portuguese, mathematics and science. The technical training, in case of the student's choice, happens after beginning this level of education. In principle, after the completion of 12 years of basic studies, students from the two countries are able to join Higher Education.

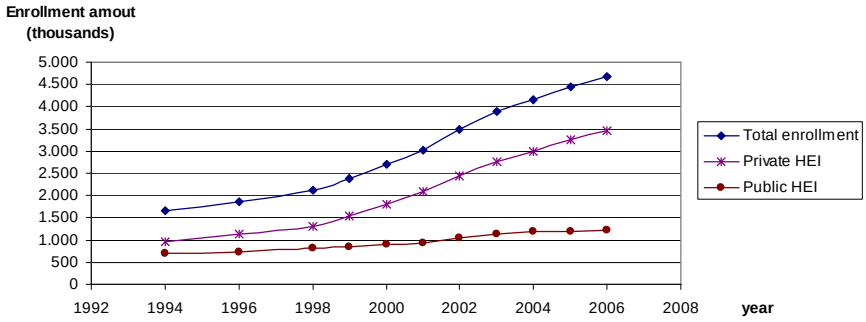
According to the Cuban Constitution, in its Chapter V - Education and Culture [5] "The education is function of the state and it is free." Today the Cuban Higher Education has 150,000 students and accumulates just over 500,000 students graduated, 5% of its population. According to 2006 data from the Brazilian Institute of Geography and Statistics (IBGE) [7], in Brazil there are about 8,932,992 people with 15 or more years of study, which means approximately 4.78% of the population with higher level. If in Cuba, there are almost only public and free Higher Education Institutions (HEI), in Brazil the framework is already more diverse - at graduation level there are public and private HEI, (only those privates are paid).

In Brazil, there are public Institutions of Education at all levels but, as it can be noticed in Table 2, the vast expansion that Higher Education experienced in the last decade has been especially due to expansion in the number of private schools. The expansion of places in Higher Education, at graduation level, is not due to significant expansion inside the institutions of education, increasing their infrastructure or decreasing their idleness, but expanding the number of schools. As the number of schools has increased in the private sphere, the expansion of places and the number of registered focused on the private sector of education, as also can be seen in Table 2.

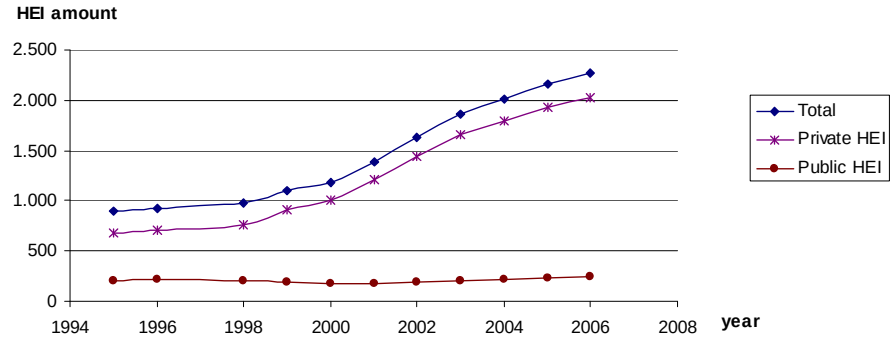
One of the factors that contributed heavily in Brazil for the leap from the private sector of education was the federal program (PROUNI) for expansion of vacancies through transference of public resources to private institutions of education, through full or partial scholarships to students.

Table 2. Analysis of Enrollment in Graduation (Presential Courses) and Higher Education Institutions (HEI) by Administrative Dependence

	Enrollment in Graduation (Presential Courses) by Administrative Dependence					**Higher Education Institutions (HEI) by Administrative Dependence**				
Year	**Total of Enrollment**	**Public HEI**	**Private HEI**	**% in Public HEI**	**% in Private HEI**	**Total of HEI**	**Public HEI**	**Private HEI**	**% in Public HEI**	**% in Private HEI**
1994	1.661.034	690.450	970.584	42%	58%	894	210	684	23%	77%
1996	1.868.529	735.427	1.133.102	39%	61%	922	211	711	23%	77%
1998	2.125.958	804.729	1.321.229	38%	62%	973	209	764	21%	79%
1999	2.377.715	833.093	1.544.622	35%	65%	1.097	192	905	18%	82%
2000	2.694.245	887.026	1.807.219	33%	67%	1.180	176	1.004	15%	85%
2001	3.030.754	939.225	2.091.529	31%	69%	1.391	183	1.208	13%	87%
2002	3.479.913	1.051.655	2.428.258	30%	70%	1.637	195	1.442	12%	88%
2003	3.887.022	1.136.370	2.750.652	29%	71%	1.859	207	1.652	11%	89%
2004	4.163.733	1.178.328	2.985.405	28%	72%	2.013	224	1.789	11%	89%
2005	4.453.156	1.192.189	3.260.967	27%	73%	2.165	231	1.934	11%	89%
2006	4.676.646	1.209.304	3.467.342	26%	74%	2.270	248	2.022	11%	89%



Graph 5. The Growth of Enrollment in Graduation (Presential Courses) by Administrative Dependence



Graph 6. The Growth of Higher Education Institutions (HEI) by Administrative Dependence

Nowadays, it is realized that the large proportion of students are "assisted" by the network of private schools and, therefore, the education market sector becomes increasingly influential in national political scene.

Here, it is clear where Brazil and Cuba differ on the effectiveness of their goals for the national higher education and their margins of action. In Cuba, with a small territorial extension and a socialist government known as centralized, more efficiently educational policies can be implemented.

In Brazilian reality, there are conflicts of interest in the implementation of public policies, especially among public national goals and private goals. The firsts aimed at the public good and the latter, the maximization of their profits and dissemination of their interests. What prevails? When the private not prevails, the mediation of a conflict of interests results in a mosaic without cohesion and with initiatives that, in general, does not point to a national project to improve education.

COMPARATIVE OVERVIEW OF ENGINEERING EDUCATION

The last action of the Brazilian government to promote the improvement of education made since 1996 when it established the Bases and Guidelines Law (LDB) [8] which regulates the education (public and private) in all its levels (municipal, state and Federal). From the LDB it was set up the National Curriculum Guidelines (DCN) which are mandatory standards that guide the planning curriculum of schools and education systems. The first was applied only on Basic Education (elementary school and high school) and, in 2001, it was released the DCN for Higher Education.

That was perhaps the only way found by the State to try to ensure the minimum quality and identity between the courses of their own nation, considering the vast territorial and cultural diversity of Brazil. In the case of graduation in engineering, the DCN establish, among other guidelines [9]:

1 – in the end of the engineering course, the students must have the following characteristics: generalist, humanist, critical and reflective, able to absorb and develop new technologies, enhancing its critical and creative performance in identifying and solving problems, considering its political, economic, social And environmental and cultural, ethical and humanistic vision, in response to the demands of society;

2 - the core of every course in Engineering: a core of basic contents (corresponding to at least 30% of the total working hours), a core of professional contents (corresponding to approximately 15% of the total working hours) and a core of specific contents to characterize the mode;

3 – work experience with a mandatory minimum time of 160 hours;

4 - graduation Final Essay required.

In Cuba, with regard to science and technology, since 1992, the Ministry of Higher Education (MES) develops a set of actions to ensure that they have space to be prominent in Higher Education in order to obtain results of economic and social importance both sooner as possible. This is due to the effort to overcome the crisis that took the country after the fall of the USSR and the economic impediment that is submitted.

It seems that in the process of globalization of higher education, despite the imposition of the national body MES, decentralization was not only geographical but also administrative and hence the great difficulty of accessing the regulation / legislation of national scope of their courses / careers. So taken up by reference to the engineering courses at the University of Camagüey and the Polytechnic Higher Institute Jose Antonio Echeverría (CUJAE), because they are the universities of greater expressiveness and that provide more information.

1 - in the end of the engineering course, the students must have great breadth of knowledge and support towards achieving the national goals, is proposing to solve real problems of society and relevant. You can see such attempts by observing the profiles of graduates at the University of Camagüey:

"... the fundamental objective in shaping the broad profile of Civil Engineers is preparing it to meet the general requirements and more frequent in the construction industry for the period designs and is able to specialize in any of the fields and spheres of activity. "

"The career of Mechanical Engineering in Cuba aims at the exploitation of machinery, equipment and installations, and develops its activities in the fields of design, construction and maintenance, supported a training complemented that allows it to adapt to their professional activity with creativity and imagination. "

2 – Concerning the structure in cycles, there are cases where the cycles are not clear and defined, and others where they are similar to the Brazilian model prescribed by DCN. As an example, we have the course of mechanical engineering at the University of Camagüey and the course of civil engineering CUJAE.

The course of Camagüey is an example of progress that is structured in cycles:
- Basic (similar to the core content of Brazilian basic cycle): grows in the first two years and addresses the natural sciences, mathematics and communication;

- Specific Basic (similar to the core content of Brazilian professional cycle): develops in the third and fourth years and addresses the science of engineering and materials science, thermodynamics, mechanics of fluids and strength of materials;

- Vocational training (similar to the core content of Brazilian specific cycle): develops in the last year and its contents are linked directly to the performances of their own profession, such as the discipline of design elements of machines.

Already the course of CUJAE has not established cycles clearly, although the materials focus on broader scope of science at the beginning of the course and more specific in order, as can be seen in Table 3.

3 - There was no reference on compulsory training course

4 - There was no reference to the obligatory of work for graduation, but this activity is reserved for the last half of all courses of engineering both the University of Camagüey as well as the University of CUJAE.

The Cuban engineer is prepared, as well as other professionals, for the "economic, social and political life, from the concept of integration of teaching with the production and the research in its broadest and rich conception, that is the one in which final products are competitive. [10] "Their graduates should be able to meet the challenges of a complex present and a future of integration in global competition. Cuban design of how they should be / act its engineers to meet the Brazilian conception, although practical developments in life of its citizens are different in both countries.

Taking as a case study the courses of Civil Engineering at CUJAE, Cuba, and the Polytechnic School of the University of São Paulo (EPUSP), in Brazil, was made brief comparison of grades curriculum. For this analysis fall some considerations: only those subjects were considered mandatory, were not considered internships, professional practices, and optional or elective subjects.

It appears that the current Cuban account with 62 disciplines and Brazil with 67, recalling that was not the working hours, only the number of disciplines. Of Cuban, 25 (40.3%) are equivalent to the Brazilian in the corresponding half. As for equivalence in semesters displaced, there are 15 (24.2%) with Cuban equity and 22 Brazilian (32.8%). There are still those subjects given only in EPUSP, which comprise 20 (29.9%), or only in CUAJE, which added 22 (35.5%).

Most of the subjects of CUJAE that there is no equivalence with Brazilian’s ones refer to the humanities and citizenship. Most of the subjects of EPUSP that there is no equivalence to the Cuban’s refer to hydraulic and to a lesser extent, the planning and management. Based on the fact that the Institute also offers the course of Hydraulic Engineer, while at EPUSP this professional formation was absorbed by the Civil Engineering course, placed EPUSP behind CUJAE in relation to hydraulic.

Table 3. Comparison of curriculum grade of Civil Engineering courses of CUJAE [11] and EPUSP [12]

	CUJAE curriculum	EPUSP curriculum	CUJAE curriculum	EPUSP curriculum	
1º term	Introduction to the Engineering Studies (Mathematics, Physics, and Learn to learn)	Introduction to Engineering	Structural Concrete I	Concrete Structures I	5º term
	Mathematics I (Differential and Integral Calculus I)	Differential and Integral Calculus for Engineering I	Traffic Engineering (*)	Road's Infrastructure Project (*)	
	Computation I	Introduction to Computation for Engineering	Project Management	Production Management on Civil Construction I	
	Linear Algebra and Analytic Geometry	Linear Algebra for Engineering I	Applied Hydraulics	Hydraulics I	
	Science of Project (**)	General and Experimental Physics for Engineering I (*)	Civil Defense (**)	Applied Hydrology	
	Civil Engineering History (**)	Graphical Geometry for Engineering (*)	Social Problems of Science and Technology (**)	Geoprocessing Principles (**)	
	English with General Purpose I (**)	General Technological Chemistry (*)	Structural Analysis	Mechanical of Structures I	6º term
	Philosophy and Society (**)	-	Geotechnical	Soil Mechanics	
	Cuban History (**)	-	Structural Concrete II	Concrete Structures II	
	Physical Education I(**)	-	Concrete Technology (*)	Civil Construction Materials (*)	
2º term	Chemistry for Engineering (*)	Introduction on Material Science for Engineering (**)	Roads Geometry (*)	Basic Principals of Traffic Engineering (*)	
	Mathematics II (Differential and Integral Calculus II)	Differential and Integral Calculus for Engineering II	Investment Management (*)	Production Management on Civil Construction II (**)	
	Computation II	Calculus (Numerical Methods)	-	Hydraulics II (**)	
	Physics I (*)	Physics for Engineering II (*)	-	General Economy (*)	
	Political Economy of Capitalism (*)	Laboratory of Physics for Engineering II (*)	Foundations Design and Containment Structures (*)	Mechanical of Structures II (**)	7º term
	Physical Education II (**)	Linear Algebra for Engineering II (*)	Metal Structures	Metal and Wood Structures	
	English with General Purpose II (**)	Graphical Representation for Engineering (*)	Concrete and Masonry Structures	Technology of Building Construction I	
	-	Mechanics (*)	Soil Movement Mechanisms	Earth Works	
3º term	Mechanical Modeling of Structures I	Introduction on Structural Mechanic	Pedagogical Training (**)	Urban Planning and Engineering (**)	
	Topography I	Spatial Information I	-	Infrastructure Building I (*)	
	Mathematics III (Series, Differential Equations and Numerical Methods) (*)	Differential and Integral Calculus for Engineering III (*)	-	Sanitation I (**)	
	Physics II (*)	Physics for Engineering III (*)	-	River and Sea Hydraulics (**)	
	Descriptive Geometry (*)	Mineralogy and Geology Elements (**)	-	Pavements (*)	
	Political Economy of Socialism (**)	Physics of Constructions (**)	-	Foundations (*)	8º term
	English with Academic Purpose (**)	Mechanic of Fluids (**)	Infrastructure Building	Infrastructure Building II	
	Physical Education III (**)	-	Constructive System	Technology of Building Construction II	
4º term	Mechanical Modeling of Structures II	Strength of Materials and Statics of Constructions I	The Engineer on Defense (**)	Hydraulics Construction (**)	
	Topography II	Spatial Information II	Edification Conservation (**)	Bridges and Big Structures (*)	
	Probability and Statistics	Statistics	Speech Skills Development (**)	Planning and Investment Management (*)	
	Physics III (*)	Physics for Engineering IV (**)	-	Sanitation II (**)	
	Design Applied to Engineering (*)	Differential and Integral Calculus for Engineering IV (*)	-	Economy and Planning of Transport System (**)	
	National Defense (**)	Business Planning Techniques (**)	Railways	Railways and Airports	9º term
	Socio-Political Theory (**)	General Eletrotechnics (**)	Pavements (*)	Principles of Business Administration (**)	
	English with Professional Purpose (**)	Introduction on Environmental Engineering (**)	Roads Conservation (**)	Graduation Final Essay for Civil Engineering I (*)	
	Physical Education IV (**)	-	Bridges (*)	-	
5º term	Strength of Materials	Strength of Materials and Statics of Constructions II	Graduation Final Essay	Graduation Final Essay for Civil Engineering II (*)	10º term
	Construction Materials (*)	Concrete Technology (*)	-	Law Institutions (**)	

(*) – there is curricular correspondence, but without correspondence of the term in which is offered

(**) – there is not curricular correspondence

The other courses have correspondence on the same turn.

As could be seen when comparing the engineering courses between Brazil and Cuba, a common core. Such core contains the pure sciences like mathematics, physics and chemistry as well as applied sciences as resistance of materials for courses in civil engineering or mechanics of fluids for courses in mechanical engineering.

Although, on average, at least 50% of Brazilian and Cubans engineering courses being the same, there are the other 50% that keeps the differences The Cubans have courses in their curricula, physical education as compulsory discipline at graduation. This indicates how much the vision of education for citizenship, which includes the health of the population, is present independent if the nature of the course is more technical or not. There are subjects in the curricula of engineering in Cuba that include discussions on the insertion of that country of worldwide geopolitics and the social needs that, finally, arrive on engineering. This can be noticed by the presence of English as a compulsory subject in engineering courses, regardless the specialty.

Or else, to examine the civil engineering curricula in the Table 3, it can be observed the presence of matters relating to defense in Cuba, as this island is on the route of typhoons and hurricanes. The analogy that might exist in the Brazilian courses would be the question of transport, since the extension of the country and an increasingly clear not sustainable matrix road. However, there is no focus on the previous mandatory curricula and also there is no discipline whose scope is to (re) think problems and solutions of science and technology in society.

Another characteristic that reflects the reality of each country also observed by that comparison exposed in the Table 3 is the concern with maintenance and conservation outlined in Cuban curriculum. Brazil, in contrast with the embargo that Cuba suffers, has relative abundance of resources and therefore does not confer such an approach in their courses. Something that can be seen in the Brazilian course and is more absent in Cuba is training for management and planning, which in Cuba, it can be inferred, is responsibility of the State.

THE COURSES CHOICE

A person has been making choices throughout his life, conscious and unconscious – in this case, just the conscious is relevant. Moreover, the procedure will be the examination of autonomy in the act of choice. Perhaps for this reason, it is used to think that a child is not, it will only be after he grows, that he will be just after transformed in means of production [13]. When looking at the adolescence is already beginning to see what the adolescent is. However, "the teenager is more concerned with what he can become" [14] since the person is not more than what he wants to be and now the teenager is the adult in pregnancy.

At the end of adolescence the individual starts to forge their ideal of adult, which usually leads to the formation of identity through a profession and a family formation. Although this ideal is increasingly distant to be found in contemporary society, it is still the most common and socially accepted and encouraged.

Before entering a graduation, the young, who most often is between 17 and 18 years, finds difficulty in choosing his professional future. Currently, the difficulty of the decision by the wide range of options is worsened much more when considering initiatives that involve the mobility of students of graduation, as the Declaration of Bologna. Initiatives to encourage the exchange opened a new level of possibilities that may influence the choice for one or another university.

It is necessary to distinguish between the choice of the course and choice of profession. Choose a course for graduation means choosing which area of knowledge to dedicate most of the time to study. But it does not mean that the young will necessarily follow professionally the area in which he specialized in the graduation. This "distortion" may occur for various reasons such as lack of post corresponding to the course or even simple change of plans after its conclusion. The approach of this article on the selection focuses on the course, but with the prospect of professional practice, without certainties.

According to Soares [15], the professional choice is a very complex issue that involves various determinants still little discussed in an integrated and systematic literature. It lists six factors that influence the career choices:

1 - Political factors - related to government policy, in this case in particular with regard to education.

2 - Economic factors - linked to the possibilities of work, to work as a means of livelihood and unemployment.

3 - Social factors - linked to social organization: division into classes, inequality, possibility / need to social ascension, influence of society in family and effects of globalization in the culture and family.

4 - Educational factors - linked to the education system itself: the structure, access, retention, a performance and evaluation.

5 - Family factors - the family is a fundamental element in the perpetuation or modification of existing

ideology. Their families' and their affection, fears, hopes and insecurities shape the prospects for the people's future.

6 - Psychological factors - linked to interests, motivations, skills and personal skills. the psychology in this case is understood as essentially of social nature and therefore the relationship of man with his work as of fundamental importance. Commonly, the idea of happiness is connected to the profession, since it is in the practice of work that the man exists in society, builds his history and develops the culture.

The continuity of studies after high school, to follow a university or technical course, and in particular among those which personal decisions are forged in society. The psychological and familiar factors are born within the social as well as the educational is born from politicians. There are those who want to be a specific professional, aware of what this may mean in fact. What happens is if you want to be like someone of that profession, or have options or attributes that this particular position offers.

Even before arriving at the choice of specific qualifications and emphasis of engineering, the young will decide among other careers, such as medicine, law, physics, mathematics, chemistry, among others. This choice may pass by the variables already mentioned, which in turn compose a scenario of Brazilian or Cuban societies. In other words, the choice of the course has a direct connection with the social needs of a country. A young living in a highly industrialized region certainly will have a different vision from another who lives in a more rural region.

The engineering courses do not escape from such behavior and, due to various qualifications and emphasis causes more uncertainty in the choice. If the proposal from the university or the nation (through laws to regulate higher education) is to have specialized courses, quite distinct and specific, the graduates will be without flexibility between the specialties and the decision taken will be more decisive and reflect on the entire professional career.

In a course with generalized formation, the choice, even early, does not occur so determinatively in professional career, since it is not just limited to an emphasis or habilitation. This is the case of the two countries to a greater or smaller degree.

With globalization and international agreements in all areas, the barriers among countries are decreasing. Today, an engineering student has a more open mind to global trends. By comparing the two countries taken for analysis, this fact is ratified by the respective desired graduates' profiles presented previously.

CONCLUSION

It can be realized that the national goals of Brazil and Cuba are quite distinct - and predictable distinctions already resulting from the economic systems they belong to. In Brazil it is basically aimed at the economic and social development as long as the free initiative is preserved .In Cuba, the development of society above any other goal.

When comparing the two education systems, it can be noticed that the rate of illiterate people in Cuba is lower than in Brazil. It is inferred that in percentage, there are more people concluding high school in Cuba than in Brazil, which means greater demand for higher education in Cuba. However, the part of population with higher level in both countries is close enough. In Brazil, is this low percentage due to inadequate public investment in education? But what about Cuba? Would the lack of competitiveness be a demotivation for the continuity of studies?

Regardless that issue, and even with the growth of both GDP per capita, it seems that public investments in education cause great impact on the socio-economic development. In Cuba, where such investments are higher, reaching HDI is always higher than the Brazilian one and with more constant rate of growth. Moreover, while the index of Cuban exports of high-tech edge to 30%, the Brazilian does not exceed 13% - and there is no way to produce and export products with aggregated value to high technology without any technical staff in quantity and quality enough for it.

In general, from a strictly technical point of view, Brazilian engineering courses have a broader formation, however, they are less connected to work in order to detect problems and propose solutions. This suggests that there is greater distance between university and society in Brazilian universities than in Cuban ones and, extrapolating, that the proximity existing in Brazilian ones occur increasingly in the private sphere while in Cuban occur within the public one.

Then it is observed that university courses do not detach from the stories of their countries, on the contrary, are the crystallization of national goals. Evidenced by this here, there's no way to have a course on engineering common to all countries, and even that would be salutary. The regional influences, including environmental, influence the social demands and how the educational structures meet these demands. So,

having something common and respected the necessary differences between courses, initiatives as the Bologna Declaration and its resulting exchanges are possible.

It is impossible to dissociate the man from his environment, it is tempting them see it as historically determined and therefore ideologically. However, it is the exception that if on the one hand it is true that it must not be forgotten that man has the power of choice, is protagonist of its own history and should be seen as an element of change in social processes.

It is important to note that at least in theory; Brazil and Cuba want their graduates with training and general criticism, it is necessary to train them even before entering the university. Even as the young who enter university may never have had a prior working experience or information necessary to make his decision.

The issue of remuneration influences heavily on the choice of whether to attend university and to desire determined profession, because it is connected to a greater or smaller degree to the survival of the individual. In Brazil, there are large differences in pay between those whose training was specifically technical and those with university education. Moreover, there is also the issue of greater prestige that benefits certain professions. Back in Cuba, despite the wage differentiation, consider the achieved educational level and employment complexity, the population income is in small scale.

It is not here to judge whether the demands of the market are more or less legitimate than those of stamped as fundamentally social. But pressure is on the market that comes from elsewhere whether by pressure from society, in defense of their sovereignty, there is always a certain status associated with the profession. Status that influences the choice of students for specific courses and that depends on the socio-economic-political-cultural present and past.

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