# Internationalisation of Research in the Colombian Tertiary Education Sector

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## Introduction

Higher education institutions (HEIs) are facing a process of global transformations in the field of research, by globalization and the knowledge society; however, in every region of the world different characteristics and trends are presented. Colombia owes its science, technology and innovation scheme to the collaborations with countries around the world. The Colombian PhD programs, which mostly began to develop in the 1990s and 2000s, were an outcome of Colombian cooperation with Spain, United States, France and Germany. Historically, these countries have been popular destination for Colombians to obtain higher education training primarily at the postgraduate and doctoral level.

Internationalization is a central vehicle for scientific diplomacy, as it is a transversal process to the missionary and support functions of an institution, whose main objective should be to improve the quality of the processes, projects and programmes of a given university. According to Knight (2015) "internationalization at the national, sectoral and institutional levels is defined as the process of integrating an international, inter-cultural, or global dimension into the purpose, functions or delivery of postsecondary education" (p. 2). For universities and tertiary education institutions, international collaborations in science, technology and innovation are linked to their international positioning strategy, as well as respond to institutional priorities and government plans. Woldegiyorgis, Proctor & De Wit (2018) explain that one of the rationales for the internationalization of research, is a more competitive agenda related to the increased productivity of individual researchers, their institutions, and their nations. To promote the internationalization of research, it is necessary to have two specific conditions, according to the authors Castro, Jonkers and Sanz-Menéndez

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(2015): well-related researchers and institutional conditions, in order to support researchers, who manage international resources for research:

> Most of the evidence about the internationalisation of scientific research often considered it to have been driven primarily through individual level self-organized networks of scientists. This, however, is not the only aspect of the internationalisation/Europeanisation process. Organizational level strategies can also play a role. Here, strategic internationalisation understood as the commitment of resources at the organizational level is different from encouraging or rewarding individual 'spontaneous' international collaborations (p. 5).

Scientific diplomacy has been described by various authors in different ways. Safdari and Elyasi (2019) describe scientific diplomacy as a way of representing the particular interests of countries internationally. Similarly, Gluckman, Turekian, Grimes and Kishi (2017) explain that the scientific diplomacy exists in order to highlight national interests internationally and to address the specific needs of countries. The idea of knowledge networks for science, according to Vessuri (2013) has allowed a horizontal culture to develop between researchers from different countries, where researchers becomes important agents of change and approaches different cultures through their work.

This article focuses on science diplomacy in Colombia, highlighting the internationalization of research in the tertiary education sector. It notes that the internationalization of research has become an important requirement that universities have to demonstrate when thinking about the accreditation of programs or institutions.

## Universities and the Higher Education Sector

Universities have been a historical epicenter of scientific diplomacy in Colombia. Institutions such as the *Universidad Nacional* or *Universidad de Antioquia* in Medellín, which received support and funding from countries such as Germany and the United States, created academic programs, laboratories, research groups among others with support from entities such as DAAD (German Academic Exchange Service), USAID (United States Agency for International Development), and support from various embassies and cooperation agencies. This supported the promotion of international mobility among researchers from Colombian universities to collaborating countries, providing them with an access to high-level training and research activities.

Historically, scientific diplomacy related with higher education has been observed mainly at the level of capacity building, with examples such as scholarships to access masters and PhD studies abroad. Likewise, Colombia offers in consideration to its international cooperators, the possibility of accessing full scholarships for postgraduate and doctoral programs in Colombia; This program is managed by the Colombian Institute of Educational Credit and Technical Studies Abroad (ICETEX, 2020), an entity delegated by the Colombian government to oversee, disseminate and manage oversees scholarships for Colombians as well as for foreign researchers who intend to access scholarships in Colombia.

In 2015, the Colombian Ministry of National Education published a compendium of guides to support the knowledge creation in Colombian higher education institutions, with the aspect of internationalization. One of them, the *Guía de Internacionalización de la Investigación* (2015), which was conceived for the subject of internationalization of science, there are various tools to promote international cooperation in science, technology and innovation which can be followed by Colombian higher education institutions. Some such as tools are, the mobility of researchers and students; the attraction of scientific diaspora; organizing scientific and technological missions abroad; and the promotion of high-level training such as masters and PhD programs.

According to a report published in 2013 by the Ministry of Education of Colombia, on the field of internationalization of research in higher education, universities collaborate with specific countries depending on the area of expertise for research. In the areas of engineering and technology, Colombian institutions cooperate with the United States, Spain, Italy, Brazil and Germany. In the area of agricultural sciences, it does so with the United States, Brazil, Mexico, Spain and Venezuela. In the case of social sciences, with the United States and Spain.

Regarding the implementation of instruments for the promotion of internationalisation of research, HEIs reported mainly having created specific funds to support the mobility of researchers, followed by the implementation of economic incentives to researchers by publications in indexed international journals and by the implementation of specific funds to provide counterparts to researchers participating in international projects (Ministerio de Educación Nacional, 2013).

There are some successful strategies for science diplomacy in the Latin American region, such as the *Alianza del Pacífico,* which was created in 2011 by the governments of Chile, Colombia, Mexico and Peru with the objective:

> To transcend the commercial sphere with the objective of strengthening joint and coordinated actions among the promotion agencies, as well as cooperation aimed at promoting the strengthening of the competitiveness and innovation of SMEs. Similarly, it seeks to promote research on climate change as well as facilitate student and academic mobility, migratory transit, among others (Alianza Pacífico 2015, p. 5).

This alliance has an axis of scholarships that allow for student and research-oriented mobility between partner countries. On a yearly basis, 400 scholarships are offered to students, researchers and teachers hailing from the four Latin American countries, wherein each country awards 100 scholarships. The focus study areas are business, finance, international trade, public administration, political science, tourism, economics, international relations, environment and climate change, innovation, science and technology, and engineering. In this way, the platform supports academic and research activities in Higher Education Institutions (HEIs) among the four countries cooperating under the *Alianza del Pacífico.*

Another program that has been very important for the establishment of collaboration networks among researchers and students from Colombia, Mexico and Costa Rica, is the *Programa Delfin*. The objective of this program is to strengthen collaboration between higher education institutions and research centers of participating countries. The mission of *Programa Delfín* is to promote academic mobility among professors, researchers, students for sharing of knowledge and scientific and technological dissemination, technological innovation and the development of postgraduate courses in Latin America. Led by Mexico, *Programa Delfin* since 1995 has been responsible for mobilizing students from universities and technological institutions to conduct research through exchanges during the summer, providing them with support and staff for their projects (Vergara, 2019). While the program began operations nationwide in Mexico, it soon expanded its spectrum to Colombia and Costa Rica. Today the program works at the network level by grouping and exchanging researchers and students. In 2019, 211 Colombian students were mobilized to Mexico; Colombian universities received 536 Mexican students for the support of research projects. In 2019, the virtual platform of *Programa Delfin* had 896 active and available researchers to receive international students within the framework of research projects (Vergara, 2019). Salinas-Polanco, Castillo-Vera, Márquez-Sandoval and Vizmanos-Lamotte (2014), consider that the participation of students in research during the summer is an important strategy to train professionals to become capable of being sensitive, analytical and able to solve problems present both in personal life and in society.

Currently, programs such as Horizon 2020 of the European Commission are also considered an important opportunity for interaction between Colombian and European researchers, in order to solve problems for societies from around world. Within the framework of the Marie Slodowska-Curie Horizon 2020 program, which seeks to structure the training of researchers, so as foster mobility and professional development, 241 Colombian researchers have participated in these actions, between 2014 and 2020 (Fonseca, 2019). The majority of the scientific collaborations in the framework of this program are conducted with Spain (42 collaborations), Germany (24) and Great Britain (22). Likewise, issues such as the Sustainable Development Goals lead international cooperation for science, technology and innovation not only in Colombia, but in the world. According to the *Libro Verde* (Colciencias, 2018), a document with guidelines on scientific policy in Colombia, the focus of science, technology and innovation should

be the progress in solving complex problems that lead the country (Colombia) towards sustainable development.

At the government level, entities such as the *Servicio Nacional de Aprendizaje* (SENA), which is a vocational education oriented institution, cooperate with governments and agencies around the world for south-south, as well as north-south cooperation projects that generate knowledge exchanges for the strengthening of government projects. In the case of SENA, in 2019, there were more than 35 cooperation projects with foreign governments, especially in the areas of orange economy, industry 4.0 and digital transformation besides the agro ecological and agribusiness sector (SENA, 2020). Likewise, Colombia transfers knowledge to countries, especially in Central America and the Caribbean, on topics such as tourism, handicrafts, coffee production, etc.

According to a document published by the Spanish Agency for International Development Cooperation (Agencia Española de Cooperación Internacional para el Desarrollo, 2017), the Scientific Diplomacy in the Latin American and Caribbean region can be improved, if the following aspects are taken into account:

*For the governments:*

Recognize the value of Research, Development and Innovation (R + D + I) as:

- Key element to contribute to the prosperity and development of countries and to the generation of knowledge-based societies.
- Fundamental dimension in political decision making through expert scientific advice, based on evidence.
- Facilitator of international relations and key element for the external image of a country through a reinforcement of scientific diplomacy.
- Fundamental part of the industrial sector for the advancement of science, technological development and innovation.

*For the academic and scientific sector:*

- Expand the training of students, scientists and researchers beyond scientific-technical capabilities including skills in communication, management, leadership, multidisciplinary teamwork, negotiation, emotional intelligence and other qualities.
- Promote the exchange of experiences and training practices between scientists and public managers.
- Strengthen international and national networks of scientists and national academies of science to propose technical and scientific solutions to common problems in Latin America and the Caribbean to politicians and decision makers of public policies.
- Involve foreign scientists and nationals abroad in strengthening national science and technology systems and in the governance of universities and research centers through flexible formulas.

## Challenges and Way Forward

It should also be noted that an important challenge facing the Latin American and Caribbean region is bilingualism, which is very important when cooperating with international partners. Likewise, some scientific diplomacy schemes depend on their own co-financing by governments or higher education institutions; this is why it is necessary to propose more financing programs that promote the internationalisation of research, as well as improve the relationship between scientists, politicians and civil society. According to a study by Gacel-Ávila and Rodríguez-Rodríguez (2018) on the internationalisation of higher education in Latin America and the Caribbean, most of the tertiary education institutions that participated in the the study (56 per cent) reported of not having an institutional policy to systematically promote internationalization of research. Further, the study notes that the institutions did not have sources of funding to support the participation of researchers in international cooperation projects.

As a ray of hope, a document published in December 2019 in Colombia by a group of national and international experts called the *Misión de Sabios* (Gobierno de Colombia, 2019) recommends for the strengthening of research center networks, which would work hand-in-hand with industries and collaborate with international partners to promote the achievement of economic and sustainable development of Colombia.

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