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Countervailing institutional forces that shape internationalization of science: an analysis of Brazil's Science without Borders program

Ronald Martin Rivas [a,*], Shawn Mullet [b,c]

[a] *Canisius College Department of Management, Buffalo, United States*
[b] *Boston International Communication Consulting (BICC), Boston, United States*
[c] *CommxBorders (CxB), Boston, United States*

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Abstract

This paper theorizes on how globalization and localization affect internationalization of science and analyzes the institutional trajectory of Brazil's large scale program, now suspended, Science without Borders (SwB). Counter to the main goal of SwB, our analysis of the historical genesis of Brazilian science institutions reveals a systemic pull toward localization that dampens internationalization. In addition, our analysis of geographic diversification of grants highlights a missing link in the study abroad value chain, which is a lack of training for global skills. The primary area of concern has been to improve language proficiency. What receives less attention is the development of additional skills, such as a student's ability to adapt to the foreign academic environment, that are critical to cultivation and maintenance of long-term professional and institutional relationships. The missing link of service ought to include improved language proficiency, but go beyond that by working with students to provide the cultural, communication, learning, social, and academic skills that are often assumed in the new foreign environment but are not so evident in the country of origin, such as Brazil.

Keywords: Internationalization; Institutional environments; Institutional trajectories; Latin America; Brazil; Higher education in STEM

Introduction

What are the institutional forcers shaping internationalization of science? The importance of understanding the global value chain of higher education in the 21st century is paramount. Governments fund large numbers of international students; universities recruit foreign students, build alliances to enhance their global reach, build offshore campuses with the purpose of reaching foreign markets and expand their global brand name recognition (de Wit, 2002; Scott, 1998; Wilkins & Huisman, 2012). Recent example of governments funding initiatives are President Obama's "100,000 Strong in the Americas" and Brazil's "Science without Borders." With respect to the cross-border movement of students, just in the 2013/2014 academic year there were 886,052 foreign students in the U.S., whereas in 2012/13 there were 289,408 American students abroad (IIE, 2014). From 2008 to 2012 approximately 85% of international students in the United States attended colleges and universities in 118 metro areas. Over this period the economic impact of these students totaled approximately $34.6 billion with $21.8 billion of that total coming in the form of tuition payments. Higher education represents a major services export (Ruiz, 2014).

Brazil has been consistently underrepresented in terms of the number of students studying abroad. To correct for the specific issue of underrepresentation in STEM (Science, Technology, Engineering, and Math) fields not only in American universities, but ones around the world, and harness the power of STEM as a driver of modern economies, the Brazilian government engaged in an ambitious effort to internationalize science through its Science without Borders (SwB) program, a series of scholarships/grants with the primary goal of giving Brazilian STEM

* Corresponding author.
E-mail: rivasr@canisius.edu (R.M. Rivas).

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students the opportunity to study abroad. Under increasing economic pressure, the SwB program was suspended indefinitely on September 22, 2015 after sending about 87,000 students abroad at a cost of RS 6.4 billion (approximately $3 billion). Although Brazilian officials shared expectations to reopen it once the economic situation improves (Chade & Vieira, 2015), there are increasing calls for an evaluation of the reach and effectiveness of the internationalization achieved by the SwB (Vieira, 2015).

In terms of the institutional framework that facilitates the internationalization of science, SwB represented governmental support for sending students abroad, while foreign universities were experienced in teaching STEM fields to international students. Even prior to the decision to suspend SwB, questions arose concerning the overall efficacy of the program in terms of the global value chain of (GVC) higher education and the internationalization of science. At the level of the individual student there were numerous cases of the GVC breaking down and the student returning home having failed to reap the desired benefits necessary to justify the cost. At both the individual and institutional level this breakdown undermined the creation, deepening, and durability of relationships that are essential to the long-term efficacy of SwB in terms of promoting the internationalization of science in Brazil. In the absence of more meaningful relationships what remains is purely transactional, based on the host institution's desire to receive international students who pay full-tuition and Brazil's willingness to pay.

Our research explores the effectiveness of SwB and the internationalization of science in Brazil. We review the genesis of the institutional framework supporting the internationalization of science in Brazil and analyze the scope of internationalization achieved by the SwB thus far. We examine what is missing in this global value chain and how it can be improved to produce superior results in terms of improved student performance and more durable institutional relationships. First, we review the literature on institutional forces of globalization, localization and internationalization of services, and we propose an analytical framework to study the internationalization of science. Second, we analyze the institutional framework supporting the SwB program and we analyze its institutional genesis and the scope of its internationalization. We finish with discussion and recommendations.

Literature review

Institutional trajectories, localization and globalization of science

According to North [1991:97], "institutions are humanly devised constraints that structure political, economic and social interaction, that consist of both informal constraints—sanctions, taboos, customs, traditions, and codes of conduct—, and formal rules—constitutions, laws, and property rights" (North, 1991). Institutional theory sustains that organizational survival depends on conforming to the rules and belief systems prevailing in the institutional environment (Meyer & Rowan, 1977). A drive for legitimacy by conforming to the main institutional logic eventually results in institutional isomorphism, that is, a similarity of patterns of organizational behavior and responses (Dacin, Goodstein, & Scott, 2002; DiMaggio & Powell, 1983; Scott, 1995).

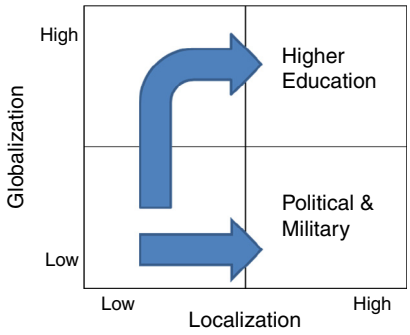

Fig. 1. Institutional trajectories: a framework to analyze internationalization of sciences.

We propose that institutional isomorphism plays a fundamental, although seemingly paradoxical, role on the internationalization of higher education in STEM. On one hand, the emergence of a global, knowledge-driven economy has increased the demand for creation and application of new knowledge worldwide (Deepak, 2008), but paradoxically the vast majority of higher education institutions have only pursued small scale mobility of individuals rather than expanding by investing abroad to seek knowledge-creation opportunities in a global community of learners.

This paradox becomes evident when institutions supporting internationalization of science face two countervailing forces, namely, globalization and localization. Globalization is the worldwide integration of countries along political, economic, technological, socio-cultural, and ecological lines. Localization is the process of responding to country-specific political, regulatory and cultural conditions. Localization could also manifest in limited regional integration comprising neighboring countries (e.g., Andean Pact, MERCOSUR) or countries with a common geographic domain (e.g., APEC, EU). Regions are often defined by national agreements, which are crafted to regulate trade among neighboring countries or to reduce the prospect of military conflict.

To analyze such paradox we employ a graphical model shown in Fig. 1 that represents two systems of beliefs driving internationalization of STEM sciences. One system that requires sharing knowledge and discovery across borders (globalization of knowledge); another that demands keeping knowledge proprietary and country-specific (localization of knowledge). Consider for example the case of internationalization of nuclear science, which is the quintessential science where these forces become evident. On one hand, higher education organizations—ever pursuing the creation of wider communities of learners—push toward globalization of (nuclear) knowledge. On the other hand, political and military organizations, whose mandate is to keep nuclear weapons and knowledge secret, push toward localization