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Faculty Perspectives on Research Collaborations between the U.S. and Mexico

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Abstract

The transfer of knowledge in science, technology, engineering, and mathematics (STEM) across countries is a common practice in academia, which is both timely and useful to achieve research collaborations. Through a qualitative research approach, using interviews and observations, five STEM Mexican professors shared their experiences and expectations in leading the research collaborations where professors and students participated. This qualitative inquiry utilized Sargent and Water's (2004) academic research collaborations framework, which highlights the interactive phases for achieving successful collaborations. The findings revealed that: 1) institutional support through department chairs' encouragement along with professors' leadership to expand research collaborations in both countries are favorable and 2) more resources to fund students' participation in international research collaborations and better climate that help students feel socially included and academically integrated to a new setting seem necessary. The article concludes with perspectives and implications for strengthening the research exchanges between the United States (U.S.) and Mexico. Among them, highlighting the positive impact that international research collaborations have for universities in both countries, the need to expand the funding for students' mobility overseas, and the improvement of English language training to strengthen students' connections, and, consequently, collaboration.

Keywords

research, international collaborations, higher education, STEM, United States, Mexico

1. Introduction

Over the last two decades, institutions of higher education have experienced an expansion in terms of capacity, extension, and, consequently, complexity (Altbach & Knight, 2007; McGrath, 2017). In effect, such complexity is the result of demographic changes, immigration patterns, international competitions, and demands for higher skills in the workforce (McGrath, 2017; Stewart, 2012). Furthermore, multiple are the challenges faced by postsecondary institutions, including 1) an increasing perception of students as merchandise and universities as businesses, placing in perilous conditions the generation of knowledge and the citizen role of students in society (Altbach, 2015), and 2) an imperative need to be able to adapt to change, create collaborations at different levels, and engage in personal and professional development that allows dealing with campuses diversity (Parker & Kingori, 2016; Schuh, Jones, Harper, & Associates, 2011).

The transformation of postsecondary institutions aligns with the globalization of a new era in the STEM leadership, which through internationalization, institutions deem necessary to carry out institutional agreements, cross-border activities, and alliances at an international scale (Cantwell & Maldonado-Maldonado, 2009). Consistently, the role of STEM faculty in working cooperatively overtakes individualistic approaches to generate knowledge (Beaver, 2001). As such, the importance of science for higher education goes beyond individual purposes; the development of science must be advantageous and beneficial for society as well (McFarlane, 2013). Likewise, the engineering profession is crucial for every country to gain visibility as a global power and improve the well-being of its citizens (Mohanty & Dash, 2016). Altogether, STEM fields in the United States (U.S.) face major concerns related to reduce the academic achievement gap among ethnic groups, enhance U.S. students' academic performance in international rankings, and lessen the differences in foreign students' college graduation rates compared to U.S. students (Gonzalez & Kuenzi, 2012). According to Watkins and Mazur (2013), in STEM fields, students should learn not only technical but also analytical skills, such as communication and teamwork. Similarly, professors should instill in students a sense of curiosity and an interest in innovation and creativity (Carter, Beachner, & Dauguerty, 2015; Roberts, 2013).

Besides, Altbach (2015) highlighted how "higher education has a central role for nations and societies that goes beyond science" (p. 3). This means that the exchange of knowledge must be significant for those sharing it and help in achieving equity in society. Knowledge sharing is increasingly taking place among higher education institutions at the international level (Carayannis & Laget, 2004; Lancho-Barrantes & Cantu-Ortiz, 2019) and especially in STEM disciplines (Landry, Amara, & Ouimet, 2007; Lee & Bozeman, 2005), where students and professors can work together on theoretical models and practical problems. According to Bozeman, Fay, and Slade (2013), research collaboration goes beyond co-authorship. The exchange of knowledge involves a "social process whereby human beings pool their human capital for the objective of producing knowledge" (p. 3). As such, the participation of students in international research projects expands their knowledge and network, where usually "sharing problem understandings and successful solutions" (Withycombe Keeler et al., 2016, p. 749)

are addressed. Also, Chang and Huang (2016) pointed out the importance of geographic closeness and cultural empathy for carrying out effective research collaborations in which professors and students can develop strong bonds. In this regard, Maldonado-Maldonado and Cantwell (2008) noted how academic collaboration between two borderland institutions, one from Mexico and one from the U.S., was framed by fears and desires related to history, in which "power, domination, subordination….and the border" influence such exchanges (p. 321). Furthermore, Melin (2000) highlighted that by analyzing international research exchanges at a micro level, that is at the individual level; individual, personal, and social factors play an essential role in data exchange and cooperative work.

1.1 Brief Overview of Scientific Exchange Approach

This article addresses the partnership between the U.S. and Mexico for scientific exchange purposes. A brief overview of how these two countries deal with knowledge research exchanges at an international level follows. In Latin America, in general, and particularly in Mexico, internationalization in postsecondary institutions is not a common practice even when institutions establish agreements with universities abroad (Berry & Taylor, 2014). One of the main obstacles concerns financial issues, especially at public institutions whose budgets are tight (Berry & Taylor, 2014; Sabharwal & Varma, 2015). Berry and Taylor (2014) noted how Mexican institutions utilize different approaches when it comes to internationalization. One of universities' strategies is seeking international partnerships to enhance research and sharing knowledge, especially if researchers are part of the Mexican National System of Researchers (SNI) and research productivity is closely tracked (Sandoval-Romero & Lariviere, 2020). Another strategy could be broadening their scientific collaborations according to the thematic studied with countries such as Spain, Canada, and Israel (Lancho-Barrantes & Cantu-Ortiz, 2019). Increasingly, Mexican postsecondary institutions perceive internationalization as a critical task "to compete globally and produce graduates who are well-informed about the world around them" (Berry & Taylor, 2014, p. 599). In this sense, Altbach (2015) and Lancho-Barrantes and Cantu-Ortiz (2019) indicated the difficulties and setbacks of countries whose postsecondary educational system struggles to compete at an international level. As such, Mexican institutions are at a disadvantage compared to other countries in which internationalization serves as a top priority.

Accordingly, the U.S., as an advanced nation in the generation of Science and Engineering (S&E) knowledge, produces 50% of the country's basic research through its higher education institutions (National Science Board, 2018) with a highly concentration in universities focusing on research known as Doctoral Universities (The Carnegie Classifications of Institutions of Higher Education, 2018). The U.S. focuses its research efforts on improving the economy by maintaining competitiveness with highly skilled employees (Freeman, 2015). In this regard, U.S. globalization as it pertains to S&E activities implies multiple aspects. One of these aspects entails research collaborations between U.S. researchers and international colleagues (Freeman, 2015). While the U.S. share the generation of S&E knowledge with other nations, the developing world (e.g., China, India, Brazil, and Iran) has begun making

important knowledge discoveries and taking a more active role in knowledge generation (National Science Board, 2016).

1.2 Conceptual Framework

A conceptual model on Academic Research Collaborations frames this study. Sargent and Waters (2004) developed a model creating an inductive process to understand successful collaborations. This framework is one of the most complete and comprehensive schemes found in the literature review including both multiple phases and influential factors (Gertler, 2017); therefore, we examined the practices of institutions and faculty as it relates to international research collaborations. According to Sargent and Waters (2004), success in research collaborations entails three aspects: First, objective goals (publications including journals, professional meetings, and grant proposals). Second, subjective goals (satisfaction at a personal and interpersonal level). And third, learning goals (knowledge acquired from the collaborative experience and research outcomes). The model highlights the importance of the context, the connection among the different collaboration stages, and the contribution of interpersonal abilities to collaborate successfully.

In the first layer, the model introduces the importance of institutional support mainly highlighting the role of faculty colleagues, information technology staff, and administrative personnel. In this regard, this study examines the critical role that chair departments have on encouraging and supporting international research collaborations. In addition, resources referring to funding may affect the type and scope of the project. However, other types of resources may encourage participation, such as access to specialized equipment, governmental support, and even researchers' incentives (Gertler, 2017). Certainly, the climate concerning the differences among universities in research collaboration approaches and professoriate development is also essential to booster collaborations (Sargent & Waters, 2004). The climate is remarkably different in each selected university, given that they are located in two different countries: the U.S. and Mexico.

The second layer consists of four research collaboration stages. In the first phase, professors' motivations to complement their research with other individuals' skills, knowledge, and data along with the interests in building long-lasting relationships with their colleagues are at the core of this cycle. In a second phase, researchers define the project's budget, scope, technical and logistic aspects as well as specific goals. In the third phase, research participants' roles are specified. In this regard, professors can take the role of mentor, advisor, or sponsor when undergraduate and graduate students participate. The final stage shows what successful collaboration looks like in terms of meeting publication goals, positive relationships, and learning outcomes (Sargent & Waters, 2004).

At the center of this inductive process, the essence of research collaborations lies in aspects such as integrity, trust, and communication. Such elements are vital to achieving a more productive and enriching learning environment (Sargent & Waters, 2004). It can be arguable that in international research collaborations, aspects such as reflectivity, flexibility, ongoing feedback among research teams,

agenda compatibility, and good research practices are of utmost importance (Gertler, 2017; Parker & Kingori, 2016).

2. Method

The paradigm framing this study is naturalistic inquiry. Naturalistic studies contribute greatly to better understand the experiences of participants' multiple realities who play an essential role in the inquiry process (Lincoln & Guba, 1985). In this study, participants' experiences were diverse due to their fields of study, workplaces, and research approaches. As such, the aforementioned factors shaped and influenced participants' kinds of experiences. In addition, the absence of similar research inquiries and a limited sample of participants framed the exploratory nature of the study. Essentially, Zainal (2007) defined an exploratory case study as "set to explore any phenomenon in the data which serves as a point of interest to the researcher…and open up the door to further examination of the phenomenon observed" (p. 3).

2.1 Definition and Purpose

In this article, short research stays are defined as *"scientific informal exchanges that are usually three months long"*. In such research exchanges, professors working at either U.S. or Mexican postsecondary institutions advise senior Mexican undergraduate and graduate students while conducting short research stays at U.S. universities. After concluding the three-month stay, the students go back to Mexico to finish their studies. The objective of this paper is to achieve a better understanding of the transfer of knowledge in STEM disciplines between the U.S. and Mexican universities in which Mexican students participate.

In this qualitative inquiry, the authors guided the interviewed faculty through the following research questions:

- What roles do STEM department chairs and faculty professors from U.S. and Mexican universities play in the process of research collaborations?
- What are the expectations of STEM faculty professors from U.S. and Mexican universities regarding the participation of Mexican students in research projects?

2.2 Participants and Settings

Before defining the purpose of the study and research questions, the authors exchanged information with the professors regarding their experiences in achieving international research collaborations. Some of the topics discussed along these conversations were related to university policies, time constraints, expectations of professors, research interests, and commitment of students.

The authors used purposeful sampling to select participants to achieve better insights into the phenomenon (Patton, 2015). The five STEM professors—working in both countries—were Mexicans with expertise in international scientific collaborations with Mexican students. To identify the potential participants for the study, the researchers searched for the binational research programs published by the Mexican National Council for Science and Technology (CONACYT), the Mexican equivalent to

the National Science Foundation (NSF). The authors sent 50 emails to professors receiving half responses. Some respondents were not retained because they were attached to other disciplines, or they had participated indirectly in international research collaborations. The five professors selected met the selection criteria and agreed to participate in this study. All five professors had experiences with undergraduate and graduate Mexican students participating in at least three-month research projects stays (see Table 1 for participants' demographics).

All five professors were males, and their first language was Spanish. The professors' names are confidential; hence, the authors identified participants as Professor 1, Professor 2, Professor 3, Professor 4, and Professor 5.

2.3 Data Collection and Analysis

To collect data, this qualitative inquiry utilized interviews and observations (Lincoln & Guba, 1985; Yin, 2009). All participants read and signed a consent form before the commencement of the interviews, which allowed them to have enough time to answer questions and clarify doubts. By interviewing participants, a researcher takes an active role in the interview process becoming the main instrument able to analyze data (Lincoln & Guba, 1985). Through a semi-structured interview protocol in Spanish, interviews lasted on average 45 minutes. Four participants were interviewed at their home institutions. One participant was conducting a short research stay; thus, the interview was conducted at the host university. Essentially, presenting information in Spanish provided more meaning and could relate to prior personal and/or professional experiences for a Spanish speaking audience. Besides, keeping the information in its original language enriched the analysis, especially when considering particular social and cultural assets related to participants and research settings (González y González & Lincoln, 2006).

All five interviews were audio-recorded. The audio records generated transcripts in Spanish. Each professor received his interview transcript to validate his responses, as this study used member checking to assure trustworthiness. Once the authors had the five transcriptions back, they started the analysis as the authors and participants share Spanish as their native language. The authors analyzed data using constant comparative techniques. Units of information, defined as "a unit of meaning stands for the smallest piece of information about something that can stand by itself" (Lincoln & Guba, 1985, p. 34) were sorted several times until categories and themes emerged. This study identified 179 units of meaning. Furthermore, 3 themes and 15 categories resulted from the data analysis. Because of the importance of the research questions, this study included only two themes and four categories. The authors defined the names of categories in English and translated the categories' content. Hence, findings included versions in English and Spanish. In this sense, Lincoln and González (2008) argued that when conducting research based on cross-cultural/cross-language studies, researchers should consider using bilingual information. Therefore, the inclusion of two different languages in one study can enrich its understanding and improve research outcomes (González y González & Lincoln, 2006).

2.3.1 Trustworthiness

To assure the rigor of this study, in addition to conduct observations, the authors used reflexive journals and member checking to guarantee the study's credibility (Erlandson, Harris, Skipper, & Allen, 1993; Lincoln & Guba, 1985). The use of reflexive journals allowed the researchers to describe and remember aspects of the settings and reflect on the interview content. The authors also documented observations of participants' attitudes and expressions which contributed to enrich the data analysis. Furthermore, member checks provided the opportunity to obtain feedback from the participants. By reading their answers, participants were able to explore their responses in-depth, make meaning of the findings, and propose future directions for the study.

3. Findings

A set of themes was found as fundamental to understand the perspectives of professors on their research experiences. The two themes comprise *Institutional Capacity in the Interchangeability of Scientific Knowledge* and *Professors' Perspectives of Mexican Students and the Educational System.*

3.1 Institutional Capacity in the Interchangeability of Scientific Knowledge

There is a myriad of individuals, actions, and activities that professors need to consider and carry out to achieve successful formal and informal scientific collaborations. STEM professors' experiences concerning the interchangeability of scientific knowledge yield the first research question: What roles do STEM department chairs and faculty professors from U.S. and Mexican universities play in the process of research collaborations? The contribution of participants allowed the codification of their responses as follows: Professors' leadership and Department chairs' support.

3.1.1 Professors' Leadership

The work of university professors goes beyond taking the role of instructors and researchers. Currently, the increasing engagement in research activities, often in interdisciplinary collaborations, illustrates how professors can influence others through their leadership. Such leadership is important at several stages of the research collaborations, but it is essential in the first phases of a project, where professors must be confident of its scope and positive impact on others (e.g., students and new junior faculty). The more experienced professors in research collaborations lead and participate in international professional meetings as Professor 1 addressed,

> "These binational conferences were supported by The National Science Foundation (NSF); I obtained a couple of grants [...] the purpose is to organize conferences between the U.S. and Latin America so that Latin America benefits." (Estas conferencias binacionales fueron apoyadas por NSF, consegui un par de becas [...] el propósito es organizar conferencias entre Estados Unidos y Latinoamérica, de manera que Latinoamérica se beneficie.)

Professor 1's leadership role has allowed improving the scientific collaboration between the two countries and by receiving NFS funding, this professor expands his visibility and credibility to successfully collaborate with other colleagues. In addition, the research collaborations are often the result of ongoing

interactions involving different university settings and entities, but with a research project interest in common. In this regard, Professor 2 and Professor 4 pointed out their leadership by managing engineering laboratories. Professor 4 commented,

> "Mainly, we work with air vehicles, with aerial robots, but we also develop terrestrial robots and systems of multiple agents, that is, several robots that work together to carry out a task in a more efficient way." (Trabajamos con vehículos aéreos principalmente, con robots aéreos, pero también desarrollamos robots terrestres y desarrollamos también sistemas de multiples agentes que son varios robots que trabajan en conjunto para realizar una tarea de manera mas eficaz.)

Professor 4's quote shows that Engineering professors work in the development of complex technological systems. Such complexity provides intellectual stimulation in which the promotion of finding innovative ways of addressing situations, the stimulation of intelligent problem solving, and the encouragement of appropriate decision making are critical in every research collaboration's participation. In essence, the extent by which professors perceive institutional support in terms of use of laboratory equipment and availability of resources in both the host and own institutions can be a motivation to carry out research collaborations.

3.1.2 Department Chairs' Support

To accomplish successful research exchanges, either by sending students to other institutions or receiving students from other countries, faculty members must be fully supported by institutional authorities. While most participants perceived support from their department chairs and deans, their opinions varied:

> "Fortunately, in the institution, both the rector and the director of research innovation of the university have the vision to make such partnerships." (Afortunadamente en la institución tanto el rector como el director de innovación de investigación de la universidad tienen la visión de hacer este tipo de colaboraciones.)—Professor 2
>
> "The institute gives us permission and freedom to contact people and try to collaborate at least informally, it means without agreements, with other researchers. They give us the endorsement to participate with the intention that later it becomes formal." (El instituto nos da el permiso y la libertad de contactar gente y tratar de colaborar al menos informalmente, quiere decir sin convenios, con los demás investigadores. Ellos nos dan el aval de participar con la intención de que mas adelante se haga formal.)—Professor 3
>
> "The rector gives you the acceptance and perceives positively research partnerships with other universities." (El rector te da como el acepta y ve de manera positiva a este tipo de relación con otras universidades.)—Professor 5

Professors perceive that high-rank university authorities look at the exchange of scientific knowledge in the form of international research collaborations as quite positive. Professors recognized chairs and deans' openness and willingness to expand and improve research activities at their institutions. Nevertheless, Professor 3 commented on the closeness of U.S. universities to exchange information or technology due

to national security reasons, making it difficult to develop international research collaborations with institutions overseas.

3.2 Professors' Perspectives of Mexican Students and the Educational System

Professors' opinion regarding the preparedness of Mexican students as it relates to their educational background and social interactions was controversial. Mainly, due to students' robust academic knowledge which contrasts with their ability to adjust socially in a foreign setting. In this regard, professors revealed interesting insights into the unique characteristics of Mexican students who decided to participate in research collaborations abroad. The reflection on the personal and professional characteristics of Mexican students to meet the expectations and participate in scientific exchanges frames the second research question: What are the expectations of STEM faculty professors from U.S. and Mexican universities regarding the participation of Mexican students in research projects? To respond to this research question, two categories frame this theme: Students' essential academic skills and Positive aspects of Mexican education.

3.2.1 Students' Essential Academic Skills

According to professors' responses, the technical and theoretical knowledge of Mexican students was appropriate to meet the requirements of courses and scientific collaborations with professors and students at U.S. universities. Professor 1 pointed out:

> "The technical preparation I do not think is any impediment for Mexican students, but certainly the English language is." (La preparación técnica no creo que sea ningún impedimento para los estudiantes Mexicanos, pero ciertamente el idioma lo es.)

In this sense, both Professors 3 and 5 mentioned:

> "At a technical level, they do not need anything, [...] the level of languages here in Mexico [...] we lack a second language." (A nivel técnico no necesitan nada [...] el nivel de idiomas aquí en Mexico [...] adolecemos de un segundo lenguaje.)—Professor 3
>
> "In first place obviously the language [...] It would be like not the most important but the most basic to be functional." (En primera instancia pues obviamente el idioma [...] Sería como no lo más importante pero lo más básico para ser funcional.)—Professor 5

Professors noted the importance of improving Mexican students' English language skills to fully and successfully participate in such collaborations when the setting is at U.S. universities. The mastering of a second language requires more than learning basic vocabulary in classrooms, it needs to be reinforced by finding different manners to practice it (e.g., reading books, talking to native speakers, or listening to music). Essentially, students need to develop not only basic English skills but also advanced abilities to understand complex technical concepts and problems, and especially meaningful interactions with foreign students and professors.

3.2.2 Positive Aspects of Mexican Education

Mexican higher education has advantageous aspects. All five professors acknowledged one advantage: the high academic quality of Mexican universities and research centers, including the Center for Research and

Advanced Studies of the National Polytechnic Institute (CINVESTAV), the National Autonomous University of Mexico (UNAM), the Mathematics Research Center (CIMAT), and the Autonomous University of Hidalgo, to mention a few. Some of these institutions have international prestige as they have been listed in renowned international rankings. In this subject, Professor 3 expressed:

> "Fortunately, in Mexico for every master's student who belongs to the national quality postgraduate program, there is a scholarship so that they can conduct research stays in Mexico or any prestigious institution abroad." (Afortunadamente en México para cada estudiante de maestría que pertenezca al programa nacional de Posgrados de calidad existe una beca para que puedan hacer una estancia de investigación en México o en cualquier institución de prestigio del extranjero.)

The benefit of having the financial support of CONACYT, the government agency, is evident for graduate Mexican students. Mexican students could take full advantage of this financial support and carry out short research collaborations in renowned national institutions or overseas. Altogether, students must prove a high intellectual capacity to receive and retain their scholarships.

Table 1. Basic Information of Participants

Professor	Age	Major	Years of professorship	Years of collaboration	Working in the U.S.	Working in Mexico	State/ Country
1	66	Mathematics and Statistics	32	30	–		Nevada, U.S.
2	35	Automatic Control	11	3		–	Hidalgo, Mexico
3	45	Electrical Engineering	14	14		–	Coahuila, Mexico
4	36	Technology of Information and Systems	3	3	–		Texas, U.S.
5	31	Electronic Engineering	4	3		–	Durango, Mexico

4. Discussion

All five professors shared similar experiences due to their international research collaborations and mentioned common expectations when conducting research projects with Mexican students. Nevertheless, professors composed a heterogeneous group in the sense that their geographical locations, level of expertise, and field of study differ greatly. The first research question analyzed the leadership and

relationship of professors with institutional authorities, in particular, department chairs and directors to maintain and increase international research collaborations.

Consistently, the leadership of department chairs and professors was an important factor in accomplishing successful research collaborations. Professors' leadership helped achieve that the interchangeability of scientific knowledge increases. The role that professors exercise as leaders, especially when they lead research collaborations, shows their attempt to satisfy higher-level needs of self-esteem and self-actualization (Hackman & Johnson, 2013). Furthermore, the favoritism of international publications over national journals in Mexico, promote professors' interest in international collaborations (Sandoval-Romero & Lariviere, 2020). As transformational leaders, professors' interactions with other collaborators and influence to attract students' interests are at the core of the academic research collaborations (Hackman & Johnson, 2013; Sargent & Waters, 2004). Likewise other studies, this study's finding revealed that by developing respect, trust, communication, and friendship among collaborators, researchers can achieve successful and long-term research collaborations (Gertler, 2017; Parker & Kingori, 2016; Sargent & Waters, 2004).

The second research question examined professors' expectations regarding the participation of Mexican students in the research collaborations. Professors addressed both the academic preparedness and socio-cultural awareness of Mexican students to perform satisfactorily in U.S. universities and some benefits of the Mexican higher educational system. On the one hand, all professors agreed that Mexican students who have collaborated in research projects in U.S. universities possess excellent academic skills, in fact, similar to their U.S. peers. However, Mexican students struggle with their social integration, as well as verbal and written communication skills in English. Students' shyness and introversion keep them away from building meaningful relationships with people from the host institution. Such behavior may be a consequence of being abroad and being new to a different culture (Coronado, 2009). On the other hand, a remarkable positive aspect of the Mexican higher educational system lies in the financial support Mexican graduate students have through scholarships. These scholarships help students focus only on their studies and provide the possibility to support short travels to foreign universities to participate in research.

The opportunity to integrate students in international research collaborations expands Sargent and Waters' (2004) framework, whose first layer studies at the institution level, the support, resources, and climate. We propose to broaden and integrate other elements to include external factors such as foreign funding and outer institutional requirements. Also, individual characteristics can play an important role, including participants' academic and cultural background as well as their level of expertise in research. All the aforementioned factors may have a great impact on the achievement of successful research collaborations (Contreras Aguirre & Gonzalez, 2021).

4.1 Recommendations

Based on the finding of this study, some suggestions to improve the quantity and quality of international research collaborations between the U.S. and Mexico are addressed next:

1) Highlight the positive impact on universities in both countries. Professors realized that while U.S. institutions benefit from the research outcomes where Mexican students participate, Mexican universities take advantage of the knowledge Mexican students acquire in U.S. universities. In effect, Maldonado-Maldonado and Cantwell (2008) highlighted the lack of symmetry in graduate students exchange between the U.S. and Mexico, increasing the differences and power relations of these two nations.

2) More support from federal, state, and institutional funds. Despite professors perceived positively the benefit for graduate students of receiving federal scholarships to be part of research collaborations abroad, professors also expressed concerns regarding additional financial support to fund binational research exchanges for undergraduate Mexican college students. In essence, Mexican post-secondary institutions need to align policies and practices; thus, students benefit from federal, state, and institutional funds. In this sense, Berry and Taylor's (2014) study pointed out the importance for students in gaining additional competencies when going abroad; however, limited funding is still a major barrier in Latin America.

3) Better English training for Mexican students to participate in international research projects. If Mexican students wish to compete with students from other nationalities in an Anglophone setting, the need to use better strategies for a second language acquisition becomes critical and imperative. For the most part, professors in this study and other scholars (Berry & Taylor, 2014; Chang & Huang, 2016) argued the necessity to improve students' English skills because language affinity may strengthen individuals' connections, and, consequently, collaboration.

5. Conclusion

The exchange of knowledge through research collaborations is a common and increasingly performed practice in postsecondary institutions. In performing conjointly research, not only universities seek to improve the research performance of professors, but also professors look for developing their skills as researchers, mentors, and advisors. In addition, professors noticed that students exposed to other work dynamics, scientific approaches, and leadership styles will eventually enrich students' prior knowledge and encourage them to pursue further studies, making a remarkable impact in their professional future. Lastly, the willingness of professors to send/bring students from disadvantaged countries comes along with a personal and ethical decision.

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