FOSTERING CROSS-BORDER LEARNING AND ENGAGEMENT THROUGH STUDY ABROAD SCHOLARSHIPS: LESSONS FROM BRAZIL’S SCIENCE WITHOUT BORDERS PROGRAM

By

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A thesis submitted in conformity with the requirements for the degree of Master of Arts Graduate Department of Leadership, Higher and Adult Education Ontario Institute for Studies in Education University of Toronto

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Fostering Cross-border Learning and Engagement through Study Abroad Scholarships: Lessons from Brazil’s Science without Borders Program

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Abstract

This study examines the potential benefits of participating in the Science without Borders (Ciência sem Fronteiras - CsF) program, a study abroad scholarship program created in 2011 by the Brazilian government. Like other scholarship programs, CsF seeks to foster human capital development and the internationalization of science and technology in the country. Differently from other programs, however, CsF targets undergraduate students in the sciences. While Brazil has received positive feedback for this initiative, critics have argued that insufficient planning may hinder this program’s ability to deliver desired outcomes. Thus, through a literature review and 20 interviews with CsF scholarship recipients at the University of Toronto, this qualitative study evaluates the program’s ability to promote important benefits. Although the study identified various student benefits, the research also found structural issues that prevented all participants from benefitting equally, demonstrating the importance of collaborative planning and implementation of study abroad scholarship programs.
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Julieta
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<tr>
<td>ACCC</td>
<td>Association of Canadian Community Colleges</td>
</tr>
<tr>
<td>CALDO</td>
<td>Calgary, Alberta, Laval, Dalhousie &amp; Ottawa Consortium</td>
</tr>
<tr>
<td>CAPES</td>
<td>Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazilian Federal Agency for the Evaluation of Graduate Education</td>
</tr>
<tr>
<td>CBIE</td>
<td>Canadian Bureau for International Education</td>
</tr>
<tr>
<td>CIE</td>
<td>Centre for International Experience</td>
</tr>
<tr>
<td>CNPq</td>
<td>Conselho Nacional de Desenvolvimento Científico e Tecnológico – National Council for Scientific and Technological Development</td>
</tr>
<tr>
<td>CONACYT</td>
<td>Consejo Nacional de Ciencia y Tecnologia – National Council on Science and Technology</td>
</tr>
<tr>
<td>CsF</td>
<td>Ciência sem Fronteiras - Science without Borders</td>
</tr>
<tr>
<td>ELP</td>
<td>English Language Program</td>
</tr>
<tr>
<td>STEM</td>
<td>Science, technology, engineering &amp; math</td>
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Chapter 1: Introduction

The Context of the Problem

International student mobility is not a new phenomenon. Already in the 7th century students, scholars and clergymen would travel distances to reach universities in other regions and countries (Rizvi, 2011). In the 12th century, after the creation of Europe’s medieval universities, students began to flock to specialized centers such as the University of Bologna, known for its faculty of law, and the University of Salerno for medicine (Perkin, 2006). The university of Oxford was actually established by English students who had studied at universities like Bologna and Paris. In this context, then, students and scholars would travel to study in a different city or country either to specialize or to interact with scholars in their field of interest. Today this phenomenon continues to be embraced but arguably to a greater extent. In fact, international student mobility has grown exponentially in recent decades, encompassing over 4 million students who study outside of their home country (Perkin, 2006; Rebolledo-Gomez & Ranchin, 2013; UNESCO, 2014).

There are various forces that have encouraged growth in international student mobility; yet, the process of internationalization, along with the discourse of globalization and the global knowledge economy, has been a major driving force (Gürüz, 2011; Banks & Bhandari, 2012; Bhandari & Blumenthal, 2011; Altbach & Knight, 2007; Rumbley, Altbach, & Reisberg, 2012). In fact, international student mobility is recognized as the most popular of all internationalization initiatives. Essentially, those who promote international student mobility suggest that it has the potential to open minds, to teach
essential skills and competencies for today’s global knowledge economy, and to promote international collaboration. These perceived benefits from international student mobility are considered critical for development and continuous growth, especially in countries that have historically lacked the capacity and infrastructure to increase talent at home. Knight actually points out that national governments that have recognized these benefits are resorting to internationalization and are sponsoring study abroad programs in order to foster human talent development and the creation of these important linkages (Knight, 2008, p. 30).

There is extensive research on the benefits of the study abroad experience. In general these studies have focused on the cultural gains and the concept of ‘global citizenship,’ which occurs when students gain intercultural communication skills and increased understanding of the world around them (Lewin, 2009; Hunter, White, & Godbey, 2006). Yet, more recently, some studies have also looked at the experience of science and graduate students and how study abroad has contributed to their academic learning and the development of international professional and academic networks (Pfotenhauer, Jacobs, Pertuze, Newman, & Roos, 2013; Mill, Johnson, Costa Mendes, Arena Ventura, & Seicenti Brito, 2014; Streitwieser, 2009).

A type of study abroad program that has become more popular in recent decades because it is believed to produce benefits for individuals and sending countries is the government-sponsored international scholarship program (Ortiz, Chang, Fang, & Y., 2015). Countries in Asia, Europe the Middle East and Latin America have been creating these scholarships because they believe in the link between study abroad, the development of human talent and socioeconomic development at home (British Council
& DAAD, 2014). However, research in this area is more limited than research of other types of study abroad programs. The literature on this subject looks at the purpose of these scholarship programs and to a certain degree analyzes the structure of particular schemes to understand how different program designs may impact their potential for success (Perna, Orosz, Gopaul, Jumakulov, Ashirbekov, & Kishkentayeva, 2014; Perna, Orosz, Jumakulov, Kishkentayeva, & Ashirbekov, 2014; British Council & DAAD, 2014; Perna, Orosz, & Jumakulov, 2015). Additionally, some studies have examined the practical benefits of these scholarships for the student and the sending country (Hassan, 1992; Celik, 2009; Luchilo, 2009). Much of the research in this area focuses on scholarships at the graduate level and does not look at scholarships supporting students at the undergraduate level. Moreover, many of these studies have focused on programs sponsored by countries in the Middle East, Europe and Asia, and little is known about Latin American efforts.

Yet, in recent years, countries such as Brazil, Mexico and Chile have created national scholarship programs in response to today’s global challenges and as a way to develop the necessary human capital and improve their higher education systems at home (ECD and The World Bank, 2010; Dutrenit & Bello, 2013; Batista de Albuquerque, 2013). In fact, Brazil offers a particularly interesting case, as in 2011 under the name of Science without Borders (Ciência sem Fronteiras - CsF) the Brazilian government developed its largest scholarship scheme, pledging over 100,000 scholarships for student mobility between the years 2012 and 2015.

The CsF program’s primary goal is to promote the internationalization of science and technology in Brazil by giving students the opportunity to attend and learn from
some of the best institutions in the world. This scholarship focuses on students in the STEM (science, technology, engineering and math) fields and it seeks to provide students the opportunity to learn and engage with scholars and professionals from around the world through courses and internship placements. However, another interesting aspect of this scholarship scheme is that its focus is on undergraduate students rather than graduate students. Aside from the size of the scholarship, it is this focus on undergraduate STEM students that has called the attention of experts and the media, who have been wondering and debating about the rationales behind this shift and its ability to succeed (Knobel, 2011; Moura Castro, Barros, Ito-Adler, & Schwartzman, 2012).

Yet, in order to understand the rationale behind Brazil’s CsF program, it is important to understand the Brazilian context and the country’s higher education system. The Brazilian higher education system is characterized by a high degree of differentiation. Aside from the fact that there are both public and private higher education institutions, it is also made up by a variety of institutions with different missions and responsibilities from small tertiary institutes to universities (Schwartzman, 2007). In total there are approximately 2,600 higher education institutions in the country from which 531 are public, and only 20 to 30 per cent of these are considered universities (INEP, 2014; British Council & DAAD, 2014). Thus, massification in Brazil occurred through the private and not the public sector. In fact, admissions to public universities are restricted and dependent on the successful completion of a national entrance exam. Maintaining quality of the public sector is the main driving rationale behind this selective system.

Quality, however, is also related to research activity, and this is evident in that
research in Brazil is for the most part done in public universities, which also hold the highest number of graduate programs (Pereira Laus & Costa Morosini, 2005). In fact, massification in the private sector has been largely in the form of low-cost disciplines such as social sciences, law and business. This also means, though, that only a small percentage of the higher education student population in Brazil is enrolled in graduate education in the STEM fields, resulting in a shortage of human capital necessary for Brazil to engage in research and innovation. Aware of this, the Brazilian government attempted to address this issue through federal plans established through the science & technology sector as well as through the education sector (Sá & Grieco, 2015; Ministry of Education, 2010; Ministry of Science and Technology, 2007). One such initiative has been to promote international student mobility through the CsF program.

As mentioned above, one of the most interesting aspects of this program is its focus on undergraduate students. Though the program has also put aside a number of scholarships for graduate students and young scholars, 64,000 of these scholarships have been set-aside for undergraduate students in the STEM fields. Study abroad scholarships are not new to the Brazilian context; in fact, the country has been providing scholarships through federal funding agencies such as the Brazilian Federal Agency for the Evaluation of Graduate Education (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES) and the National Council for Scientific and Technological Development (Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPQ) for decades. However, the focus on undergraduate students is distinct and unique to the CsF program.

According to CAPES and CNPq, the sandwich scheme has been chosen over supporting full-length Masters or PhD programs because Brazil is already equipped with
these programs back home (Moura Castro, Barros, Ito-Adler, & Schwartzman, 2012; Sá & Grieco, 2015). Others have suggested that the sheer number of scholarships could simply not be granted only to students at the graduate level considering that there are not enough students enrolled in graduate programs in Brazil (Knobel, 2011). Ultimately, however, it is still valuable to ask whether promoting international student mobility for undergraduate students in the STEM fields can effectively respond to Brazil’s needs.

Although Brazil has been commended for this initiative (Ossola, 2014; Stallivieri, 2015; Stevenson, 2015), since its creation the scholarship scheme has also been put to question, as experts have expressed concerns with its structure and, ultimately, with the government’s ability to sustain efforts in terms of financial and operational capabilities. A number of experts, for example, have questioned the goals and targets of the program, arguing that the numbers are unrealistic as there are not enough students in the STEM fields in Brazil qualified and prepared to engage and take advantage of this experience (Knobel, 2011). Others point out that the program’s processes have not been evaluated and structural decisions have been made without solid findings supporting them (Moura Castro, Barros, Ito-Adler, & Schwartzman, 2012). In addition, supporting students at the undergraduate level requires different resources than supporting graduate students, who are generally guided by their academic advisors, potentially creating more challenges for this scholarship program. The sheer fact that students at the undergraduate level are equipped with fewer skills and less knowledge regarding their field can certainly impact their ability to engage deeply throughout all the components of the CsF program (Brewer & Cunningham, 2009). Nonetheless, this program could also have the potential to elicit important benefits associated with study abroad. Additionally, this scholarship could also
foster a desire in students to pursue graduate education, potentially resulting in an increase of graduate students in the STEM fields in Brazil. Overall, these are valuable considerations that, if examined, could provide a better understanding of the capacity of this scholarship program to reach its goals.

Thus, through a case study of the CsF program, this thesis seeks to increase our knowledge of international student mobility in Brazil and Latin America, providing an analysis of a study abroad program designed and implemented to promote the expansion of science and technology at home. In addition, in order to inform the broader context of international student mobility programming, this thesis also seeks to uncover the structural factors that are necessary in a study abroad program in order to help foster critical benefits for the student that would encourage the development of human capital.

The Research Question

The following main research question has guided this project:

*How do students benefit from the experience of the Science without Borders Program?*

The literature suggests that students can benefit from study abroad programs in several ways. First, through study abroad students gain a cross-cultural experience, which allows them to benefit from intercultural learning as they learn to communicate with people from different cultures and with different worldviews (Lewin, 2009; Hunter, White, & Godbey, 2006). Similarly, when students study in a country where the language of instruction is different from their own, study abroad programs can also contribute to the development of foreign language proficiency (Varghese, 2008). Additionally, through the study abroad experience students gain new knowledge and perspectives within their
academic fields (Wainwright, Ram, Teodorescu, & Tottenham, 2009). The cross-border learning experience opens up new approaches to looking at similar phenomena and students may also be exposed to new technology and innovative methods that are still unavailable at home (Perna, Orosz, Jumakulov, Kishkentayeva, & Ashirbekov, 2014). This is especially relevant for study abroad programs that have been designed to increase the availability of high-skilled talent. Moreover, study abroad programs also result in practical benefits, such as providing meaningful work opportunities for the student and improving employment outcomes (Varghese, 2008; Streitwieser, 2009; Crossman & Clarke, 2010). Either by giving participants access to direct employment opportunities abroad, or simply by helping students gain an edge to compete in the global market, study abroad is often perceived as a factor that helps students succeed in the job market (Gates, 2014). This is because students that have studied abroad are perceived to be better prepared to face the challenges imposed by the global knowledge economy (Varghese, 2008). Along these same lines, study abroad can foster the development of academic or professional networks from which students can profit into the future (Wainwright, Ram, Teodorescu, & Tottenham, 2009; Mill, Johnson, Costa Mendes, Arena Ventura, & Seicenti Brito, 2014). These networks could either contribute to further study opportunities or more directly to job opportunities otherwise unavailable to the student.

In view of the potential benefits of such programs and using the case of the CsF program at the University of Toronto as the main unit of analysis, this qualitative study seeks to understand how far this government-sponsored international scholarship program is effective in promoting important benefits and which obstacles prevent it from doing so. Through a case study approach, this study employs document analysis and semi-
structured interviews as its methods. The University of Toronto was chosen as an extreme case, as it actually receives the highest number of undergraduate CsF students in the world, providing an unmatched scenario for analysis.

Overall, the study shows that students can experience various benefits through the three stages of the program: the transition period, the course component, and the placement component. Yet, certain structural characteristics have also presented challenges to participants and their ability to gain important benefits from the experience.

The open-ended structure of the program coupled with weak pre-departure orientation services was certainly a common theme that seems to have negatively impacted students’ transition into the CsF program. This had an effect on how students transitioned into the new culture and academic environment. Post-arrival orientation services served to create a better framework for the student to gain cultural competence and to prepare for the new academic experience. Nonetheless, for the most part, only those who participated in the English Language Program gained important insights about the differences between academic life in Canada and academic life in Brazil. Lack of orientation for those who were not offered these services negatively impacted their transition and failed to prepare them for the next step of the program: the course component.

The inclusion of both courses and a placement component appears to have created the conditions for highly driven students in certain fields to engage in cross-border learning and to create lasting professional relationships with their supervisors and peers. Yet, some factors have challenged the program’s ability to provide equal opportunities in terms of courses and placements for all students alike. During the course component
compatibility issues between degree systems prevented students in the health sciences from taking relevant courses, often affecting their ability to learn new content knowledge and develop relationships with peers and faculty in their field. This also affected them when searching for their placements, as networks were shown to be important for students searching for placements. During the placement component the unclear process to acquire a research or internship placement challenged many participants. At times this resulted in a match that did not foster desired benefits such as the strengthening of networks and future opportunities. Ultimately, these issues have impacted the extent to which CsF students are able to benefit from the program. To respond to these issues, several recommendations have been outlined in the final chapter of this study.

**Organization of the Thesis**

Following this introduction, Chapter Two presents a literature review and outlines the conceptual framework that has been used to guide this project and analyze its findings. Chapter Three discusses the methodology and methods employed to collect data, explaining the case study approach and the interview process. This chapter also provides a case background of the context of Brazil and the CsF program. In Chapter Four I present my findings, first outlining motivations and rationales, followed by factors that help students benefit from the program as well as the challenges that have impacted their experience. These issues are discussed in more depth in Chapter Five. In addition, Chapter Five offers a conclusion with recommendations for areas to focus in further planning of the program and also suggestions for further research.
Chapter 2: Literature Review

This chapter provides a critical review of the literature on internationalization and international student mobility that serves to contextualize my topic and research question. As a result, this chapter starts from the overarching topic of the internationalization of higher education, followed by a summary of what is known about the flows of international students and the rationales supporting this phenomenon. In addition, the following section provides a review of the implications of international student mobility on sending countries, which helps situate my research topic as it considers both the negative aspects and the positive outcomes of outbound mobility. Lastly, this chapter ends by providing a review of the literature on study abroad program design, which also results in a model onto which the structure of CsF program is examined in subsequent chapters.

Internationalization of Higher Education

In the realm of higher education the discourse of the global knowledge economy coupled with a strong conviction in human capital theory pushed countries around the world to invest heavily in internationalization initiatives (Gürüz, 2011). The pressures of globalization and increased global competition has compelled many higher education systems to seek a way to respond to these challenges and internationalization appears to offer countries a way to stay relevant. Knight provides the most cited definition of internationalization by describing it as, “the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of postsecondary education” (Knight, 2003, p. 2). From adding an international perspective to the
curriculum to promoting study abroad and exchange programs, internationalization is expressed by various initiatives not necessarily appropriate for all contexts, but individually relevant to particular needs and rationales.

Certainly, many postsecondary institutions such as universities have always had an international mission. Since the origin of the western university, universities have housed students from around the world and have studied issues looking at a comparative or international perspective (Perkin, 2006; Rizvi, 2011). Yet, today carrying an international mission helps these institutions swim the wave of change that the global economy has brought along. In fact, many countries and institutions believe that the process of internationalization is simply inevitable.

As it is the case for globalization, Knight (2006) suggests that there are economic, political and cultural rationales driving internationalization around the world. Economic rationales are founded upon a desire to foster economic growth and the belief that countries ought to develop their talent to respond to the needs of the global knowledge economy. For example, countries invest in international student mobility in order to obtain a high-skilled labor force able to communicate and interact with people from around the world. On the other hand, Altbach (2006) shares an example of political rationales when he explains that, during the Cold War, the USSR and the US would offer scholarships for study abroad in the hopes that this would reinforce alliances with other countries. Finally, cultural rationales are those that drive internationalization in order to foster greater cultural understanding between people from different countries and in order to increase the cultural capital of a country or community. Though these three rationales exist, they don't all have the same power of influence. Knight (2006) notes that economic
and political rationales are more prevalent than cultural ones. In terms of initiatives, international student mobility remains the most popular form of internationalization and way to promote the outcomes stipulated by these rationales (Gürüz, 2011; Banks & Bhandari, 2012; Bhandari & Blumenthal, 2011; Altbach & Knight, 2007; Rumbley, Altbach, & Reisberg, 2012). This is demonstrated in its exponential growth and popularity around the world as by 2012 there were already over 4 million students studying abroad (UNESCO, 2014).

**Flows of International Students**

Although many countries around the world participate in both inbound and outbound mobility, certain countries are more often categorized as sending countries rather than receiving countries. With 694,365 and 189,472 students abroad respectively, China and India are the top sending countries (UNESCO, 2014). Though countries in Latin America do not reach similar numbers, the number of students studying abroad from Mexico and Brazil has been increasing steadily, with Brazil surpassing Mexico in recent years (UNESCO, 2014). Germany, France and the US are generally categorized as receiving countries because of their stage of development, but these countries also send a substantial number of students abroad with 117,600, 62,400 and 58,100 students abroad respectively (UNESCO, 2014).

When looking at receiving countries, the US is the leading destination for postsecondary international students, hosting 21.1 per cent of all postsecondary international students (Rebolledo-Gomez & Ranchin, 2013; Gacel-Avila, 2012; UNESCO, 2014). Other top destinations are the UK receiving 12.2 per cent, France
receiving 7.7 per cent and Australia hosting 7.1 per cent of all students abroad
(UNESCO, 2014). In addition, a number of countries in Europe, Japan and Canada also
receive an important number of international students. Certainly, most receiving nations
are countries in the global north, but in recent years demand has expanded to include
emerging economies such as China, which receives 2.5 per cent of all international
students (Yang Xinyu, 2011; UNESCO, 2014).

**Rationales for International Student Mobility**

Although countries in the global north are both host nations and sending nations,
these countries play a greater role as destinations for international students. In fact, 90 per
cent of international students will choose a developed nation as their destination (OECD,
2013). Developed countries promote inbound student mobility because they perceive
direct and indirect benefits from this phenomenon. Direct benefits are evident in the
immediate financial gains brought about by having international students pay fees and
other expenses in their host destination (Banks & Bhandari, 2012). In fact, international
students invest a substantial amount of money on their international experience, adding
an extra source of income for the host nation. Thus, some nations are compelled to
promote inbound mobility because of economic reasons, and, in turn, they treat higher
education as an export.

Indirect benefits are less tangible; yet, Banks and Bhandari (2012) argue that
receiving nations will also benefit indirectly if foreign students decide to stay in the host
country after finishing their education and in order to enter the labour market. When this
occurs foreign students become part of their host nation’s talent pool and, thus, can have
a positive impact on this country’s economy. Altbach (2012, p. 42) points out that this phenomenon becomes even more critical when we observe that the major host nations are challenged by an ageing population and low domestic enrolments in STEM fields. He also notes that countries like the US, the UK, Australia and Canada have noticed the advantage of integrating international students into their labour market in order to fill in the gap and have, therefore, invested considerable resources in promoting inbound mobility (Altbach, 2012, p. 50). In fact, Tremblay (2005) adds that these countries have designed immigration policies to facilitate the permanent migration of international students.

Unlike developed nations, developing nations and emerging economies are seen mostly as sending countries (UNESCO, 2014). This notion would seem to suggest that the rationales supporting these countries in the global south to participate in international student mobility are different from those influencing countries in the global north. On the one hand this is true, as according to the literature one rationale motivating these countries to support outbound mobility is the need to increase their supply of higher education.

Perkins and Neumayer (2014) argue that partially the growth in the middle class in recent years can explain the exponential growth in international student mobility. The unmet demand for postsecondary education has pushed middle class families in China and India to look for educational opportunities abroad for their children (Yang Xinyu, 2011; Agarwal, 2011). Both of these systems are continuously growing making China the largest system and India the third largest, just after the US; yet, the demand continues to exceed capacity. In addition, both China and India together with other countries in the
global south face another issue of capacity. It is not merely that these systems do not have the necessary seats for all students, but it is also that these systems sometimes lack specific programs found in countries in the global north. For example, some of the most innovative PhD programs in science and technology found in North America and Europe are not available in countries in Asia and Latin America (Perkins & Neumayer, 2014).

In general, issues of capacity have compelled individual middle-class families to engage in outbound mobility. Nonetheless, aware of the economic importance of having a large share of the population attend higher education, in some cases even national governments promoted outbound mobility for capacity reasons (Bhandari & Blumenthal, 2011). National governments have done so by offering study abroad scholarships and they have validated these initiatives by arguing that the scholarships recipients can learn from innovative programs and contribute to their own higher education systems once they return.

Yet, similarly to receiving countries, sending countries also promote outbound mobility because they want to increase their availability of high-skilled talent and become more competitive in today’s global knowledge economy. Certain countries have developed policies and programs that promote mobility in order to increase the flow of skills and knowledge that can promote innovation and respond to the country’s developmental concerns (Banks & Bhandari, 2012). In China, for example, this movement began in the 1980s when Deng Xiaoping opened China to the world and decided that promoting student mobility could speed up development trumped during the Cultural Revolution (Yang Xinyu, 2011). In Latin America this rationale has also become evident in countries such as Brazil, Chile and Mexico which make references to the
creation of study abroad programs as a strategy to increase the availability of high skilled human capital at home (Mexico, 2007; Ministry of Education, 2010; ECD and The World Bank, 2010).

Overall, then, when comparing the cases of countries in the global south and countries in the global north, they both share rationales for promoting mobility. Just as in the global north, countries in the global south understand the importance of promoting and supporting study abroad programs in order to develop a high-skilled and flexible talent with essential skills for the global knowledge economy. Yet, more interesting is the fact that, as receiving countries, developed nations promote inbound mobility also to gain more talent from abroad, a strategy that presents a conflict to efforts in the global south to promote outbound mobility. Hawthorne (2012) points out that this has generated an ethical debate, where on the one hand countries in the global north spend resources to encourage inbound mobility and subsequent permanent migration, while on the other hand countries in the global south promote outbound mobility hoping that their students will return with new knowledge and skills to help develop their country. In this context, therefore, a conflict is created where both receiving and sending nations compete for the same talent. According to Perking and Neumayer (2014), more often than not, this results in a loss for the sending nation as their nationals decide to reside in their host nation because of employment opportunities and the promise of a better future. In fact, under the concept of brain drain, a plethora of research discusses how this situation may position international student mobility as a detrimental phenomenon for developing nations with high outbound mobility.
The Implications of International Student Mobility on Sending Countries

Some authors argue that along with increased academic mobility came increased permanent migration, which, in turn contributed to increased brain drain in the global south. The brain drain phenomenon can encompass the permanent emigration of any sort of high-skilled worker. Both Robertson and Vinokur mention that the term originated in the 1960s to represent a phenomenon in which people from less advanced economies would move to a country with a more advanced economy with the hopes of better employment, causing brain drain at home (Robertson, 2006; Vinokur, 2006). However, Dassin suggests that more recently the term has turned to refer more specifically to the impact of the general migration of high-skilled talent from south to north induced by globalization and the discourse of the knowledge economy (Dassin, 2005). This includes the permanent migration of students and scholars from one country in the global south to a country in the global north.

In general, the literature points to the negative impacts of brain drain on sending countries in the global south. Dassin (2005) has argued that countries in the global north are part of the problem. While they promote developmental ideas supported by international organizations with programs such as the Millennium Development Goals, these countries also promote high-skilled immigration, not considering the dangers of brain drain in the global south. Altbach (2012) argues that in this scenario, sending countries risk their possibilities of regaining high-skilled individuals trained abroad who could potentially impact their country’s socio-economic development. Additionally, brain drain can also have a detrimental effect on the progress of higher education institutions in
the global south. Essentially, these institutions’ lack of resources and infrastructure make it harder for them to reclaim their internationally trained scholars who have been exposed to world-class institutions in the global north (Dassin, 2005).

Overall, according to these scholars, brain drain exposes countries in the global south to great negative effects. As a result, when assessing the relationship between brain drain and international student mobility, it may seem that countries in the global south that support mobility through national scholarships may be playing a losing game with no students returning to work for their economy (Tremblay, 2005). Even when considering the case of self-funded students, Vinokur (2006) argues that sending countries may come to believe that they have wasted resources from funding the primary, elementary and secondary education of these migrants. Thus, in this light, international student mobility is a risky endeavor that puts to question whether sending countries in the global south should promote it at all.

Nonetheless, the literature has also looked at the positive implications of international student mobility. After all, sending countries that promote international student mobility share the belief that this initiative will elicit positive outcomes for individual students and their country. Through the creation of study abroad programs, these countries believe that they will be able to develop the necessary human capital to fuel development at home (Banks & Bhandari, 2012; Perna, Orosz, Gopaul, Jumakulov, Ashirbekov, & Kishkentayeva, 2014). Informed by human capital theory these initiatives are founded upon the notion that investing on sending students abroad can help these countries gain and accumulate new knowledge created by a more advanced country (Kim, 1998). Knowledge in this context does not only refer to content knowledge, but it also
refers to knowledge of different cultures, which along with other benefits become critical outcomes of the study abroad experience.

Certainly, one of the potential benefits of studying abroad is content knowledge gain. When students study abroad they may take courses or engage in practical placements related to their area of study where they are exposed to new knowledge or new perspectives to understand phenomena in their field. In the case of international students from the global south studying in the global north, the expectation is that the student will learn more advanced knowledge from higher education institutions that generally have greater participation in scientific production (Kim, 1998; Gürüz, 2011; Banks & Bhandari, 2012). Through this experience, students from the global south who study abroad have an opportunity to learn this content knowledge and bring it back with them once they return home, also impacting their country.

Additionally, for students participating in study abroad intercultural learning is also an important benefit because it helps these students improve their intercultural communication skills necessary to succeed in today’s global knowledge economy (Lewin, 2009; Hunter, White, & Godbey, 2006). By being immersed in another culture students can become aware of cultural differences and similarities and can learn to translate their views and respect the views of people from different cultures (Akli, 2013). In the same light, often students who study abroad gain greater language proficiency in a second language (Varghese, 2008). Generally, the focus is on English because it is the primary language in the world of science and business. By gaining greater cultural competence and proficiency in a second language, students are seen as global citizens who are better prepared to engage and respond to the challenges of a globalized world.
Another critical benefit of study abroad is the development of academic and professional networks. In certain study abroad programs students have the opportunity to build relationships with peers and faculty in their field or build linkages with individuals with whom they worked with during an international placement or internship (Wainwright, Ram, Teodorescu, & Tottenham, 2009; Mill, Johnson, Costa Mendes, Arena Ventura, & Seicenti Brito, 2014). These relationships can be beneficial because they may offer students future opportunities either through further educational opportunities, opportunities to collaborate in research or future employment opportunities. Moreover, the literature suggests that through study abroad students can also gain a competitive advantage in the job market, because of the positive traits developed through study abroad—such as adaptability and cross-cultural understanding—and associated with succeeding in the global knowledge economy (Varghese, 2008; Gates, 2014). Altogether, these benefits represent some of the positive implications of international student mobility for participating students. If countries that promote such study abroad programs are also able to mitigate brain drain, these countries could also experience the benefits derived from the new high-skilled human capital.

Aside from the more direct benefits described above, international student mobility can also have other positive implications that challenge the notions of brain drain. In fact, the emergence of the concept of ‘brain circulation’ has challenged this notion and has pointed to a new way of understanding the relationship between international student mobility, migration and development. The concept of brain circulation suggests that even in cases where students do not return right away from a study abroad program it does not
mean that the country has experienced brain drain because ideas can continue to circulate in other ways (Vinokur, 2006; Welch & Zhen, 2006; Saxenian, 2006). Essentially, these authors believe that the relationship between international student mobility and migration needs to be reassessed in order to take into account factors like the influence of the diaspora community on a country’s development.

Already in 1997, for instance, Kaplan’s (1997) study on the impacts of the South African diaspora on South Africa suggested that these individuals were involved in a form of brain circulation rather than brain drain. In this study, he argues that the scientific diaspora residing in Australia, New Zealand and the UK was eager to work with local scientists back in South Africa. This positioned them as a great source of knowledge and skills that could contribute to their country’s development, as they could bring with them not only scientific knowledge and knowledge of new technologies from abroad, but also an understanding of the local South African context. Welch and Zhen (2006) have also examined the influence of a diaspora by studying the case of Chinese high-skilled workers in Australia and their relationship to China’s economic and scientific development. In another study, Blachford and Zhang (2014) also demonstrate that the Chinese-Canadian diaspora of academics can also contributed to brain circulation in such a way that both countries felt they benefitted from this phenomenon. These authors point out that diaspora communities may have a positive impact on development as they can contribute to building the capacity at home needed for innovation and growth.

Focusing on cases of Taiwanese, Israeli, Indian and Chinese high-skilled migrants, Saxenian (2005; 2006) also examines the potential of the brain circulation framework by looking at how these individuals engage in this phenomenon after studying
and working in the US. More specifically, her case refers to foreign-born high-skilled workers in Silicon Valley who moved to the US to pursue graduate education and decided to enter the US labour market thereafter (Saxenian, 2005, p. 36). In her view the digitalization of communications and the lower costs of travel has prompted high-skilled migrants to return home either to work or establish new businesses while preserving their connections and networks in the US (Saxenian, 2006). As an optimal example of brain circulation, this pattern is also an exemplar of the ideal conditions of migration for development. With their integration into knowledge networks in the global north and increased investments at home, these high-skilled migrants are able to learn new knowledge at a faster rate and subsequently apply them in their own country.

Nonetheless, the brain circulation framework has its limitations, as it cannot be used to understand patterns in all countries in the global south. In fact, Saxenian (2005, p. 56) argues that this phenomenon takes place in developing countries or emerging economies that have invested heavily in higher education and are experiencing a politically and economically stable environment appealing to return migrants. In addition, Velema (2012) suggests that conditions at the host institution where high-skilled migrants pursued their studies also should be taken into consideration. In general, he suggests that students that are successful in developing strong international connections for future collaboration generally attend top-tier institutions abroad as opposed to other institutions. Moreover, a major tenet in the brain circulation literature establishes that foreign trained scholars who eventually engage in brain circulation were already the best and brightest in their country when they decided to study abroad and, therefore, already had the necessary foundations to make meaningful connections abroad (Saxenian, 2005; 2006).
Additionally, this literature argues that transfer of knowledge and skills can only occur if individuals had strong academic and professional relationships with local scholars at home prior to going abroad, which would allow them to collaborate in the future (Saxenian, 2005; 2006; Welch & Zhen, 2006). Thus, the concept of brain circulation often cannot apply to cases of students studying abroad at the undergraduate level, and should be limited to refer to the case of students who travelled abroad for graduate studies or to engage in research as new scholars. On the whole, then, these ideas suggest that in order to understand the potential implications of international student mobility on a specific sending country it is also important to assess the design of the particular study abroad program.

**Study Abroad Program Design**

Although there are several types of study abroad programs, there are certain essential characteristics that should be found in all programs. First, institutional commitment and oversight is pivotal to the successful implementation of study abroad programs. Essentially, sending and receiving institutions should demonstrate a commitment to the goal of the program and a desire to collaborate with each other to ensure that the program promotes the desired outcomes (NAFSA, 2008). This also means that institutions that engage in study abroad should consider this initiative as an integrative part of the overall education experience of students and not merely as a separate feature (Brewer & Cunningham, 2010). Thus, institutions should commit to developing study abroad programming that is linked to the student’s overall program of study.
Additionally, all study abroad programs should exhibit a structured approach to program planning. That is, there should be a clear link between student and institution selection and the goal of the program. In addition, when choosing courses or practical placements students should be presented with a clear structure and choices that are relevant and informed by faculty members who understand curriculum requirements and expectations (NAFSA, 2008). Essentially, students should have a clear plan prior to embarking in the study abroad program and should be aware of what is expected from them in the completion of this program (Streitwieser, 2009). This also includes re-entry features that should consider the steps to be taken once students return home. Finally, all study abroad programs should count with an evaluation process that examines the different components of the experience and assesses the factors that impact its potential for success (British Council & DAAD, 2014). With this process of evaluation, stakeholders can become aware of any potential issues in the program and may find ways to resolve them (NAFSA, 2008).

Aside from these underlining characteristics, study abroad programs should exhibit specific design features to respond to the goals of the specific type of program. From short-term programs that last four to eight weeks, to full degree programs, study abroad can be designed to exhibit different structures and to achieve different goals. In general, short-term study abroad programs seek to promote intercultural competence or focus on providing students with language immersion to improve the student’s proficiency level (Donnelly-Smith, 2009). More long-term programs that last between a term or a year have the potential to promote further benefits such as gain of field-specific knowledge (Lewin, 2009). Additionally, some programs include internship components that can also
provide other benefits such as the possibility to develop international professional
linkages and the potential to improve future employment outcomes (Gates, 2014).

Given that the CsF program is an example of a government-sponsored
international scholarship program it is critical to examine the program features that make
such initiatives effective. In their study, Perna et al. (2014) suggest that the structural
characteristics of government international scholarship programs define the way in which
the program contributes to fostering critical benefits that help develop human capital and
may play a critical role in deciding whether the program will induce brain drain, mitigate
it or encourage brain circulation. The authors provide an outline and description of the
different types of international student mobility programs sponsored by national or
federal government scholarships. It suggests that some are more conducive to mitigating
brain drain because certain scholarship programs place an obligation on the recipient to
return home for a determined period of time after completing the study abroad program.

It also points out that certain scholarship schemes are more popular than others depending
on the economic, political and social context of the sponsoring country.

In general, their findings suggest that the majority of scholarship programs target
graduate students instead of undergraduate students and offer awards for degree
attainment as opposed to exchange (Perna, Orosz, Gopaul, Jumakulov, Ashirbekov, &
Kishkentayeva, 2014). This study also came up with four categories of study abroad
scholarships distinguished by various factors such as length and purpose. Type 1 includes
scholarships that develop basic skills, while Type 2 and 3 are geared towards the
development of advanced knowledge in developing and developed nations respectively.
Finally, Type 4 refers to scholarships for short-term mobility including the CsF program.
Overall, this typology helps when trying to understand common and differing characteristics of programs when comparing between countries, and in this way it helps one begin an assessment of a program and whether issues can be attached to a misfit between the program design and the country’s particular context. However, this study does not provide a critical view at program structures and does not offer insights as to best practices for successful programs.

Nonetheless, other studies that examine government-sponsored international scholarship programs do offer a critical perspective. For example, Perna et al. (2015) examined the case of Kazakhstan’s scholarship program and established that this program was effective in promoting several benefits including the development of an open mind about other cultures, increased content knowledge in their field and English language proficiency. Certain structural features were found to have an impact on the program’s ability to promote these benefits. For example, rigorous student selection criteria were found to be important to ensure that participating students are prepared to engage in the program, but were also found to restrict participation of students with fewer financial resources. Additionally, careful selection of study destinations was found to be necessary to ensure that students attend schools that can provide valuable opportunities (Perna, Orosz, & Jumakulov, 2015). Other factors affecting the program’s effectiveness in promoting benefits were the level of study of the student, the student’s field of study, and the employment and further educational opportunities available at home. Overall, this study is a valuable addition to our understanding of the connection between program design and the benefits of government-sponsored international scholarship programs.

Another important study that looks at characteristics of program design for
government-sponsored international scholarship programs is a report published in 2014 by the British Council and the German Academic Exchange Service Commission (DAAD) (British Council & DAAD, 2014). This report looks at a number of scholarships developed by countries in the Asia, Europe, the Middle East, and Latin America in order to promote the development of high-skilled human talent. This report is valuable when trying to understand the features of program design because it outlines important characteristics that have elicited similar challenges in all programs. For example, given that generally these scholarships are administered by a central agency, managing the study abroad program becomes quite complex, often resulting in a stronger focus on providing services to help students with logistics and documentation, and less attention given to student re-entry and program evaluation (British Council & DAAD, 2014).

These are critical insights that help inform the analysis of the structure of government-sponsored scholarship programs such as the CsF program.

Although not all the following studies examine study abroad programs that have been sponsored by a government scholarship, their focus on STEM fields, research and internship placements offers important information that can be used when analyzing the structure of the CsF program. Pfotenhauer, Jacobs, Pertuze, Newman and Roos (2013) discuss a program developed by MIT together with several Portuguese universities in order to promote knowledge gain and the development of linkages in the STEM fields. This study shows that a targeted program that is well planned can develop international networks and positively impact the future career prospects of the student as well as the transfer of knowledge and skills internationally. Other studies reflecting similar areas of research speak to the experience of nursing, engineering and other life and health science
students and scholars that complete research or industry placements abroad (Streitwieser, 2009; Mill, Johnson, Costa Mendes, Arena Ventura, & Seicenti Brito, 2014; Ynalvez & Shrum, 2009; Niemantsverdriet, van der Vleuten, Majoor, & Scherpbier, 2005). These studies examine the structure of programs offering research or internship opportunities abroad in order to understand the positive factors but also challenges presented to these programs.

Another area of research looks into the relation of study abroad programs to technical or professional fields, and argues for the need to promote study abroad for those in innovative fields such as engineering or medicine that are usually constrained from the international experience because of the stringent nature of their curricula and issues of quality and transferability (Wainwright, Ram, Teodorescu, & Tottenham, 2009; Streitwieser, 2009). These studies speak to these issues and reflect on the ways in which programs can be structured to improve participation of students in such fields, and which models are better suited for a satisfactory and valuable experience. Within this area, researchers also review instances when international internships are part of study abroad programs and assess the characteristics and conditions that are to be found for a positive experience. This, then, in part explores the building of international linkages as it provides information on how technical fields can get involved in study abroad and how their technical skills can be developed through internship placements.

On the whole, the combination of all these perspectives on study abroad program design suggests that the questions in table 1 should be considered when assessing a study abroad program and its ability to mitigate brain drain and promote desired outcomes:
Table 1

**Critical Considerations of Study Abroad Program Design**

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Features of an effective program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is there an institutional commitment from all parties to deliver an effective program?</td>
<td>Sending and receiving institutions demonstrate collaboration through the effective planning and implementation of the program.</td>
</tr>
<tr>
<td>2. Does the program place an obligation for students to return home?</td>
<td>Students are required to return home for a determined period after the completion of the program.</td>
</tr>
<tr>
<td>3. Is the program’s length appropriate?</td>
<td>The program’s duration allows students to fulfill program requirements in a meaningful way.</td>
</tr>
<tr>
<td>4. How are students selected?</td>
<td>Students are selected according to their ability to fulfill program requirements and their match with selected destinations.</td>
</tr>
<tr>
<td>5. How are study destinations selected?</td>
<td>Destinations are selected according to fit with participants’ fields of study and compatibility with the education system and degree structures of the sending country.</td>
</tr>
<tr>
<td>6. Does the program count with targeted planning and orientation services?</td>
<td>The program’s support services have been designed to appropriately respond to the particular needs of participants.</td>
</tr>
<tr>
<td>7. Are courses in the host institution related to the student’s field and interests?</td>
<td>Students take courses in a relevant area of study and at an appropriate level.</td>
</tr>
<tr>
<td>8. Are students matched with placements that reflect their interests and abilities?</td>
<td>Students are matched with placements that are relevant to their interests and offer opportunities to learn appropriate skills.</td>
</tr>
</tbody>
</table>

With these questions, therefore, one can examine whether an international scholarship program is structured in such a way to incur important benefits. For example, when looking at program’s length, the type of knowledge and linkages that may occur within
three weeks is quite different from the depth of experience achieved within three months, demonstrating that length matters. Similarly, referring to question seven, if students are not taking courses closely related to their fields of study it will become more difficult for them to engage with relevant material and peers and scholars in their field than if their courses were strongly related to their field and interests. Thus, these considerations are important in guiding the evaluation of a program’s effectiveness in reaching desired outcomes.
Chapter 3: Methodology, Methods and Case Study

Methodology

This thesis uses a case study approach to analyze how students can benefit from a government-sponsored study abroad program from the perspective of an emerging economy. The CsF program at the University of Toronto is the main unit of analysis, chosen purposefully because of the unique characteristics of the program and the size of the CsF student population at the University of Toronto. Given its size and its focus on STEM undergraduate students, the CsF program is unique in comparison to other study abroad programs and provides an unparalleled opportunity to learn about new structures of international student mobility. In addition, this study has focused only on one institution—the University of Toronto—because it has received the highest number of CsF students, presenting a uniquely fruitful opportunity for this project (Ciência sem Fronteiras, 2015b).

The case study approach was chosen because, as Yin (2003, p. 5) suggests, this study seeks to answer a “how” question rather than a “what” question. By asking “how” this study seeks to uncover the various benefits experienced by CsF students, examining also the structural and contextual factors that affect the program and its ability to promote these benefits. Thus, in this study the context is important and cannot be isolated from the object of study. In fact, this notion further justifies the use of the case study approach as Yin suggests that the case study approach is appropriate when we are dealing with “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly
evident” (Yin, 2003, p. 13).

As Yin (2003, p. 85) clarifies, the case study is not a method but an approach where different research methods can be used to study the subject matter. Possible methods include surveys, interviews, participant observation, or document analysis. However, not all methods are the same and some may be more appropriate than others depending on the object of study. In addition, the researcher can choose to use more than one method to provide triangulation and increase validity and reliability. Considering this, I have chosen to combine document analysis with qualitative interviews.

Given the quantitative limitations of this qualitative study, it does not seek to provide statistical generalization (Yin, 2003). Instead, this study seeks to generalize to theoretical propositions by providing a new layer of information to expand our overall theoretical knowledge of international student mobility. While, this work will become valuable to those studying Brazil’s CsF program, it should also become valuable for those seeking to understand how a program of this sort may contribute to the development of high-skilled human capital and what possible challenges may present in the way in order to inform future program design.

**Document Analysis**

In terms of document analysis, this thesis focused on analyzing governmental documents that describe the purpose, goals and structure of the program, as well as, institutional documents that illustrate the responsibilities of the particular institution and the services provided to CsF students at the University of Toronto (see Appendix A). In addition, I was fortunate to be able to explore and make use of publicly available online quantitative data on the current status of the program around the world. These data
provided me with number of participants at every institution around the world using various demographical variables. Moreover, I also studied media reports on the CsF program, which provided me with qualitative data on the program. These data not only helped me understand the main issues of concern globally, but it also increased my awareness of the main areas of focus of media coverage in Toronto to understand the specific context of my case.

**Interviews**

The empirical portion of this research project mainly consisted of 20 semi-structured interviews. In July 2014, once I had decided on my case study and research question, I completed the ethics protocol and submitted it for review to the University of Toronto’s ethics board. In August 2014, I received approval of my protocol (see Appendix B). In late August I sent an email to the CsF manager at the Centre for International Experience (CIE)—the international student services office at the University of Toronto—to distribute my recruitment information, which consisted of an e-mail for students interested in participating in my interviews to contact me (See Appendix C). The CIE quickly sent out my recruitment information during the last week in August. Soon after, I received six responses from students interested in participating. The e-mail asked for CsF students who had already completed the research or industry placement. Although this certainly limited the candidate pool it was a necessary condition for my study that sought to understand the experience of CsF students throughout all the stages of the program. Given that after my first call for participants I needed more students to participate, I included an amendment to my ethics protocol adding compensation for
participation (see Appendix D). In addition, I asked the CIE to send out a new email with my recruitment information (see Appendix E). This time I received another 17 responses, from which I pursued 14 in order to reach my 20-interview cap.

From the participant pool, I was able to reach almost an even split with 11 female participants and nine male participants. Eight students completed an industry placement, while 12 students completed a research placement. According to information gathered by the CIE, this is reflective of the overall case of CsF at the University of Toronto, as more students are admitted into a research placement than an industry placement. As shown in Table 2, in 2014 there were 388 undergraduate students sponsored by CNPq and 14 students sponsored by CAPES. As will be explained in future sections, only CNPq students were expected to complete a research or placement component; therefore, the CIE only kept track of the field of study distribution of these students and was unable to provide information on the distribution of CAPES students.

In total, I interviewed nine engineering students, four computer science students, two biology students, two medicine students, one student of architecture, one pharmacy student and one biotechnology student. Considering the distribution at the University of Toronto, I was able to get a representative number of students from the respective fields.
Table 2

2014 undergraduate CsF student distribution and sample distribution

<table>
<thead>
<tr>
<th>Field</th>
<th>Male</th>
<th>Female</th>
<th>Total1</th>
<th>Sample (M)</th>
<th>Sample (F)</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>155</td>
<td>55</td>
<td>210</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Computer Science</td>
<td>68</td>
<td>2</td>
<td>70</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Medicine &amp; Surgery</td>
<td>13</td>
<td>17</td>
<td>30</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Biology &amp; Biomed</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Architecture</td>
<td>6</td>
<td>8</td>
<td>14</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>9</td>
<td>4</td>
<td>13</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Physics, Stats, Math</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental Science, Forestry, Geography</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nursing</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>274</td>
<td>108</td>
<td>388</td>
<td>9</td>
<td>11</td>
<td>20</td>
</tr>
</tbody>
</table>

In the last week of August, I began my interviews, completing them by the end of September. Interviews lasted within 30 minutes to one hour, but there were two interviews that lasted approximately one hour and 30 minutes. In order to keep consistency I developed an interview protocol as a guide that included questions that referred back to the main research question (see Appendix F). Guided by an understanding of the literature on study abroad program structures, questions also asked about the different stages of the study abroad experience in order to assess how each

1 The total number of students reflects those sponsored by CNPq, who made up the vast majority of scholarships and were required to complete a placement. Aside from the 388 students sponsored by CNPq, during the summer of 2014 there were 14 students sponsored by CAPES, who were not required to complete a placement. From these only one student participated in the interviews.
could potentially impact the outcome of this experience. This included looking at orientation and support services, as well as the course and placement portions of the scholarship program. In addition, to contextualize the findings interview questions also asked students why they had chosen to participate in the CsF program and why they had chosen the University of Toronto. In the first week I performed two pilot interviews, allowing me to review some of my questions for the next 18 participants. Thereafter, I performed minor changes adjusting some questions to better reflect concepts in order to help participants comprehend during the interview.

Every participant signed and received a copy of the informed consent form (see Appendix G) prior to the interview and received a $10 gift card to a popular coffee shop as compensation for their participation. Following ethics protocol, every participant was given a code name following the pattern “Participant A” to remain anonymous.

Interviews were recorded using a tape recorder and were transcribed thereafter by the principal investigator.

The Science without Borders Program

Brazil and the Science without Borders program

With a population of over 200 million people, approximately 7.2 million students are enrolled in tertiary education in Brazil (CIA, 2015; Ministerio da Educação & INEP, n.d.). In terms of expenditure, Brazil invests approximately 6.06 per cent of its GDP on education and 1.02 per cent of its GDP on tertiary education (UNESCO, 2015). This is similar to American standards, as the US invests approximately 5.22 per cent of its GDP on education and 1.36 per cent on tertiary education. As mentioned before, Brazil’s
higher education system is made up of both public and private institutions, including tertiary and technical institutes, colleges and universities. Approximately 2,069 of all higher education institutions are private and only 531 are considered public, from which only about 20 to 30 per cent are considered universities (British Council & DAAD, 2014; INEP, 2014). While private institutions focus mostly on delivering professional education in social sciences and business, it is within the public system that research and the focus on the STEM fields takes place. Due to a rigorous admissions system and limited spaces in public institutions, in 2013, 74 per cent of students were enrolled in private institutions and only 26 per cent were enrolled in the public system (Ministerio da Educação & INEP, n.d.). The vast majority of undergraduate students in Brazil pursue social sciences or business, and only 33 per cent is enrolled in the STEM fields (OECD, 2013; Ministerio da Educação & INEP, n.d.). This factor also affects enrollment in graduate education, as an even smaller percentage of the student population enrolls in Masters and PhDs in the STEM fields, resulting in a small number of graduates in these areas relative to the overall population in Brazil (Observatório do PNE, 2013).

Although Brazil has supported the development of high-skilled human talent through international mobility scholarships for graduate studies for decades (Machado Rezende, 2013); in recent years, increased concern regarding a skills gap resulted in greater funding for international student mobility, particularly in the STEM fields (Ortiz, 2015). This has resulted in an exponential growth in outbound mobility in the country with over 60 per cent increase in 10 years, from 20,087 in 2003 to 32,051 in 2013 (UNESCO, 2015). Without question much of this growth is due to the creation of the CsF program, a government-sponsored international scholarship program designed
specifically for STEM students, that aimed to award 100,000 scholarships from 2012 to
the end of 2015 (Batista de Albuquerque, 2013).

Established by Brazil’s federal government through a presidential decree in 2011,
the goal of the program is to promote innovation and the internationalization of science
and technology in Brazil by investing in human capital training through international
student mobility (Ciência sem Fronteiras, n.d.a). Additionally, the program seeks to insert
Brazilian science in the international community and promote the creation of institutional
partnerships between Brazilian universities and higher education institutions around the
world (Ciência sem Fronteiras, n.d.b; Batista de Albuquerque, 2013; Sá & Grieco, 2015).
The focus on students in the STEM fields actually derives from a desire to foster growth
in these areas given that only 1 in 50 students in Brazil choose to pursue engineering or
similar fields (n.d., 2011). Overall, even though CAPES and CNPQ will continue to
provide scholarships for all areas of study, this scholarship program has been created for
Brazil to strengthen its capacity for technology and innovation.

From the 100,000 scholarships available, this program holds a portion of
scholarships for Brazilian graduate students and for visiting scholars from other countries
in the hopes that it will also promote inbound mobility and that this will help increase
international collaboration. However, as shown in figure 1, the majority of the
scholarships—totaling 64,000—are set-aside for undergraduate Brazilian students in the
STEM fields accepted to the one-year sandwich program (Ciência sem Fronteiras, n.d.c).
Within the STEM fields the priority are students of various engineering and technological
fields, together with students of health sciences (medicine & nursing) as well as students
of pharmacy and students in the creative industries such as architecture (Ciência sem
Fronteiras, n.d.d).

![Graph showing the number of CsF students per category]

*Figure 1. No. of CsF students per category (Ciência sem Fronteiras, n.d.c)*

The program was created as a national scholarship with Brazil’s federal government funding the bulk of the program through two government agencies, CAPES and CNPQ. This resulted in over R$3 billion—approximately CAD$1.2 billion—in public investment for 75,000 scholarships. Money coming from private industry was expected to cover for the remaining scholarships (n.d., 2011). This money is used to cover for tuition and ancillary fees at the destination institution, as well as the fee put aside to pay for the organization or lab where the student is admitted to complete the internship requirement (CBIE, n.d.). The student also receives a monthly stipend to pay for food, housing and other living expenses, coupled with health insurance and a return
flight ticket (Batista de Albuquerque, 2013).

In order to be admitted in the undergraduate sandwich category, students enter a competition where their qualifications are evaluated against the following criteria: 1) The student is enrolled in a STEM field, 2) The student has language proficiency in the language of the destination country, 3) The student has been accepted in the destination university, 4) Finally, the student demonstrates above average academic performance (Batista de Albuquerque, 2013). Additionally, the student is required to have completed at least 20 per cent but less than 90 per cent of their degree by the time they enter the CsF program, as students are required to return to Brazil to complete their program. This last stipulation has been put in place in order to mitigate brain drain, a common approach for international scholarship programs (Perna, Orosz, Gopaul, Jumakulov, Ashirbekov, & Kishkentayeva, 2014; Giordano & Pagano, 2013). Though these requirements were established during the inception of the program, the language requirement has changed slightly because of the challenges it has presented to participation. In particular, English language proficiency has been a problem for Brazilian students entering the CsF program, and many students wish to attend institutions in English speaking countries. As a result, English language programs have been created to allow for more students to participate in the program and improve the language skills once they are admitted (Batista de Albuquerque, 2013). In addition, some destination countries have lowered English proficiency exam score requirements to be more competitive when attracting CsF students.

An intention of the program was to send students to the most scientifically prolific institutions around the world. In lieu of a better method, the programming agencies
resorted to international rankings such as *Times Higher Education* and the *QS University Rankings* (Batista de Albuquerque, 2013). However, it is unclear how the administration has drawn parameters in choosing institutions through these rankings, as the chosen institutions are from a wide range of positions in these rankings. Students, then, choose their destination from the list of institutions provided by the program. For some countries the process is more independent than for other countries. For instance, students choosing to attend a university in the US can only choose the country, while students choosing to attend a university in Canada get three choices for institutions and are placed with their match.

To help students throughout the process each participating university in Brazil counts with a coordinator in charge of dealing with applications. However, Brazilian institutions are not required to provide orientation programs where students can become familiar with the institution or culture of their destination (Batista de Albuquerque, 2013). Destination institutions are also not required to provide any form of orientation, but may do so using their own resources.

The latest data, which reflects results from March 2015, suggests that 78,173 scholarships have been granted, of which 61,542 have been granted under the undergraduate sandwich scheme (*Ciência sem Fronteiras*, 2015b). Thus far, the US has received 22,064 undergraduate CsF students, the majority of the scholarship recipients, followed by the UK with 9,115. Closely competing for third place, Canada (6,531) and France (6,456) also count with an important number of scholarship recipients (*Ciência sem Fronteiras*, 2015b).
A substantial majority of scholarship recipients, 34,545, are in engineering fields, followed by those in the health sciences with 13,723 recipients (Ciência sem Fronteiras, 2015b). Not surprisingly, 92 per cent of all CsF scholarships granted to engineering students have been in the undergraduate sandwich category, while only 65 per cent of all scholarships granted to students in the health sciences have been at the undergraduate level. The lower percentage of students in the health sciences at the undergraduate level makes sense given that these disciplines present important international differences in degree structure when comparing Brazil to North American universities (Fulbright, 2014). Aside from these two fields, students in the creative industry with 6,431, students in earth science with 6,171 and students in computer science with 4,867 have also received a great portion of the undergraduate sandwich scholarships (Ciência sem Fronteiras, 2015b)
In terms of origin, most students come from the southeast region. In fact from a total of 30,364 from the Southeast, 15,618 students come from the state of Sao Paulo, followed closely by the state of Minas Gerais with 13,351 (Ciência sem Fronteiras, 2015b). In terms of gender, 43 per cent of undergraduate sandwich scholarships have been granted to female students leaving the numbers at 26,412 female recipients and 35,125 male recipients by March 2015.

**Science without Borders in Canada**

As mentioned above, Canada receives a substantial number of CsF scholarship recipients. By March 2015 the country had received 6,531 students, from which 85 per cent were within the undergraduate sandwich scheme (Ciência sem Fronteiras, 2015b). In Canada the vast majority of CsF students pursue engineering, followed by the health science and computer science. Approximately 41.40 per cent of CsF students in Canada are females and the majority of students come from Sao Paulo and Minas Gerais (Ciência sem Fronteiras, 2015b).

The Canadian organizations in charge of administering the program for universities in the country are the Canadian Bureau for International Education (CBIE) and the Calgary, Alberta, Laval, Dalhousie & Ottawa (CALDO) consortium. Both these organizations are located in Ottawa and represent different institutions across Canada. Given that some Canadian colleges also participate in a parallel program, the Association of Canadian Community Colleges (ACCC) has also been called to administer this portion of the program (CBIE, n.d.). CALDO is a smaller organization in charge of representing the University of Alberta, the University of Calgary, Dalhousie University, Université Laval, the University of Ottawa, Queens University, the University of Saskatchewan, the
University of Waterloo and Western University (CALDO, 2014). The CBIE represents a much larger spectrum of institutions including the University of Toronto. In fact, given that the CBIE represents most Canadian universities, the organization manages most of the CsF scholarships. Though there are three organizations managing the program in Canada the requirements are similar to all institutions. Aside from the general requirements established for all participating institutions, Canadian institutions specifically require CsF students to achieve, at least, a 6.5 on the IELTS or a TOEFL iBT score of 86 (Ciência sem Fronteiras, n.d.e).

Depending on the institution the student wishes to attend, he/she will have to submit an application to the CBIE or to CALDO. This application is then sorted out and evaluated by these agencies, which then distribute to the respective universities. Within one application the student can have three choices and it is ultimately the university that decides whether the student is admitted or not. Nonetheless, even though the CBIE and CALDO are not the final step for students to be admitted into a Canadian institution it is an important one. These organizations have been responsible for structuring the program in Canada at the macro-level, including considerations about how and in to which faculty students are admitted. This means that they are responsible for placing all CsF students in undergraduate programs in Canada, even when in Brazil the student may have been studying in a professional school, such as medical school. In addition, these organizations also establish parameters in terms of courses students are allowed to take and in terms of the type of placements students can pursue while in the CsF program. Certainly, though, CAPES and CNPQ guidelines frame these parameters.

Science without Borders at the University of Toronto
The University of Toronto receives the vast majority of CsF scholarship recipients with approximately 1,039 scholarships by March 2015, from which 935 are in the undergraduate sandwich scheme (Ciência sem Fronteiras, 2015b). Second to the University of Toronto, by the same period the University of Manitoba had only received 328 students. This shows that the University of Toronto is certainly a major player for the CsF program in Canada, counting with the largest amount of CsF students in the country. This becomes even more interesting and compelling when looking at data from countries with similar numbers of CsF students, such as the US, the UK, France and Australia and noticing that none of their institutions individually receive as many students as the University of Toronto (Ciência sem Fronteiras, 2015b). Even in Portugal, where language is an advantage for Brazilian students, no institution reaches the same number of CsF scholarships as the University of Toronto. Thus, the University of Toronto has individually received the largest number of CsF so far.

![Figure 3. No. of undergraduate CsF scholarships per institution (Ciência sem Fronteiras,](image-url)
Located in the city of Toronto in the province of Ontario, the University of Toronto is formed by three campuses. As a result, CsF students may study either in the downtown St. George campus, in the Scarborough Campus (UTSC) in the east part of the city, or in the Mississauga Campus (UTM) in the west part of the city of Toronto (Centre for International Experience, 2014). Nonetheless, many of the services provided by the university for CsF students are located in the downtown campus in the Centre for International Experience (CIE).

The CIE is the first place of contact for every international student in the university’s St. George campus. Due to administrative reasons it is also the first place of contact for all CsF students, regardless of the campus in which they attend classes. According to information provided by the CIE, the term structure of the CsF program depends on the host university. In the case of the University of Toronto the program’s terms are structured to fit the specific needs of the particular student. This means that if the student requires six months of English classes to reach proficiency, the student will first be able to attend the university’s English Language Program (ELP) for six months and then enter courses. In fact, for students that have not reached the English proficiency requirement it is mandatory that they attend the ELP before enrolling in classes or taking part in a practical placement. However, some students will actually continue with the placement after finishing the ELP and before entering the course portion of the program. This depends on the term the student started the program. Below the table provides an example of the different possible structures:
Table 3

*Program term-structure at the University of Toronto*

<table>
<thead>
<tr>
<th>Summer (Jul – Aug)</th>
<th>Fall (Sept – Dec)</th>
<th>Winter (Jan – Apr)</th>
<th>Summer (May – Jun)</th>
<th>Summer (Jul – Aug)</th>
<th>Fall (Sept – Dec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Courses</td>
<td>Courses</td>
<td>Placement</td>
<td>Courses</td>
<td>Placement</td>
</tr>
<tr>
<td>Courses</td>
<td>Courses</td>
<td>Placement</td>
<td>Courses</td>
<td>Placement</td>
<td>Courses</td>
</tr>
</tbody>
</table>

Source: (Centre for International Experience, 2014)

Though having different options is perceived as favorable this may also present some challenges to the student. This is especially true for those who do not attend the ELP because they have enough proficiency to enroll in courses right away (see Table 3, second row). Aside from providing a space to improve English language skills the ELP helps students learn about the Canadian culture, the system of education at the university, including the level of expectations. Students who do not attend this program miss out on this information and will have to seek for it independently.

Nonetheless, aside from the ELP the CIE offers other services to help CsF students have a positive experience at the University of Toronto. These include workshops that help students with their transition at University of Toronto and help students prepare for their search for placements, and a program designed specifically to help CsF students connect socially and integrate within their new environment. This latter program, known as the Don program, consists of an activity program where student leaders from the
University of Toronto and CsF student leaders help organize social activities for all CsF students at University of Toronto such as ski trips during the winter. Altogether, these services have been put together to help students in the CsF program feel comfortable in their new environment so that they can effectively engage in their studies while feeling confident that there is a supportive community surrounding them (Centre for International Experience, 2014).

In terms of course selection, the CIE helps students when choosing their courses by providing the course calendar and helping students with any inquiries about the courses. However, though course selection is done through the regular system at the University of Toronto, CsF students are not allowed to take any course they wish as there are certain restrictions placed both by the University of Toronto and by the CBIE. At the university CsF students are only allowed to take courses within the faculty they are admitted to, and in the campus where they have been accepted. This means that a student admitted into Arts & Science at UTM cannot take courses in a different faculty at St. George or UTSC. In addition, the CBIE has to approve the selected courses checking for suitability and relevance (CBIE, n.d.). In general, the student is required to take a minimum of four courses per term in his/her field, the student is not permitted to take courses in the humanities or social sciences, and distance courses are not allowed (CBIE, n.d.). With the exception of engineering and architecture students, who are admitted into their respective faculties, most undergraduate CsF students are admitted into the Faculty of Arts & Science. Thus, even students of medicine and pharmacy are admitted into Arts & Science and are not admitted into their respective professional faculties. This is because, unlike engineering and architecture, at the University of Toronto medicine and pharmacy are
graduate programs that require students to have completed an undergraduate degree prior to admissions. This is an important detail because it certainly limits the ability of students choosing courses in their field and can challenge the outcome of their overall experience.

Finally, the CIE is in charge of helping students find a 14-16 week placement as it coordinates this portion of the program. According to their website, “The CIE's CsF Office oversees this aspect of the program and supports students in finding a meaningful placement through workshops, internal placement processes, collaboration with placement agencies, and ongoing one-on-one student support” (Centre for International Experience, 2014). However, the CIE does not feel fully responsible for this aspect of the scholarship program, as they do not formally match and place students with appropriate internships. Instead, the office focuses on facilitating the process by providing valuable resources to the student.
Chapter 4: Findings

As mentioned before, this study has been guided by one main research question that seeks to uncover the potential benefits of the CsF program, as an example of a government-sponsored study abroad program. This question is:

*How do students benefit from the experience of the Science without Borders Program?*

After coding and analyzing the findings four main categories came to light. First, interviews exposed students’ motivations and rationales for joining the program and choosing the University of Toronto. These findings are important as they help contextualize the experience of these students during the program. Additionally, the data also illustrated how students benefitted from three distinct stages of the program and how certain structural issues presented challenges. Even though, as Table 3 shows, there is no one single term-structure to the CsF program, the most common and natural progression of stages assumes that, after a transition period, students complete courses, followed by the placement component. As a result, the findings in this section have been organized following this common progression. As it will become evident under each section, in each stage certain benefits are more prominent than others and different structural issues have presented obstacles.

1. Motivations and Rationales

   1.1 Motivations to join the program.

   Student’s intentions when joining the program can certainly frame their experience.
Thus, it is important to have an understanding of their rationales for joining the CsF program and for choosing the University of Toronto as their host institution.

When asked about their intentions to participate in this program, 16 of the 20 participants mentioned they had a desire to study abroad and gain an international experience. This rationale goes along with the program’s goal of promoting the internationalization of science and technology in Brazil by promoting international student mobility. For example, Participant R explicitly mentioned he joined the program to get an international experience and defined what this international experiences means to him:

I always wanted to travel to have an international experience … I was curious [about] how a developed country works and how people are. I always heard good things about Canada, about people here, and I [thought] it would be a very different experience. So that was the first reason. I guess the second reason was for my resume, international experience comes [up] a lot when you want to get a job.

(Participant R)

According to him, this program would allow him to get an international experience by exposing him to a new country and new culture, and it would be beneficial to him, not only on a personal but also on a professional level.

Half the participants also mentioned the possibility to improve their English language skills as a motivator to engage in the program. In fact, Participants B, C and R said this was their number one reason for participating in the program. When asked why he had decided to participate in the CsF program Participant B answered, “First for the English, I speak English since … High School. But I always wanted to improve [it], so I
decided to come to Canada because there would be an English course here for four months [and] I would not spend anything” (Participant B). Though he also mentioned that he found the opportunity valuable for other reasons, such as an opportunity to gain new knowledge and skills through a placement, for Participant B this was a way to gain the necessary proficiency and fluency in English that would allow him to succeed in academia in the future. Additionally, the fact that the program was funded was also a deciding factor for him.

In fact, when asked why they had chosen the CsF program in particular, students mentioned that, compared to other international student mobility programs, this program was more appealing because it offered them the opportunity to study abroad without incurring a substantial financial cost to the individual as each student would receive a generous financial assistance package. For example, Participant A said, “I always wanted to [complete] an internship, and there were other kinds of internships in my university, but they didn’t give financial assistance as this program. This was really important.”

Agreeing with Participant A, Participant M offered this response:

It’s been my dream since I was young to study in another country. But it was really hard because my parents don’t have enough money to pay for me. But then I saw this opportunity and I said, ok I’m going to do it because the government is going to pay for me to study in another country. (Participant M)

Therefore, the financial assistance was certainly an important factor motivating students to apply to the CsF program. Certainly, most students wanted this opportunity in order to gain the international experience, but in many cases what actually compelled them to apply was the fact that this program offered a generous financial package.
Interestingly, when mentioning the benefit of gaining an international experience only 5 of the 20 participants actually mentioned the internship component and the ability to take specific courses at the University of Toronto as a motivator. In general, students referred to the appealing aspect of a study abroad program that offered the opportunity for them to live in another country. Nonetheless as shown above Participants A felt the internship was a unique and important motivator. Agreeing with her Participant I said, “[This program] gives you the work/research permit. In my case I did the industry placement, and I wanted to see how the workplace was here. Because I had worked in Brazil before” (Participant I). In his case, the program’s placement component was a unique opportunity and one of the reasons for which he decided to participate. Thus, a few participants referred more specifically to the unique opportunities of the CsF program.

1.2 Rationales for choosing the University of Toronto.

In order to understand the expectations of CsF students at the University of Toronto, I asked participants to explain why they had chosen this university as their host institution. First, some students mentioned that, though they may have wanted to participate in the program in the US or in the UK, the fact that they could actually choose the institution in Canada and that Canadian institutions were comparatively less selective, compelled students to choose a Canadian university. Additionally, reputation and standing on global rankings was the most prevalent factor for these students in making their decision to choose the University of Toronto amongst all other Canadian options. In fact, all except for one participant expressed that they had chosen the University of
Toronto because of its reputation. Yet, interestingly, only eight participants said they measured reputation looking at their particular program of study.

Connections were also an important factor in helping some students make their decision to apply and attend the University of Toronto. Participant N, for example, mentioned that he chose the University of Toronto because he already had friends in the university who were enjoying the program. He said, “I had some personal reasons … I knew some friends that were here and they said that it was great being here at University of Toronto” (Participant N).

Participant K expressed a similar idea when he mentioned, “I had a friend here and his grades were almost the same as mine, so I knew I had a chance, and he said the program was very good. We are both computer science students” (Participant K). Thus, word of mouth helped some students make their decision to choose a university of which they already had some anecdotal information. Similarly, some students mentioned that they had chosen the University of Toronto because their mentors in Brazil had suggested it would be a good institution for them. For example, Participant G’s mentor had studied at the University of Toronto and had completed an internship at an associated hospital. Thus, through his contacts Participant G was able to learn about the university.

Certainly, having a contact or more information when making such an important choice is beneficial to the student as the student may feel better prepared to make a decision. Those who received anecdotal information were more aware of what the University of Toronto could provide and were more prepared to engage in all the different processes that this program required—such as course selection and the placement process. However, most students chose the university because of its global
reputation, and less than half of the participants focused on their program when looking at which institution they wanted to go to in order to complete the program. Nonetheless, all participants had the University of Toronto as their first choice and were pleased to be attending the institution for the CsF program.

The following sections of the findings deal with the benefits CsF students experienced at the different stages of the program. Along with the benefits, I also describe the challenges that created obstacles for students and explain how these challenges negatively impacted their experience. Informed by the literature and the findings, Figure 4 shows the ideal process through which CsF students would experience these benefits. Essentially, intercultural learning and language learning should be experienced all through the stages, while each stage should exhibit unique features that are necessary for the student to successfully move through each step of the program. As shown in the concept map, in the transition period students should gain intercultural learning in general, but also focus on learning the distinctions between their academic environment at home and the environment at their host institution. This together with language proficiency would eventually allow the student to truly engage in the following stage of the program: the course component. During courses students should continue to engage in intercultural learning, but should also gain content knowledge relevant to their field of study and begin to form linkages that could help them engage with the material or find a meaningful placement. If these features are present students should then complete a placement that is relevant to their interests, where they can reinforce their professional networks. If this occurs, placements could also be a place where students strengthen professional linkages, learn about future opportunities and gain a competitive advantage.
2. The transition into the CsF program

The transition period is the first stage of the program, and it begins before students depart to their host country and while they are preparing for the study abroad experience. Thus, this stage includes features such as the orientation services provided at the host institution, and also refers to the involvement of the student’s home institution in developing and providing pre-departure orientation programming and services. In the
transition period students are expected to prepare for the program and may begin to experience some initial benefits of study abroad. In fact, in order for CsF students to benefit from the subsequent stages of the program, this stage should include components of cultural and academic orientation to prepare students for their new cultural and academic environment (Andrade, 2006; Brown, 2008). The interviews suggest that in this stage a number of CsF students benefitted from intercultural learning and language learning through the orientation and support services provided by different entities responsible for the program. Nonetheless, not all students experienced these benefits because of insufficient pre-departure and academic orientation. This together with a strong program focus on open course selection created some challenges for certain students in their transition, ultimately impacting the subsequent stages of the program.

2.1 Benefits

2.1.1 Intercultural Learning. In this study, over half of the participants referred to intercultural learning as an important outcome of orientation programming. Often, these programs and support services helped CsF students gain knowledge about people’s culture in their host country as well as knowledge regarding the academic culture of universities in Canada. From the interviews I identified three entities that students felt were responsible for providing these services: their home institution, the CBIE and the University of Toronto. However, most students emphasized that it was at the University of Toronto that they received most support in the transition. For example, Participant I had positive comments to make about these services:

They did help us all the way through … Sometimes in Brazil you just have to do everything yourself without any help. I got all the help they offered, because why
[wouldn’t I]? The university offers all of these resources, and it’s not just useful now, but it’s useful for your life. (Participant I)

Participant I spoke generally about the different student services available at the University of Toronto. Yet, some students were more specific and referred to the CIE, the international student office at the University of Toronto that developed programming specifically for CsF students.

The services provided by the CIE include orientation workshops, where students are invited to learn about the University of Toronto and about the process to acquire a placement, and the Dons program, where student ambassadors act as liaison between the CIE and CsF students and plan social events to get students more integrated with the social community at the University of Toronto. CsF students are not required to attend these workshops and social events, but they are encouraged to do so. Both Participant D and Participant C mentioned that they felt these services were important to their transition and beyond. Participant D said, “[The CIE] helped a lot at the beginning [with] housing and orientation, and even [with] the internship. I had a lot of support from them on how to [secure] the internship” (Participant D). More specifically, Participant C commented on the benefits of having the Dons program, “We had Dons ... They helped us a lot. They do a lot of activities to get people together” (Participant C). Participant C pointed to an interesting aspect of the Dons program, which refers to the fact that this program is designed particularly for CsF students and in order to get the group together. Though the Dons program does not contribute to building connections between CsF students and other students at the University of Toronto outside of the scholarship program, participants mentioned that the program is effective in getting CsF scholarship recipients
acquainted with each other and with their new environment.

According to the interviews it seems that many participants felt the CIE’s programming taught them mostly about Canadian culture and helped them with the social challenges of the transition. Ultimately, even though some workshops referred to academic orientation, it was during the ELP program that students felt they learned about the academic culture at the University of Toronto and gained the skills to tackle courses in the Canadian university.

2.1.2 Intercultural academic learning through language learning. When talking about support services all students referred to the ELP administered by the University of Toronto’s School of Continuing Studies. The ELP is a language program for speakers of English as a Second Language. This program was not designed solely for CsF students, as it serves to train anyone who wishes to improve their English language skills. However, the ELP provides specific courses for the CsF student group that enters the university each year. Not all CsF students are required and admitted to complete this program as some of them have the necessary English proficiency to enter courses directly. Those who enter the ELP spend between two to four months advancing their English skills.

The literature suggests that one of the most significant challenges for international students in their transition to their new academic environment is language (Andrade, 2006); therefore, this program is certainly important and valuable in helping students adapt. As Participant E mentions when he said, “If I want to write a paper, I learned this in the ELP and it was very helpful,” (Participant E) this program allows students to learn the skills necessary to succeed academically in their courses at University of Toronto.
In addition, despite the fact that the ELP’s primary goal is to help CsF students reach the proficiency level necessary to be admitted into courses at University of Toronto, the program also serves as a way to help students get acquainted with their new city, the Canadian culture in Toronto, and the system of education at the university. A number of students mentioned that it also contributed to other aspects of their transition, including intercultural learning and increased awareness of the differences between the academic culture and the university systems in Brazil and Canada. Considering the length of time of the ELP and the fact that this is an immersion program designed by the university it makes sense that students would benefit from other learning aside from language learning. Participant A had a positive opinion about this program and its contribution to her transition into the other stages of the CsF program:

I think the ELP helped me more [because] they had classes about how you would behave in an interview, they taught us [how] to write academic works and the teachers in the ELP gave to us background about the culture here. [This way] I was not so shocked. (Participant A)

Thus, while improving their English language skills through this program, CsF students had the opportunity to learn about course structures at the University of Toronto, academic writing and issues of plagiarism, as well as types of evaluations and expectations. In addition, through this program, students were able to gain some insights about what to expect from the work environment during their placements, and had a chance to practice interview skills. Altogether, students who participated in the ELP did not just improve their English language proficiency, but they also benefitted from academic and professional orientation.
2.2 Challenges

2.2.1 Insufficient pre-departure orientation and academic orientation. As mentioned above, not all students participated equally in orientation programming and other programs such as the ELP. Although several entities, including the home institution, the CBIE and the University of Toronto were mentioned when discussing orientation and support services, only two students mentioned that their home institution provided orientation services. For example, Participant F says:

Actually [my university] was really good at [orientation], because I know that some places didn’t have the right infrastructure to do this. But as [it is] one of the biggest universities in Brazil they already had the infrastructure for this whole CsF thing. So once we were accepted they started to do workshops on cultural differences and they called professors and professionals on this area. So it helped a lot. But in many ways we did things on our own too. And I know that many universities were not prepared for this. (Participant F)

Participant F felt her university provided her with a solid pre-departure orientation, however she also suggested that these services were unique to her institution and were linked to an overwhelming amount of students participating in the CsF program from that particular institution. This student had attended a university in Brazil that has sent out 1,159 undergraduate CsF students abroad, one of the highest numbers in the program (Ciência sem Fronteiras, 2015b). Some universities from Brazil only counted with 90 undergraduate CsF recipients from 2012 to March 2015, limiting the interest of developing orientation programs for students in the CsF program. In documentation prepared by CNPq and CAPES, the granting agencies, there is no mention of orientation
programs at home institutions, suggesting that this is not a requirement. In fact, in a handbook prepared by the CBIE the responsibility for orientation is positioned under the Canadian agency on behalf of CNPq and CAPES (CBIE, n.d.). Nonetheless, students who received this pre-departure support felt it helped them with their transition into a new country and a new university. In fact, the literature suggests that students who receive pre-departure services at their home campus are better prepared to embrace the study abroad experience and gain valuable knowledge and skills than those who did not benefit from these services (Brewer & Cunningham, 2009). Hence, the overwhelming lack of pre-departure orientation services for most interview participants could have had a negative impact on their transition and ability to engage and interpret their new cultural and academic environment.

A number of students pointed out that the CBIE played a role in providing pre-departure orientation through documents and webinars. These documents and webinars focus on providing the student with the administrative information they need prior to their arrival. For example, these tools remind students that they need a student visa to study in Canada and direct them to the appropriate contact where they can process this visa (CBIE, n.d.). In addition, the CBIE handbook and webinars refer to the requirements of the program particular to the Canadian context and provide information about the system of education in Canadian universities as well as information on the process of acquiring a placement (CBIE, n.d.). However, this information is general in nature and does not focus on the specific characteristics of each university. In addition, attending these webinars and reading the handbook is highly recommended but not mandatory. A participant who used these resources said that she felt they were not enough to prepare them for the
program and their experience at the University of Toronto:

When you are in Brazil there are a lot of webinars but I don't think they prepare us for the real deal here … And [when it comes to] culture [it’s important], because the university is different here. I have a lot of readings [here]. In the first week I went to a lot of classes where we had a [pop] quiz, and I only [noticed afterwards] that I had to read 50 pages that I didn't read. (Participant K)

Participant K did not participate in the ELP program; instead, he proceeded to the course component as soon as he arrived to the University of Toronto. In turn, pre-departure orientation and the CBIE webinars or handbook was critical to his transition. However, given that these webinars are of a general nature they did not speak to the particularities of studying at the University of Toronto and were limited to referring to the broad picture of university life in Canada. In addition, the handbook, which refers to course selection, only mentions certain considerations such as taking into account that a student must choose courses related to their field and that courses in humanities are not allowed for CsF students (CBIE, n.d.). Yet, this handbook does not refer to particular programs or how to choose courses at the particular institution, where an explanation of how to read course codes would be found. As a result, several students mentioned that they felt they needed more orientation on the matter.

In certain cases, the lack of orientation on course selection resulted in students taking courses for which they felt underprepared, even though no prerequisites were required. This occurred because students were not aware of the difference between a 200 level course and a 400 level course, a matter strictly of lack of knowledge as to how to read the course handbook. Participant S makes this clear when she says:
I didn’t receive any guidance to choose my courses. I learned about the 100, 200, or 300 levels once I was already enrolled. I took a 100 [level] course and this was pretty easy, you didn’t even need to know science to be there. Then the other three were all 400 [level] courses … They were too specific, and my knowledge was too general for that, maybe the 300 level [courses] would've been more appropriate.

(Participant S)

Participant S felt she had not received enough guidance on course selection. Though the CIE provides orientation and support services for CsF, students like Participant S were either unaware of the services provided at the University of Toronto or were not prepared to access them because they had insufficient preparation before arriving to Toronto. Without this guidance students participating in a study abroad program may feel lost and face cultural shock, which can present challenges to the potential benefits of the experience.

Additionally, as mentioned above, the ELP was an important component to academic orientation for those who participated in the course. Students who were not offered the program were, therefore, at a disadvantage. Overall, the participants who had taken part in the ELP referred to this program as an important step into getting acquainted and integrated into the system of education and the Canadian culture. In fact, a student who did not complete the ELP, because she had the necessary level of proficiency to enter courses directly, pointed out that she felt she missed out on important information and felt her transition was too drastic as a result:

My roommate got here at the same time [as me], but she took the ELP, so it was a little easier. She was taught about the culture and she didn’t have exams or
assignments like me right away. So I don’t know, I think the description of the courses is a little confusing, I regret one of my choices in fact. I think that especially for students that get here without the ELP it is a big challenge.

(Participant F)

Interestingly, though academic orientation is clearly a component of the program it is not the primary objective of the ELP. As a result, this program was only planned for those who required the English language classes and was not offered to students who already had the necessary proficiency to enter courses. Yet, no other support service seemed to replace the information from the ELP, as students who attended the workshops and were not offered the ELP felt they still lacked some critical transition information, such as how to choose courses.

The CsF program was designed to include both a course and a placement component; yet, the program also assumed a self-guided structure where students choose the courses and placements in an independent manner. This design can give students the opportunity to create a unique study abroad experience, but it can also be ineffective if students are not prepared to make such choices. For example, Participant G explains, “A lot of people are very young in this program, so they don't really know what they are looking for. This is why it can become almost like a High School program” (Participant G). Thus, in this context, if students are not provided with sufficient intercultural and academic orientation it becomes more difficult for them to successfully navigate their new environment and benefit from the subsequent stages of the program.
3. The Course Component

Since the CsF program requires students to complete two terms of courses, students spend the majority of the time in this stage of the program. This stage consists of the completion of 4 half courses per term, all of which should be related to the student’s field of study. Hence, through this component, students are expected to learn new knowledge that is relevant to their field, while gaining new perspectives on how to look at the phenomena. Additionally, as shown in Figure 4, given that the course component precedes the placement component, this stage should also provide students the opportunity to form linkages with peers and professors that could potentially help them find relevant opportunities for the placement requirement. The findings show that some CsF students benefitted from this stage by gaining field-specific knowledge, but also by engaging in intercultural learning and gaining knowledge about a different system of education and academic culture. In addition, in this stage a number of students began to form networks with other CsF peers and with professors in their field, which eventually impacted their experience with the placement. This stage was not without a challenge, however, as degree compatibility issues presented obstacles for students in the health sciences.

3.1 Benefits

3.1.1 Intercultural learning. Courses tend to be seen as a place to gain content knowledge and skills related to the field of study. Yet, when students study abroad courses can also foster intercultural learning. By studying in a different country, students can engage in a different system of education and experience a different academic culture that they can then compare to their own. Data from the interviews suggests that CsF
students were able to experience these benefits by participating in the program. For example, Participant C refers to practical differences in course structure that impacted her learning, “The professor’s approach [here] is very different. For example, the class in Brazil is two hours long and I can’t take it in … but here it is [approximately] 50 minutes … and I would say that, in a way, it feels like I learn better here” (Participant C). Echoing this comment Participant F said the following:

I feel that here the whole university is structured differently; here you have [fewer] classes and you have more work to do at home, like more readings and everything. In Brazil we have a full week of classes [that last] the whole day … Here I feel like I have more time, but at the same time I feel like I have more to [accomplish]. Actually I prefer it this way. (Participant F)

These comments were rather frequent in the interviews, as many participants mentioned that they noticed important differences in the way courses are delivered at the University of Toronto when compared to their home universities. In addition, students commented on the differences in evaluation methods as well as faculty-student relations. Overall, courses helped students gain a better understanding of Canadian academic culture, while helping them learn about themselves and the cultural differences with Brazilian universities.

3.1.2 Knowledge gain. Although this was not the case for all CsF students, for many participants, courses served as a place to gain new knowledge and to gain a new perspective from which to understand their field of study. By attending a university in a different country these students were given the opportunity to take courses taught by Canadian or international faculty and learn new ways of approaching their discipline.
Participant T, for example, mentioned that through this program he was able to take courses that were not offered in his university, expanding his knowledge and perspective of his field.

Some courses that I took here are specific to the University of Toronto because of the way the University of Toronto understands biomedical engineering. The University of Toronto sees biomedical engineering much more from the bioengineering point of view, rather than from the medical equipment [perspective] and all those fields that are more common in countries like Brazil. And because of that, some courses that I took here, I would never be able to take in Brazil. Those courses just don’t exist there … I took a course that was more like a tissue-engineering course, where we had the opportunity to build a blood vessel in a lab. One of the labs of the course was just to build a blood vessel using stem cells, which would be an unbelievable thing in Brazil. (Participant T)

Participant N, a health sciences student, and Participant Q, an engineering student, echoed this notion:

During the first courses I [developed] a total new perspective on health and [even though] I had discussed social determinants before in Brazil, I never got so deep in this topic. And I think it’s pretty useful for me, especially because I want to do a masters or PhD after school, so I think it will be good for me. (Participant N)

As I didn’t have so much experience before [in] this [area] of electrical engineering, the courses I took in this field were pretty helpful. For example, to be more specific, I worked with embedded systems during the internship and if I didn’t get the
previous knowledge about memory, and that kind of thing that I [learned] in the last term, I wouldn’t be able to get so much knowledge in this embedded system I worked in [during] the internship. (Participant Q)

Thus, gaining new knowledge from courses was a theme among students in the CsF program. In certain cases, these students took courses related to their fields but unavailable in their home institution. These courses exposed them to new perspectives and new lenses for them to look at their field. In addition, students in the technological sciences such as engineering, computer science and architecture felt that the courses helped them learn new software or technology unavailable to them back in their home institution. The following are answers to a question that asked whether they had learned new skills relevant to their fields:

Yeah, I think so, especially for me in architecture [where we use] software. In Brazil we use different software from here ... I took something from everything, but I think basically it was the software that I learned during my first term that I could apply to the research [in Brazil]. (Participant F)

I learned a new language for programming, and I never played with this program before. At the University of Toronto I had to use this, and the teacher would help [me]. Learning in the university is different than learning in a job, so it helped a lot. (Participant K)

There is this course that I’m taking here where they teach three different languages and another way to program, and we don’t have it in Brazil in any university that I
[looked at] … I researched universities in Brazil to apply, and I didn’t notice this specific course. And I think that [this course] is really important. (Participant P)

3.1.3 Formation of networks. In several cases, courses also helped students create connections with peers and professors. Though the interaction with students outside of the CsF program appeared to be quite limited, CsF students were able to engage with each other and develop a strong community. Participant J speaks to this in the following quote:

When I started classes, [I had] two friends, [who] were also from Brazil, and we developed a really strong relationship. It was good because we were doing two courses together and we did the group projects together. It was really good for me because sometimes I don’t feel like studying, but having them there always helped.

(Participant J)

According to Participant J, having a network of CsF students helped him transition into the program and integrate with the academic and social community more easily. This is an important factor, given that Brazilian students come from a more collectivist culture that gives preference to a close-knit community (Hofstede, 2001). Additionally, aside from providing a community of support, the CsF network was also important because it helped students get connected and find potential opportunities for their placement component. Three of my interview participants mentioned that they were able to get their placements in research or industry through a CsF peer who had already completed this component of the program. Participant O, who completed an industry placement, mentioned that it was a friend who helped make the link. She said, “My friend gave me
the contact in November or October, and I went to the Christmas party at [the company], and then I sent an email to him in January and he scheduled the interview and I started in May” (Participant O).

Similarly, Participant C, who had originally struggled to find a placement, referred to a CsF peer as the particular factor that helped her secure a placement with a researcher. She mentioned, “Getting the placement was easy [in] the end, because my friend was working with this professor, so I just talked to him” (Participant C). Thus, the formation of peer networks through the course component of the CsF program was a clear benefit of the experience as it not only helped students by providing a close-knit support community, but it also linked to other connections and future opportunities.

Moreover, courses played a role in helping students form initial linkages with professors, who could eventually become their supervisors during the placement component. Participant B summarized this nicely when he said:

[Courses] had a huge influence on what I was doing during the summer, because basically it was like an extension of what I did in one of the courses. So if I did something basic during the courses, I researched something more advanced in the placement. (Participant B)

Participant M and Participant E spoke about a similar experience:

My professor ended up being my supervisor. He was my professor and I talked to him, I knew his project, his field, and it was easier. When you are taking courses with a professor it’s always easier. (Participant M)

I took [a] placement with a professor [who] taught me a course that I liked. I don’t
have this [course] in my major in Brazil, because there is no genetics in my campus … It was a good opportunity to learn something new, and I didn’t know any other professor that I’d like to work with. (Participant E)

Additionally, one student mentioned that even though she did not end up working with one of her course instructors, her relationship to these instructors encouraged her to make connections with a supervisor she wanted to work with:

Actually, I had two professors at UTM—because I study there actually—they were always encouraging me. Because, at first, when I contacted my current supervisor she didn’t respond, and they would encourage me to continue pushing. They would say, “Go and knock on her door and don’t give up.” It was a lot of support from them; because I was even more insecure back then, so it was very important at the time [to get the encouragement]. (Participant D)

Ultimately, the initial development of connections through coursework gave students in the research stream the opportunity to secure placements they were interested in and that were connected to the specific phenomena they had studied during coursework.

Overall, students felt that there was always something they could learn from their courses; whether it was about the differences in the system of education, content knowledge or knowledge of new technologies. In some cases, the experience with courses actually helped students develop the relationships to find appropriate placements, resulting in a direct link between the courses and the internships. This suggests that, aside from knowledge gain, another possible benefit of having students taking courses closely related to their interests is the formation of networks. However, these outcomes were not
reflected in the experience of all interview participants, suggesting that there were certainly concerns with how the design of the program seeks to ensure that all students have access to meaningful courses and can engage in this component of the experience.

3.2 Challenges

3.2.1 Compatibility issues between systems of higher education. The new knowledge and the new perspectives gained through coursework are critical benefits of the international scholarship programs that seek to promote human capital development. Thus, one would assume that the CsF program’s design took into consideration this notion and ensured that all students benefited from the academic learning experience of studying abroad. However, in some cases compatibility issues between the differing systems of higher education became an obstacle. This was especially true for my interview participants in medicine and pharmacy. In Brazil medicine and pharmacy are undergraduate programs, just like engineering or life sciences in Ontario universities and at the University of Toronto (Fulbright, 2014). However, in Ontario medicine and pharmacy are professional degrees that require students to have an undergraduate degree as a prerequisite for admissions (OUAC, n.d.). As a result, all CsF students in medicine and pharmacy seeking admissions in Ontario universities are admitted into the Faculty of Arts & Sciences and not into their respective faculties. Certainly, this creates limitations in terms of course selection, which, in turn could increase challenges for students looking for research internships with faculty members in their field.

According to the CBIE students are required to take courses directly related to their field (CBIE, n.d.). Students may take courses in ESL or FSL depending on their level of proficiency in the language of instruction of the host institution, yet, students are not
allowed to take courses in the humanities and social sciences. However, for students in
the health sciences compatibility issues that impose limitations on course selection have
hindered the ability for students to learn curriculum-relevant knowledge for their field.
This was evident in the answers participants provided to the question that asked whether
they had learned relevant skills during the program. Participant G, a medical student in
Brazil who ended up taking humanities courses and ended up in a placement below his
skill level, refers to this in his answer:

Not so much. I am thinking about medical skills, which means if you are in surgery.
Here I am not allowed to do that. Probably I have [gained] a little bit of this
doctor/patient contact and relationship [skills] because I met many people of other
cultures, but this is because I had some skills already and I simply further
developed them by applying them to different contexts. I did not take any courses
[relevant to] my medical skills. (Participant G)

Participant N, another medical student, echoed this comment when he was asked whether
he had been able to take courses in medicine:

No. Not in the medical school. In the first term I tried to do things that I’m not very
used to seeing during medical school, like medical anthropology or stuff that is
more related to social determinants of health. I took two courses in HIV and we
discussed a lot of what determines the instances of HIV, and other discussions that
are not focused on the medical stuff. I [also] took one course in intro to psychology
because I’m interested in psychiatry too. This term is kind of the same; I’m taking
two courses on psychology because of my interest and one course on biostatistics,
because it’s easy for me, and one course on introduction to global health.
In the case of Participant N, he was able to take courses related to the area of research he was interested in: psychiatry. His interests were more related to certain fields located under the Faculty of Arts & Sciences, so he was able to benefit from taking courses in the psychology program and public health. However, in the case of Participant G whose interests were more inclined towards the medical field, the situation was less positive as he ended up taking courses that did not have an impact on his direct field and professional area of interest. Similarly, when asked whether she was able to take courses in her field Participant S, a pharmacy student, answered, “Not really, because we, the health [science] students, were accepted by the faculty of arts and science and this didn’t work” (Participant S). Overall, then, though health science students found other ways to feel engaged in the program, their coursework was often unrelated to their specific area of interest.

To a lesser extent, other students in more compatible fields referred to issues arising from differences in academic curriculum structure and equivalences that prevented them from taking courses they were interested in pursuing. Participant L mentions an issue with prerequisites when he says, “I tried to take two courses of nanotechnology with my professor but I was not allowed because of prerequisites” (Participant L). The fact that he was not allowed to take these courses hindered his possibilities to continue learning the knowledge and skills he had acquired in the internship placement. In addition, this also prevented him from being able to strengthen his academic relationship with his internship supervisor and professor. Additionally, Participant M, who studied forestry, also found that she took courses that provided new perspectives on the subject but did not include
content about tropical forests more relevant to the Brazilian context.

Certainly, through study abroad it is expected that students learn content that is different from that they learn at home. The rationale behind these programs is often to foster the learning of new perspectives and ways to observe similar phenomena so that students can learn to be critical and to think independently. Yet, when compatibility issues extend to the point that they prevent students from learning relevant content knowledge to apply to their experience back home, the potential human capital impacts of this knowledge diminishes. As it will become evident in the following section, this issue not only impacted their ability to learn content relevant to their field of study but also created more difficulties when looking for placements.

4. The Placement Component

Placements and international internships are increasingly becoming popular in study abroad because of the perceived benefits that result from these opportunities (Gates, 2014). International placements can help students improve their intercultural communication skills and gain new knowledge related to the work in their field. In addition, they can provide students with the opportunity to gain international work experience, which can help students gain a competitive advantage to advance their careers in the future. The findings in this study show that a number of CsF students benefitted from the placement component because they continued to learn new knowledge and they had an opportunity to gain practical experience in a foreign country. At the same time, this component helped strengthen their professional linkages with supervisors and peers. This occurred mainly for students in the research stream. Yet,
certain issues with the process of acquiring a placement prevented all students from benefitting equally, as not all students secured relevant opportunities appropriate for their interests and capabilities.

4.1 Benefits

4.1.1 Intercultural learning. During their placements CsF students were able to engage in intercultural learning as they learned how to work in a new cultural environment. Participant D emphasized that one key takeaway from this experience was learning how scientific research is performed in a North American environment.

The best science is done in North America. So it’s extremely useful to learn how things work here, the process, how to find a question, how to evaluate the relevance of the question, and after how to develop an experimental design and write something in the models of the journals here. So some things [are] not possible to learn [in] Brazil. (Participant D)

Additionally, Participant H, who completed an industry placement, mentioned that his work environment was quite different from Brazil in the level of responsibility he was given in his placement in Toronto. He said, “As an intern they give you lots of responsibility here ... In Brazil you have always a supervisor looking or reviewing your job, or something like that ... Here they just trust you, so its a lot of responsibility” (Participant H).

Participant R mentioned that he also noticed differences between the workplace in Toronto and his experience working in industry in Brazil. He stated that in Toronto he learned to be more focused on work and getting results, and found that colleagues presented less obstacles when trying to complete tasks in his job. He said:
I guess the way that professionals act here in Canada is a little bit different … I think that I changed a lot since I arrived here. I guess it has made me a better person and a better professional for the future … What is different here in Canada from Brazil is that people here are careful with their actions … I don’t know, maybe people here are more focused on their jobs and more serious. I don’t know if it’s a Toronto thing, but people here are very focus on working, working, working (Participant R).

According to the literature, learning about the workplace in different cultures is important in study abroad programs as it prepares students for future international opportunities after graduation (Kelleher, 2013; Gates, 2014). By learning to interact in the workplace in a difficult cultural environment students are trained to be flexible and adaptable, while gaining greater cultural sensitivity. Although some students mentioned that through orientation programming they had learned about the differences between the Canadian and Brazilian culture, the placements were important in providing students the opportunity to put this knowledge into practice and gain greater cultural competence.

4.1.2 Knowledge gain. Like courses, when appropriate for the student, the placement portion of this program helped students gain new knowledge and ways of looking at phenomena in their fields. For many of the interview participants who had completed a research placement it served as a forum for them to learn about a different area of research in their field, exposing them to literature and technology they had never worked with before. Participant A referred to new knowledge that she learned by being exposed to new research areas through the literature she was given during her placement:

Before I started working with my supervisor she gave me a lot of essays to read and
those essays have a lot of information that I didn’t know yet. Also, according to a
postdoc from Brazil, who I was working with, those fields that I was working in
were not explored in Brazil, so for us this is good because it’s really new in Brazil.
So [the placement] helped me a lot. I had worked in Brazil to develop software for
children, as I did here, but when I searched for essays I didn’t find too much in
Portuguese and I didn’t know English very well, so I didn’t search in English. And
this was really hard for me because I would want to do something and I wouldn’t
find anything related. (Participant A)

Participant N had a similar experience, as he was able to get involved in a new area of
research during his placement:

I feel that I learned a part of research in the etymological area that I didn’t learn
[before], [because] I was working with a large number of populations and here I
was working with health policy and it was just like research on websites and
scientific journals. But it was great because I learned other areas that I was not used
to working with. (Participant N)

In addition, students participating in industry placements also felt that these
placements helped them gain new knowledge, but more in reference to entrepreneurship.
For example, Participant I said, “I [think] would like to build my own company. That’s
something I learned here in my placement” (Participant I). Participant J echoed this
notion:

I actually have an idea of opening a company and it’s an innovative concept. I
already had this idea before but after coming here I think it’s possible. Where I did
my internship it was in a startup company, so I could see there how they do
business. We had meetings and during the meetings I could see customer insights, financial statements, and these kinds of things. And that's how I became familiar as to how they do it. The company that I want to [create] is also very related to software and the company that I worked with is also very related to software. So it gave me the confidence that I can do it. (Participant J)

4.1.3 Strengthening of networks & future opportunities. Often interview participants who had participated in a research placement mentioned that they had developed strong professional relationships with their supervisors. When asked if they had developed relationships during their placements, Participant N, who was in a research placement at a hospital, said, “Yes, specially [with] the professor at CAMH. I finished there, but we are still working on a paper and I think that he wants to write other papers with me” (Participant N). Participant T also felt the same way about the connection between his placement and future opportunities. He mentioned that his interests in his placement was so strong that it developed a desire for him to continue the research further, helping students find the area in which they want to focus for future studies:

I think that my experience during this internship has totally changed my field; like what I thought about biomedical engineering. The field that I worked [in] during the summer was a field that I had never thought about working in before, and I do now because of the things that we have achieved … I’m still doing research for my professor during the term, because I don’t want to stop the research. And what we can achieve from that I think is going to become my future field of specialization. (Participant T)

In the case of industry placement, students felt that they had developed professional
relationships strong enough that they could reach out to in the future; yet, none of the participants mentioned specific plans to continue working on projects with members in their placement. Participant K’s comment serves as an example:

At my internship we [formed] a team and we were developing like a home surveillance system that you just give a simple code and you don't have to be an expert. All the guys are thinking of taking this project and making something more [like a] business [with] it. Because IBM sponsors the company, and everyone working there worked at IBM [before], they made some events to show their bosses or other people from IBM so we could network. (Participant K)

Finally, in a few instances participants mentioned that the placement also helped them strengthen connections back in Brazil with researchers interested in working with them in the same area of research. For example, Participant B said:

Well, because of this research internship I am [getting] in touch with people from my home university to get a research placement or a scholarship when I come back, and I am having good results. There is a professor that is interested in working with me once I come back because of everything that I did here. So the results are not just [in Canada]. (Participant B)

This last quote refers to a very important benefit of the placement component. Identifying tangible employment opportunities after the placement component is a desired outcome of study abroad programs. Through these programs students seek to gain a competitive advantage, and identifying new opportunities at home as a result of this program is certainly an example of the advantage a study abroad participant may experience. Unfortunately, only a handful of students mentioned that they could already identify
tangible employment or research opportunities for the near future. Nonetheless, all
students said that they are confident that the international experience gained through this
program will position them ahead of candidates who did not participate in study abroad
and remained at home.

4.2 Challenges

4.2.1 Structural Issues with the process of acquiring a placement. While
CsF students gained important benefits by completing their placements, not all students
experienced the unique benefits of a placement component as outlined by Figure 4. Some
students were unable to strengthen professional relationships and identify future
opportunities because they were unable secure a relevant and appropriate placement in
the first place. Findings suggest that this was due to structural issues with the process
implemented to attain a placement.

According to the literature the process to acquire a placement needs to be well
structured and clear to the student (Streitwieser, 2009). For students completing courses
or internships abroad the process tends to be more overwhelming than for domestic
students, demonstrating a greater need for support (Andrade, 2006; Ramsay, Barker, &
Jones, 1999). During the interviews it became evident that CsF students at the University
of Toronto expected and believed that the University of Toronto would actively help
them find placements. Looking at the student handbook provided by the CBIE to all
participating Canadian universities partnered with the organization and to all CsF
students, one could understand why this expectation might be warranted. The handbook
mentions that,

All CNPq sponsored students will complete a mandatory research or industry
internship for one term. When possible, the research or industry internship will be identified by the university; otherwise it will be identified by CBIE or through a third party. (CBIE, n.d., p. 4)

Though the handbook states that students sponsored by CAPES would not necessarily receive assistance to find a placement (CBIE, n.d., p. 4), in the summer of 2014 there were only 14 undergraduate CsF students at the University of Toronto sponsored by CAPES, and 388 were sponsored by CNPq. Similarly, only one of my interview participants was sponsored by CAPES, while 19 others were sponsored by CNPq. Clear in the text is that students sponsored by CNPq are not responsible for finding their own placements; instead, the responsibility is placed on the host university and the CBIE. In the case of CsF at the University of Toronto, the CIE would be responsible for this process. As a result, students seemed surprised at the fact that the process at the University of Toronto was organized as an independent search for the most part.

In order to help students acquire an appropriate placement the CIE provides workshops, and points students to valuable resources at the university, such as the Career Centre, which is an office for all University of Toronto students dedicated to helping students find work opportunities and prepare for applications and interviews. In addition, the CIE developed a process to help students reach out to faculty for research placements, whereby CsF students would gather three names of professors they would like to work with and then the CIE would help them by contacting the professor and advising them of the program and the student. In the case of industry, the CIE does not feel responsible to place students directly, but for the 2014 year the CIE hired the Academic Internship Council, an agency to help place approximately 50 students looking for an internship
placement. The agency would decide which students could be placed and would only follow along with these students. The rest of the students would generally have to look for placements on their own using the online platforms available to them as University of Toronto students and other job search platforms.

A dominant theme throughout the interviews suggested that students felt the process of acquiring a placement lacked a solid and clear structure. This resulted in a challenging process for students, sometimes forcing them to take on a placement less suitable for their interests. One of the biggest issues seems to be that there is a mismatch between student expectations and the services provided by the CIE. Students expected the CIE to place them, which means they expected to have a full-range of services that would locate placements for them and help them acquire an appropriate one. On the other hand, the CIE felt their responsibility was to facilitate information and workshops to help the student throughout an independent process of acquiring an internship.

Participant A and Participant H mentioned that the lack of clear structure of the process was concerning as the process did not reassure them that they would not find a placement for the summer:

I was a little afraid of the professors not choosing me, because [placements] were limited [and] the CIE had to help a lot of students. I was really close to the date of starting my research placement, so if this professor, who was the only one that contacted me, hadn’t done so, I would go crazy to find someone [else] or something in industry ... But, she contacted me really a little bit [too close] to the date and I was getting desperate. (Participant A)
I chose to look for [the placement] by myself [from] the beginning, and it was hard because you get answers like “your curriculum is really good but we are not taking interns this year” so I got a lot of good feedback but no real feedback. They had meetings at the University of Toronto, but they just have IT positions [and] not many for engineering, so that was kind of annoying. And some people [needed] the CIE to place them, and it never happened. Just a month before placements would start they sent everyone an email saying that we would have to look for them by ourselves and that the company they had hired was not going to do it. (Participant H)

Given that the process at University of Toronto was thought out as an independent search, students were faced with having to look for opportunities on their own. Unlike the case of domestic students or full program international students, however, CsF students come here in a one-year program and must search for these opportunities quickly after they have entered the program. Thus, in many cases, these students had to focus on finding opportunities and preparing their applications while completing the ELP program or their first term of courses. Participant I, who started courses at the University of Toronto in the winter term, felt the process was rushed because he was still working on his transition, creating more stress during his first term.

It was a little rushed because I got here during the winter and I had to secure a placement for the summer, so we suddenly had to make a lot of decisions that we were not aware of. It sounded like permanent decisions because we had to choose between research and industry, and do everything [by ourselves]. We were in the middle of midterms, and you had to build up all your career skills while you were
studying. So, I think it was a bit rushed. (Participant I)

Participant C shared this feeling and explained that the process to acquire internships is different for students in Brazil, suggesting that CsF students are not familiar or comfortable with the process employed at University of Toronto:

In Brazil the system is a little bit different. We do not work throughout the program, and in our fifth year we go on our internship. So it was a lot of competition with a lot of people with experience, and it was frustrating. I would say the worst part of the exchange. (Participant C)

In addition, students felt the process did not offer a clear structure and response-program for choosing between industry and research. Issues in communication sometimes forced students to start placements late in the summer term, sometimes risking the ability of students to fulfill the required time for the internship placement according to program requirements.

First, I was looking on the Internet for companies in the field. And then the University of Toronto—I guess the CIE—said they would help us. And I agreed to that, but they weren’t [communicating] very often so I didn’t know how good the process was … I think they hired another company to help them, but also one of the guys there said that the company wasn’t so clear about what they were doing. I know people that were able to find jobs this way … but in my field and for me it wasn’t very helpful. So, I basically did it by myself. Actually I started my internship exactly 16 weeks before the [deadline] that would allow me to work the amount of time I should work. (Participant R)

Moreover, according to an overwhelming number of participants, industry
placements were hard to find and secure. In some cases, this pushed students who would otherwise choose industry to change their path and choose a research placement. In the case of Participant T this was an early-on voluntary decision, as he wanted to make sure he would be placed in an internship that he would find interesting and valuable for his career goals:

My initial idea was to get an [industry] placement instead of research. But because some people were having trouble finding the work placement itself, I decided that it would be better if I just go for the research [from] the beginning. This would give me the opportunity to find a good professor and a good placement, instead of fighting for an industry placement and at the end being allocated to a random professor. So that's why I chose the research, and the process was really good. Since the beginning they gave us the opportunity to find our own professors, and then send a list of professors to them and then they would choose us. In the end my first option ended up being the professor I worked with. (Participant T)

In Participant T’s case the issues with acquiring an industry placement ended up working to his benefit as he was happy with his research placement and found it suited what he was looking for. As a result, he was engaged in his research and developed strong connections with his supervisor and team. However, in many cases issues with acquiring an industry placement resulted in students having to choose a placement with little time and sometimes with little interest, reducing the placement to a mere requirement of the CsF program and not a valuable experience. Participant Q refers to this in his comment:

Many people who wanted to get industry went to search for an internship by themselves. Some of them got one, but some of them didn’t, and for those who
didn’t get it, they had to take the research placement because it’s kind of easier to get. (Participant Q)

Although Participant Q does not speak from his own experience, the case of Participant C provides further evidence of this issues. Like others, Participant C wanted to complete an industry placement but was not successful during the process, forcing her to apply for research placements. Even when she made the decision to apply, it was too late to get a research placement she would be more committed to, forcing her to accept a placement she was less interested in doing:

I tried [to get] an industry [placement] but I couldn’t get it. That was very sad because I was working really hard on it. I think what made it complicated is that I went a little bit late, because I was so focused on the industry placement, that when I got to talk to the professors, they said, “we are full”. (Participant C)

Although this was a rare case, Participant K had difficulty finding a research placement and ended up working in an industry placement he was less interested in pursuing:

I think it was not so good because, at first, I wanted research and they said that we had to give three options of [professors] that we would like to do research with, but for three or four months … I didn’t have any feedback. Then they sent me an opportunity for an industry placement and then I applied there and got the placement. It was a bad time to do the research and I started one week late, so maybe a little more feedback [would be better]. (Participant K)

Finally, students expressed concerns regarding the Academic Internship Council, the agency used by the CIE to help CsF students find research placements. A few
participants that had looked for internship placements mentioned that they tried to use this service, but it often did not result in a match.

I could choose to find an internship on my own, or I could contact the Agency. And I tried to contact the Agency but they told me that my resume didn’t fit what they were looking for. I don’t know why. I think they just look at the majors and then they choose which ones they can work with. And the other ones they just reject. But I didn’t become worried because I had [a] contact. (Participant O)

I don’t think the agency really cared about the students; they just care about putting them anywhere. So you say you want to go someplace, but they put you anywhere they want. (Participant I)

So what happened with this agency is that they were supposed to help mostly the engineering students, and I knew that. So I went to talk with the CIE to see if my area would be covered by this agency and then they said that it wouldn’t, so I just did it by myself. (Participant S)

Essentially, this agency could only help a specific segment of the CsF student population. In general, this meant that the agency helped those students studying in fields were internships were more abundant, like computer science. Other students had to find opportunities in an independent fashion. Ultimately, none of the interview participants mentioned that the process of acquiring an internship was based on the university or the CBIE helping them secure a placement. This situation created more challenges for students. In fact, many times this induced more stress during the course term, and also
limited the ability for students to acquire meaningful placements. In cases where students felt their placement did not reflect their interests well, their level of engagement was lower and they did not demonstrate as much interest in continuing their work in this area. Since the process seems to have challenged all students, certain conditions were noticed that helped those students who did find meaningful placements. As explained in previous sections, it was the contacts made with other CsF students and with professors during the course term that helped students identify appropriate internships.

Overall, it seems that in the case of students in the research stream, those who had a better idea of what they wanted to do during their placement or how this placement would be connected to their interests and acted quickly were successful in securing an appropriate placement even when faced with a challenging process. In the case of industry, the field of study and the student’s location in relation to opportunities had a heavy weight on positioning students for success. For example, students in fields such as computer science that have more offerings in Toronto than other fields would find the process rather simple, as opposed to students in other fields such as engineering, who are currently experiencing a more competitive job market in Toronto. Altogether, the program’s weak structure allowed different variables to penetrate affecting the experience of CsF students in different fields or different streams. This resulted in uneven outcomes when comparing the experience of students in the program.
Chapter 5: Discussion

Analysis

This study set out to examine how the experience of the CsF program, as a government-sponsored international scholarship program, could benefit participating students. In addition, this study has used the international student mobility literature to frame and inform this analysis. This included an overview of the implications of outbound mobility for sending countries and a review of the literature on study abroad program design. A look at the goal of the CsF program shows that Brazil believes that by sending students abroad they will be able to benefit from increased interaction with the international scientific community. With this in mind, I came into this study with the assumption that the structure of the program would have the potential to promote several benefits including intercultural learning, gaining of new knowledge and perspectives about science and the student’s field, and the development of academic and professional networks. However, given that this program is a novel and recent development, I also anticipated that there would be challenges, as I expected certain structural characteristics or contextual factors to present obstacles. As a result, when developing my empirical study and my interview protocol, I did so with a framework in mind of the different design features that the literature suggests should be present in a study abroad program of this kind. Ultimately, I used this framework as a guideline when formulating my questions and evaluating my findings.

A number of findings answering my research question came from this analysis. Three distinct program stages were identified, including the transition stage, the course component and the placement component. While each stage was conducive to students
gaining several benefits, it also became clear in the findings that in each component there were certain outcomes that were essential for students to successfully proceed into the following stage. Structural features of the program played an important role in framing the experience of each CsF student and their ability to experience these benefits. Though some factors helped promote critical benefits, some features presented obstacles for a number of CsF students. Below, this section will focus on critically analyzing these findings and discussing their significance considering the literature.

Given that the student experience and the opportunities accessed at the host institution will shape the individual’s ability to learn and make connections, the transition stage plays a critical role as it prepares students to take advantage of the overall study abroad experience. In the transition period, effective study abroad programs count with orientation and support services administered by either the home institution, the host institution or the sponsoring agencies. The literature suggests that, while orientation programming should focus on preparing students for the cultural aspects of the experience, it should also prepare students for the new academic environment (Andrade, 2006; Brown, 2008). In fact, aside from furthering their English language proficiency, the findings in this case study suggest that in the transition period CsF students should benefit from intercultural academic learning before proceeding to complete the other components of the program.

The literature argues that students should participate in orientation programming both before and after departing to the host institutions (Brewer & Cunningham, 2009; Pedersen, 2010). Orientation programming is important because through orientation students not only learn about program goals and expectations, but they can also begin to
learn about the new culture they will be exposed to and begin to understand how to navigate and engage in their new environment. However, in this study only two participants mentioned that they received pre-departure orientation services. In fact, even the pre-departure orientation material provided by the CBIE, though mentioned, seemed to play a secondary role in helping students transition and adapt in the program.

Pre-departure orientation programming is vital because it helps participating students better understand program expectations and learning objectives (Goldoni, 2013). Findings from the interviews provide evidence of this notion and demonstrate how lack of pre-departure orientation negatively affected the experience of CsF students. The majority of participants mentioned that they had no guidance before leaving their home universities regarding the types of courses or placements they should be completing during the CsF program and, as a result, some students felt confused. At times this also resulted in students choosing inappropriate courses in terms of relevance and level, which became detrimental to their learning. Moreover, the lack of pre-departure orientation programming may seem unimportant when post-arrival orientation is delivered; yet, pre-departure orientation can help prepare students to understand the new cultural and academic environment they will enter, also preparing them to access post-arrival services. As shown by the case of Participant S, insufficient pre-departure services affected her ability to access important student services when she arrived to the University of Toronto, which resulted in her lack of understanding and ability to choose courses that were more appropriate for her level of study.

In general, participants alluded or directly pointed to post-arrival services provided by the CIE or more generally by the University of Toronto. The ELP was a
recurring example of a program that not only helped students improve their English skills, but also provided them with academic orientation. In general, students felt that this was invaluable when trying to navigate a new university and when transitioning into a new environment. For those who completed the program it helped them gain the skills and confidence to communicate with peers and also with professors. It also gave them awareness of the course structure and assessment methods at the University of Toronto, arming students with the tools to succeed and feel comfortable with their courses.

Overall, as Ryan and Viete (2009) suggest, for international students to have a chance for success certain critical conditions, such as the feeling of being able to communicate and relate to others with confidence, should be in place. The literature also agrees that programs such as the ELP can arm the students with the necessary tools to gain the confidence they need to be successful in school and develop relationships with peers and professors (Guo & Chase, 2011; Streitwieser, 2009).

Nonetheless, from the interviews it became evident that post-arrival orientation and support services displayed some issues. For example, not all students were offered the ELP course, which positions students at different stages of transition even as soon as they arrived. This is illustrated by Table 3, which shows the different sub-structures of the program. Students who were not admitted into the ELP course were forced to take courses at a new university and in a new system of education as soon as they arrived, without an opportunity to become more comfortable with their new environment. This was the case of Participant F, who felt that she missed out on important information and lacked time to transition into the new environment compared to her CsF classmates who were admitted into the ELP before coursework. Certainly, however, this discrepancy is
due to funding. Only those who are required to improve their English language skills in order to be admitted into courses are given the opportunity to enter the ELP. This program was designed simply as a way to help students gain the proficiency level necessary to attend the University of Toronto, and as a response to overwhelming low rates of English proficiency in Brazil. As a result, it was surprising to find that some participants shared strong feelings about the ELPs role in their transition. However, this also shows that the program does not need to focus on English language and could serve to help with the academic and cultural transition of CsF students regardless of their level of English proficiency. This is emphasized by the literature that suggests that at the initial stage facilitating a supportive transition is even more important for international students than English proficiency (Button, Green, Tengnah, Johansson, & Baker, 2005).

Aside from the ELP, the University of Toronto also provides other transitioning services mainly through the CIE. Yet these programs are not mandatory and are offered concurrently to academic courses. This suggests that, unlike other programming, the ELP is helpful in that it provides transitioning help during a period of two to four months, allowing students to gradually adjust to the program and their host institution. In turn, those students who are not offered the ELP do not have a chance to experience a gradual transition and must adapt quite quickly into their new academic environment. This is an issue because it increases the stressors for the international student, which can impact their chances to develop connections and learn effectively (Guo & Chase, 2011).

Ultimately, the ELP or a post-arrival program of this kind is critical for students in the transition period and for their preparation to proceed to the course component of the program. Overall, the findings have shown that the transition period is just as important
as the other two components of the CsF program as it not only promotes intercultural and language learning but it should establish the foundations for success in the following stages of the program.

Following the transition stage, the course component of program was shown to promote important benefits associated with study abroad and with government-sponsored international scholarship programs. As expected, when strongly linked to the student’s interests, the course component provided students a space to engage intercultural learning and gain knowledge relevant to their field of study. Additionally, when appropriate to the student’s interests, courses also served as a forum for students to develop academic or professional relationships that they could often profit from during the summer placement. However, this did not occur in all cases because certain compatibility issues between systems of higher education were not considered in the planning and implementation of this component at the University of Toronto. Ultimately, this negatively impacted a number of students whose degrees followed a different curriculum structure in Brazil compared to Canada.

All interviewees mentioned that they felt they gained cultural competence through coursework and learned more about the differences between the Brazilian and Canadian education systems. As shown in the literature, this type of learning is critical for study abroad programs that are part of a larger project of higher education reform and internationalization (Banks & Bhandari, 2012; Gacel-Avila, 2012). Additionally, for those students whose transition was more drastic and felt orientation was insufficient, learning about the different systems during courses became vital to their ability to succeed in their classes.
Moreover, countries in the global south that promote outbound mobility tend to do so with the expectation that students will gain new knowledge that can help them excel once they return home, and potentially share this knowledge with others (Kim, 1998). In fact, gain of new content knowledge is considered an important benefit of government-sponsored international scholarship programs (Perna, Orosz, & Jumakulov, 2015). Thus, in this context courses are a fundamental component of the study abroad experience. The literature also suggests, however, that students should take courses strongly linked to their interests because this sets up the proper conditions for students to learn the new field-specific knowledge (Wainwright, Ram, Teodorescu, & Tottenham, 2009; Streitwieser, 2009). In fact, some CsF students who felt they had not taken courses closely related to their interests felt discouraged and disengaged, reducing the strength of the impact of this experience on the student’s academic life. Instead, students who felt their courses were more relevant to their interests were more likely to emphasize the value of their knowledge for their future. Participant T even mentioned that through the course component in the CsF program he was able to narrow down the area of specialization he wishes to pursue in graduate school.

Often courses also helped CsF students develop linkages with peers and faculty members. In most cases the peer network was comprised of CsF students, who helped each other during courses by providing the communal support to engage with the coursework through group-study meetings, by sharing notes and tips about courses, or simply by attending similar courses. In fact, the literature suggests that, unlike other study abroad programs where students travel individually, programs that count with greater number of students benefit from the close-knit interaction with their peers (Mill, Johnson,
Costa Mendes, Arena Ventura, & Seicenti Brito, 2014). Additionally, having peers from the same international scholarship program can be beneficial as they go through the transition together and learn from each other’s experience with the program.

Moreover, for some students the network of CsF students served as a link to placement opportunities. Participant C and Participant O mentioned that they found placements by talking to other CsF students who had either completed their placements and could put them in contact with companies or professors that could hire them, or who could simply give them a contact of a prospective employer. Similarly, through courses, a number of CsF students were able to develop linkages with faculty members at the university. Often these relationships resulted in placement opportunities as either their professor hired them for summer research or connected CsF students with other faculty members able to work with them. For students who benefitted from making these connections, this facilitated the process of acquiring a placement and provided them with meaningful and relevant experiences that were strongly linked to the content knowledge they had learned in their courses. Ultimately, then, courses helped some students initiate the creation of international academic and professional networks (Wainwright, Ram, Teodorescu, & Tottenham, 2009).

However, not all CsF students were able to experience these benefits. As mentioned above, compatibility issues between degree systems hindered the experience of students in the health science. The difference between the degree structure in the health sciences in Brazil compared to the degree structure in Canada prevented these CsF students from taking courses at an appropriate level and strongly related to their field. This did not only hinder their ability to learn new knowledge relevant in their field, but
often impacted their ability to network with peers and faculty and develop the relationships necessary to help them secure an appropriate placement. Thus, this issue not only had a negative impact on the experience of particular students during courses, but it also affected the experience of a number of these students during the placement component. Essentially, given that these students were not able to engage with relevant content knowledge during their courses and were not exposed to peers and faculty within their area of study, securing a meaningful placement where they would feel engaged was more challenging.

According to the literature, in programs like CsF, students should experience the benefits of learning relevant content knowledge or developing relationships during study abroad for the program to be considered effective (Kim, 1998; Wainwright, Ram, Teodorescu, & Tottenham, 2009; Perna, Orosz, & Jumakulov, 2015). Findings from this study agree with the literature and show that both content knowledge and the development of linkages are critical components for students to profit from the subsequent stage of the program, the placement component. In order to ensure this occurs, there should be a clear structure of program planning for the student to follow when selecting courses (NAFSA, 2008). As a result, such programs should arrange with host institutions either an established course schedule for participating students or, at least, secure a number of courses for students to choose from. At minimum, sponsoring agencies must ensure that degree or curriculum structures between the home institutions and the host institutions are compatible. This structural feature was not evident in this case study of the CsF program, and it certainly had a negative impact on the experience of a number of students.
Finally, like the other stages of the program, the placement component was linked to several potential benefits of studying abroad. During placements students often had the opportunity to gain cultural competence and learn new knowledge relevant to their field, but placements were even more important in helping students strengthen academic and professional relationships and their desire to continue working in their respective areas within their fields. The optimal situation appeared for students in the research stream who had taken courses closely related to their interests and developed relationships with potential supervisors by approaching their professors. Certainly these students had more direct contact with prospective supervisors than students looking for industry placements outside the university. Many times this helped them secure a placement in the specific area of research they had studied during courses. The strong link between their courses and their placements, together with built-up passion for the subject, created the conditions for deep engagement during the placements. This group of students mentioned that they expect the relationships they have developed with their supervisors to continue even after their placements, and some of them mentioned they would like to continue focusing on the same area for their future research.

As it is suggested by the literature on study abroad internship programs, placements are an important means to facilitate the creation of international academic and professional networks (Pfotenhauer, Jacobs, Pertuze, Newman, & Roos, 2013; Wainwright, Ram, Teodorescu, & Tottenham, 2009). This is because placements can provide a first-hand environment for international students to interact with academics and professionals in their host country. In addition, the fact that it is a work placement frames the form of interaction in a way that is more independent, personal and individualized as
opposed to the case with courses where students interact with faculty members and peers in a larger group setting while focusing on a different set of goals. Overall, the data collected from the interviews supported the notion that placements may promote important benefits for participating students, but some issues have also posed challenges and limited the impact of this structural component. In fact, one of the aspects that presented challenges was the process to acquire a placement. Overall participants suggested that the process did not have a solid and uniform design, leaving various students confused when trying to secure an internship. In fact, several structural issues in the process created challenges and prevented all students from benefitting equally.

Discrepancies between the process to acquire a research placement and the process to acquire an industry placement elicited a different experience for students in each stream. Often students mentioned that securing a research placement was easier because these would generally take place at the university with faculty members as their supervisors. Many students ended up completing research placements with professors they had taken classes with. Other times they approached professors in their departments who they had not met but at least had an awareness of the existence of the CsF program at the University of Toronto. In fact, many students mentioned that they felt the conditions of the placement were appealing to prospective supervisors at the university and less appealing to industry.

Stipulated by CsF program guidelines, employers and supervisors are not required to pay the student during the placement and actually receive a grant in order to fund supplies and other resources used by the student during the placement (CBIE, n.d.). This arrangement is more clear and constructive for a faculty member already part of the
University of Toronto and the institution where the program is taking place. Faculty members are also used to receiving grants and funding for their research assistants and are also accustomed to working with students to help them learn through experiential learning. This is different in the case of industry, where even though they are accustomed to offering internships, these employers tend to feel more uncomfortable with unpaid work and with hiring international students, creating barriers for students in the CsF program. Altogether, given that finding research placements presented fewer challenges to students because they were already in the environment to create connections with prospective supervisors, more services were created to help students looking for industry placements. Yet, not all those searching for industry placements were given the same support.

Due to discrepancies in the availability of placements between different fields, some students received more help than others. To help them find placements, the University of Toronto hired an agency that could find summer internships for students. However, this agency was hired to support approximately 50 students from the 388 CsF students looking for placements in the summer 2014. Though not all 388 students were looking for industry placements, approximately half this number was hoping to secure one. This means that less than half the students received help from the agency. Participants were not clear as to how decisions were made in terms of who would receive the help of the agency and who would have to search for placements independently; yet, the process suggests that the agency would first look at the applicant’s qualifications and field of study and assess whether they would be able to help them at all. Thus, unlike more common approaches where more support is provided to students with more
complex situations, in the case of industry placements more services were provided to students in fields were placements were more abundant. In fact, if the agency did not find a match between the companies they were working with and the student’s field of interest and qualifications, the student would be taken out from the pool of applicants. This would then require the student to look for an industry placement independently or choose a research placement instead.

Overall, these findings suggest that no prior arrangements were made with companies when this program was designed. Brazil’s agencies, CNPq and CAPES, left the program in the hands of CBIE and CALDO, which, in turn, left each institution to manage the process independently. Though the CIE has tried to develop programming to help students secure appropriate and meaningful placements, the lack of guidelines and procedures resulted in a weak and confusing process. Certainly, the help provided through workshops at the CIE designed to help students draft resumes and cover letters and excel during the interview process have been helpful. Yet, while students seeking research placements found it easier to connect with prospective supervisors, without a solid structure in place to create relationships with industry, most students in the industry stream were left to their own devices to find a placement in a city that is still foreign to them. Therefore, insufficient resources were set aside to help students to connect with prospective employers. Certainly, there is no clear approach to create awareness of the program for target companies and no clear structure of placement requirements and learning outcomes so as to ensure a positive learning experience that would promote international collaboration. This resonates with the literature, as funding for services that support international students can be low relative to the amount of students being
serviced (Forbes-Mewett & Nyland, 2013). The literature suggests that this is due to these services’ low relative impact in an international students’ decision to choose the institution. Unfortunately, however, this has negative implications on the experience of the international student, and in this case on the experience of CsF students who came to the University of Toronto to complete industry placements.

Ultimately, there was insufficient planning regarding this component of the program, which resulted in a weak structure of the process to acquire a placement. As shown in the literature, study abroad programs should make sure that they present clear and thorough procedures and clear set of expectations to participating students (NAFSA, 2008). Moreover, undergraduate study abroad programs that include a placement component should ensure that they can deliver the necessary preparation and institutional support to students (Streitwieser, 2009). Through these features, the program can help students make independent decisions about their study abroad experience, while ensuring that students are matched with appropriate opportunities. When this does not occur, students face greater challenges when making decisions and following the steps of the process, as was the case with the CsF program. Additionally, having a clear set of expectations can also help students make better choices while in the program. For example, if the program has an established re-entry process that requires students to demonstrate what they learned and how they benefitted from the practical placement, students can better examine their choices and plan their study abroad experience accordingly. This notion does not only apply to the placement component, but is also relevant to the course component. Ultimately, in order to ensure that both courses and placements deliver a meaningful experience students must be aware of what is expected
from them when they return or how this study abroad experience will be integrated into their overall undergraduate program (Brewer & Cunningham, 2010).

On the whole, the CsF program’s design, which includes a transition stage, the course component and the placement component, has the potential to help students gain important benefits from the study abroad experience. Yet, fostering high-skilled human capital development through undergraduate study abroad is still a challenging task that requires clear guidelines, institutional commitment and oversight, as well as, sufficient student support. The critical issues outlined above have negatively impacted the experience of several participants and their ability to truly gain all the potential benefits of the program, demonstrating a weak structure that requires some consideration.

**Conclusions and Recommendations**

The structure and size of the CsF program is unprecedented and matched by no other international student mobility program in Brazil. As a result, the Brazilian government has received extensive attention for this initiative (Ossola, 2014; Stallivieri, 2015; Stevenson, 2015). On the whole, there is no question that the CsF program has contributed to building a stronger image for Brazil in the eyes of internationally renowned universities such as the University of Toronto (Bradshaw, 2012; Ahmed-Ullah, 2015; Stupavksy, 2015; Taylor, Ledger, Falk, Baichwal, Anderson, & Morris, 2015). Moreover, in June 2014, while the empirical portion of this research project was taking place, Brazil’s government announced that they would be launching a second phase of the CsF program in 2015. This phase would also consist of 100,000 scholarships for international student mobility in the STEM fields with a focus on undergraduate students (Custer, 2014; Foreque, 2015).
Yet, to date no formal evaluation of the first phase of the CsF program has been published and the program has not been without criticism. Higher education scholars familiar with the context of Brazil have pointed to certain characteristics of the program that can jeopardize its success. Overwhelmingly, these experts mention issues with student selection and with the absence of a program evaluation process (Moura Castro, Barros, Ito-Adler, & Schwartzman, 2012; Stallivieri, 2015; Knobel, 2011). The findings of this study are consistent with the views of these experts and suggest that the program has not created instruments that ensure that all students are matched with an appropriate host institution that can offer relevant courses and placements for each student. Ultimately, this points to the conclusion that structural issues present an obstacle to the effectiveness of the program in promoting desired outcomes. Thus, for the second phase, the program’s structure should be reevaluated taking into consideration some key elements. First, findings suggest that a more collaborative and integrative approach at administering and implementing the CsF program is necessary to improve the experience of students. This also involves developing strong pre-departure and post-arrival orientation services at home and host institutions. Additionally, the program should institute a more rigorous selection and matching system of student to study destination. Moreover, going forward, a comprehensive monitoring system should be implemented to track the opportunities available at host institutions and the progress of CsF students in order to provide insights on the program’s effectiveness and areas for improvement. These elements are described in more detail below. Given that Brazil is not the only country funding scholarships for study abroad in order to promote international student mobility for capacity development (British Council & DAAD, 2014), these conclusions
and recommendations may be relevant for similar existing or prospective programs—especially within the context of Latin America.

In fact, a look at the context of higher education and international student mobility in Latin America shows that these findings are relevant to the overall region. Evident in the literature, both inbound and outbound international student mobility in Latin America is often trumped by its incompatible model of higher education when compared to the system in other regions of the world (de Wit, Jaramillo, Gacel-Avila, & Knight, 2005; Gacel-Ávila, 2005; 2007; 2012). In terms of inbound mobility, foreign students find challenges in Latin America’s monolingualism, the limited availability of courses in English, and an admission system that is unfriendly to foreigners. The foundation of the Napoleonic model, which emphasizes undergraduate professional education over research, continues to hamper the ability of Latin American students to study abroad. As shown by this study, curriculum differences and differences in degree structures were critical obstacles to students of medicine and pharmacy who were prevented from taking courses in their specific area of interest. This occurred because, while graduate education exhibits a more compatible structure, the undergraduate degree structure in Brazil is still widely different from the structure of the Anglo-American research university. Additionally, other systemic differences in the structure of the curriculum and coursework have also affected participants. For example, findings from the interviews suggest that differences in the way courses are taught—with a strong focus on inductive learning and research—were surprising to CsF students at the initial stages of the program.

Altogether, this demonstrates that there are systemic differences that have not been
taken into consideration and can certainly hamper the study abroad experience. Given
that other countries in Latin America share systemic structures with the Brazilian system
(Bernasconi, 2008; Gacel-Avila, 2012), it is possible to argue that similar study abroad
programs in other Latin American countries would have to consider these challenges. In
the case of Chile, for instance, a set of scholarships under the name Becas Chile was
created in 2008 to promote international student mobility for graduate students. Although
by 2014 already 5,364 scholarships were awarded (CONICYT, 2014a; CONICYT,
2014b), a study found that a mismatch between the program’s goal and the student’s
rationale to pursue the scholarship could hinder this initiative’s ability to promote human
capital development (Mendoza, 2014). Additionally, issues with the administration of the
scholarship and the selection process of study destinations have also been identified
(Rivera Ojeda, 2010). In the case of Mexico, the federal government has been providing
study abroad scholarships for decades through the National Council on Science and
Technology (Consejo Nacional de Ciencia y Tecnología - CONACYT) (British Council
& DAAD, 2014). Though these scholarships have been promoting the development of
high-skilled human capital at the graduate level, in 2013 an agreement between Mexico
and the US shifted focus to also include undergraduate students (FOBESII, 2013). Much
like the case of CsF, under the name of Proyecta 100,000, this initiative has doubled the
number of Mexican tertiary students studying in the US in just a year (U.S. Department
of State Diplomacy in Action, 2015). Given their similarities in their higher education
system and in the targets established by both scholarship programs, the Mexican initiative
could potentially face similar challenges to those elicited by CsF, making the findings in
this study also relevant for Mexico’s case.
Overall, Latin American countries such as Brazil still need to respond to these structural challenges in their own higher education systems in order to benefit from the outcomes of international student mobility more profoundly. Ultimately, this issue helps illuminate and emphasize the notion that internationalization should be approached as a comprehensive process with integrated initiatives and cannot be treated as a short-term strategy. Thus, attention to issues at home is just as important as the creation of initiatives to send students abroad. As suggested by the literature, in order to benefit from the potential benefits of government-sponsored international scholarship programs, countries in Latin America will also need to focus on the internationalization of the curriculum and not only on funding international student mobility (Gacel-Ávila, 2007; Gacel-Avila, 2012). In the case of Brazil and the CsF program, internationalization of the curriculum at the undergraduate level could better ensure that these students benefit from the courses and placements abroad, as they could put the new knowledge to better use when they return home. Certainly, though, this is a long-term process that will take time. Nonetheless, there are practical issues that can be addressed in order to improve the outcomes of the program for the second phase of CsF and for other similar programs. Below I discuss these practical concerns and offer recommendations.

A common characteristic of government-sponsored scholarship programs is that they are generally designed through a top-down approach from a government perspective and administered by a government agency (British Council & DAAD, 2014). This is important because it impacts the program’s logic when it comes to the relationship between the goal of the program and the practical issues elicited by the particular context of higher education systems and institutions. When sending or host institutions are not
involved in the design or coordination of the program certain considerations may be missed. For example, without the involvement of higher education institutions government agencies may have more difficulty when choosing study destinations because they lack the knowledge of how different programs of study at these institutions fit with the interests and field of study of scholarship recipients. This was, in fact, the case exhibited by this study of CsF at the University of Toronto, which points to the need for a better collaboration framework between key players. A more collaborative approach between sponsoring agencies, sending and host institutions could better ensure and reinforce the link between rationales and outcomes (NAFSA, 2008). This approach should also ensure that there is more clarity in the division of each actor’s roles, in order to establish clear responsibilities and accountability.

When looking at program design and the different stages of the CsF program, this study has demonstrated that more attention should be paid to the transition period as it is a critical component that helps ensure students are prepared to gain important benefits. As it became evident in the findings, students who felt they lacked sufficient orientation and support struggled more during courses and when searching for placements. Ultimately, then, the transition period will impact the subsequent stages of the program. Thus, sponsoring agencies, together with sending and receiving institutions should ensure that both pre-departure and post-arrival orientation programs are available to all CsF students and to students participating in other study abroad programs. Informed by the findings and the literature, orientation programs should help prepare students to communicate and engage in their new social and academic culture (Ramsay, Barker, & Jones, 1999; Andrade, 2006; Brown, 2008; Guo & Chase, 2011; Goldoni, 2013). While
pre-departure orientation programming should focus on explaining the different steps of the program and on clearly outlining program expectations, post-arrival programs can focus on aspects that are more specific to the host institution such as information regarding course selection and evaluation methods. Even though the language component of programs like the ELP may be unnecessary to students who already have high proficiency in the language of instruction, post-arrival orientation programs should focus on preparing students to engage in the new classroom and understand academic expectations and issues such as plagiarism. Additionally, post-arrival orientation should help students navigate their new social environment, including how to approach peers and faculty members. Ultimately, like all other study abroad programs, the CsF program should set up the conditions to ensure that participants are emotionally and academically ready to take advantage of the experience.

In addition, the findings regarding the course and placement components suggests that it would be useful to implement a more comprehensive selection and matching system of student to study destination that takes into consideration degree compatibility between the student’s home institution and prospective host institution. This would help ensure that each student will attend an institution that can provide appropriate opportunities that promote desired benefits. Though the program already exhibits a targeted approach by focusing on the STEM fields, students in professional fields in the health sciences have faced greater challenges to find relevant courses and placement opportunities than students in life sciences, computer science and engineering. Often, this negatively impacted their ability to learn important content knowledge and develop professional and academic networks—two critical benefits associated with these program
components. Thus, planning needs to consider the differences between these fields when assessing student selection and matching with study destination. As mentioned above, this is especially relevant in the context of Latin America, as many professional fields in the health science differ in structure with the context of the Anglo-American research university. Sending abroad medical students or students of pharmacy is certainly important, as these students can benefit from learning about new advances in technology and scientific research that can impact their professions at home. In addition, the social aspect of the experience can also be valuable, as these students can learn to engage with patients from different cultures and can gain a greater understanding of the social determinants of health (Button, Green, Tengnah, Johansson, & Baker, 2005). Yet, if program planning does not take into consideration the incompatibility between the degree structure of their system and the education system of the host country, students may not be able to access the appropriate courses and opportunities and might not be able to reach the desired outcome of the program. Ultimately, the education system and other contextual factors of a study destination will inevitably create discrepancies in the availability of opportunities for a student in a given field.

Additionally, a better framework for identifying and outlining courses and placement opportunities is necessary. Sponsoring agencies should collaborate with home and host institutions to establish more clearly the courses that CsF students can choose from when entering the program. As demonstrated by the findings, students felt that there were not enough guidelines for course selection, resulting in a challenging and stressful process. According to the literature, in order to establish an effective process of course selection, scholarship administrators should involve faculty members, who are
knowledgeable about curriculum differences and requirements, as part of this consultative process (NAFSA, 2008). This same concept can also apply to placements, as sponsoring agencies could collaborate with host institutions and focus on pre-establishing partnerships with industry in order to secure meaningful opportunities for students prior to their arrival. This way, students will engage in the process with greater confidence and trust that this component will result in a valuable experience.

Finally, government-sponsored scholarship programs have to be accountable to the public and should include measures that can help ensure the successful completion of the program. This can be possible if a program has a monitoring system in place that can track the student’s progress while and after finishing the program. According to the literature government-sponsored scholarship programs tend to lack accountability; yet, should consider it an essential aspect of the program’s administration (British Council & DAAD, 2014). In the case of CsF, there is a system in place that tracks the number of scholarships granted as well as the names of participants and their program of study (Ciência sem Fronteiras, 2015; Ciência sem Fronteiras, 2015b). Yet, introducing monitoring systems to track courses and placement opportunities available to students in the study destinations could help ensure that the program promotes critical benefits. In addition, by also monitoring the progress of students in the program the sponsoring agencies would have a greater ability to assess the outcomes of the program when students return home. In fact, the progress of CsF students can be tracked even once they return to Brazil, in order to evaluate whether the program has helped them acquire relevant research or industry opportunities at home. Lastly, a monitoring system could also help by delivering answers about structural issues in the program and pointing to
specific areas for improvement. Ultimately, in this way supporting agencies could assess whether the scholarship program has achieved its goal and what can be improved to ensure that it is successful. Monitoring systems are useful for all government-scholarship programs and would provide sponsoring agencies with more efficient tools to evaluate and improve these initiatives.

Certainly, this research is not conclusive and further research of the CsF program could enhance our understanding of what this scholarship has to offer. Following this study, I believe it would be useful to conduct a longitudinal study to uncover the long-term effects of this program on Brazil and the country’s higher education system. In addition, in order to assess the weight of individual institutional factors such as the services provided by the CIE at the University of Toronto, it would also be useful to conduct a comparative study across various institutions. This could occur by studying institutions with similar numbers of CsF students but varying degrees of resources available for the program. More generally, similar studies that look at other government-sponsored scholarships could also help expand our knowledge of this type of study abroad program. Studies of this kind could continue to increase our understanding of the potential benefits of such programs and could help ascertain our knowledge of the essential structural characteristics found in effective study abroad scholarship programs.
References


NAFSA. (2008). *Strengthening Study Abroad: Recommendations for Effective Institutional Management for Presidents, Senior Administrators and Study Abroad Professionals*. NAFSA, Task Force on Institutional Management of Study Abroad. NAFSA.


http://www.state.gov/r/pa/prs/ps/2015/01/235641.htm


http://www.uis.unesco.org/Education/Pages/international-student-flow-viz.aspx


## Appendix A: List of Documents

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<thead>
<tr>
<th>Type</th>
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<td>Government documents</td>
<td>Brazilian Ministry of Education</td>
<td><em>Produto 1: Programa Ciência sem Fronteiras</em> [The Science without Borders Program]</td>
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<td></td>
<td>Brazil’s National Institute for Education Studies and Research</td>
<td><em>Resumo Técnico: Censo de Educação Superior 2012</em> [Technical Summary: Census of Higher Education 2012]</td>
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<td>Institutional documents</td>
<td>CBIE</td>
<td><em>Canada-Brazil Ciência sem Fronteiras Scholarship Program: Undergraduate Student Handbook</em></td>
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<td>University of Toronto</td>
<td><em>Ciência sem Fronteiras</em></td>
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<tr>
<td>Media reports</td>
<td>Ahmed-Ullah</td>
<td><em>Brazilian students bring dance, joy and culture to Toronto: More Science Without Borders students come to U of T than anywhere else in the world.</em></td>
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<td>Bowater</td>
<td><em>Dismay as Brazil recalls Science Without Borders fellows.</em></td>
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<td>Bradshaw</td>
<td><em>Canadian Universities reach to Brazil for Brainpower</em></td>
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<td>Custer</td>
<td><em>Brazil: 100,000 more Science without Borders scholarships.</em></td>
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<td>Foreque</td>
<td><em>Governo lança nova etapa do Ciência sem Fronteiras mesmo sem cumprir meta inicial</em> [Government launches new stage of Science without Borders without fulfilling initial goals].</td>
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<td>Knobel</td>
<td><em>BRAZIL: Study-abroad initiative needs careful study.</em></td>
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<td>n.d.</td>
<td><em>Ministro da C&amp;T lança o programa Ciência sem Fronteiras.</em> [Ministry of Science and Technology launches</td>
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<td>Ossola</td>
<td>Can brain drain be beneficial?</td>
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<td>Stallivieri</td>
<td>Brazil’s Science without Borders Program</td>
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<td>Stevenson</td>
<td>Canada has much to learn from Brazil</td>
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<td>Stupavksy</td>
<td>Learning across borders: UTSC is a destination - and a launch pad - for students studying in the Americas. (Bradshaw, 2012)</td>
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<td>Painel de Controle do Programa Ciência sem Fronteiras. [Control panel of Science without Borders Program]</td>
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<td>Bolsistas pelo Mundo. [Scholarship Recipients around the World]</td>
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Appendix B: Ethics Approval

PROTOCOL REFERENCE # 30574

July 29, 2014

Dr. Creso Sa
OISE/UT: LEADERSHIP, HIGHER AND ADULT EDUCATION
OISE/UT

Ms. Julieta Antonela Grieco
OISE/UT: LEADERSHIP, HIGHER AND ADULT EDUCATION
OISE/UT

Dear Dr. Sa and Ms. Julieta Antonela Grieco,

Re: Your research protocol entitled, "Fostering international collaboration at the undergraduate level: A case study of the experience of undergraduate students participating in Brazil’s Science without Borders program at two Canadian universities"

<table>
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<th>ETHICS APPROVAL</th>
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<tr>
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<td>Expiry Date: July 28, 2015</td>
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<td>Continuing Review Level: 1</td>
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We are writing to advise you that the Social Sciences, Humanities, and Education Research Ethics Board (REB) has granted approval to the above-named research protocol under the REB’s delegated review process. Your protocol has been approved for a period of one year and ongoing research under this protocol must be renewed prior to the expiry date.

Any changes to the approved protocol or consent materials must be reviewed and approved through the amendment process prior to its implementation. Any adverse or unanticipated events in the research should be reported to the Office of Research Ethics as soon as possible.

Please ensure that you submit an Annual Renewal Form or a Study Completion Report 15 to 30 days prior to the expiry date of your current ethics approval. Note that annual renewals for studies cannot be accepted more than 30 days prior to the date of expiry.

If your research is funded by a third party, please contact the assigned Research Funding Officer in Research Services to ensure that your funds are released.

Best wishes for the successful completion of your research.

Yours sincerely,

[Signature]

Sarah Wakefield, Ph.D.
REB Chair

[Signature]

Dean Sharpe
REB Manager

OFFICE OF RESEARCH ETHICS
McMurrich Building, 12 Queen’s Park Crescent West, 2nd Floor, Toronto, ON M5S 1S8 Canada
Tel: +1 416 946-3273 • Fax: +1 416 946-5763 • ethics.review@utoronto.ca • http://www.research.utoronto.ca/for-researchers-administrator/ethics/
Appendix C: Recruitment Email

Dear student,

My name is Julieta Grieco and I am a graduate student at the Ontario Institute for Studies in Education at the University of Toronto pursuing a Masters degree in Higher Education.

You have been contacted on my behalf because you are participating in the Science without Borders program hosted by the University of Toronto.

I am currently working on my thesis, which seeks to explore the factors of the Science without Borders program that foster international collaboration. As a result, I wish to interview scholarship recipients to understand more about the experiences and reflections of the program’s structure and possible outcomes.

For more information, I have attached a copy of the informed consent form for your review. If you choose to participate, we will discuss this further and I can respond to any questions you may have.

Please, know that responding to this e-mail does not hold you to participate and you may respond to simply ask questions regarding the research or your potential role in the research. To contact me, you can e-mail me at julieta.grieco@mail.utoronto.ca or call me at (416) 624-3929.

Thank you in advance.

Sincerely,

Julieta A. Grieco
M.A. Candidate, Leadership, Higher and Adult Education
OISE/UT
Email: Julieta.grieco@mail.utoronto.ca
Phone: (416) 624 - 3929
Appendix D: Ethics Amendment Approval

PROTOCOL REFERENCE # 30574

September 8, 2014

Dr. Crescencio Sa
OISE/UT, LEADERSHIP, HIGHER AND ADULT EDUCATION
OISE/UT

Ms. Julieta Antonela Grieco
OISE/UT, LEADERSHIP, HIGHER AND ADULT EDUCATION
OISE/UT

Dear Dr. Sa and Ms. Julieta Antonela Grieco,

Re: Your research protocol entitled, “Fostering international collaboration at the undergraduate level: A case study of the experience of undergraduate students participating in Brazil’s Science without Borders program at two Canadian universities”

We are writing to advise you that a member of the Social Sciences, Humanities, and Education Research Ethics Board (REB) has granted approval to an amendment (Received August 28, 2014) to the above-referenced research protocol under the REB’s delegated review process. This amendment approval letter only applies to what was outlined in the request form under section 5.a) or otherwise marked in the revised protocol.

Any changes to the approved protocol or consent materials must be reviewed and approved through the amendment process prior to its implementation. Any adverse or unanticipated events should be reported to the Office of Research Ethics as soon as possible.

Best wishes for the successful completion of your research.

Yours sincerely,

Sarah Wakefield, Ph.D.
REB Chair

Dean Sharpe
REB Manager

OFFICE OF RESEARCH ETHICS
McMurrich Building, 12 Queen’s Park Crescent West, 2nd Floor; Toronto, ON M5S 1S8 Canada
Tel: +1 416 946-3373 ● Fax: +1 416 946-3763 ● ethics.review@utoronto.ca ● http://www.research.utoronto.ca/for-researchers-administrators/ethics/
Appendix E: Amended Recruitment Email

Dear student,

My name is Julieta Grieco and I am a graduate student at the Ontario Institute for Studies in Education at the University of Toronto pursuing a Masters degree in Higher Education.

You have been contacted on my behalf because you are participating in the Science without Borders program hosted by the University of Toronto. I am currently working on my thesis, which seeks to explore the factors of the Science without Borders program that foster international collaboration. As a result, I wish to interview scholarship recipients to understand more about the experiences and reflections of the program’s structure and possible outcomes.

As a token of appreciation for your participation you will receive a $10 gift card for Starbucks.

If you would like to participate in this project, please read the attached information. To participate you can e-mail me at julieta.grieco@mail.utoronto.ca or call me at (416) 624-3929.

Please, know that responding to this e-mail does not hold you to participate and you may respond to simply ask questions regarding the research or your potential role in the research.

Thank you in advance.

Sincerely,

Julieta A. Grieco
M.A. Candidate, Leadership, Higher and Adult Education
OISE/UT
Email: Julieta.grieco@mail.utoronto.ca
Phone: (416) 624 - 3929
Appendix F: Interview Protocol

1. Why did you decide to participate in the Science without Borders (CsF) program?

2. Why did you choose the University of Toronto?

3. Were there any services provided at your home institution or was there a professor in Brazil who helped you locate an appropriate placement here in Toronto?

4. In your host institution, how did you feel about the process to attain and secure the research or internship placement? Was it organized? Was it complicated?

5. Were there any specific factors that eased the process or made it complicated?

6. Did your experience with courses and classes at your host institution impact your research or internship placement in any way? Or did your experience with your internship placement impact your courses or classes in any way?

7. Did you develop relationships with faculty members or classmates that influenced your participation in research or internship placements? Or your learning (skills and knowledge)? In Canada? Or before coming, in Brazil?

8. From your experience in the CsF program, have you learned any knowledge that you think is valuable to bring back to Brazil as a person studying in your field that you would otherwise not have acquired?

9. From your experience in the CsF program, have you learned any skills (know-how) that you think are valuable to bring back to Brazil as a person studying in your field that you would otherwise not have acquired?

10. Do you foresee obstacles in Brazil that would impede you from engaging in similar research or industry placements once you return?

11. Do you think you will continue to have contact with researchers, faculty members, or students in Canada for academic reasons?

12. Overall, what is it from your experience with the CsF that you think will contribute to your future in academics or employment in Brazil?

13. If there is anything you could change about the program, what would it be?
Appendix G: Informed Consent Form

Study Name: Fostering international collaboration at the undergraduate level: A case study of the experience of undergraduate students participating in the Science without Borders program.

Researcher: Julieta Grieco
MA Candidate, Leadership, Higher and Adult Education, OISE/UT
Julieta.grieco@mail.utoronto.ca

Invitation to Participate and Criteria: As a recipient of the Science without Borders (CsF) scholarship you are invited to participate in a research project examining aspects of the CsF program. This research project has been designed and will be implemented in order to satisfy the requirement of Master’s thesis for the completion of a Masters of Arts in Higher Education at the Ontario Institute for Studies in Education, University of Toronto (OISE/UT). The study will be conducted under the supervision of Dr. Creso Sá from the department of Leadership, Higher and Adult Education at the University of Toronto (OISE/UT). Given the specific purpose of the research stated below, only scholarship recipients at the undergraduate level and who have completed the research/industry placement portion of the program are asked to participate.

Purpose of the Research: The purpose of this research is to examine and analyze the factors that promote skills and knowledge transfer through the creation of knowledge networks and collaboration, facilitated within the Science without Borders program. This study seeks to understand how government scholarship programs for study abroad in STEM disciplines can contribute to skills and knowledge transfer that would serve for the development of the sending country and the internationalization of higher education in Brazil. Of main interest are the structural, pedagogical and social factors influencing the experience of students participating in the Science without Borders program at the University of Toronto and Ryerson University.

Your role in the Research: By participating in this research, you will be asked to be available in person for approximately 1 hour to answer questions regarding your experience with the Science without Borders program. More specifically, these questions will refer to your experience with the research or industry placement, your expectations with the program, your learning outcomes and your perception towards research collaboration now and in the future. As a token of appreciation for your participation you will receive a $10 gift card for Starbucks.

Risks and Discomforts: I, the principal investigator, do not foresee any risks or discomfort from your participation in the research. At no time, will you be judged or evaluated, and no value judgment will be placed on your responses. Overall, at no time will this research put you at risk of harm.
**Benefits:** Your participation will directly benefit the completion of my Master’s thesis results, by providing necessary evidence to substantiate research claims, discussion and conclusion. In terms of the scholarly benefits, with this study I aim to help expand the knowledge of international student mobility issues by adding another layer of understanding of the structural aspects of a specific government student mobility scholarship and its relationship to development. In addition, though there is no direct benefit to you from participating in this research, you may experience the benefit of having a deeper understanding of the scholarship program you are participating in, and be able to explore your feelings about your experience.

**Voluntary Participation:** Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your participation in the Science without Borders program, or the nature of your relationship with the University of Toronto/Ryerson University or home institution either now, or in the future.

**Withdrawal from the Study:** You can stop participating in the study at any time, for any reason without consequence. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher, OISE/UT, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

**Confidentiality:** All information you provide during the research will be held in confidence and your name will not appear in any report or publication of the research. To ensure confidentiality the interviews will be coded from the beginning by tagging your transcript to a specific codename (i.e. Participant A) that only I will be able to recognize in order to keep track of the data. The key to codes will be stored securely and separately from the raw data. During the interview I will take field notes and, with your consent, I will record the interview using a tape-recorder. Both methods of data collection will be named after your code. Your data will be safely stored in a locked facility in my office and only my supervisor and I will have access to this information. In addition, electronic data will only be kept in my personal computer and will be password protected. Before interpreting your data, the transcripts of your interview will be sent to you for review. Finally, this data will be stored until the Master’s thesis has been accepted by the thesis committee, which is estimated to be between 8-10 months from the date of the interview. After that, the transcripts will be destroyed. As a participant, you will be asked if you wish to receive a summary of the research results, and if so, I will send you the results once they are final.

**Questions About the Research?** If you have questions about the research or about your participation in the research at any stage, please feel free to contact me either by telephone at (416) 624-3929 or by e-mail at Julieta.grieco@mail.utoronto.ca. In addition, if you have any complaints or concerns about how you have been treated as a research participant, please contact the Office of Research Ethics at ethics.review@utoronto.ca or (416) 946-3273.
Thank you in advance for your participation.

Julieta Grieco  
MA Candidate, Leadership, Higher and Adult Education  
OISE/University of Toronto  
252 Bloor Street West  
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Telephone: (416) 624 – 3929  
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Creso Sá  
Associate Professor, Leadership, Higher and Adult Education  
OISE/University of Toronto  
252 Bloor Street West  
Toronto, ON  
M5S 1V6 Canada  
Telephone: (416) 978 - 1277  
Email: c.sa@utoronto.ca

By signing below, you are indicating that you are willing to participate in the study, you have received a copy of this letter, and you are fully aware of the conditions above.

Name: _____________________________________  
Signed: ____________________________________  
Date: ______________________________________

Please initial if you would like a summary of the findings of the study upon completion: ______

Please initial if you agree to have your interview audio taped: ______

Please keep a copy of this form for your records.