

Sabato's Triangle and International Academic Cooperation: The Importance of Extra-Relations for the Latin American Enhancement

Kazuo HATAKEYAMA

CEFET-PR - Centro Federal de Educação Tecnológica do Paraná, PPGTE – Postgraduate Program in Technology, Av. Sete de Setembro, 3.165 - CEP 80.230-901 - Curitiba – PR - BR, phone: +55 (41) 310 4846 - Fax: +55 (41) 310-4432, kazuo@ppgte.cefetpr.br

Dirlene RUPPEL

CEFET-PR - Centro Federal de Educação Tecnológica do Paraná, PPGTE – Postgraduate Program in Technology, Av. Sete de Setembro, 3.165 - CEP 80.230-901 - Curitiba – PR - BR, phone: +55 (41) 310-4846 - Fax: +55 (41) 310-4432, druppel@cefetpr.br

KEYWORDS: *science and technology, development and growth, international academic cooperation*

ABSTRACT: *As the information era has impelled an unmatched speed in the advancement in science and technology, developed countries already conquered the predominance in the technology domain and the improvement in the quality of life of their society. In the counterpoint, emerging countries due to their chronic structural frailty, still envisage as a challenge the access to the technology in the context of world competitiveness. This paper intends to present the classical Sabato's triangle with the requirement of Latin American countries to face the challenges for development and growth using as recourses the international academic cooperation that could be a suitable means to lessen the size of gap between developed and developing countries.*

1 INTRODUCTION

Latin America (LA) has a long road to run to face the challenge to the new economic order, although seems to go global, paradoxically, shows fractional, in the sense that generates great opportunities of progress, but at the same time, segregates the great portion of humanity when obstruct the total or partial access to the benefits of this progress.

Authors such as, SAGASTI and AREVALO (1999, p. 247) illustrate the LA condition based on the average wage per population of the region. This wage, that in 1990, reached around US \$ 2,000.00, if increased in sustainable manner (annual rate of 6%) and supposing, at the same time, that the economy of countries of the Organization for the Cooperation and Economic Development (OCDE) – where the average wage per population, was around US \$ 19,500.00 in 1990 – if this increased also in the sustainable manner (annual rate of 2%), LA will take around 60 years to reach the average income per population of OCDE.

With modest strive, there will need some 40 years for the region to reach the level of the income per population that OCDE had in 1990, and 30 years to reach to the level of 1965. This indicates that, although supposing the increase in the average income per population of 6% per year, during the minimum period of three decades – that is possible, but not probable, considering that, in the last decades, this indicator didn't surmount 3,3%. In 2020, LA will have the economic level similar to those developed countries 25 years ago, argument the authors.

According to the studies carried out by the World Bank, the history of Latin American countries points out for the common needs, like as to harness a satisfactory socio-economics performance, adequate training of human resources, performance in the competitive basis in the enterprise sector, mechanisms of integration to the world economy, and macroeconomics policy that contemplates adequately these needs.

The essence of this study, published in the beginning of the 90', already had sketched, in simple manner, through the Sabato's Triangle, one conceptual configuration that kept updated for present use, although it had proposed 35 years ago.

2 SÁBATO'S TRIANGLE: CONCEPTUAL BASIS

In 1968, JORGE SÁBATO and NATALIO BOTANA published one article in the Argentine news "Revista de la Integración", that was a strong argument for shifting the existing paradigm. The contents, advanced for the time, especially considering the era of dictatorship environment in LA, keeps updated, and is recourse issue in discussions on relationships between government, productive sector and the infrastructure of scientific-technologic as the basis for development through innovation.

The article entitled "La ciência y la tecnologia en el desarrollo futuro de América Latina", constitutes the conceptual basis that permeates afterwards broach on the issue, in spite of distinct focus that exploits the triangulation in its multiple dimensions. Contemporary author, REIS (2000:110) describes the arguments defended by SÁBATO and BOTANA, which sustained that the surmount of LA underdevelopment will be possible only by emphasis given to S&T (Science and Technology) in the development process, through actions in the fields of scientific-technologic research. Four arguments were highlighted:

- Technology absorption that every country must, necessarily import is more efficient if the receptor country had an availability of solid infrastructure of scientific-technologic sector. This infrastructure only can create, maintain, and prosper through the action of the research itself.
- The intelligent use of natural resources, raw materials, man power and capital, require specific researches of each country;
- The transformation of LA economies to fulfill the needs of industrialization and exportation of these countries, and;
- Science and technology as the propeller of the social change.

To make these arguments viable, the government, the productive structure and the scientific-technologic infrastructure of the countries must be interacting in the coordinated manner. In this paper, the productive infrastructure will be considered as the company and the scientific-technologic infrastructure as the university, thus composing the Sabato's Triangle, as shown in Figure 1.

The relations among the three vertexes – government, university and company – arises three configurations: the intra-relations inside each vertex: the inter-relations among three vertexes: and the relations with external boundaries or extra-relation.

- **Intra-relations inside each vertex:** Relations that establish inside each vertex have as a basic objective to enable institutions to create, to incorporate and to transform the needs in the final product that is the scientific-technologic innovation. This is attributed to institutions in each vertex having the particular connotation with each of vertexes considered:

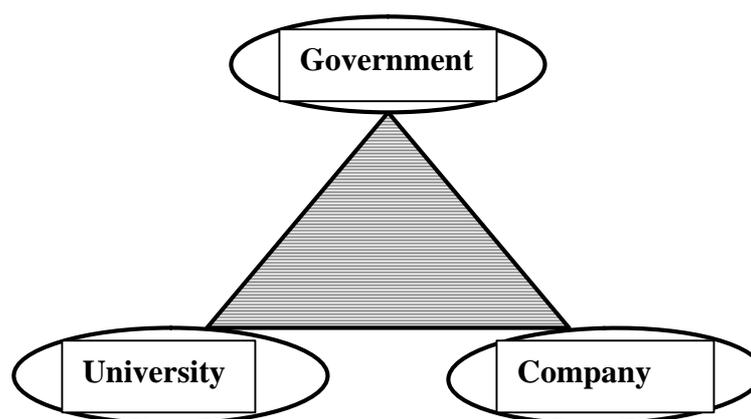


Figure 1- Sabato's Triangle

- **Inter-relations among the three vertexes:** Relations that establish among vertexes can be vertical inter-relations, between government and scientific-technologic infrastructure, or between government and productive structure; or horizontal inter-relations, between the scientific-technologic infrastructure and productive structure;

- **Relations with the external boundaries or extra-relations:** Societies don't live isolated, thus each vertex or all triangles relates with external environment. Each vertex or all triangles relate to the external environment or with structured triangles. The extra-relations manifest, for example, in the scientific interchange, in the foreign commerce of technology and the adaptation of the imported technologies.

In spite of the dynamic systems that permeate the three vertexes, it is in the relations with the external boundary or extra-relations that the universities, especially of the technology based – supported by the government and by the companies – must search, with more systematized manner, the interchange of knowledge required to the S&T to fulfill its role in the development of the LA, through actions in the field of the scientific-technologic research, thus fulfilling the four arguments proposed by SÁBATO and BOTANA.

3 INTERNATIONAL ACADEMIC COOPERATION IN THE BOUNDARY OF THE SABATO'S TRIANGLE

Since SÁBATO and BOTANA designed the Sábato's Triangle, the importance of the knowledge in the societies happen to be considered as a strategic factor. Regarding to this matter, Conceição and Heitor (apud REIS:32) argument that the welt and well-being of individuals, organizations and countries settle increasingly in the creation, diffusion and utilization of the knowledge, being that the concepts such as capabilities to learn, the creativity and the sustained flexibility arises with renewed vigour as principles of orientation to the behavior of individuals, of institutions, of nations and regions.

The knowledge can be explicit (or codified) as tacit (or implicit). The explicit is the formalized knowledge and structured, that can be manipulated as an information, whereas that the tacit is restrained in the beliefs, values, knows and individual skills or of the know how of the organization. Furthermoe, LUNDVALL (2002:202) considers that the shared learning is the key to the tacit knowledge generated jointly and can be learned by the exchange with other persons, which leads that the tacit knowledge can be disseminated by the process of interchange and cooperation.

The boundary of the Sábato's Triangle comprises the external environment on which the universities can magnify by updating and interchanging their own knowledge, through interchange and cooperation processes, using as the means the international academic cooperation.

According to the document entitled "Analysis and Potentialities of the Ibero-American Cooperation in Higher Education" (2000), published by the Secretary of the Ibero-American Cooperation (SECIB), the role and functions of the international cooperation in the higher education suffered profound conceptual and instrumental changes in last ten years, due to the pressure of modernization and appropriateness of the institutions of higher education [...]. More substantial evolution produced in the change of perception over the international academic cooperation, surmounting the concept of cooperation understood as an end to obtain financing benefits, to a strategic instrument for institutional enhancement, provoking important changes in the role of the organisms and actors, over different instruments of cooperation, in the management processes and in the financing schemes. About financing, DIAS (2002:2) considers undeniable fact that the international cooperation has special importance:

- As fundamental political instrument and programs turned to the development of countries;
- For promotion of the competitiveness and access to new knowledge as much in terms of scientific, technologic and productive;
- For a consolidation of the regional blocs resulted from the better understandings among partnerships.

In this context, RIBEIRO (2002:66) arguments that the international academic cooperation implies the transmission for students, professors and administrative staff of the universities, new knowledge and skills that allows to act in efficient manner in the international and multicultural environment. By this process, can foresee the organization of one set of activities and programs of international standard that operate in the academic sector, such as the integration of international dimension in professorship, the organization of specific courses to the foreign community, the development of joint research, studies of distinct cultures and social systems, the technical assistance and the support to the development of interchanging countries.

Meanwhile, SARAIVA (2002) alerts to be aware of that the universities, referring to the nationals, needs to conquer the place in the contemporary international relations as still couldn't find the better manner to exploit the possibilities of its internationalization. The answer to the international challenges yet has been carried out in authoritative manner, isolated, dislocated of the productive and cultural processes generated by accelerated pace of the internationalization of the societies.

4 ANALYSIS OVER INTERNATIONAL ACADEMIC COOPERATION

This analysis, over international academic cooperation, resulted from participative process of ministers of education, counsels and university associations, directors of organizations and cooperation programs, specialists in international university cooperation, published in the above mentioned document by SECIB, has reached, among others, to the following conclusions:

- Although there are some well planned and productive programs of international academic cooperation, yet perceives a dispersion, dislocation and few coordination;
- Also is known in the universities the generalized absence of institutional policies and strategies for a cooperation, so that the impact of the initiatives of fomentation of the related cooperation is lesser;
- almost all the initiatives analysed contemplate primordially universities, taking an account few effort of the ministries of learning and other government sectors related to the higher education, that are also the actors of the cooperation;
- Perceives the deficiencies in the organizations and in the management capabilities of some initiatives, as well as an excessive dependence on self-willed and the extent of objectives in view of available means, provoking dispersion in the activities and lesser impact of cooperation.

The statement on science and the use of scientific knowledge, published in the World Conference on Science (ICSU:1999) brings that the building of scientific capability must be supported through regional and international cooperation, assure right development, divulge and utilize the human creativity without discrimination to any country, group or individuals. The cooperation among developed countries and emerging countries must be executed in conformity to the principles of open and total access to information, equity and mutual benefits. In all cooperation efforts, diversity of traditions and cultures must be respected.

According to Conceição and Heitor (op. cit.), the accumulation of knowledge signify the learning, not in the strict sense of individual formation, but in more broad context, where can speak about the organizational, national and regional formation. The international ambit can be added to other proceedings, to complement the argument proposed by authors.

This manner, two challenges are present to international academic cooperation: the first refers to the building and management of the knowledge, and at the same time, exchange through extra-relations; the second refers to the format of university structures capable to impulse the management dynamics of the process and exchange of knowledge. According to LEVY (apud CHERMANN:91) is the circulation of the association and the metamorphosis of the thinking communities that births the "Knowledge Space". [...] . The members of the collective intellectual co-produce, manage, continually modify the virtual world that express its community: the collective intellectual learn and creates all the time.

5 CONCLUDING REMARKS

In spite of privileged locus of knowledge building, compete the universities to intensify the efforts of internationalization by two demands that make relevants. The first refers to professionals graduated that will face increasingly the challenges imposed by the globalized market, thus requiring the universally open graduation. The second refers to the needs of the international cooperation aiming increments in the S&T sector, thus comprising, university, with other two vertexes of Sabato's Triangle – government and company – the strong triad required for LA to face the challenges of development and competitiveness.

NOTE

1. Professor of Postgraduate Program in Technology
1. Graduate student in Technology Program

REFERENCES

- DIAS, L.de C. (contribuição). *Perspectivas das Relações do Brasil com os Países da América do Sul*. In: Seminário "Política Externa do Brasil para o Século XXI". Brasília, Câmara dos Deputados, 13 a 15 de ago. de 2000.
- LEVY, P. *A cultura da informática e a educação*. In: Conferência Universidades da América Latina. Memorial da América Latina, São Paulo, 1996.
- LUNDVALL, B.A. *Políticas de inovação na economia do aprendizado*. Artigo publicado na Revista Parcerias Estratégicas, Brasília, Brasil, número 10, p. 200 - 218, CGEE/MCT, 2001.
- REIS, D.R. *Contributos para a melhoria de eficiência e eficácia nas relações de cooperação entre universidades e pequenas e médias empresas industriais brasileiras*. 2000. 377p. Tese de Doutorado - Secção Autónoma de Gestão e Engenharia Industrial, Universidade de Aveiro, Portugal.
- RIBEIRO, P.J.G. *Adaptação organizacional estratégica na instituição de ensino superior, por meio da internacionalização: o caso da Universidade Católica de Goiás*. Dissertação de Mestrado. Programa de Pós-Graduação em Engenharia da Produção, Universidade Federal de Santa Catarina. Florianópolis, SC. 2002. 133p.
- SAGASTI, F.R., ARÉVALO, G. *A América Latina na nova ordem global fracionada*. In: A nova ordem mundial em questão. José Olympio: Rio de Janeiro, 1999.
- SARAIVA, J. F.S. A universidade e as relações internacionais. CorreioWeb, Correio Braziliense, 18 fev. 2002.
- SECRETARIA DE COOPERAÇÃO-IBERO AMERICANA (SECIB). *Análise e Potencialidades da Cooperação Ibero-Americana no Ensino Superior*. Madrid, Espanha, 2000.
- UNESCO ICSU WORLD CONFERENCE ON SCIENCE. *Declaration on Science and the use of scientific knowledge*. Budapeste, 1.o jul. 1999. Available in <URL:http://www.unesco.org/general/eng/programmes/science/wcs/eng/declaration_e.htm>. Acesso em 27 dez. 2003.