

Globalization of Engineering Education The case of the North American Region

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When World War II ended, the United States emerged as practically the only superpower that had its industrial apparatus fully producing all the equipment required to reconstruct the cities and industries destroyed by the war both in Europe and the Asian Pacific region. With the help of the United States some of the European and Asian economies rapidly recovered and trade among the nations was restored in a few years. Even though the trade rules were very much the same before and after the war, it is natural to consider that the terms imposed on the defeated nations in the Second World War were not the same as those followed by the winners. Logically, most of the winner nations benefited from these policies. This picture started changing in the two decades following the war. Germany, Japan and Italy recovered their economic strength in less than half a century and took their places among the industrialized countries of the world. Even though open competition among most of the western countries was already a common practice as early as the fifties, there were still at that time protectionist policies that restricted the trade market in the western world.

With the collapse of the Soviet System most of the so-called Iron Curtain countries have joined the world trade. Healthy competition among all nations is now commonly accepted as the necessary ingredient to keep high standards of products quality and low prices. The world seems headed for a global common market in some near future. But present reality shows that the industrialized nations have evolved to form well-recognized trading blocs perhaps to keep world prices of products at reasonable levels, or perhaps to adjust world trade policies to their regional needs. It is clear that in the current world market two main areas of influence, namely the European Union and the Asian Nations of the Pacific Rim have emerged in the last 20 years. Their success in the global economy has been tremendous and the present trend is that they are going to continue economically growing.

The theory of how relations among nations have evolved throughout the history of mankind, particularly in the last decades, has been explained from mainly two international policy theories: Realism and Cooperativism^{1,2}.

Realism theoreticians claim that the main objective of government is to increase national power in relation to that of other nations in order to enhance security, wealth and influence in international affairs. Other factors, such as human and natural resources, industry and education, are also recognized as contributors to the power of a nation, but the followers of realism assert that the use of military force represents the critical instrument for pursuing the national interest.

Power (whose building, increasing and maintaining often requires a country to sacrifice other national aims), is the ultimate objective among the national interests and, therefore, the highest goal of national policy. The political competition, and the competition for world markets in the international arena are won by the state that properly uses this kind of power. However, a nation's power can only be increased by diminishing that possessed by another, which in international relations is known by realists as "the zero-sum game". In other words, it is impossible for all states to concurrently augment their power relative to one another or to equally benefit from trade competition unless the weaker nations align with the stronger states to get some kind of "protection" from them.

Cooperativists, on the other hand, affirm that the problems confronted by mankind in recent times have become so burdensome that world survival depends on its ability to unite the efforts of all nations and devise global solutions. Overpopulation, environmental pollution, depletion of natural resources, epidemics, human rights violations, energy crises, monetary crises, can be mentioned among the most well-known global problems. Perhaps the worst of them, but one that has always been attached to human development, is poverty. A condition that involves more than half of the world's population, poverty is the root of many of the above-mentioned problems. However, these problems strike harder in the so-called Third World Countries (TWC). Comparisons of economic indicators between the Developed Countries (DC) and the TWC are striking: The income per capita is about 30 times higher in the developed nations than in TWC, energy consumption in DC is about 50 times that of TWC, and infant mortality rate keeps similar proportions. While illiteracy is almost nil in highly industrialized countries, in some of the TWC it is over 80% [2]. Cooperativists believe that the threat posed by these problems is so obvious that nations are increasingly willing to form a united front to combat them.

If the United States is to face, at least temporarily, the protectionist policies of the European Union and the Asian-Pacific economic regions, creation of a strong economic region of its own emerges as an urgent task. According to the economic theory of "Realism" we can expect that the growth of the other two regions will be at the expense of the rest of the world. I argue, therefore, that the United States needs to fortify its natural trading bloc, the countries of the Western Hemisphere. The Americas, for reasons that are not going to be discussed in this paper, have remained generally an impoverished region, a market incapable of competing on a world level. The standard of living of most of the Latin American population must be raised in order to assure the buying power to maintain a healthy internal market in this Hemisphere. However, poverty diminution necessarily involves increasing the levels of education among the poor, a theme not yet taken into serious consideration by American market strategists.

Reduction of poverty as an objective of international economic stability is formidable task, but one sure step to attain those goals is to improve education among the poorer classes of the population.

Steps toward integration of the American continent as the third trade group have already been taken. The Andean Regional Agreement, the South American Trade Agreement and recently the North American Free Trade Agreement (NAFTA) are some examples of these efforts. However, no steps to include education have been taken as yet. NAFTA does not specifically describe any policy towards this goal³. Frontiers cannot be torn down for free movement of raw materials or

free movement of industrial components only. Freer mobility of university faculty members, graduate and undergraduate students together with academic accreditation, must be encouraged.

Integration of private higher education into the globalization mechanisms is not a problem; private universities usually have contact with their Canadian and American counterparts and are usually attended by upper middle class students who can easily study abroad if they need to do so. But globalization of higher education in the American continent should also aim to include the poorer student population, those who attend the public universities.

As governments consider the feasibility of extending educational interaction the following problems should be analyzed:

INTERCHANGE OF STUDENTS

At present, the discrepancy between university expenses for undergraduate students in Mexico versus students in the United States is a barrier to the interchange of students. The agreements signed between American universities and Mexican institutions take into account that the students who choose to go to the other country have already paid their annual room and board and tuition fees in their home university before traveling to the other country. In the case of Mexico, for example, public university education is practically free and usually there are no room and board facilities inside the university campuses. The common practice is that the student lives with relatives or in the home of a close friend at very low cost and daily commutes using inexpensive public transportation. Therefore, adequate financial support for the student going to the United States or Canada is necessary. Fortunately, some attempts for financially assisting interchange of Mexican undergraduate students are being made from the CONACYT (an organism created by the Mexican government to support the advancement of research and higher education) and from NAFTA. However, these attempts are being made to cover the expenses of very few students and are still critically underfunded.

ACADEMIC ACCREDITATION

If the idea is to expand this interchange, it would be advisable to promote some kind of general rules for academic accreditation between ABET, ANUIES and CEAB which are the accreditation boards from the United States, Mexico and Canada respectively so, in the long run academic credits between the three countries can be also interchangeable.

RETURN OF STUDENTS TO THEIR COUNTRY OF ORIGIN

Among most of the graduate students who attain a degree in an American university, there is a great temptation to try to remain in this country permanently. They usually fulfill this goal with the help of the companies where they are accepted for work. There is nothing wrong in this case. But if the objective is to improve the standard of living of the Mexican lower classes by improving their general education, all the students that benefited from these policies should return home to help in the building of a stronger society.

COMMENTS AND SUGGESTIONS

The ideas of Globalization, according to Ambrose⁴, started in the late thirties and were conceived as a means to improve international business' profits and as a secondary objective to diminish poverty by letting part of those profits to trickle to the lower economic levels of the world's population. To achieve these objectives, manipulation of all aspects of international trade and economic activity was considered. The current trend in the globalization of trade among the nations suggests that there are going to be, at least temporarily, two strong groups of nations with which the United States is going to compete. The conditions under which the trade competition is going to take place, will not be as favorable as they were in the post-World War II years.

The United States must encourage a stronger trade activity among the countries of our hemisphere, but at the same time we must support the rise of the standard of living of the majority of the Latin American countries.

So far, the ideas on globalization have been applied only to trade. Education must also be included among the global activities planned for the XI Century.

If we fail to include education in the globalization concept, we are taking the risk of dividing our continent in two sections: One that will provide cheap labor and cheap raw materials and another with a high standard of living but constantly threatened by illegal migration, political restlessness in the neighboring nations and constant pressure to have our markets loaded with illegal substances. Under these conditions trade competition is going to be increasingly difficult in the years to come for Canada and the United States.

Stronger communication with public universities south of our border, will not only give us a broader vision on world higher education but also will support whatever steps our government take to improve the conditions of an internal market in our hemisphere.

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