The Chinese Knowledge Diaspora and Diaspora Knowledge

Network: Australia and Canada compared

By

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AUTHOR'S DECLARATION

This is to certify that:

I. this thesis comprises only my original work towards the Doctor of Philosophy Degree

II. due acknowledgement has been made in the text to all other material used

III. the thesis does not exceed the word length for this degree.

IV. no part of this work has been used for the award of another degree.

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ABSTRACT

In the context of globalization and the knowledge economy, brains, increasingly mobile, have assumed unprecedented importance, and even more so in the coming decades when the academic profession is ageing. Developed nations like Australia and Canada compete to attract and retain the best and brightest. A related development, advancement in information and communications technology, enables the establishment of powerful cross-boundary research networks.

The study builds on previous research in order to understand the Chinese knowledge diaspora in Australian and Canadian universities, and trace their transnational intellectual networks to colleagues in mainland, and other parts of the Chinese intellectual diaspora. A qualitative, grounded theory approach was used for the study. Semi-structured in-depth interviews were conducted for data collection. The data gathering techniques yielded a rich volume of detailed descriptions that were categorized and thematically analyzed.

The study investigates the role of the Chinese knowledge diaspora, and the dynamics of the diaspora network with special reference to the factors that both sustain and limit such transnational knowledge networks. The strong sense of cultural/ethnic identity and motivation for closer academic ties were reiterated, as were commonly-expressed sentiments that doing science in the West was a primary source of satisfaction. Substantial accounts of scientific communication and transnational collaboration were highly illustrative. While some had one or two kinds of interaction, most had multiple types of collaboration with China. The influencing factors at personal, institutional,

and system level were well documented and categorized. Among the most prominent were the differences of research culture across the two systems.

Limitations of this study include small sample size and distribution. Recommendations for future study include increasing the sample size, recruiting indigenous scholars and administrative staff, examining the Chinese knowledge diaspora from both research-intensive and less research-intensive universities in the United States, and investigating further how gender affects both academic being and knowledge networks with the mainland academia of China.

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LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
AEN	Australian Education Network
ARWU	Academic Ranking of World Universities
AUCC	Association of Universities and Colleges of Canada
CAS	Chinese Academy of Science
CIC	Citizenship and Immigration Canada
CSC	China Scholarship Council
DIAC	Department of Immigration and Citizenship
EU	European Union
G-7	Japan, Germany, the United Kingdom, France, Italy, and Canada
GATS	General Agreement on Trade in Services
GFC	Global Financial Crisis
GSM	General Skill Migration
HEIs	Higher Education Institutions
HREC	Human Research Ethics Committee
HRST	Human Resources in Science and Technology
ICT	Information and communication technology
IEEE	Institute of Electrical and Electronics Engineers
IIE	Institute of International Education
ILO	International Labor Office
IOM	International Organization for Migration
MIT	Massachusetts Institute of Technology

MLP	Medium- to Long-term Strategic Plan for the Development of Science and Technology
MOE	Ministry of Education, China
MOST	Ministry of Science and Technology, China
NICs	Newly Industrialized Countries
NLs	National Laboratories
NRC	National Research Council of Canada
NSERC	Natural Sciences and Engineering Research Council
NSF	National Science Foundation
OECD	Organization for Economic Co-operation and Development
PPPs	Purchasing Power Parities
R&D	Research and Experimental Development
S&E	Science and Engineering
S&T	Science and Technology
SAFEA	State Administration of Foreign Expert Affairs
SCI	Science Citation Index
SKLs	State Key Laboratories
SNAHE	Swedish National Agency for Higher Education
SV	Silicon Valley
THES	Times Higher Education Supplement
TNCs	Transnational Corporations
UA	Universities Australia
UNECA	United Nations Economic Commission for Africa

UNESCO   United Nations Educational, Scientific and Cultural Organization

WCU   World-Class University

WTO   World Trade Organization

Chapter One   Introduction

1.1   Introduction

In an era when the knowledge economy is increasingly global in form,   its
implication for higher education in terms of knowledge creation and dissemination,
has been highlighted by a series of publications from multinational organizations
such as UNESCO, World Bank and OECD. The centrality is that education,
especially higher education, with its vital role in local and regional economies
(Yusuf & Nabeshima, 2007), has been an important factor in constructing the
knowledge base (Kitagawa, 2004; World Bank, 2002) and the foundation for the
evolution of human society. Among the prominent is the role of higher education in
contributing to an efficient national innovation system as well as building a strong
human capital base.

Among other aspects discussed in relation to the globalization process, the
international mobility of the highly skilled, referred as to the human face of global
mobility (Favell, Feldblum & Smith, 2007) has become a central motif. The
underlying reason is the escalating value of knowledge workers as producers and
facilitators of innovation, cutting edge technology and its transfer. As such, the
increase in the brainpower is central to sustain and increase national economic
competency, and therefore scarce human capital becomes a target of competitive
national migration and innovation policies (Kuptsch & Pang, 2006). The growing
demand and competition for talents in OECD countries is increasingly fierce,
especially in the USA, Canada, Australia and the UK. A proliferation of new

schemes and policy measures directed to increase the size and quality of a country's labor force has been developed.

This has triggered a war of unprecedented ferocity at a global level, a global battle for brainpower (The Economist, 2006; Wildavsky, 2010). While advanced countries experiencing net brain gain refine their policy and strategy aiming at more gains, sending countries make strenuous efforts to regain their lost brains. The emerging impetus for wealthy countries, besides the abovementioned, is the decline in population growth rates and ageing of the work force that confront many industrialized economies, but is also confronting some developing countries (e.g. China and parts of Africa), for different reasons. An issue that has aroused worldwide attention since 1963 when the British Royal Society first coined the expression Brain Drain to describe the outflow of scientists and technologists to the United States (Brandi, 2006; Woolley, Turpin, Marceau & Hill, 2009), the phenomenon has become more critical in this globalized age and remains unsolved. The fact is that the old-style brain drain continues to a significant degree although there is some evidence of brain exchange (Altbach & Ma, 2011).

Knowledge diaspora and academic mobility are not new phenomena. Academic mobility was evident in both the ancient Greek and ancient Chinese worlds, and in the Arab world of the Middle Ages, with peripatetic scholars (Welch, 2005, 2008) travelling to seek and disseminate knowledge. However, the rise of global knowledge diaspora is a more recent phenomenon related to both increases in global migration flows, and the rise and increasing ubiquity and density of ICT (Welch & Zhang, 2008a). Universities embed themselves deeply in the cross-border

flow of knowledge workers (Yang & Welch, 2010, p. 594). In effect, what has occurred has been the emergence of a global market for academic talent (Altbach, 2002a) as universities provide cross-border educational services and research is increasingly being conducted at a global level. This trend coincides with a large increase in the number of students who have studied overseas for higher degrees during the last two decades. But the flow remains unequal: largely, the global flow of knowledge workers and students remains a South-to-North phenomenon. After their short-term sojourn, most stay at the center of scholarship and become the intellectual diaspora.

This phenomenon has triggered concerted efforts to understand the undergirding rationale. Studying China's brain loss to the developed West, Chen and Liu (2003, pp. 22–23) employed the 'core–periphery model', albeit acknowledging the stagnant nature of the model. This has been substantiated by what Altbach termed the center-periphery in the international knowledge network (2004). One prominent outcome of these debates has been the rise in league tables and rankings of various sorts and, subsequently, the growing desire among governments and institutions to compete for a place at the top of a global hierarchy of tertiary education (Salmi, 2009). The power of tertiary education to contribute to development from the perspective of excellence in research and scholarship at its most competitive levels has been reiterated in terms of educating the new generation of personnel needed for technological and intellectual leadership, developing new knowledge necessary for modern science and scholarship, and, equally important, serving as an element of worldwide communication and collaboration (Altbach, 2009). Arguably, here

again, is that the presence of a critical mass of outstanding faculty and top students is the first and perhaps foremost determinant of excellence (Salmi, 2009).

A study of China's current rise to international prominence must include an understanding of the importance of knowledge as a pillar of Chinese development, and a deep commitment to enhancing the quantity and quality of its research and higher education, internationally. Despite its impressive achievements in the economic and scientific arenas, China continues to lose talent to developed countries, including significant numbers to Australia and Canada (Hugo, 2008a; Li, 2008). Since the inception of the opening up and economic reform in the late 1970s, China has been among the top source of overseas students in the world. More recently, more middle-class families are able to afford overseas education themselves, so that about 93% of Chinese students are now self-funded (MOE, 2012), with more than 90 percent of the students studying in leading destinations including the United States, Australia, Japan, the United Kingdom, South Korea, and Canada (Chen, 2011). Recognizing the potential of this resource, and in an era of skills shortages, key industries countries of migration, such as Australia, Canada and the USA have targeted their migration schemes at high-skill individuals, many of whom are mainland Chinese (Hugo, 2005).

This loss of human talent poses a great dilemma for the Chinese government, with its ambition to join the league of upper-middle-income countries and to reinvigorate the nation. The underlying fact is that the outbound movement of study abroad with very low return rates has severely damaged domestic teaching and R&D, hindered China's scientific and technological progress, and affected its

international competitiveness (Hayhoe, 1989). While, in terms of China's huge population, the scale of outflow of the highly skilled may seem insignificant, its negative impact cannot be ignored. This has been substantiated by a recent OECD study (2008b), which stresses that the main constraints for China's future development may come from shortages in the specialized human resources that are needed at various stages of innovation processes, notwithstanding the rapid growth of all components of the HRST pipeline, from undergraduate enrolments to PhD programs, and even taking into account the large potential for improving the productivity of HRST. With the global knowledge-based economy increasingly relying on science and technology, the emigration of the highly skilled from China has become an even more crucial, and as yet unsolved, problem. Although the return rate has been increasing fast in recent years as more opportunities open up in a dynamic China, the Chinese knowledge diaspora still remains underexploited or non-mobilized, with the related strategies being at best partially successful (Cai, 2011; see also Zweig, 2008).

At the same time, the positive effects of highly skilled diaspora on their home country have been highlighted (see Chen & Wellman, 2007; Saxenian, 2006; Zweig, 2008). Literature reviews of the rise of diaspora knowledge networks indicate a new solution is emerging (Fullilove, 2004; Meyer, 2001; Meyer et al., 1997; Meyer & Brown, 1999; Welch & Zhang, 2008a; Wickramasekara, 2002). The underlying assumption is that the explosion of ICT and the changing dynamics of the world system have triggered changes in the pattern of international knowledge networks (Altbach, 2004). This reflects an increasing interest in reversing 'brain drain'

without physical relocation. Arguably, China is a highly illustrative case, in terms of its huge resource represented by its own highly-skilled diaspora as well, as the Chinese government's persistent efforts to transform the traditional disadvantage into strategic advantage to fulfill the vigorous ambition to strengthen its innovation system. This represents a determination not to be dependent on foreign know-how—and to reclaim the country's historic role as a global leader in technology (see also the *Medium-and Long-term National Plan for Science and Technology Development 2006-2020*).

Resonance has emerged in the studies on Chinese knowledge/academic diaspora in their strong intention to contribute to their motherland (Hugo, 2008b; Welch & Zhang, 2008b; Yang & Welch, 2010; Zhu, 2009). Specifically, China has witnessed the setting up of collaboratories and student/faculty mobility programs through diaspora knowledge networks. In this sense, the diaspora option and diaspora knowledge networks are reshaping the perception of the international mobility of the highly skilled - a response to the limitation of viewing this movement as a zero-sum or winner-loser game. As such, highly skilled mobility is understood as potentially offering mutual benefits for both host and origin countries. While the sending country gains through the additional capacity that these expatriates may bring, the host country does not lose. In the context of a global network, instead, increasing mobility of the highly skilled strengthens links between countries through opening up more opportunities at both ends of the relationship.

While studies of the intellectual diaspora have been increasing with the recurring emphasis on the impact of this pool of manpower on national development, there is

insufficient literature that utilizes both a comparative approach and analyses the diaspora knowledge network from the actors' perspectives. Moreover, there has been a surprising lack of study of the factors affecting those networks. Also unarticulated in the literature is the Chinese knowledge diaspora who comprise a large part of the global knowledge diaspora network. Lastly, diaspora studies largely fail to incorporate gender perspectives. Accordingly, there is an urgent need for examining the contributions such key individuals make to both their homeland and the host land, and what factors influence their knowledge network (Yang & Welch, 2010, p. 594). It is the need to understand the Chinese knowledge diaspora and their knowledge diaspora networks, and the search for better ways to sustain trans-national research and development networks that can be of benefit to both the more developed and less developed systems, which inspires this study.

1.2 Diaspora, Knowledge Diaspora and Diaspora Knowledge Network

The consensus within the diaspora literature (Akyeampong, 2000; Cohen, 1997; Safran, 1991; Smith & Stares, 2007) is that the term "diaspora" has its origin from the Greek word *diasperein*, which means the dispersal or scattering of seeds. Although the concept was originally used to describe the dispersal of the Jews from their historical homelands, recently it has been used extensively to refer to other dispersed groups such as Koreans, Palestinians, Chinese, Kurds, Armenians, Mexicans, Tamils and others (Smith & Stares, 2007, p. 18). Intrinsically, it refers largely to a group of people who are linked by common ethno-linguistic and/or religious bonds who have left their homeland, often under some form of coercion,

and who have developed a strong identity and mutual solidarity in exile (Cohen, 1997).

Numerous analyses (Akyeampong, 2000; Chaliand & Rageau, 1995; Clifford, 1994, p. 304; Cohen, 1997, pp. 22-27; Gillespie et al., 1999; Van Hear, 1998, p. 5) of diaspora make reference to Safran's (1991, pp. 83-84) work on the common features of a diaspora, including: (1) Dispersal from an original "center" to two or more foreign regions; (2) Retention of a collective memory, vision, or myth about their original homeland including its location, history, and achievements; (3)The belief that they are not – and perhaps never can be – fully accepted in their host societies and so remain partly separate; (4) The idealization of the putative ancestral home and the thought of returning when conditions are more favorable; (5) The belief that all members should be committed to the maintenance or restoration of the original homeland and to its safety and prosperity; and (6) A strong ethnic group consciousness sustained over a long time and based on a sense of distinctiveness, a common history, and the belief in a common fate.

Realizing that very few modern-day diaspora conform to all of the aforementioned characteristics, Reis (2004, p. 46) distinguishes between two categories of diaspora: on the one hand, the 'classical' diaspora based on the Jewish and Greek experience, while, on the other, contemporary diaspora co-mingling with issues of transnationalism and globalization. It is the contemporary concept that is of particular relevance to the discussion of the impacts of emigration on development in origin countries, a distinction "between a symbolic ethnic identity of 'being' and a more active 'diaspora identity' requiring involvement" (Butler, 2001, pp. 191-193)

with the latter implying active participation in activity in the homeland (Hugo, 2008b). Meanwhile, terms such as 'citizens of national origin', 'non-residents', 'second generation' and 'labor migrants' are sometimes used as synonyms to diaspora (Ionescu, 2005).

Since the mid-1960, the world has witnessed a dramatic increase in population mobility across international borders. The factors that triggered this world wide movement have been multilayered, including the structural upheaval in developing countries, new immigration programs adopted by some leading Western nations, more efficient transportation and improved telecommunication technology, and more recently a globalized labor market (Ma, 2003). These developments have aroused an increasing awareness of what Castles and Miller (1993) defined as "the age of migration". In the contemporary context, with the acceleration in international mobility, the term "diaspora" has been used more broadly to encompass expatriate populations who are living outside their home countries and retain linkages with their origin countries (Hugo, 2008b; Safran, 1991; Vertovec, 1997).

As the world morphs into the 21st century globalized economy, more contemporary theoretical gazes focus on differential effects of global migration with special reference to the highly skilled (Welch, 2010a). The underlying rationale is the interdependence between technology transfer and the mobility of human capital. As Mahroum (1999, p. 189) describes, "Nations increasingly view technology transfer as primarily a people-oriented phenomenon." The increasing reliance on the knowledge-generating and value-adding capabilities of science and technology is

associated with the recognition of the value of highly skilled knowledge workers (Woolley et al., 2008). For example, data concerning Australia and Canada shows some parallel trends. In 2009/10, Australia allocated 59 percent (108,100 of a program total of 182,450) of its permanent migration places to skilled applicants (Hawthrone, 2011), while Canada selected 280,681 migrants across permanent resident categories in 2010 with economic migrants constituting 66.6 percent (CIC, 2011).

Irrespective of its centrality to the contemporary migratory movement, the recent advent of the terms 'S&T diasporas', 'intellectual diaspora' or 'knowledge diaspora' are often subject to ambiguous interpretation (Séguin, State, Singer & Daar, 2006). According to Barré and his associates (2003), the term 'scientific diasporas' was defined as a "self-organized community of expatriate scientists and engineers working to develop their home country or region, mainly in science, technology, and education" (as cited in Séguin, Singer & Daar, 2006, p. 1602). Global knowledge diasporas, sustained by both increases in global migration flows and the rise and increasing ubiquity and density of information and communication technologies (Welch & Zhang, 2008a), are, *interalia*, a novel form of transnational human capital in the new millennium. They have become more valuable in a context of ever-increasing geographical mobility and worldwide communication linked to globalization (Yang & Welch, 2010; Zweig, Chen, & Rosen, 2004).

Diaspora knowledge networks (DKNs) stand out among challenges to zero-sum conceptions as regards traditional brain drain debates (Brown, 2002; Meyer & Wattiaux, 2006; OECD, 2008b). Such networks show potential to solve the

respective brain issues confronting both poorer and richer countries (Meyer & Wattiaux, 2006; Welch, 2010a) by "converting the loss of human resources into a remote although accessible asset of expanded networks" (Meyer & Wattiaux, 2006, p. 5). Empirical studies of DKNs have been emerging (Brown, 2002; Meyer, Brown & Kaplan, 1999; Meyer, Kaplan & Charum, 2001; Stein, Stren, Fitzgibbon, & MacLean, 2001). For example, Meyer and Wattiaux identified DKNs among forty different developing countries and four specific regional groups. Their study indicates that DKNs are "substantial, constituent, (and) imitative of international cooperation" (2006, p. 15).

Also evident in the literature is that diaspora knowledge networks represent a significant feature of knowledge transfer in the Asia-Pacific region. For example, Xiang (2007) has shown how national diaspora networks in the IT sectors of India and China have different outcomes in terms of local outputs (socioeconomic development and basic research, respectively) depending on whether they are predominantly framed by commercial actors, including multinational corporations (MNCs) (India) or government programs (China). Saxenian (2003, p. 3) highlights the case of NeWave Semiconductor Corp., a Chinese IT startup that drew upon networks in Hong Kong, Taiwan and the United States. In short, NeWave was a global company from the start—leveraging the distinctive resources of three different, and distant, regional economies. Similarly, Ramirez and Dickenson (2007) unpack how the Zhongguancun Science Park in Beijing has enabled Chinese universities and companies to integrate their R&D activities into global scientific and industrial networks with diaspora connections.

Arguably, universities are deeply embedded in the international knowledge network, and the diaspora knowledge network in particular (Welch, 2010a). One of the highly illustrative examples can be seen in Canada's University of Alberta. Its China Opportunity Fund was created in 2005, and supports University of Alberta's Joint Research laboratories (JRL) program with China's State Key Laboratories (SKLs) and National Laboratories (NLs). The idea was initiated by a community-based group, the Association of Chinese Canadian Professors (ACCP) at the University of Alberta, and was piloted by some of its members (Zha, 2011, p. 114). It was subsequently adopted as a university initiative, and further supported by the provincial government through the Ministry of Alberta Advanced Education and Technology, and then the Chinese government via the MOST, which funds State Key Laboratories (SKLs) and National Laboratories (NLs). Current priority areas of research consist of energy, environment, nanotechnology, life science, and information and communication technologies. Three types of collaboration between Alberta researchers and SKLs and NLs have been supported, including the initiation of contact with SKLs/NLs, the nurturing of an existing research partnership with SKLs/NLs, and technology commercialization.

For the purposes of this investigation, the term "Chinese knowledge diaspora", "overseas Chinese scholars" or "Chinese intellectual diaspora" refers to the mainland Chinese academics who work in Australian or Canadian universities as academic staff, and who undertook at least some higher education in Mainland. The term "mainland colleagues" refers to the mainland Chinese colleagues working at Chinese universities. The terms "diaspora knowledge networks", and "intellectual

diaspora networks" are used interchangeably, to refer to the academic/professional networks between overseas Chinese academics and mainland colleagues, with the aim to promote scholarly communication, and the dissemination of knowledge (Teferra, 2003, p. 131), through formal channels such as published information, and informal channels including conferences, symposia and seminars (Russell, 2001, p. 271).

1.3 Research Questions

The research focus is part of a recent wave of scholarship on the knowledge diaspora, diaspora option and the capacity of intellectual diaspora networks to redress brain drain under the context of globalization and its far-reaching implication for the changing landscape in science and technology and higher education, specifically in geopolitical terms. The focus of this study is to understand intellectual diaspora networks between the Chinese intellectual community in Australian and Canadian universities with both the home country and overseas Chinese scholars elsewhere. The aims of this study are to:

(1) identify the key characteristics of the diverse Chinese knowledge diaspora;

(2) explain the dynamics of diaspora knowledge networks;

(3) identify and assess the factors affecting diaspora knowledge networks, and to construct meaning out of their experience of scientific communication;

(4) explore the strength of ethnicity in sustaining diaspora knowledge networks;

(5) investigate and understand the importance of such networks in the context of debates surrounding globalization and knowledge societies, both as an impetus to improving China's higher education provision and research capacity, and as a strong potential resource for effective and mutually beneficial research co-operation (China-Australia, and China-Canada).

Building on literature and a previous pilot study, the study begins with a specific hypothesis, i.e., that the Chinese knowledge diaspora can become an important agent of development for their home research system, and leverage the asymmetrical global knowledge network. As such, the aim of the study is also articulated in the following research questions:

(1) What are the characteristics of the Chinese knowledge diaspora?

(2) How do the Chinese intellectual diaspora perceive their positioning in Australian and Canadian universities?

(3) What are their motivations to collaborate/communicate with the home country?

(4) How and of what worth are the knowledge networks with the mainland colleagues developed by the Chinese knowledge diaspora?

(5) What are the influential factors in terms of the effectiveness of the channels perceived/experienced by the Chinese knowledge diaspora?

1.4 Design of the Study

This study undertook an in-depth exploration of the notion of knowledge diaspora

and the diaspora knowledge networks operating between Chinese intellectual diasporas and mainland, and those in different countries. Underpinning the study was the guiding assumption that the knowledge diaspora and their professional networks with mainland, at large, were conducive to brain drain reversal in China, and brain circulation between China and Australia and Canada, and therefore mitigated the asymmetrical international knowledge network across the different systems. Chinese knowledge diaspora employed by a regional university in both Australia and Canada were taken as the population for study in this research. The study was undertaken with eleven academic staff from mainland China at each university. All the informants gained their bachelor degrees in China before moving overseas for further studies or work. In order to obtain a wide range of viewpoints and perspectives, some variables were considered: length of stay overseas, specialty, professional rank, gender and age group.

A constructivist epistemology underpinned the approach to the research. To study informants' experiences, an attempt was made to take account of the subjective meanings that informants attributed to them. The study focused on understanding and interpreting each informant's experience of the intellectual diaspora network in scientific communication with their home country, and the construction of meaning around the specific experience. In this regard, semi-structured in-depth interviews were applied to gain a better understanding of the experiences of the Chinese intellectual diasporas in Australia and Canada, to explore the dynamics of the diaspora knowledge networks and analyze advantages and difficulties. The Australian interviews were conducted in from April 25 to May 5 in 2009, and the

Canadian interviews were carried out from November 10 to 25 in the same year. Based on a previous pilot study, and feedback from this process, open-ended questions were provided to informants in advance. Each interview lasted at least one hour. Mini-disc recording and note-taking were employed as data collection methods during the interview. Time and venue were arranged at the convenience of the participants.

1.5   Significance of the Study

Along with China's striking economic development, its presence and influence in the international community has grown, together with the dramatic rise in its higher education system and S&T sectors (though it is worth noting that the rise is more impressive in quantitative than qualitative terms). For both Australia and Canada, as middle-range powers, and China as an emerging economy, mutual understanding, including cultural and educational links, represents one of the most critical contemporary challenges and opportunities. Diaspora knowledge networks, like the concept of the diaspora more generally, represent a particular test case of the assumption of the ongoing importance of the nation-state, by focusing on groups and processes that feature hybridity, and embody more complex and contested forms of identity (Li, 2005).

China's substantial scientific diaspora, as well as growing intellectual capacity and strong commitment to enhancing the quantity and quality of its research output, offer great potential for fruitful collaboration and partnerships. Australian and Canadian universities enroll a large number of (graduate) students from mainland

China, and many, particularly in Australia, have partnerships with Chinese universities. In Australia, for instance, in 2012 China replaced the USA as its number one knowledge partner (Universities Australia [UA], 2012). China-born academics have staffed Australian and Canadian universities in increasing numbers. This study contributes to an enriched understanding of such connections, and the key role of the Chinese knowledge diaspora as a key cultural bridge that fosters and sustains such trans-national relations. This assumes greater importance, in light of the traditionally low return rates of Chinese students overseas to their homeland. Such individuals are critical to strengthening the connectivity (Kenway, 2005) between each of the two systems (Australia and Canada), and China. This study provides detailed investigation of the importance of diaspora knowledge networks – the dynamics, effectiveness and some of their advantages and difficulties.

The study contributes a fresh assessment of the relative status of the Australian and Canadian academic systems, using the Chinese academic community as a test case. It delivers in-depth analysis of the role of the Chinese intellectual diaspora, in Australia (with comparative investigation on the Canadian equivalent), and its networking practices and potential. It provides a much closer understanding of networking between the Chinese knowledge diaspora in Australia (and Canada), and mainland, as well as other parts of the Chinese intellectual diaspora. This also involves an exploration of the significance of ethnicity in sustaining trans-national intellectual networks, and of issues of institutional racism in Australian and Canadian universities (CAUT, 2000). Last but not least, this study focuses on non-metropolitan universities that are almost invisible in the knowledge diaspora

research, with the aim to contribute a comprehensive analysis of the Chinese knowledge diaspora in universities outside the top tier and its impact on their collaboration and communication with the mainland Chinese colleagues.

1.6 Organization of the Thesis

The dissertation consists of six chapters. The introductory chapter (Chapter One) has been designed to define the study of the knowledge diaspora and the diaspora knowledge networks in scientific communication against the context of globalization, and identify the need for the research.

The subsequent Literature Review provides a background for the study on the basis of contemporary studies of highly skilled mobility, and higher education dynamics under globalization and the knowledge economy; followed by a summary of China's brain issues and strategies. The theoretical framework for the research is also presented in this chapter (Chapter Two).

The methodological framework for the study is fully explained in Chapter Three. It begins with the description of the context of the study in terms of setting, participants, and ethical considerations. The research method, including a rationale for the qualitative inquiry, and sampling is discussed. The chapter concludes with an outline of the approach to data collection and data analysis (Chapter Three).

Chapters Four and Five present, discuss and analyze findings from two research sites where empirical fieldwork was conducted: Australia and Canada. In Chapter Six, a summary of findings is presented and the main research themes and findings

are discussed. This final chapter also provides the overall research conclusions and outlines the analytical research contributions of this thesis, together with the limitation of this study and suggestions for further research in the area.

Chapter Two Reviewing High-skilled Mobility

2.1   Introduction

As the first chapter outlined, the issue of highly skilled migration, with a special reference to academic mobility, has aroused world-wide attention especially in the political arena. The Chinese government has made great efforts to reverse the brain drain with, at best, partial success. Hence, the focus of this study, the Chinese intellectual diaspora and the intellectual diaspora networks, is both complex and broad. It is complex because it involves issues related to mobility of the highly skilled, the brain drain, the diaspora option, the intellectual diaspora networks, international scientific communication, and comparative education. It is broad because it covers and crosses the boundaries of several disciplines: namely education, sociology, anthropology, economics and political science.

With reference to these pragmatic boundaries, efforts have been focused on the major themes of particular significance of the diaspora option to brain gain in the field of higher education against the backdrop of globalization and the knowledge economy. The literature review begins with a focus on highly skilled mobility, with special reference to the impact of globalization. Subsequently, a summary of key changes of higher education in the globalized age, followed by discussion of China's brain issues and related strategies delimits the focus of the study. Concurrently, the emergence of the diaspora option and the intellectual diaspora networks as the most effective strategy to reverse brain drain, and more importantly the theoretical framework undergirding these are explored.

2.2   Globalization and Highly Skilled Mobility

In the context of the globalized economy, there have been changes in the nature and organization of production in capitalist countries, and correspondingly in the demand for different types of labor. The underscoring fact is that a global economy requires a free flow of highly skilled labor. As such, what has been witnessed is the increasingly intensified flow of people, capital, information, goods raw materials and services across national boundaries at an unprecedented rate (Li, 2008). As a key factor in the growth and restructuring of industrial economies, the importance of international labor migration is increasingly more apparent in that human movement has become a much more integral component of how nation states and the global economy are interconnected (Castles, 2002). Mirroring the unprecedented volume and complexity of trade and capital flows, the current international human movements are unparalleled, in terms of volume and social and spatial complexity (Walsh, 2011). This section focuses on highly skilled mobility in the context of globalization in terms of the migratory pattern and trends, and the role of the state regarding formulation and acceleration of regional and global free trade agreements.

2.2.1 Global Overview

A study conducted by the OCED reveals that about 3 per cent of the world's population lives in a country other than that of their birth. While this proportion has remained more or less stable, recent decades have witnessed steady growth in the migrant share of the population of more developed regions, to about 9 per cent

(2007, p.11). The foreign-born population is especially high in Australia, Canada, Luxembourg, New Zealand, Switzerland and the United States (OECD, 2011a). Demographic changes in major English-speaking immigrant-receiving countries, Australia, Canada and the United States have been notable in terms of the source countries of their immigrants. The absolute number and share of immigrants from the "traditional areas", the British Isles and, more recently, the continent of Europe, have declined. The number and share of immigrants from non-traditional sources, particularly the less developed countries have increased due to changes in the criteria for rationing immigration visas (as explained in Chapter Four and Five).

This supports the observations of Khoo and his colleagues, of a phenomenal outbound movement among highly skilled people for employment purposes (Khoo, McDonald, Voigt-Graf & Hugo, 2007). For example, Chompalov (2000, p. 8) finds that "Bulgaria has lost one small town of 55,000 to 60,000 of its highest educated and skilled population each year during the last decade"; referring to the Russian Federation, Saravia and Miranda (2004) state that between 500,000 and 800,000 scientists from the region have emigrated to industrialized countries during the past 10 years, where they can earn 30-70 times higher than in the Russian Federation. The overarching fact is that highly skilled mobility, with special reference to intellectuals and graduates, represents one of the most dynamic cross-border movements, reflecting the reality of today's global labor market. Clearly evident is competition among immigrant-receiving countries like Australia, Canada and the US for highly skilled immigrants, and also that the immigration policy of each country affects the competition for skilled immigrants in the global market (Cobb-

Clark & Connolly, 1997).

The spread of globalization and knowledge-based economies has widened the already huge gap between rich and poor countries. Countries seeking qualified workers have been drawing from a worldwide talent pool to boost economic growth, to overcome bottlenecks in the labor market, and to counter the aging population to fill long-term shortages of skilled employees. Evidence has been found in the immigration policies of countries experiencing labor shortages in certain fields: Canada's immigration policy is already focused on accepting workers with special skills; Australia's immigration policy is aimed at easing the immigration of highly skilled workers; Singapore's government provides tax incentives to companies that bring in needed talent from other countries; and the United States high-tech industry increasingly draws on foreign talent (Cohen & Zaidi, 2002). Regardless of the scarcity of completely reliable data on highly skilled mobility, the growing demand, and competition, for talent in OECD countries is increasingly fierce, especially in the USA, Canada, Australia and the UK. Countries like Singapore, Iceland, Italy, Finland, Germany and Ireland have been stepping into the arena, though not viewed as traditional or core migration countries (Ruddock, 2002).

2.2.2 Multidirectional or Periphery-Center Mobility

The complexity of highly skilled mobility has been highlighted in literature. Brain outflow is not confined to developing countries and can occur at different levels within the developed world (Meyer, Kaplan & Charum, 2001; Wickramasekara,

2004). Specifically, skilled migration among such specialists as IT workers, engineers, nurses, and other professionals, mainly originates from both developing and developed countries to other developed countries, with some flows also occurring between developing countries (Khoo et al., 2007; Ouaked, 2002). What happens in Africa can be highly illustrative. Teferra and Altbach (2004), among others, illustrate the complexity, by alluding to Africa: while several African countries complain about the loss of talents to South Africa, South Africa itself bemoans its loss to other countries, while also facing difficulties domestically, in accommodating the inflow from other African states.

However, OECD member states, too, suffer from brain drain effects. Australia and Canada, for example, as affluent 'magnets' for immigration, suffer a significant outflow of talents to the US and European countries. This is in line with the OECD's (2007) finding that a significant portion of skilled migration originates from other developed countries. This migration is partly due to TNCs' transferring professional and managerial staff internationally, partly motivated by the individual's desire to gain international experience in today's global labor market (Khoo et al., 2007), and partly due to economic trends (the global financial crisis has affected US, UK and EU higher education systems more than Australia and Canada). The emigration of nationals from some rich countries to the centers of knowledge-based industries in the US and Europe underscores what Saravia and Miranda term as the "multidirectionality and interconnectedness" (2004, p.609) of the highways of highly skilled migration.

Although migrants to OECD countries come from a wide variety of sending

countries, with different migration patterns and varied migration histories, human movement from developing to high-income countries dominates today's picture of international mobility of the highly skilled. An OECD study (2008a) shows that the share of people with tertiary education across OECD countries is higher for foreign born (23.6%) than for the native-born (19.1%). Among non-member countries, the biggest migrant community is that originating from the former USSR (3.5 million), followed by the former Yugoslavia (2.5 million), China (2.1 million), India (1.9 million), the Philippines (1.9 million), Viet Nam (1.5 million), Morocco (1.5 million), Algeria (1.3 million) and Puerto Rico (1.3 million).

Irrespective of the term used to describe the phenomenon, the asymmetry of the outflow exacerbates the deficit of highly skilled labor in developing countries. Among the most noticeable is the South to North, East to West trend, corresponding to the intensity of knowledge-based, high-level and specialist jobs in developed regions (Ackers, 2005c; Findlay et al., 1996; Guth & Gill, 2008; Meyer et al., 2001). Another OECD study (2008a) substantiates these phenomena by detailing that African and Caribbean countries have been disproportionately affected by the emigration of health professionals, with expatriation rates above 50%. According to research by Canadian scientists, South Africa and Zimbabwe suffer the worst economic losses due to doctors emigrating, while Australia, Canada, Britain and the United States benefit the most from recruiting doctors trained abroad (Mills et al., 2011). Of all African nations, Ethiopia is among those that suffer the most brain drain (Mills et al., 2011).

Equally important, highly skilled individuals are disproportionately more likely to

leave developing countries. It appears that flows of highly skilled emigrants have increased at a faster rate than those of less skilled. The OECD study (2008a) reveals that highly-educated people have a higher propensity to migrate than the less educated, due to a number of reasons: greater incentive to migrate linked to much higher expected gains, weaker budgetary constraints to mobility, or better connections with migrant communities in the countries of destination. What's more, in today's global labor market, high caliber individuals are in far greater demand than ever before, as they comprise a limited international pool. Better educated immigrants are much more able to clear formal and informal employment barriers. In this regard, highly skilled individuals are more mobile and have more options than their low-skilled peers.

2.2.4 Deregulation or Reregulation

In the light of restructuring of the global economy and the rise of global trade, highly skilled mobility is increasingly recognized as an important factor accelerating growth, innovation, and competitiveness. The formulation and acceleration of regional and global integration during the 1990s has exerted a profound bearing on migration policies. The General Agreement on Trade in Services (GATS) under the World Trade Organization (WTO) covers the cross-border movement of all production factors in service trade, including the cross-border movement of natural persons for the purpose of service supply, with an aim to abolish barriers to trade in services. Measures relating to the movement of natural persons are referred to as "mode 4" which represents a first step toward labor market liberalization and facilitates the transfer of skilled workers to provide

services. In the context of GATS, and the WTO, "Member" refers to the member state, and "commercial presence" stands for the opportunities for foreign service suppliers to establish, operate or expand a commercial presence in the Member's territory, such as a branch, agency, or wholly-owned subsidiary. Table 2.1 provides certain criteria for distinguishing the four modes of supply and explaining their relevance.

Table 2.1 Modes of Supply

Supplier Presence	Criteria	Mode
1. Service supplier not present within the territory of the Member state	1. Service delivered within the territory of the Member state, from the territory of another Member state	1. cross-border supply
	2. Service delivered outside the territory of the Member state, in the territory of another Member state, to a service consumer of the Member state	2. consumption abroad
2.Service supplier present within the territory of the Member state	3. Service delivered within the territory of the Member, through the commercial presence of the supplier	3. commercial presence
	4. Service delivered within the territory of the Member, with supplier present as a natural person	4. presence of natural person

Source: WTO (n.d.)

However, there is a contradiction between increased liberalization of trade and capital flows, and the maintenance of tight regulatory controls over migration in capitalist economies (Held, McGrew, Goldblatt & Perraton, 1999). Arguably, the key site for immigration and labor market regulation remains the bounded territory of the national state (Williams, Baláž & Wallace, 2004). This deficit is gradually being addressed. Regarding the mobility of the highly skilled, the fallacy is that it

has been reported as an unavoidable phenomenon of globalization due to the liberalization and internationalization of the labor market (Iredale, 2000). In fact, the state's authority in this domain has grown rather than diminished. As Lavenex stated (2007), the entry and stay of foreign nationals, highly skilled or unskilled, has been regarded as one of the last bastions of state sovereignty. With the rationalization of politics and proliferation of infrastructures for tracking and regulating movement (border guards, medical inspectors, statistical profiles, passports etc.) governments have displayed unprecedented control over the arrival, incorporation and life chances of the newcomers. While migration's velocity, impact and spatial extent have expanded, controls over movement and membership remain sovereign prerogatives whose prevalence, sophistication and consequences have intensified (Walsh, 2011, p.16).

Clearly evident is that the competition for the highly skilled has been intensified by national policies of developed countries. As stated by Mahroum (1999, p. 189), "Nations increasingly view technology transfer as primarily a people-oriented phenomenon … Immigration is thus becoming increasingly an inseparable segment of national technology policies." Further, Ackers (2005c) noted that the increasing specialization of highly skilled labor markets, along with scarcity, ageing and imminent demographic decline, will exacerbate the fierce competition for highly skilled labor. For example, Australia's annual labor force growth is forecast to decline from 1.6 per cent in 1998-99 to 0.4 per cent in 2015-16. By 2016, the labor force aged 55 or over is projected to be 15 percent (Ruddock, 2002, pp.12-17). It is notable that countries of migration like Australia and Canada do not face as severe

a scenario as others, since they are continually replenished by migrants (now increasingly highly-skilled). More precisely, there has been re-regulation rather than deregulation of migration (Brenner & Theodore, 2002; Williams et al., 2004). Among the most prominent is the selective immigration policy more tailored to skilled persons.

Notable here is the double-sided immigration policy implemented by developed countries. On the one hand, national governments have sought to facilitate migration of, or even actively to recruit, workers in key sectors of national labor markets facing acute skills shortages. For another, measures have usually been accompanied by tighter regulation and restriction of unskilled migration and asylum seekers (Castles, 2002; Li, 2003; Welch, 2007). Though contentious, the selective immigration policy and the procurement of highly skilled immigrants have been prioritized by post-industrial nations (Boyd, 2001; Cornelius, Espenshade & Salehyan, 2001; Fincher, Foster, Giles & Preston, 1994; Man, 2004). Some well-known schemes and measures are the introduction of the Highly Skilled Migrant Program in the United Kingdom, proactive recruitment of foreign students in the UK and France, the German 'Green Card' scheme, and the points system for independent immigration in Australia and Canada (as explained in Chapters Four and Five). In particular, the points system lays greater emphasis on tertiary education and language proficiency.

2.3   Higher Education Dynamics in a Global Era

This rise of the much-touted knowledge economy adds further impetus to the

development of global capitalism, as nations jockey for position, re-structuring their educational systems in order to maximize economic growth rates (Welch, 2010a). As Altbach (2002b, p. xi) commented,

> Higher education in the twenty-first century is a multifaceted phenomenon, combining a variety of institutions and systems, as increasing diversity of students, and a range of purposes and functions…and… higher education is a central enterprise of the twenty-first century and a key part of the knowledge-based economy.

The central point is that higher education institutions are increasingly viewed as important drivers of economic growth, not only through the development of graduates but also because of the new knowledge their research generates. This section explains the dynamics of higher education in the global age in terms of the changing landscape of higher education, and the strengthening of international research collaboration, which underpins the focus of this study.

2.3.1   Changing Landscape of Higher Education

The internationalization of higher education

According to the OECD (2011b), over the past three decades (particularly since the late 1990s) the number of students enrolled outside their country of citizenship has risen dramatically, a more than fourfold increase (from 0.8 million in 1975 to almost 3.7 million in 2009). Foreign students enrolled in G20 countries account for 83 percent of total foreign students, and students in the OECD represent 77 percent

of the total foreign students enrolled worldwide. This trend mirrors the globalization of economies and societies, universities' expanded capacity and a substantial increase in global access to tertiary education, as well as the hierarchy and inequality between higher education systems. Higher education is big business (Ali et al., 2007). It is critical to underline that the internationalization of higher education has been used deliberately and strategically by most developed countries, with the policy conferring twofold benefits on countries of destination.

International-oriented education provision in developed countries represents an important source of export revenue. A majority of international students are self-financed, paying significantly higher fees than local students and producing substantial income for the host institutions and countries. International education is an Australian export success story. From a small base, it has now become Australia's third largest sector behind coal and iron ore, and is the largest service export sector in the economy (Australia Trade Commission, 2011). International education activity contributed $15.7 billion in export income to the Australian economy in 2011 (see Table 2. 2).

Table 2.2 Export income and proportion from education services by sector, 2011

HIGHER EDUCATION	VET	ELICOS	SCHOOLS	NON-AWARD
$9.9 billion	$3.1 billion	$675 million	$655 million	$490 million
65.6%	20.6%	4.5%	4.3%	3.2%

Source: AEI, 2012

IIE (2011a) reveals that international students contribute more than $21 billion to

the US economy, through their expenditures on tuition and living expenses. Higher education is among the United States' top service sector exports, as international students provide significant revenue not just to the host campuses but also to local economies of the host states for living expenses, including room and board, books and supplies, transportation, health insurance, and support for accompanying family members (IIE, 2011a).

Furthermore, students constitute a major potential source of labor in the knowledge economy. A high correlation between overseas studying experience and subsequent migration procedures has been underscored in the literature. This is partly because they intend to maximize their investment in education and training by seeking the highest paid employment (Iredale, 2001) which involves "a simple trade-off between sacrificing something today for the sake of having more tomorrow" (Psacharopoulos, 1996, p. 278). As the principal destination of international students, the United States seems to be the most prominent beneficiary. Johnson and Regets (1998) reveal that immigrants comprise 29 percent of the US labor force of doctoral degree holders who conduct research and development in S&E. Studies conducted by the National Science Foundation reveal that some two-thirds of foreign-born scientists in the US and France gained their PhD from the United States (NSF, 1998, pp. 3-19; Saravia & Miranda, 2004). Central to the fact is the ability of the United States higher education to attract, support, and retain foreign S&E graduate students.

Rethinking academic mobility

Rapid expansion of education after the Second World War led to a dramatic increase in the number of universities in many countries (Welch, 1997). Of particular significance was the move from "elite" to "mass" higher education (e.g. in Canada, UK, USA and Australia). While supporting the expansion of opportunities for higher education, successive governments in some countries, including Canada and Australia, paid insufficient attention to ensuring an appropriately qualified and experienced supply of faculty to fill the newly created positions. Moreover, developed countries, including the US, Canada and Australia are seeing the ageing of their native-born technical community. CAUT (2004) notes that nearly 30 per cent of university professors in Canada were over the age of 55, while Hugo (2008b) comments that academics are one of the oldest occupational sub-groups in the Australian workforce, some 24.7 percent being aged 55 years and over and 54.2 percent 45 years and over. Hence, there will be a high level of recruitment in the universities over the next two decades and it is unlikely that this demand will be met by the domestic labor markets (Hugo, 2008b; Richardson, Mcbey & Mckenna, 2006).

Accordingly, the opportunities for foreign-born academics and researchers in those countries will increase (particularly those who can teach and research in English). Indeed, Academia is an international profession and the higher education workforce is increasingly multinational. Maintaining international connections is a key feature of an academic career. The development of an international academic job market means that academic salaries and working conditions in one country will have an impact on those offered in other market places. For example, Suttmeier and Cao

(2006) point out that scientists and engineers from China have become an important source of rejuvenation for the greying profession in the United States, but new opportunities in improving living and working conditions in China, as well as the impact of the global financial crisis, could dampen the supply of Chinese technical personnel for work in the US research environment.

A vivid description is put forward by Scott (2002) that the rivalry of the powers took place not only in laboratories where nuclear weapons were developed but in the cultural arena where professors were the most powerful generators. A new study from the National Bureau of Economic Research substantiates the scholar's observation. It has provided objective data on which countries are gaining the most academic talent and which ones are losing it, based on analysis of scientists in 16 countries working on biology, chemistry, earth and environmental sciences, and materials. The data shows that Switzerland has by far the greatest percentage of scientists from other countries (56.7 percent), followed by Canada (46.9 percent), Australia (44.5 percent) and the US (38.4 percent) (Franzoni, Scellato, & Stephan, 2012).

Specifically, the role of foreign-born scholars in the development of science in the US has been widely documented. For instance, foreign-born and foreign-educated scientists and engineers are typically among the most able of their contemporaries (Batalova & Lowell, 2007; Stephan & Levin, 2001) and make exceptional contributions to US science (Levin & Stephan, 1999). Similar results have also been disclosed by Lee (2004) and Tanyildiz (2008), who found evidence that the US has benefited greatly from the inflow of foreign talent. It is probably because

immigrants are the cream of the crop of graduates from US and foreign institutions. Nonetheless, Australia and Canada, traditional immigration countries with multicultural policy, take an active part in the rivalry as well (as explained in Chapters Four and Five, and see Koleth, 2010).

Scientific migration as a "continuum of choice" (Ackers, 2005a, p. 104) is explicable in terms of the "pull-push" rationale. Among the significant "pull" factors are higher salaries, better working conditions and prospects for career development, which have consistently been weighted in favor of the center (Iqbal, 2001). Arguably, scientists are attracted to places where they can work effectively with enthusiasm and support (Dickinson, 2003). They are also keen to work at the forefront of their field, with the newest and best equipment, and with the leading researchers in that subject (Guth & Gill, 2008) to exert influential outcome. The "push" factors can be categorized as the deficiencies in academic and/or social systems in less-developed areas. Specifically, the relatively lower levels of scientific output, small disciplinary communities, low level of interdisciplinary and university-industry mobility, and barriers to geographical mobility (Kozlowski, 2003, p.7), coupled with a limited number of vacant posts and non-meritocratic systems of recruitment (Jalowiecki & Gorzelak, 2004), may encourage scientists to leave their home countries.

Given that science is conducted in an increasingly international domain, an intrinsic correlation between migration and progression in science careers has been uncovered. Chompalov (2000) underscores the differences in mobility rates among scientific disciplines by pointing out that natural scientists are more likely to

emigrate than social scientists because their knowledge is more readily convertible (pp. 17-32). Furthermore, important differences both at institutional and national level, as well as different kinds of pressures faced by scientists and those in transnational companies (Ackers, 2005a, 2005b) contribute to the complexity of cross border academic movement, although this is not to deny that universality of science has made those trained in one country, almost more than in any other profession, easily function in another that offers them better working conditions (Dickson, 2003, p.1). Understandably, scientist/academic migration cannot be shaped in a vacuum, but it is better to embed this discussion within the specific context of scientific migration and the nature of science careers (Ackers, 2005c).

While academic mobility is certainly growing, it is still the minority in each country who engage in it, with the majority locally embedded. However, scientists/academics make at least one international move often to different locations (Ackers, 2005c; Ackers & Gill, 2008). As the potential stock of highly skilled labor, international students stay on, return to their countries of origin, or move to a third country at the end of their courses. King defines these modalities of movement as "multiple and spatially capricious" (2002, p. 98). Scientists as "pilgrims" migrate towards the best opportunities for science (Mahroum, 1999, p. 7). Williams and his colleagues (2004) further the notion by defining the nature of academic scientific mobility that incorporates short-term visits, fellowships, and longer-term migration for individual career development as diverse temporalities. This resonates with what Meyer et al., (2001) define as "scientific nomadism". These forms of mobility do not necessarily occur in a linear and static fashion but

reflect an ongoing spatial manifestation of career and family-related mobility (Ackers, 2005c). The overarching fact is that mobility in science careers has become the norm (Guth & Gill, 2008). Researchers, especially those at the formative years of a research career become 'socialized to the idea of mobility' (Ferro, 2006, p.181) and mobility is now an integral part of a science career (Ackers, 2005a, 2005b; Woolley, Turpin, Marceau & Hill, 2008).

Therefore, the contribution of academic mobility to these new and more diverse modalities emanates from a varying blend of new motivations, new spatial-temporal flexibilities, globalization forces and personal self-realization (Ackers, 2005c; King, 2002). It is evident therefore that scientists, particularly those who have already been mobile, are weighing up their career opportunities by comparing countries, and socio-economic and scientific conditions. Yet, mobility within this group was not found to be economically driven in the 'traditional' sense of moving to earn more (although this could influence moves). Rather it was science expenditure that more broadly influenced moves, for example through the number of positions available and their attractiveness (e.g. infrastructure and equipment in the working environment). Furthermore, the prestige and 'capital' of the host supervisor, group or institution were all magnets alongside available infrastructure (Guth & Gill, 2008). In this context, no country can afford to be complacent about a steady supply of talent. Increased mobility, greater opportunities to move and return, make the possible losses and gains brought about by mobility less cut and dried (Guth & Gill, 2008). Concomitantly, these changes in patterns and motivations blur the "never straight forward boundary between migration and

mobility [and] melt away some of the traditional dichotomies" (King, 2002, p. 90).

2.3.2 International Research Collaboration

Major and simultaneous changes in science, technology and production have been triggered by this globalized age. Changes of this magnitude have been unparalleled since the modern era began about 300 years ago (Sagasti, 2003). From its early beginnings, modern science has been an international undertaking, relying on the exchange and development of knowledge and ideas among scientists from different countries (Powell, 1956). Many early efforts can be seen when scientists sought to enable collaboration on matters of a global scope, such as climate issues and disease prevention (Wallerstein, 1984). Indeed, collaboration is fundamental to how knowledge is created, diffused, and applied within and across countries today. The growth and increasing ubiquity of modern and dense forms of ICT are making this all the more common. Also justifiable is that scientific collaboration is a key feature of the innovation-driven knowledge economy. The innovation process itself is not merely marked by collaboration at different levels of analysis, but is virtually defined and determined within those interactive relations (Rycroft & Kash, 1999).

As science has expanded in the late 20th century and into the 21st century, it has become increasingly interconnected. Collaboration occurs when scientists work together to pursue scientific activities, principally conducting research and other related activities, such as data collection, conferences, and technical support (Bukvova, 2010; Wagner, 1997). A collaborative research project can involve individuals from the same institutions as well as among individuals from different

institutions, and cross-national sites. It can also connect different disciplines (Bukvova, 2010). A recent study by the Royal Society (2011) reveals that less than 26 percent of papers are the product of one institution alone, and over a third have multiple nationalities sharing authorship. Collaboration can enhance the impact of research and bring together a diversity of experience, funding and expertise to bear on a large range of research questions. Accordingly, collaboration is itself a resource, providing access to knowledge, skills, techniques, intellectual diversity, and epistemic communities and colleagues (Katz & Martin, 1997; McNeely & Schintler, 2010).

In this globalized age, knowledge exchange and diffusion across borders has taken place at an increasing pace, with new patterns emerging, mainly transnational team work, the internationalization of science, and the changing research landscape with the emergence of the scientific powers (Jones, Wuchty & Uzzi, 2008; Schubert & Braun, 1990; Wagner, 2008). Studies corroborate that science is becoming increasingly interlinked and global in the emerging knowledge economy, evidenced by dramatic increases in international collaboration over the last several decades (Arunachalam, Srinivasan & Raman, 1994; Katz, Hicks, Narin & Hamilton, 1996; Qin, 1994; The Royal Society, 2011). The intensified international collaboration not only holds for the North but is also becoming more evident in emerging scientific countries such as China, India, and Brazil (Adams, King & Ma, 2009; The Royal Society, 2011). The trend has increased the awareness of what Wagner (2008) describes as the emergence of a "new invisible college" of international knowledge exchange.

Scientific research projects are often costly and complex. Researchers have therefore

been interested in harnessing the potential of ICT to support them (Jankowski, 2007). The underlining fact is that dramatic reduction in communication costs due to IT development and the Internet's popularization are making idea cross-fertilization and technical expertise transfer much easier even without the establishment of designated institutions or facilities (Barjak, 2006; Laband & Tollison, 2000; The Royal society, 2011). Specifically, the emergence of digital repositories as an efficient solution to the issue of capturing, storing, organizing, searching, processing, and retrieving knowledge from electronic text, images, and multimedia data collections has been greeted with relief, although it is important to acknowledge wide differences in access across and within nations.

For geographically dispersed collaborations, the use of ICT can act as an enabler (Stokols, Misra, Moser, Hall & Taylor, 2008, p. 102). After reviewing the development of collaboratories, Lee and his colleagues define as "laboratories without walls where researchers can perform their research independent of time and location" (Lee, Mcdonald, Anderson & Tarczyhornoch, 2009, p. 12). It is critical to underline that virtual research communities are of growing importance in an era of global communication (Welch, 2010a). An NSF study reveals the importance of cyber infrastructure (CI) that is intrinsically international: "crucial data collections in social, biological and physical sciences are now online and remotely accessible" (Atkins et al., 2003, p. 9). Without such databases, some international research including the genome project would be impossible.

Despite the dynamic development of ICT, there are still considerable barriers regarding the use of ICT in research collaborations. A research project relying heavily

on ICT also requires a high level of technology readiness from the participating researchers (Olson & Olson, 2000). The calculation here is that pursuing science and technology research anywhere requires a level of finance and infrastructure, research capability, and a never-ending quest to keep up with advances in science and technology to maintain this capability (Sagasti, 2003). Here, again, however, the disparities wrought by globalization are evident. Those countries who fail to take advantage of it would be left behind. Although the potential for such national and international "collaboratories" is great and increasingly recognized, only a handful of rich countries are privileged to have access to them. For example, the budget of developing the supercomputer needs, data storage capacity, and associated technical infrastructure, was estimated some years ago at not less than US $900 million per year. Such amounts are something that only the United States, or perhaps the EU, could afford (Welch, 2010a).

Nonetheless, the potential to exploit the complex international knowledge networks and narrow the gap is great for some emerging economies. For example, Saxenian (2006, p. 331) reveals that China and India are already the largest and fastest-growing markets for wireless technologies, while the Asia-Pacific's share of consumption of semi-conductors has quadrupled in 15 years: from 6 percent in 1985 to 20 percent in 2000. By 2010, it has been estimated that the level would have reached 46 percent (16 percent in China alone). The trend has been corroborated by a study of the Royal Society (2011) that uncovers a strong rate of growth in internet penetration among the countries showing the fastest rate of growth in publication output and those rising up the global league tables as collaborative hubs. Internet growth in Iran, for example,

has grown 13,000% since the turn of the century (albeit from a starting point of only 250,000 users). Internet use in China has grown over 1,800% in the same period (from 22.5 million users to 420 million) (The Royal Society, 2011, p. 65).

Of notable importance, and more pertinent to this study, is China's proactive role in international research collaboration, and therefore a stronger impact on the international knowledge network. A recent study reviews China's international research partners over the last decade (Adams, King & Ma, 2009). The USA stands out in terms of frequency of co-authorship, with US-based authors contributing to nearly 9 percent of papers from China-based institutions between 2004 and 2008. With Italy and Russia slipping slightly, Sweden and the Netherlands have moved higher. Also notable is significant regional expansion. While collaboration with Japan grew slowly, collaboration with South Korea and Singapore almost trebled and collaboration with Australia expanded at well above the China average (See Table 2.2). This coincides with China's striking economic development. The key indicators of China's economic health continue to exhibit remarkable growth, especially when compared to the growth rates of other countries during the global financial crisis (GFC). This fast accumulation of wealth has provided the Chinese government with stronger capacity to escalate R&D funding. Although China's R&D expenditure was initially low, China's spending on research has increased by more than 20% each year since 1999. Such growth is even more impressive given that China's GDP has simultaneously grown at close to a double-digit rate every year on average (Adams & Wilson, 2006).

Table 2.2 China's leading overseas research partners in the last decade

Papers collaborative with China				Share (%) of China Total
1999-2003		2004-2008		
USA	16,389	USA	39,428	8.9
Japan	7,251	Japan	13,418	3.0
Germany	4,480	UK	9,987	2.3
UK	4,433	Germany	8,263	1.9
Canada	2,806	Canada	7,547	1.7
Australia	2,796	Australia	7,116	1.6
France	2,196	France	4,997	1.1
Singapore	1,782	Singapore	4,635	1.0
South Korea	1,565	South Korea	4,485	1.0
Taiwan	1,471	Taiwan	3,219	.73
Italy	1,221	Sweden	2,311	.52
Russia	1,042	Netherlands	2,261	.51
Netherlands	970	Italy	2,114	.48
Sweden	944	Russia	1,880	.43

Source: Adams, King & Ma, 2009, p. 8

Strongly evident is the role of ethnic ties in transnational scientific collaboration. Based on the investigation in eight countries, namely USA, Japan, Germany, England, Australia, Canada, France and South Korea, Jin and his associates conclude that ethnic ties play an essential role in the collaboration pattern of mainland with other countries (Jin, Rousseau, Suttmeier & Cao, 2007). As noted, one of the striking features of the S&T over the past three decades has been the large number of Chinese students and scholars who have gone abroad for advanced study and remained overseas. They have become a vital factor in helping Chinese scientists to establish international collaboration channels, and in finding international collaboration partners. While constituting a brain drain, increasingly

the brain drain is less a zero-sum phenomenon and more of a positive sum experience, as suggested by the concept of brain circulation (Suttmeier & Cao, 2006). According to the scholars, the 'Overseas Chinese Phenomenon' in international collaboration seemingly serves as a mechanism of knowledge transfer in the developmental process of Chinese science, and is likely to remain important even when China is fully integrated into the world of international science (as explained in the next two sections).

2.4   China's Brain Issues and Strategies: Context and Development

2.4.1   Overview of Brain Drain in China

The Chinese government has been dedicated to the implementation of the strategy "Invigorating the Nation through Science and Education", a principle first promulgated in 1995. The overarching theory is Deng Xiaoping's often-repeated maxim that "Science and Technology are the Chief Productive Forces". In line with the guidelines, the central government has invested tremendously in the higher education system. Major transformations have focused on increased resource commitments to higher education central to the nation's R&D development, and significant changes in organization form including deregulation and university merging (Li, Whalley, Zhang & Zhao, 2008). This in turn reflects the government's commitment to continued high growth and sustainable development through quality upgrading and technological autonomy as set out in the 10th (2001-2005), 11th (2006-2010) and 12th five-year plans (2011-2015), and more specifically the "Medium- to Long-term Strategic Plan for the Development of Science and

Technology (2006-2020)". The MLP represents a fascinating and ambitious effort to bring Chinese science and technology into a leading international position by the year 2020 (Suttmeier & Cao, 2006), while also making breakthroughs in key technologies vital to China's economic and social development.

China is now engaged in large-scale higher education provision with an aim to strengthen capacity building and to educate and supply human resources in science and technology (HRST). With total enrolment at tertiary level having remained more or less stable before 1998, the number has expanded rapidly since 1999. The steady growth from 1999 was due to the deliberate policy of massification of Chinese higher education. In 2010, 6.6 million commenced their undergraduate education, which is almost sevenfold the number in 1995. Enrolment in 2010 totalled 22,317,900, which is 6.5 times larger than that in 1998 with 3,409,000 undergraduates (MOE, 2010). This omits self-study enrolment at 5,360,388, therefore the total enrolments are closer to 30 million. According to NSF (2012), more than half of first university degrees granted in China were in S&E fields (1,143,338 out of 2,256,783), compared with about one-third in the United States (496,168 out of 1,580,413) in 2008. The disparity was especially large in engineering. In the States, about 4 percent (69,908) of all bachelor degrees are in engineering, compared with 19 percent in Asia, and approximately one-third (704,604) in China. China has traditionally awarded a large proportion of its first university degrees in engineering, although the percentage has declined in recent years.

Despite the rapid growth of all components of the HRST pipeline, from university

enrolments in undergraduate studies to PhD programs, and even taking into account the large potential for improving the productivity of HRST, the bottlenecks that will mainly constrain China's future development may come from shortages in the specialized human resources that are needed at various stages of the innovation processes (OECD, 2008b). According to President Hu Jintao (2007), China needs to create conditions conducive to innovation, work to train world-class scientists and leaders in scientific and technological research, as well as innovative personnel in the frontline of production, and therefore inspire the creative wisdom of the whole society with large numbers of innovative personnel in all areas in order to attain the ultimate objectives of economic development.

Furthermore, an OECD study (2008b, p. 308) reveals that the share of the population with a tertiary education remains relatively low in China. It shows that only 9.5% of the Chinese population aged 25-64 had attained a tertiary education, well below the levels in OECD countries and Russia, and even below that of India, at 11.4%. What's more, the full-time equivalent of R&D researchers per thousand in China is at 1.5, well below the OECD average (OECD, 2011b). At the same time, China is facing its own demographic changes. Its population is aging, and will do so more rapidly in the coming decades. Also uncertain is its ability to educate large numbers of highly qualified scientists and engineers in the future (Suttmeier & Cao, 2006). Therefore, China is still facing a shortage of skilled labor despite the rapid increase in domestic institutional capacity for providing large numbers of new entrants to the national S&T labor market. What is even worse is that China has long been an important player in the global supply of professionals and students

although its emigration has been a mix of highly skilled and less skilled.

The outflows of tertiary educated Chinese

The origin of Chinese studying overseas can be traced back at least to the late mid-nineteenth century, when the then Qing government selected students to study Western techniques and science in the US (Rhoads, 2011). The underlying rationale was the realization that the lack of modern technology and democracy caused China's weakening. China was the most powerful country in the world in ancient times. In modern history, China was defeated by the gun boats and modern technology of the West and was forced to open its doors by Western powers after the Opium War in 1840. This presaged a gradual opening of the gate to Western education. The first Chinese overseas student was RONG, Hong, who went to America to study in 1847. As part of the Self-Strengthening Movement, the late Qing government sent 120 young boys to learn in America, before abruptly summoning them home again, in 1881, less than a decade later. Since then, many of China's best and brightest minds have journeyed West to pursue knowledge, study advanced science and technology, and seek personal well-being.

Well before the founding of the People's Republic of China in 1949, there were already a number of Chinese going abroad for further education in order to bring home knowledge that could help build a stronger country. Among the prominent figures were the Chinese democratic revolution forerunner Sun Yat-sen (usually called "Sun Zhongshan", 孙中山), Chinese leader Deng Xiaoping (邓小平), Chinese Premier Zhou Enlai（周恩来）, world-famous rocket scientist Tsien

Hsue-Shen（钱学森）and nuclear physicist Qian Sanqiang（钱三强）. After the establishment of the People's Republic of China in 1949, the Chinese government decided to send students and scholars to the former Soviet Union and other socialist countries to study advanced science, technology and management skills. Those who studied in the former Soviet Union in the 1950s included many of China's third-generation leaders, including former Chinese President Jiang Zemin（江泽民）, and former Premier Li Peng（李鹏）. Between 1950 and 1960, 10,678 Chinese went overseas to study. The destinations were 29 countries, mostly socialist, but some capitalist countries such as UK, France, Denmark, and Canada (Yao, 2004). In the 1960's and 70's, study abroad was hugely curtailed, as China withdrew into a more hermetic phase, due to the political atmosphere in China during the Cultural Revolution.

Since the reform and opening up in 1978, the policies of studying abroad have been changed. As someone who believed that the most important and efficient way of development for a country was enhancing national science and technology level, it was Deng Xiaoping（邓小平）who was the key person behind the policy changes. He made the important decision to send a great number of Chinese students and scholars to study abroad. He delivered a speech in 1978, stressing that China should expand academic communication with foreign countries, and send more students to study abroad. This ushered in the largest-scale study-abroad movement in China's history, which has continued to expand to the present day. Under his command, the new policy for studying abroad was worked out quickly. The State Education Commission (later the Ministry of Education) quickly selected 3,348 candidates

and sent 1,750 state sponsored people to study overseas the next year, with the number larger than the total number for the previous 7 years (1972 to 1978) (Yao, 2004). Consonant with general socio-economic development, a management and implementation system related to studying abroad was set up at institutional and national levels, which mainly consists of three complementary channels for students and scholars, namely, state-funded, employer-funded and self-funded.

With the encouragement of government policy, more young people left China for overseas studies. Both the quantity and scale was unprecedented in the history of China. In the past, the US attracted a large portion of the total number of Chinese students studying abroad. A more recent trend is for the number of Chinese students to have increased drastically in countries like Britain, Australia, Canada, New Zealand, the Netherlands, Singapore, Germany and France. MOE data (2012) shows the outbound movement and return of Chinese students and scholars. In 2011, the students and scholars who chose to study overseas totaled 339,700, of which the overwhelming proportion (92.7 percent) were self-funded (314,800). As opportunities in China proliferated, and options post GFC in the US, EU and UK diminished (see the abovementioned "pull-push" factors), return rates rose appreciably. Over the period from 1978 to 2011, the number of overseas Chinese students and scholars has reached 2,245,100. Return students have also increased to 818,400, or 36.45 per cent of the total. Among the 1,426,700 who remained overseas by the end of 2011, 1,108,800 have engaged in studying and collaborative research. Informal audit may suggest a larger number because not all Chinese students going abroad register with the government authorities, and the number

excludes students under the age of 18 (OECD, 2008b). The country has by far the largest number of overseas students in the world (Chen, 2011).

Concurrently, China has witnessed substantial outflows of excellent students who graduated from top Chinese universities since the 1990s. For example, almost 40 percent of graduates from the Departments of Physics, Chemistry and Biology of Peking University went abroad as self-supported students (Zhang & Li, 2002). Reviewing the situation, Xiang (2005) estimates that the majority of overseas Chinese are in the field of science and technology (65 percent), while a mere 4 percent are in the field of social science and humanities. Of particular concern to China is that the outflows of excellent young researchers from the best universities and research institutions in China have also been significant. The underlying fact is that China is losing "the best and brightest" to developed countries, at least temporarily (see Welch & Zhang 2008a, 2008b). The most recent study by NBER reveals that China again has been among top source countries providing foreign-born scientists to Japan (33.7 percent), the US (16.9 percent), Australia (12.5 percent), and Canada (10.9 percent) (Franzoni, Scellato & Stephan, 2012).

The United States has been the principal destination for Chinese students and scholars. A recent study by IIE (2011a) reveals that there were 157,558 Chinese students studying on US campuses in the 2010/11 academic year, representing a record-high from a slight post-9/11 decline. Chinese students comprised 21.8 percent of the total international student population in the US, and increased 23 percent from the previous year. While the majority of Chinese students study at graduate level (48.8 percent), the US continues to experience an upsurge in the

number of undergraduate students (36.2 percent) coming from China. Specifically, Chinese students in the US are concentrated at the graduate level and in science and engineering fields. In November 2010, India accounted for 81,590 foreign graduate students with 76.5 percent in S&E fields. China accounted for 73,040 foreign graduate students with 64.85 percent in S&E (NSF, 2012). The number of Chinese scholars teaching and doing research at US colleges and universities has followed a similar general upward trend in recent years. China is by far the largest sending country for foreign scholars (faculty members and visiting lecturers and researchers). With 30,094 Chinese scholars in the US in 2010/11, China sends almost three times as many scholars to the US as India (11,930), the second largest sending country (IIE, 2011b).

What makes the trend more significant is that the stay rate of Chinese students has been quite substantial. During the 1990s, approximately half of the doctoral recipients from China have sought and received opportunities for further study and employment in the United States (Johnson & Regets, 1998). More recently, NFS (2008) research shows that more than 90% of 2002–05 US S&E doctoral recipients from China and 88 percent of those from India reported plans to stay in the United States, and 60 percent and 63 percent, respectively, reported accepting firm offers of employment or postdoctoral research in the United States. After reviewing the China—US S&T collaboration during the past decades, Suttmeier and Cao (2006) estimated that some 62,500 China-born (excluding Taiwan-born scholars) PhD's in science and engineering decided to pursue professional careers in the United States. Of these, 74 percent are between the ages of 30 and 49, with roughly 37 percent of

the total employed in educational institutions with another 49 percent employed in industry. Approximately half are now US citizens.

The movement of tertiary educated people from China to developed countries is large in absolute terms. Despite the unavailability of systematic data, China has been losing many of its most talented academics to the North, and this may result in negative effects on the Chinese academic institutions (Altbach, 2004). Recently, the positive dimensions of China's reversal of the brain drain have been emphasized, due both to the Chinese economic boom and the further opening of Chinese society. What seems to be neglected, however, is that there has been a consistent increase in the outflows of Chinese residents and the profile tends to be younger and more educated than the national population. Excessive emigration can deplete the stock of highly skilled citizens faster than it can be regenerated despite both the higher return rates and the huge expansion of Chinese higher education, which may impact negatively on China's growth prospects in the long run, as human capital formation is now viewed as a central engine of growth.

2.4.2   Tapping Chinese Talents Abroad

Different from other emigration countries, the formation of the overseas Chinese professionals has been directly shaped by state policies (Xiang, 2005). As noted above, up to the end of the 1970s, the Ministry of Education sent selected researchers to the West to study. In 1979, the MoE, the National Science Committee and the Ministry of Foreign Affairs jointly issued a document to detail how Chinese overseas students should be regulated; those who did not return on

time would be punished. A more flexible policy was released by the Chinese government in late 1986, which reduced the limitation on self-financed students studying overseas (Yao, 2004). The late 1980s saw the beginning of the formation of a sizable overseas Chinese professional group when, with the gradual relaxation of regulations, the number of migrant students increased, but the return rate dropped significantly.

The Tiananmen Incident was a crucial turning point in China's student migration history. The United States issued an executive order to grant PRC students permanent residency in 1990, followed by the 1992 Chinese Students Protection Act. Other major Western countries followed suit. As a result, 70,000 Chinese students and scholars in the United States (including 20,000 family members), over 10,000 in Canada through the OM-IS-399 policy (as discussed in Chapter Five), and 29,500 in Australia following Prime Minister Hawke's intervention (as discussed in Chapter Four) obtained permanent residency in those countries. The Tiananmen incident, however, dealt only a temporary blow to the student migration policy in China, and the government continued sending students out. Furthermore, the government soon made a significant policy shift, namely from preventing and punishing students who were overstaying, to encouraging their return regardless of whether they had ever broken the agreement with the state.

As noted above, China is facing the dilemma of building up an innovative economy with insufficient highly skilled personnel. As the world shrinks due to more convenient travel and widespread communications technology, the Chinese government has recognized the opportunity to tap Chinese talent abroad for

domestic development purposes (Dahlman & Aubert, 2001; Saxenian, 2003; Zweig, Fung & Han, 2008). China, too, joined the group of some fortunate developing economies such as South Korea and Taiwan that have turned the international flow of their human talent into a reversal of the brain drain (Zweig & Wang, 2013). Specifically, in 1992, the central government promulgated the policy on Studying Abroad, which follows "supporting study abroad, encouraging returning, and guaranteeing the freedom to travel back and forth". In 2001, the government further loosened its policy regarding the overseas Chinese talents, calling upon them to engage in various types of activities to "serve the country (Weiguofuwu,为国服务)" rather than "returning to the country（Huiguofuwu,回国服务）" (Wescott, 2005). The period from the second half of the 1990s up to today saw a proliferation of policies enacted at national, provincial, city, and institutional levels aimed at attracting returnees (see for example, Welch & Cai, 2010; Welch & Hao, 2013).

Since the mid-90s, the wealthy eastern coast provinces and municipalities including Shanghai, Beijing, Zhejiang, and Guandong, have adopted numerous policies to offer skilled returnees a handsome package, including high salaries, beneficial tax rates, special business loans, housing subsidies, and subsidies for children's education (Xiang, 2003, and see Welch & Hao, 2013). Moreover, with the country's continued emphasis on supporting returning talent, "Returned Overseas Students Industry Parks" (*Huiguoliuxueshengchuangyeyuanqu,*回国留学生创业园区) have been established especially to provide incubation services and support to returnees' enterprises, generally with excellent facilities and a series of supportive policies. By the year 2010, more than 150 industrial parks nationwide, hosting

8,000 companies, had attracted 20,000 returnees who have greatly contributed to the scientific innovation and industrial restructuring (Xinhua Net, 2011).

Further reflecting the policy changes alluded to above, the Chinese Government currently encourages both permanent and temporary return; as a result, a group of typical "transnational migrants" may well emerge (Xiang, 2003). The Government has implemented a so-called "dumb bell model" (*Yaling Moshi,*哑铃模式), which encourages migrants to maintain professional and/or business affiliations in both China and overseas, and move back and forth regularly. For example, MoE established the "Spring-Light Plan"(*Chunhui Jihua*，春晖计划) to finance short visits to China to participate in conferences and seek opportunities for joint programs. Co-sponsored by Li Ka-hsing's Cheung Kong Conglomerate and the MOE, the Changjiang Scholars Project (长江学者计划) was instituted to retain and attract high-caliber teaching and research staff with emphasis on attracting scholars with overseas learning and working experience. As a means to facilitate other passport holders including those overseas Chinese experts to enter and exit China, the Chinese government introduced its "Green Card" in 2004, the internationally accepted name for a resident management system. This signaled that China would open its doors wider to attract foreign talents.

Of notable importance is the "One Thousand Talents Scheme" (*Qianren Jihua,*千人计划), (successor to the "One Hundred Talents", *Bairen Jihua,*百人计划), initiated in 2008 by the national Organization Department. It represented a new effort to tap top-tier global talent. Offering favorable policies in terms of taxation, insurance,

housing, children and spouse settlement, career development, research projects, and government awards, the scheme comprised the following key elements: (1) A plan to attract about 2,000 leading talents under the age of 55, who hold professorships or equivalent positions in renowned foreign universities or research institutes, over a period of 5–10 years; (2) The Thousand Youth Talents Program for Distinguished Young Scholars (launched in 2011) aims to attract about 2,000 excellent young overseas scholars, under the age of 40, by 2015.

Since its launch 3 years ago, the Recruitment Program of Global Experts has sponsored more than 2,263 overseas innovation talents, including 1,902 Thousand Talents and 361 Thousand Youth Talents (Wei & Sun, 2012). Among the most well-known are Shi Yigong (施一公) and Rao Yi（饶毅） who gave up academic chairs at Princeton and Northwestern universities, respectively and returned to Tsinghua and Peking universities. Realistically, however, a great majority of Chinese overseas talent has not been mobilized, due to affecting factors at personal, institutional and systematic level. Therefore, more effective measures have been called for to mobilize and utilize the pool of talents abroad to the fullest degree.

2.5　　　Conceptual and Theoretical Frameworks

2.5.1　　　Evolution: Brain Drain, Brain Gain and Diaspora Network

Research into highly skilled migration first appears in the mid-1960s with a history now spanning about four decades. Two phases can be recognized in the literature: (1) the 1960s and the 1970s, when highly skilled migration from the South to North was the principal emphasis; (2) the current phase of globalization. Debates

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regarding brain drain have tended to ebb and flow with various waves of emigration and immigration. While reaching its peak at the end of the 1960s, the following decade saw a decline in research interest, with the main themes centering on policy implications to mitigate the negative effect of the outflow (Gaillard & Gaillard, 1998). The 1980s witnessed a moderate increase in literature on international migration, not specifically on migration of the highly skilled (Koser & Salt, 1997). The recurring interest soared as more Asian economies (notably South Korea and Taiwan) experienced brain return due to their dramatic socio-economic development, and targeted skilled migration programs were developed in countries of migration including Australia and Canada (as seen above and detailed in Chapters Four and Five), and upheavals in the scientific and technical systems took place in the ex-Soviet systems post the collapse of East European communism (Gaillard & Gaillard, 1998; Koser & Salt, 1997).

More recently, migration of the highly skilled has assumed increased importance, reflecting the interlinked impact of globalization and the explosive growth in ICT, which has paradoxically contributed to global knowledge creation and distribution, global inequality, and national development. The notion of winners and losers wrought by the phenomenon has become more complicated. The reasons are attributed to potential benefits, and challenges include micro-level effects on individual migrants, families, and communities, and macro-level effects on economies and societies (Castles, 2000). The so-called "brain drain" issue came to be regarded as more serious when a large number of one type of professional migrated to more developed countries, such as the emigration of doctors from

African countries to OECD countries (as discussed earlier). Brain drain can have particularly detrimental effects on smaller states. Countries such as Jamaica, Haiti, Mauritius and Fiji, for example, have more than 40 percent of their highly skilled people abroad; in some cases, even 80 percent (OECD, 2008a).

While receiving countries reap substantial economic and other benefits from highly skilled migrants, the effects on source countries are more ambiguous, and include both costs and benefits. Skilled emigration is not a serious problem in countries with a broad and flexible human resource base, and a capacity to replace the outflows through increased training or immigration. Australia, for instance, sends skilled migrants to other developed countries (Hugo, Ruddock & Harris, 2003), and in turn receives even larger numbers of skilled migrants from elsewhere. However, for poor countries that are already short of human capital, the exodus of a significant portion of the country's skilled workers can be a major impediment to their hard-won scientific capability (Kapur & McHale, 2005; Mullan, 2005) and future economic growth (Iguch, 2003; OECD, 2008a; Wickramasekara, 2002).

Specifically, Solimano (2002) pinpoints that the loss of a critical mass of tertiary educated persons can even cause a phase of stagnation of the science and technology development in the sending countries. As an example, the phenomenon of brain drain is especially relevant for Ghana: some 34 per cent of Ghanaians in the OECD are highly skilled. While the trend began in the late 1980s, Ghana has remained a net sender to date. The OECD Database on Immigrants and Expatriates (2004) reports 189,461 Ghanaians as residing in the OECD, including 67,190 in the United States and 56,112 in the United Kingdom. This shows that skilled

emigration at significant levels may create challenges for sending countries, notwithstanding the lack of systematic data and substantial empirical and comparative research.

The approaches adopted by developing countries to reverse the brain drain can be divided into two basic forms of interpretation of this phenomenon: the "brain drain" approach to respond to, and minimize, the negative effect of migration; and the "brain gain" approach to mobilize and utilize the diaspora as highly trained human resources abroad (Meyer et al., 1997). According to Gaillard and Gaillard (1998), the countermeasures including prevention, restriction, restitution and taxation have proved to be unsuccessful because people are believed to leave the country for economic reasons. By contrast, brain gain strategies have increasingly been developed on the premise that the expatriate skilled population should be considered as a potential asset instead of a definite loss (Brown, 2000; Lowell, 2001; Meyer & Brown, 1999).

The first alternative to emerge has been the return option, which grew gradually through the 1970s (Glaser, 1978) and became more extensive in the 1980s and the early 1990s (Meyer & Brown, 1999). Those returnees, as carriers of knowledge and advanced skills, have made significant contributions to cutting-edge fields which are underdeveloped in their home countries (Lou & Wang, 2001; Yoon, 1992). However, some scholars observe that only a few newly industrialized economies, like Singapore, Taiwan and South Korea, and developing country giants such as India and China have been able to implement this strategy effectively (Meyer & Brown, 1999). The underlying reason is the adequate capacity for investing in

science and technology material as well as human infrastructure. Chinese universities, for example, are also offering help with housing, and schooling for returnees' children with additional language support (as discussed earlier). Such a prerequisite cannot be easily matched by many developing countries.

Further, there has been an increasing recognition in the literature that the existence of a diaspora of researchers, scientists and technologists can provide a "brain gain option" without returning to their home nation since they can be avenues for technology transfers, information spread and training for people in their home country (Barre et al., 2003; Hugo, 2008b; Meyer, 2001; Meyer et al., 1997; Meyer et al., 2001). The trend is giving rise to the notion of brain circulation taking place in a number of nations, whereby highly educated people first cycle out of their native countries and into Western countries but later circulate new knowledge and technology back to their native society (Patternson, 2005; Saxenian, 1999, 2002a, 2002b, 2005). For example, the Korean American scholar Choi (1995) revealed that many Asian-background academics in American higher education keep in close contact with their countries of origin, maintaining scientific and academic relationships with colleagues and institutions at home. More recently, Saxenian (2006) concludes that highly-skilled professional immigrants have led to unprecedented opportunities for formerly peripheral economies by sifting among the Chinese and Indian communities in Silicon Valley.

Hence, the diaspora option has assumed increased importance as a strategy for utilizing the outflow without the need for physical repatriation. The feasibility of this type of remote collaborative work has become manifest in international

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research initiatives and operation of multinational corporations (Meyer & Brown, 1999). Critical to the point is how to mobilize the diasporic resources to contribute to the development of the country of origin. Arguably, this is done through effective networking. As discussed earlier, the rapid development of ICT, especially the Internet, plays a crucial role in the growth of intellectual diaspora networks and the contribution of diaspora communities by supporting their interaction and encouraging their involvement with their institutions at home (also see Lowell, 2001). In short, the diaspora option is essentially building upon intellectual diaspora networks. Priority has been placed on the educational, social, cultural and professional advancement of their members. By encouraging nationals to seek opportunities in advanced, high-technology countries, developing countries can benefit from future knowledge exchanges and technology transfer from their knowledge diaspora. Central to the point is that the main objective of intellectual diaspora networks is the economic, political and social development of the countries of origin. In other words, brain circulation and diaspora-homeland collaboration can be a viable development strategy for developing countries.

Those countries with a large higher education system, and highly educated diaspora residing in developed countries, and that pursue a vigorous diaspora-homeland collaboration agenda, have a comparative advantage in terms of mobilizing and utilizing this potential asset. This is highly illustrative of China, specifically during the past decade when the central government has implemented a series of talent deployment programs. Among the most prominent advantage is the strong enthusiasm and interest among the Chinese knowledge diaspora to contribute to

China's development, evident in the literature, and that is largely irrespective of family history (Kuznetsov, 2006; Meyer & Brown, 1999; Welch, 2010; Welch & Zhang, 2008b; Yang & Welch, 2010; Zweig, 2006; Zweig et al., 2008). Based on their comparative study on Indian and Chinese knowledge diaspora in Australia, two contemporary scholars conclude that there is some evidence that the Chinese knowledge diaspora maintain stronger academic links with the homeland, than their Indian peers (Hugo & Dasvarma, 2008). Meanwhile, China has used administrative means to encourage such networking (Xiang, 2006). The potential of 'virtual return' through the use of ICT has led to a recognition of the increasing ability of the diaspora to deliver benefits to the homeland while abroad (Welch, 2010; Welch & Zhang, 2008a, 2008b), and is associated with a significant change in China's official policy toward the highly skill people in its diaspora (as discussed earlier and see Hugo, 2008b).

As the foci of power and growth are now multiple and disperse, the hierarchical distribution and categories of research and development (R&D) are more complex and blurred. This more multi-polar quality of the global knowledge network means that the intellectual diaspora can be instrumental in narrowing the North–South scientific gap (Brown, 2000; Meyer & Brown, 1999; Meyer et al., 2001; Welch & Zhang, 2008a, 2008b; Zweig, 2006; Zweig, Chen & Rosen, 2004; Zweig, Fung & Han, 2008). The statement underscores the shared professional and ethnic identity of the knowledge diaspora as well as their deep integration into key knowledge centers. Understandably, the transferring process requires deep knowledge of the local context, both underneath and on-surface differences in social, cultural, and

institutional settings. Substantial transnational collaboration rarely succeeds or is sustained without a shared language and social context that facilitate communication (Saxienian, 2006). Saxienian's view on the significance of ethnicity to cross–cultural collaboration resonates with the "Yin-Yang" paradigm (Meyer et al., 2001), i.e., the periphery is represented in the center by its own expatriates and the center's resources can be utilized by the periphery as it has access to them through its own means, the diaspora.

Therefore, the diaspora option and the diaspora knowledge networks involve a major re-conceptualization of highly skilled migration, seeing it less as a permanent exodus than as a pattern of brain circulation (Welch & Zhang, 2008a, 2008b; Zweig, Fung & Han, 2008), where talent remains abroad, but with much information being circulated back to the sending country. The highly skilled emigrants, once perceived as a permanent loss to the sending country are now treated as potential assets for the home country. Critical to the point is the recovering of highly qualified professionals as part of a comprehensive development policy (Meyer & Brown, 1999; Meyer et al., 1997). This does go beyond traditional approaches in recognizing an opportunity to capitalize on the very characteristics of the brain drain through the remote mobilization of highly skilled people in the diaspora.

2.5.2   Reframing the Core-Periphery Paradigm

Diaspora knowledge networks are essentially the specific knowledge networks connecting expatriate intellectuals across the world, and with their home country. Despite their invisibility and intangibility, the significance of these networks in

strengthening the innovative capacity of developing countries has been frequently reiterated in the literature. With its very recent development, and the fact that theory building is still in its youthful phase, it is not surprising that the literature is almost reticent in probing the dynamics of the diaspora network systematically. Specifically, one point unarticulated is how the diaspora knowledge networks have figured in the international scientific network and thus been affected by circumstances related to it.

Meyer and his colleagues (2001) make an insightful attempt to get round this problem. In their study, the scholars define the diaspora option as intrinsically a new and original logic in international scientific relations regarding the center-periphery approach in international scientific network and world system theories, by scrutinizing the intellectual diaspora network at meso- and macro-level. Notably, the scholars go beyond the façade of the intriguing phenomenon and place it into mainstream theories of comparative education. These theories provide a solid rationale that is embedded in social science to understand the diaspora knowledge networks at a macro level. The rationale underscores the unevenly stratified socioeconomic and political grounds for transnational scientific interactions. Therefore, it has significant implications on how the expatriate knowledge networks can be explored and understood.

Inequality or asymmetry is one hallmark of international knowledge networks (Altbach, 1987, pp. 65-69). The underlying assumption is differential geopolitical status, more pertinent, the center-periphery thesis is a distinct feature of knowledge production and dissemination. Choi depicts the role of the centers as "teaching,

creating and autonomy", and peripheries as "learning, validating and dependence" (1995, pp. 6-9). This can be illustrated by the intense concentration of top-tier universities, and control over and opportunities for scholars publishing at the center of science and scholarship, i.e. the North. With powerful Western universities dominating the creation and transmission of knowledge, the weaker ones have to follow due to limited resources (Altbach, 2002a, 2004; Choi, 1995). This results in the pervasive influence of the Western orientation in the international scientific community. With the information and communication flow at unprecedented rate in this global era, there has been the awareness in the South of the ubiquity and omnipresence of what Altbach termed the global knowledge network (Altbach, 1994, pp. 2993-8; 2002a, pp. 1-21; Crystal, 2003; Welch, 2010a).

This has been buttressed by the observation that developed countries make up the center of the world's educational and intellectual systems while developing countries are at the periphery (Kanjanapan, 1995; Patternson, 2005). A recent phenomenon illustrating the hierarchy in the global knowledge network has been the somewhat chaotic university rankings or league tables. Although contentious and contradictory, the three most cited ranking lists, namely the Academic Ranking of the World Universities from Shanghai Jiaotong University (ARWU), the World University Rankings from the Times Higher Education Supplement of Britain (THES) and the US News and World Report, all tend to place the prestigious American and to a lesser extent UK universities at the top of the list. Further, a new *Universitas 21* research into national education systems gives the first ranking of countries and territories which are the 'best' at providing higher education, with the

top five found to be the United States, Sweden, Canada, Finland and Denmark (Williams, de Rassenfosse, Jensen & Marginson, 2012).

More importantly, the knowledge-intensive centers can be mapped according to scientific capacity and output. These are mainly measured by bibliometric indicators, with SCI being the most known, and clustering of tip-top global brains. For example, the USA leads the world in research, producing 20% of the world's authorship of research papers (The Royal Society, 2011). Arguably, the distribution of the Nobel Prizes provides some indication of the loci of the knowledge center. According to Bloom (2005, p. 35), 670/736 (91.0 percent) Nobel Prizes awards till January 2003 went to people from high-income countries, the majority to the USA, with just 3.8 percent from the Russia/Soviet Union and Eastern Europe and 5.2 percent from emerging and developing nations. Of the nine scientists from emerging or developing countries who won Nobel Prizes in Chemistry, Physics, Physiology or Medicine, four were working in the USA and two in the UK and Europe.

Unsurprisingly, the emergence of English as the global academic language has handed a major ranking advantage to universities from nations whose first language is English, in competition with Western Europe and the emerging science nations in East Asia and Singapore (Marginson, 2006b). Of notable importance is that English is the primary language of research publication and the only one with global standing, albeit not the only language of research. For example, Held et al. (1999) reveal that approximately ten times as many books are translated from English to other languages, as are translated from other languages into English and thus made

universally accessible. The underlying fact is that expensive research facilities, citation indexes and patents are dominated by wealthy and largely English language education systems. Also critical is that such indexes as the Science Citation Index (SCI), the Social Science Citation Index (SSCI), and the Engineering Index (EI) are skewed in favor of English language journals, thereby widening the North-South gap in academic output and impact (Welch, 2010a). Universities and research centers in developed countries provide the theoretical framework and research methods that dominate the peripheral educational and intellectual domain in developing countries.

The stratified international scientific network, to a large degree, has been caused by the uneven structure of the world economy. There is a high correlation and interdependence between economic prosperity and scientific development. In financial terms, R&D expenditure and intensity are two of the key indicators to monitor resources devoted to S&T worldwide. Sagasti (2003) comments that technological disparities between the North and the South are substantial when economic indicators are plotted against scientific and technological indicators. He revealed that the GDP of OECD countries was 64 times larger than the GDP of low-income countries, while scientific output was 88 times larger, technical output is 197 times larger, and technical production 645 times larger.

Specifically, the United States has been the leading spender for almost three decades, and again, the largest single R&D-performing country, 31% of the 2009 global total, down from 38% in 1999. Wealthy economies generally devote larger shares of their GDP to R&D than do less developed economies. According to the

NSF (2012), the US R&D/GDP ratio (or R&D intensity) was about 2.9% in 2009 and has fluctuated between 2.6% and 2.8% during the past 10 years. The top European R&D performing countries include Germany (2.8%), France (2.2%) and the United Kingdom (1.9%). The Japanese and South Korean R&D/GDP ratios were among the highest in the world in 2008, each at about 3.3%. China's ratio remains relatively low, at 1.7%, but twice as much as 0.8% in 1999, and is set to rise substantially again by 2020.

As the advancement of modern S&T demands substantial inputs in property, facilities and equipment, and human resources, a nation's capacity to support R&D in S&T has been of critical importance. What also makes a difference is how well the investment is spent. Only wealthy nations can provide the necessary scientific infrastructure to conduct basic research on sufficient scale, mostly via government funding. Outside the English-speaking nations, these systems are found in Western Europe, Japan and rising Asian science powers such as Korea and Singapore (Marginson, 2006a). However, developing countries are at a significant disadvantage in terms of infrastructure and sound framework requisite for knowledge creation and distribution, due to economic underdevelopment. Further, the international differentials in resources devoted to S&T are correlated with the outflows of scientists and academics from developing countries to the US and other OECD countries (Solimano, 2002). In this regard, scientific/knowledge networks are asymmetric, and the intellectual migration often adds to the tremendous gap between affluent and underdeveloped countries.

Central to the dynamics of the international knowledge network, and specifically

the diaspora knowledge networks, is the debate whether the stratified international knowledge network has changed to become more equal and interdependent, under the influence of globalization and the extraordinary development in ICT. Some are pessimistic. After reviewing the characteristics of globalization, Yang (2002, p.58) points out that "globalization never meant global equality". This scholar's observation is based on pessimism regarding possibility of more equal interactions between societies through knowledge networks, due to the tremendous gap of knowledge and skill between the centers and the peripheries. The underlying reason is that globalization and the knowledge society yield opportunities for the privileged or knowledge-rich, with the knowledge-poor being worse off. Indeed, global inequality of knowledge creation and application has been exacerbated since developed countries attract talents from developing countries, who consolidate the already-strong knowledge base in the former, at the cost of the latter.

However, the hierarchical structure in knowledge distribution and dissemination has become more complicated (Altbach, 2004; Welch, 2010a), and fluid. The underlying fact is that the loci of power and growth are now multiple and more disperse (Meyer et al., 2001). For example, North America has lost the lead to the EU in share of world publications since 2000, now representing 36.8 percent of the world total, a decrease from 41.4% in 1981. The latter accounted for 40.2 percent (up from 32.8 percent in1981) (UNESCO, 2005). Current statistics reveal that the share of world literature which carries a US author or co-author address has fallen to some 29 percent, while the European Union nations (the EU27, following the accession of countries in the former Eastern bloc) increased their share of research

papers moderately, from 33% to 36% (Adams & Pendlebury, 2010). In disciplinary terms, the share of physics, chemistry and engineering papers is significantly higher in the newly-industrialized countries in Asia, while developed countries are better weighted in clinical medicine and bio-medical research (Adams & Pendlebury, 2010; UNESCO, 2005). Moreover, the diaspora option is seen as critical to narrowing the North-south scientific gap (Brown, 2000; Meyer, 2001; Suttmeier & Cao, 2006; Welch & Zhang, 2008a; Zweig, Fung & Han, 2008) for the reason that knowledge transfer is integral to the diaspora option, which goes largely downstream from knowledge-intensive places to less intensive ones.

2.6 Conclusion

The literature has critically reviewed ideas on the diaspora option and the intellectual diaspora networks. However, little research is yet available at the theoretical and the empirical level due to the recent inception of intellectual diaspora networks, and the trans-disciplinary nature of the diaspora option. Also problematic is a lack of reliable data. Most studies remain hypothetical, since they lack first-hand data collected from the knowledge diaspora themselves. This is not a criticism of the quality of research carried out. Rather it reflects the predominantly practical research interests by governments and policy makers, hoping to fully utilize the specific pool of talents. This pragmatic interest is also influential on researchers, who tend to mainly analyze the impact of economic globalization and immigration policy on national economic development.

While some lessons are evident in the literature about the impact of the diaspora

option in relation to brain gain, there is also a significant need for more quality research about the diaspora option related to effective utilization of the talent. In addition, the literature remains reticent regarding the limitation and constraint of the specific network. Indeed, most studies in the field can be categorized as descriptive, being non-intrusive, conducted at a distance and lacking insiders' perspectives, even though the centrality of the intellectual diaspora to the viability and effectiveness of the diaspora option has been recognized.

Moreover, too little research has focused on links between changes in the international scientific networks, specifically the intellectual diaspora networks, and changes in the world system. There has been a call for integrating social science theories into the analysis of the intellectual diaspora networks. Also, it is essential to produce in-depth studies in order to examine the nature and dynamics of the intellectual diaspora networks. The current study is intended to develop a better understanding of the diaspora option and provide more illustrative, insiders' perspectives, thus contributing greater insights into how the knowledge diaspora can be utilized to contribute to both ends of the knowledge bridge.

Although a few case studies focusing on India and European countries have been conducted, there is lack of comparative study on intellectual communities in different host countries. It is also surprising that the Chinese knowledge diaspora have been relatively poorly documented and investigated in literature, given the fact that China has long been the major sending country that loses substantial talents overseas, and that a plethora of governmental and institutional initiatives and schemes have been announced to attract and retain overseas talents with special

reference to Chinese ethnicity.

In this chapter, the impact of globalization and China's status quo in relation to the migration of the highly skilled and the brain drain has been illustrated. In addition, the significance of the diaspora option and the intellectual diaspora networks has been discussed as the most recent strategy to reverse brain drain. Furthermore, the theoretical explanation of the new strategy has been highlighted as the base for the study. Limitations of the existing literature have also been identified, while a number of conditions have been illustrated that influence how effectively the knowledge diaspora option can be deployed.

Chapter Three   Research Methodology

3.1 Introduction

In the previous chapter, the justification for the study was outlined in terms of the current literature on the knowledge diaspora and diaspora knowledge networks. This chapter describes the context of the study, and then explains and justifies both the qualitative research paradigm and the grounded theory research method that were selected for this study. Specific aspects of the research method are discussed including data collection procedures such as in-depth interviews and pilot study, and data analysis procedures such as open coding, axial coding, selective coding, and theoretical sampling, followed by a summary of quality considerations.

3.2 Context of the Study

3.2.1 Why Australia and Canada

Canada and Australia share common characteristics. They are both populated by immigrants and their descendants, initially by British (in Australia), and French and British (in Canada), and followed by multiple ethnic groups. Their major language is English (with the exception of francophone Quebec in Canada); they have similar political and economic systems; and they are at the most advanced level of economic development and knowledge network. Interestingly, they even share somewhat similar problems. They are benefiting largely from net inflow of brains while losing some of their top talent to the U.S. and Europe. Canada in particular

can act as a staging post at times for those, including some mainland Chinese academics, who see the USA as their ultimate destination. They both target highly skilled migrants to maintain moderate population growth and working age populations, as the native population is greying. It is highly illustrative in the case of the academic profession (as discussed earlier).

A further important point of commonality is the growing Sino-Australia and Sino-Canadian ties, with China being Australia's largest individual trading partner in 2010-11 (DFAT, 2011) and Canada's second biggest trading partner, behind the US (CBC News, 2012). Those ties have contributed to their ongoing scientific communication and collaboration, in the form of the Chinese studying in and migrating to the two countries, while continuing an academic/professional relationship with Chinese universities and Chinese scholars in other parts of the world. The two countries have remained among the favorite destinations for Chinese students for decades (as explained in later Chapters), while the USA remains the most favored choice to fulfill their dreams of foreign study. The increasing number of the mainland Chinese faculty, especially in the field of S&E, provides a solid rationale for focusing on Chinese scholars as an important group in understanding the diaspora knowledge networks.

Along with the above considerations, there are certain calculations on the comparison of the experience of these two nations. Australia's regional proximity to China and Canada's geographic proximity to the huge US system, a long-lasting magnet for Chinese intellectuals, have shed light on the understanding of the dynamics of the intellectual knowledge networks. This study does not argue that

Chinese scholars in Australian and Canadian universities are the most crucial node in Chinese intellectual diaspora networks. However, the underpinning conviction is that Chinese scholars in Australia and Canada are among the most prominent groups in constructing diaspora knowledge networks, because of their size, significant involvement in research and development in the host universities and their ongoing communication and collaboration with peers in China.

3.2.2 Settings and Participants

The in-depth study will be conducted at two non-elite universities located in non-metropolitan area, one from each country. Hereafter, these will be termed Australian Regional University (ARU) and Canadian Regional University (CRU), respectively. According to the recent MacLeans ranking, CRU was among the lower top group in the stream of Medical Doctoral Universities. In the ARWU ranking, CRU resides in the group of 201-300. ARU is a relatively younger institution, with decades of history and a multi-campus structure. ARU was ranked in the middle group in the national ranking from Australian Education Network (AEN), and it did not have a presence in the ARWU ranking of the top 500 universities worldwide. Although each has distinct features, they both focus on the core roles of teaching, research and community outreach. Be it an Australian university or a Canadian one, international partnerships have been emphasized as an important strategy for institutional development. With a wide range of disciplines, the two universities hosted many Chinese students and scholars. These two universities were chosen due to the consideration of their academic ranking and geographical location in order to get a complex picture of the Chinese

knowledge diaspora and their academic networks with the mainland colleagues and overseas Chinese elsewhere, and to provide a contrast with more research intensive universities, that were part of a larger study of the Chinese knowledge diaspora in Canada and Australia.

A tentative name list of mainland Chinese academic staff from each university was compiled using the university, faculty and department websites. It was not difficult to identify these names because they were spelled according to the Mandarin spelling (*hanyu pinyin*) system adopted in China. Ethnic Chinese born in places other than mainland China do not employ this system to spell their names (Tsang, 2001). The details of universities from which they obtained their first degrees further confirm their mainland Chinese identities. However, they may also be seen as a "difficult-to-reach population" (Neuman, 2003, p. 213) because they hold a higher societal and/or professional rank and possess expertise that can make it difficult to arrange an interview with them. Potential subjects were contacted individually by fax and email, to ascertain who was interested in the research topic, and seek their permission. Appendix E provides a complete listing of all the respondents who were recruited for the study.

3.2.3 Ethical Concerns

It is critical to underline that this knowledge diaspora study involved collecting data from people, about people (Punch, 2005). Accordingly, I observed standard procedures strictly to ensure that rights of the participants were protected during the course of this study. Ethical approval was obtained from the HREC at the

University of Sydney (Appendix A), before I recruited any participants. I sent information about the study, participant consent form, and a subject information sheet to potential participants for their interest in and availability for the interview. Approval of each participant was gained before the research was carried out.

To begin the interview, I informed the participants about the purpose of the study and its basic procedures, and presented an outline of any reasonably foreseeable risks, or discomfort, a description of the likely benefits of the study, a statement that participation is voluntary and that the participant is free to withdraw at any time or to decline to answer any particular question, the identity of the researcher and the sponsor, and some information about the way in which the data and conclusions might be put. I assured each participant that the interview data would be treated confidentially and that I am the only person who could associate individual participant with their comments. The recordings and transcripts were labeled with pseudonyms. Confidentiality was further guaranteed by the fact that I myself conducted all the interviews, transcription and analysis. I stored all records related to the study securely and will keep them for seven years. In reporting the findings, the dissertation has been written in a manner to ensure that the informants are not identifiable. I have made every effort to disguise the identity of the institution.

I have observed conscientiousness and rigor in research, acted in terms of the good of the whole, and respected the truth; in this way deceptive means to acquire knowledge has been automatically ruled out. During the whole process, I guarded against misconduct and temptation to mislead by only reporting convenient or

positive results when I found some contradictory data in the field. I rethought and modified the assumptions to accommodate 'negative' results, cope with new, challenging, problems (Isreal & Hay, 2006) and to reflect the complexity of social life.

3.3 Research Method

3.3.1 Rationale for Approach

Studying knowledge diaspora and the intellectual networks between them with the home country meant that a thorough understanding with the discovered complexity of those invisible networks could not be obtained without directly seeking the perspective of those who are directly involved. According to Marshall and Rossman (1999, p. 57), "One cannot understand human actions without understanding the meaning that participants attribute to those actions—their thoughts, feelings, beliefs, values, and assumptive worlds; the researcher, therefore, needs to understand the deeper perspectives captured through face-to-face interaction". As such, qualitative research is the most suitable way to understand such personal, individual perspectives. Also pertinent is to understand the nature of qualitative research by definition to ensure right direction. The researcher borrowed from Denzin and Lincoln's most recent effort to convey the nature of this inquiry:

> "Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including fieldnotes,

interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretative, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (2005, p. 3).

In practical terms, the study used Creswell's rationales for using a qualitative research approach when (a) the research question starts with a how or a what so that initial forays into the topic describe what is going on, (b) the topic needs to be explored – including when theories are not available for certain populations and need to be developed, (c) there is a need to present a detailed view of the topic, or the distant panorama shot will not suffice to present answers to the problem, (d) it involves studying individuals in their natural setting, (e) there is an interest in writing in a literary style – bringing the writer into the study directly, (f) audiences are receptive to qualitative research, and (g) there is the emphasis on the researcher's role as an active learner who can tell the story from the participants' view rather than as an "expert" who passes judgment on participants (1998, pp. 17-18). These criteria are a good fit for this study's research agenda.

I adopted a cross-sectional, qualitative study as the research approach for this study. The factors that primarily influenced this decision were the nature of the research questions and the data pertinent to the research topic. The research questions, as outlined in Chapter one, focused on participants' lived experience, i.e. their positioning in the Australian and Canadian universities and their collaboration with

the mainland colleagues, and overseas Chinese elsewhere. To study those questions, I needed to understand the meaning that participants attributed to those actions, including their thoughts, feelings, beliefs, values, and assumptive world (Marshall & Rossman, 1999). Qualitative research is most appropriate because it offers structured approaches to exploring people-oriented phenomena within the social and cultural contexts in which they work and live and involves inquiry into the meanings ascribed by individuals and groups with respect to particular social phenomena (Creswell, 2007).

Hence, instead of lending themselves to simple correlations, the questions would be explored in an interpretive and explanatory pattern. It was predictable that the ideas and evidence in relation to the topic would be mutually interdependent, that is, the concepts were closely tied to the specific data, and could be expressed in the words and concrete actions of the people being studied (Neuman, 2000). Finally, I employed in-depth interviews as the primary method of data collection in that the informants could provide their reflections on scientific communication and collaboration with the home country and Chinese scholars in other parts of the world. As a mainland Chinese, the cultural background and academic context that I shared with interviewees provided a powerful base for empathy and lent an easy rapport to conducting this in-depth study. Moreover, the pilot study further buttressed the rationale for the in-depth qualitative approach.

In terms of time dimension in the study, cross-sectional design is preferable regarding the approach of data analysis and the manageability of conducting research. The approach to data analysis revolved around the construction and

comparison of the participants' experience in relation to diaspora knowledge networks. Furthermore, cross-sectional research is characterized by simplicity and cost-effectiveness. For an individual student to conduct research, particularly within a prescribed time-frame, manageability is critical to the implementation phase.

3.3.2 Grounded Theory

The qualitative research paradigm is composed of numerous choices of approaches, with five frequently cited methodologies being narrative research, phenomenology, grounded theory, ethnography, and case studies (Creswell, 2007, p. 6-10). To a larger degree, these methods share a philosophical framework and foundational themes, including design strategies, data collection and fieldwork strategies, and analysis strategies (Patton, 2002). Nonetheless, the intent of grounded theory is to move beyond description and to generate or discover a theory, an abstract analytical schema of process (Creswell, 2007, p. 63). In this sense, grounded theory differs from other qualitative methods because it aims at "generating theory" as well as "its completeness of method" (Walther & Myrick, 2006, p. 548).

Grounded theory, originating from the collaboration of Glaser and Strauss (1967), has its foundations in social science and symbolic interaction, and has been utilized to build a theory about a phenomenon by systematically collecting and simultaneously analyzing relevant data (Charmaz, 2000; Corbin & Strauss, 2008; Field & Morse, 1985; Glaser & Strauss, 1967; Mayan, 2001; Strauss & Corbin, 1998). In practical measures, grounded theory research explores basic social

processes that occur within human interactions and is well suited when the researcher is seeking to understand the meaning or nature of experiences of people under specific circumstances. The underlying principle is that the researcher does not begin with a preconceived theory that needs to be proven, as is common in quantitative studies, because this research method focuses on building theory, not testing theory (Dey, 1999).

As a primarily inductive investigative process, grounded theory is a key element in qualitative research approaches. The embedded inductive nature of grounded theory is that there is no pre-existing conceptual framework to formulate data collection and analysis (Mayan, 2003). Rather than a set of numbers, or a group of loosely related themes, the research findings consist of a theoretical formulation of the reality under investigation (Strauss & Corbin, 1990, 1998). The specific methods essentially lead to the building up of middle-range theoretical frameworks that explain the collected data (Charmaz, 2000). Middle-range theories are "abstract renderings of specific social phenomena that were grounded in data" (Charmaz, 2006, p. 7). The advantage of middle-range theories is their narrow scope, limited number of concepts, relevance to the real world and that they can be empirically tested (Steubert-Speziale & Carpenter, 2003). Further, Creswell (2007, p. 63) argues that the essence of grounded theory is the fact that "this theory-development does not come off the shelf, but rather is generated or grounded in the data from participants who have experienced the process".

Another distinct feature of grounded theory is the use of a constant comparative approach to data collection and analysis. Bryand and Charmaz (2007, p. 1) suggest

that grounded theory research encourages researchers to persistently interact with their data, and "remain constantly involved with their emerging analyses". In other words, in grounded theory research, data collection proceeds simultaneously with data analysis. During data collection, I actively engage in coding and data analysis in order to identify emerging themes and to inform and streamline subsequent data collection. This allows me to investigate the legitimacy and relevance of emerging themes by comparing new data with the results of initial analysis (Morse & Richards, 2002; Steubert-Speziale & Carpenter, 2003). In fact, this process of moving back and forth between data and analysis "makes the collected data progressively more focused and the analysis successively more theoretical" (Bryant & Charmaz, 2007a, p. 1), a strategy to ensure reliability and validity of the research because the researcher ensures data fit with the analysis on an ongoing basis (Mayan, 2003).

The paucity of empirical studies addressing the dynamics of the invisible diaspora knowledge networks, and my interest in understanding the collaboration between the Chinese intellectual diaspora and their mainland peers, influenced the choice of method. I chose grounded theory as the methodology for this study because the procedures appropriate to this approach enabled a systematic picture of the experiences of the intellectual diasporas to be constructed, thereby giving them a voice in the attempt to develop an understanding of the basic social and academic processes. As Sherman and Webb put it, grounded theory "offers a systematic method by which to study the richness and diversity of human experiences and to generate relevant, plausible theory which can be used to understand the contextual

behavior" (1988, p. 127). The principles and practices of grounded theory offer explanatory power, potentially providing a theoretical generalizability of the findings from this study (Charmaz, 2006). Through grounding in real-world data and inductively arrived abstractions, along with transmitting meaning through rich and thick descriptions, the grounded theory research method was deemed appropriate for creating theoretical propositions regarding this study's research question.

Consonant with the principles of grounded theory, semi-structured interviews were employed. Open-ended questions based upon 'what', or 'how' were posed to allow informants to provide their own accounts of their experiences to raise issues they felt to be significant. Individual interviews continued until theoretical saturation was achieved, which meant "more than a matter of no new data", and denoted "the development of categories in terms of their properties and dimensions, including variation, and if theory building, the delineating of relationships between concepts" (Corbin & Strauss, 2008, p. 143). It is a strategy to advance theory construction and keep the analysis grounded and fit the studied phenomenon (Charmaz & Henwood, 2008, p. 243). Then, following Glaser and Strauss's injunction, I attempted to seek and consider both corroborating and dissonant perspectives during theory development from the data using a constant comparative method of analysis, which involves "generating categories and their properties; integrating categories and their properties; delimiting the theory; and writing the theory" (1967, p. 105).

3.3.3 Sampling

This qualitative study is concerned with in-depth understanding of the issue under investigation, and the sampling strategy is referred to as theoretically grounded (Mason, 1996). It relies heavily on individuals who are able to provide rich accounts of their experience from which researchers can learn extensively about the issues under examination (Liamputtong, 2010; Patton, 2002). Therefore, choice in participants is driven by a conceptual question, not by a concern for "representativeness" (Miles & Huberman, 1994, p. 29). Rather than quantitative research that requires generalization of the findings, qualitative researchers focus on examining a process or the meaning that people give to their own social situations (Morse, 2006, p. 530). This has been further buttressed by Creswell (2007), who argued that, in a grounded theory study, the researcher chooses participants who can contribute to the development of the theory. Following this guideline, the author considered purposive sampling the most appropriate method for informant selection because it allowed information-rich cases related to the purpose of the research to be chosen. Purposive sampling refers to the deliberate selection of specific individuals, events, or settings because of the crucial information they can provide as regards to the understanding of the research problem and central phenomenon in the study (Creswell, 2007), and that cannot be obtained so well through other channels (Carpenter & Suto, 2008). As outlined in Chapter One, the purpose of the research was to understand the participants' experiences in scientific communication and collaboration with the home country through diaspora knowledge networks. In view of this, a great deal more could be

learnt by focusing on the experiences of a relatively small number of carefully selected participants than by collecting standardized information from a statistically representative sample group (McClure, 2003). The research aims could best be achieved by conducting an in-depth study of a carefully selected sample.

Equally important, I needed to make decision about how many people were to be sampled. The underlying strategy was not only to study a few sites or individuals, but also to collect extensive detail about each site or individual studied. The intent of qualitative research is not to generalize the information, but to elucidate the particular, the specific (Pinnegar & Daynes, 2007). A critical point here was to select the respondents meaningfully and strategically (Carpenter & Suto, 2008; Patton, 2002) against the not-so-large population in each site. The university web searches revealed that there were some forty mainland Chinese academics at each university, with a majority residing in Faculties of Engineering, and Business. The important question to ask when deciding about the sample size was whether the sample provides enough data to allow the research questions to be thoroughly addressed (Mason, 2002). The key guideline was theoretical saturation, or specifically theoretical sampling, a concept associated with grounded theory research, that was employed as a way of justifying the number of research participants (Carpenter & Suto, 2008; Corbin & Strauss, 2008; Liamputtong, 2010; Morse & Richard, 2002; Padgett, 2008).

In the study, I selected the key informants purposefully because it was hypothesized that they played an active role in networking with other Chinese expatriates and mainland China. In order to obtain a wide range of viewpoints and perspectives,

some variables were considered in terms of the length of overseas stay, disciplinary speciality, professional rank, gender and age group. I interviewed the ARU informants at the university from late April to early May in 2009, and their Canadian peers at CRU in November that same year. As for recruiting the sampling, I contacted potential informants mainly by email and invited them to participate in the study. Following Patton's (1990) instruction, a letter was written to inform them of the aims and importance of the study, their involvement in the interview, and the voluntary nature of their participation in the study. Although a sample of 11 from each site could not to be claimed to represent the total population, it did allow for an adequate range of demographic characteristics and experiences to be covered.

3.4 Data Collection

The data collection procedures for this study were guided by the principles of grounded theory, mainly involving semi-structured in-depth interviewing to uncover and describe individuals' perspectives on cooperation with the home country, and overseas Chinese scholars. This section discusses related practical matters such as defining the interview questions, employing an appropriate interview technique, choosing the venue, and recording interviews, together with reflections on the pilot study.

3.4.1 Semi-Structured In-Depth Interview

Consistent with a grounded and qualitative approach, semi-structured in-depth individual interviews were used to gather information pertinent to the research questions in the participants' own words. This style of interview allowed the

meaning of events and actions held by those academics to be explored, and to test the emerging interpretations. According to Johnson, the in-depth interview "seeks to build the kind of intimacy that is common for mutual self-disclosure" (2002, p. 103). It requires a greater depth of self-expression by the participant than do other interviewing methods, and therefore seeks deep information and understanding (Johnson, 2002, p. 106). Referred to as an intensive interview (Charmaz, 2006; Hesse-Biber & Leavy, 2005), in-depth interviewing allows me the access of knowledge from an insider "without the preconceived biases inherent in using existing structured instruments that may contain items irrelevant to local population" (Schoenberg, Hopenhayn, Christian, Knight & Rubio, 2005, p. 92). The flexibility of the method is therefore particularly suitable to grounded theory research (Charmaz, 2003, 2006; Creswell, 2007).

There are some further considerations that led to the use of this data collection method. I was also guided by Taylor and Bogdan's (1998, pp. 90−91) instruction that in-depth interviewing is best addressed in the following situations: (1) the investigator has a relatively clear sense of the research interests and the kinds of questions that need to be pursued; (2) participant observation is not practical; (3) the investigator has time constraints and needs to complete the study within a shorter period of time than participant observation would allow; and (4) the investigator is interested in understanding a broad range of settings or people. This fits this study on the knowledge diaspora and their invisible knowledge networks with mainland colleagues. Practicability is of great importance for me needing to complete my study within a prescribed time-frame, when international and multi-

campus field work made the task more challenging and resource intensive.

I used open-ended interviews to probe for details about the participants' experiences. This strategy allowed a list of key topics to be touched on with each informant, without precluding other topics that arose in the course of conversation. To assist in a deep exploration of the research questions, thirteen questions were formulated in a systematic and explorative manner, as the instrument for conducting the interviews. The respondents' role as knowledge producers and distributors was the focus, as it was essential in understanding the structure and dynamics of the diaspora knowledge network. Their experience as faculty members in the Australian and Canadian universities, and participants in continuing knowledge and technology exchange with the mainland peers and other overseas Chinese scholars was investigated.

The interview schedule comprised open-ended questions covering the following areas (see Appendix D): personal information; impact on academic development; comparison of academic atmosphere and research traditions; comparison of academic exchanges; cooperation with the mainland colleagues and other Chinese intellectual diasporas; methods of disseminating/obtaining academic findings to/from academics in China and other Chinese intellectual diasporas, and effectiveness of, and reasons for, these channels. In the nutshell, the questions comprised a narrowing of the central question and sub-questions in the research study (Creswell, 2007). Following the suggestions of Kvale (2007) and Barbour (2008), the opening question of the interview allowed participants to talk at length. For example: "In your own words, please tell me about your decision to come to

Australia/Canada?" This question allows participants to choose where they want to start and which parts of the story they want to emphasize (Laimputtong, 2010).

Also vital for in-depth interviewing is that the interview is as natural as possible and that participants feel free to express their views without constraint (Hall & Hall, 1996). Therefore, I tried to create an atmosphere conducive to free discussion of participants' experiences and reflections in the interviews. Being Chinese assisted greatly to foster a more trusting relationship. For example, participants often asked me about my background and history, although I had forwarded my resume before the interview. Also helpful was my cultural and contextual understanding due to my decade-long work experience in a top Chinese university, and a much shorter period in the MOE, together with years of study in a prestigious Australian university. With a more or less similar background, it was not difficult to build up rapport and understanding during the interviews.

More importantly, the success of the in-depth interview to a large degree relies on the establishment of a productive interaction between the researcher and the participant (Minichiello et al., 1995). During the interviews, I applied clarification, paraphrasing and reflection to ensure that I understood each participant's meaning clearly. This was also a good way to show that I enjoyed what I was hearing (Glesne & Peshkin, 1992) and "to learn to listen to what is said and how it is said" (Kvale, 2007, p. 63). In addition, at the end of each interview, I invited participants to make comments or ask questions about anything that he or she thought was relevant to the topic or the interview process. I always assured the participants of my appreciation for their time and energy by participating in the interview.

The location of the interview is of significant importance. It is recommended that the venue for the interview be a private place where the talk will not be interrupted and where participants will feel comfortable (Taylor & Bogdan, 1998, p. 97; Bryman, 2008). Following this suggestion, I conducted all the interviews in participant's office at the campuses of the university of their preference. I recorded the interviews with the participant's consent by using a mini-disc recorder, and later I translated and transcribed the audio document to provide accurate records for analysis. None of the informants seemed to be disturbed by the presence of the recorder. Even so, I tried to minimize potential discomfort by placing it in an unobtrusive location during the interviews. The mini-disc recorder was used to avoid unnecessary interruptions such as renewing a tape.

3.4.2 Pilot Study

Worthy of mentioning here, is that the project I conducted as part of my University of Sydney Masters degree followed much the same procedures of qualitative data collection and data analysis, recruiting informants from some of the same population (mainland Chinese intellectuals, working abroad). I conducted the pilot study with one mainland Chinese academic from a Canadian university when he spent his sabbatical in my home university in China. The pilot study was employed to test the research process (Glesne & Peshkin, 1992), and the wording of the questions (Oppenheim, 1992). That experience gave me more confidence and familiarity with interview techniques such as building rapport, guiding the flow of ideas related to the research questions, and the way of handling chunks of textual data. More importantly, some refinements of the interview questions were made in

order to get the exact information needed, and to be specific to the national settings. That saved a lot of time in clarification when doing cross national interviews.

3.5 Data analysis

From the moment that data are collected, a systematic and inductive process of analysis takes place that gradually moves the researcher toward theory development (Bryant & Charmaz, 2007a; Corbin & Strauss, 2008; Glaser, 1992; Glaser & Strauss, 1967). Based on the premise that collection and analysis of data are performed simultaneously, researchers should not allow data collection to get too far ahead of data analysis. The key reason is that "the focus of subsequent data collection, that is, the questions to be asked in the next interview or observation are based on what was discovered during the previous analysis" (Corbin & Strauss, 2008, p. 145). The patterns of interactions among the concepts are discovered, as the researcher collects and analyses the data (Glaser & Strauss, 1967).

This is an important aspect of grounded theory, as data from an earlier interview often informs and provides direction for the next. Emerging concepts and ideas are categorized through a systematic coding process. The continual reassessment, refining of concepts and data reduction process is the end goal of qualitative research design (Janesick, 1994). In line with the grounded theory approach, the aim of the data analysis was to understand Chinese academics' experiences in a careful and detailed manner. The data analysis process was therefore characterized by three phases: (1) drawing together the individual stories; (2) identifying commonalities and differences across the stories; (3) comparing the stories across

the two nations.

To begin with, I listened to each interview within the first two days after the interview to keep it fresh in my mind, writing down my observations, thoughts, and questions. As I played and replayed them, I then transcribed the interviews in word form and translated those sections that seemed central to my investigation. It was necessary to reduce the over 200-page long interviews, observations and reflection data to a manageable size without losing the essence of the participants' experiences and meaning-making processes. The transcript was then read while listening to each interview, to examine how narratives implied to what extent they fitted into the larger picture of the intellectual diaspora network. Notes were taken of the characteristics, worth and limitations of the diaspora knowledge network, as described by participants. Questions were asked about patterns such as, what is happening in their communication and collaboration with their mainland colleagues, how do these connections occur, and why do they seem to happen.

Meanwhile, data collection continued, asking respondents questions to gather more detailed descriptions of the patterns that were emerging consistent with the principles of theoretical sampling. Earlier transcripts were returned to for analysis, more questions were asked, and this process was repeated iteratively. As I understood categories better, I began linking them together, testing relationships between categories, drawing correlations to illustrate relationships and going back and forth to the data to confirm or refute them. This analytic process was consistent with established procedures for grounded theory studies involving three main coding procedures (Corbin & Strauss, 2008; Strauss & Corbin, 1990, 1998). I

began with open coding, referred to as the first run at coding data (Liamputtong, 2010), moved through to axial coding that presents a more conceptual level and finally, to selective coding, "the process of integrating and refining the theory" (Strauss & Corbin, 1998, p. 143).

Open coding is described by Strauss and Corbin as, "the process of breaking down, examining, comparing, conceptualizing and categorizing data" (1998, p. 61). In practical terms, it "opens the data to in-depth views" (Charmaz & Henwood, 2008, p. 242), with the data being pulled apart so that it can be put back together in new ways at a later stage (Mayan, 2003). To do so, transcripts were read repeatedly in a line-by-line manner to allow categories to emerge, based on significant aspects of participants' stories, as in the analytic induction approach (Goetz & LeCompte, 1984). I identified and highlighted themes and key ideas from the text, word for word. I wrote self-reflections that documented descriptions of each code. Early codes tended to reflect how different participants' academic professions are and how the diaspora knowledge networks are. While using the words of participants to label the codes, I created more than 100 codes, but I quickly grouped them together to formulate initial categories. Then, I compared the initial codes and grouped them into categories that could pertain to a similar phenomenon (Strauss & Corbin, 1990). For example, a category relevant to participant data called "Alma Mater relations" was established to combine codes such as "my old university", "my classmates", "my alumni" and "my former teacher".

Then axial coding was employed, involving "making connections between codes" (Strauss & Corbin, 1990, p. 96) to group concept categories that were conceptually

similar or relevant in a set of relationships. Axial coding ensures each code is fully elaborated, instead of an attempt to make links between codes. Strauss and Corbin (1990, p. 125) comment that axial coding attempts to answer questions like "when, where, why, who, how and with what consequences?" These questions enables researchers to describe their studies more thoroughly (Charmaz, 2006; Liamputtong, 2010). At this stage, the data were put back together in new ways to form in-depth explanations of the central phenomena. For example, in the case of the Diaspora category, "less *Guanxi* here" was a recurring concept. An attempt was made to understand why "less *Guanxi*" makes a difference, and how *Guanxi* affects their decision to stay on and their scientific communication and collaboration with the mainland colleagues. This allowed me to understand each element of the evolving theory in greater depth and how they related to one another. These categories were later elevated to a more abstract level as they were subsumed into the selective coding, theoretical concepts.

The identification of the core category led to selective coding. This was achieved by focusing on core categories, to which the other categories were related. Those relationships were validated, and categories that needed further development were filled in or merged (Strauss & Corbin, 1990). To accomplish it, Corbin and Strauss (2008, p. 104) suggest that researchers need to select from "among the many categories developed over the course of a study: the category that appears to have the greatest explanatory relevance and highest potential for linking all of the other categories together". In this study, the core category was developed as a substantive theory grounded in the data (Creswell, 2007). This came as a result of immersing

myself in the data, reasoning and re-reasoning, and finally visualizing how each category fitted with others. For example, the central DKN category, "uneven development/stratification" across the two systems emerged to explain the nature and dynamics of the invisible networks and this category was able to account for the variation across all cases.

Throughout the analytic process, theoretical sampling was an important concept to be considered. Theoretical sampling, as a defining feature of grounded theory, relies on the comparative methods to identify conceptual boundaries and pinpoint the relevance of a category (Charmaz, 2000). Nonetheless, it was among the challenges confronted me as a novice. I followed Charmaz's (2006, p. 113) suggestion that it is time to stop when "categories are saturated" and "when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of your core theoretical categories". Another concern throughout the research process but especially during more focused analysis was memo writing (Marshall & Rossman, 2006), which is "the theorizing write-up of ideas about codes and their relationships as they strike the analyst while coding" (Glaser, 1978, p. 83). I recorded the emerging categories and tied them together in a set of relationships. At the beginning, I found that my memos were very fragmented and made little sense. The more I wrote memos and data was continued to deconstruct and reconstruct, the clearer I became about my categories, eventually leading to higher-level abstraction.

3.6 Evidence of Quality

For many qualitative researchers, the concepts of validity and reliability are seen as incompatible with paradigmatic foundations of qualitative research (Carpenter & Suto, 2008; Corbin & Strauss, 2008; Smith, 1993; Tobin & Beley, 2004). The argument is based on the view that qualitative research is unique to specific historical, social, and cultural context, and therefore rigid duplication is impossible for the justification of reliability (Liamputtong, 2010; Johnson & Waterfield, 2004). Charmaz (2006, pp. 182-183) suggested that the evaluation of grounded theory revolves around a four category typology of credibility, originality, resonance, and usefulness. Those criteria require self-evaluation throughout the research process, and it requires a certain degree of sophistication and experience to accurately evaluate one's own work and even then it's hard to remove the bias (Corbin & Strauss, 2008, p. 300).

Building on the previous work in the field (Glaser & Strauss, 1967; Lincoln & Guba, 1985), Corbin and Strauss (2008) posit credibility as the principal evaluation standard for grounded theory studies. The term "indicates that findings are trustworthy and believable in that they reflect participants', researchers' and readers' experiences with a phenomenon but at the same time the explanation is only one of the many possible plausible interpretations possible from data" (p. 302). Also, the two scholars provided eight criteria for judging grounded theory research albeit the recognition that these may not be applied to all qualitative research methods or other grounded theory methods. These include: (1) Fit; (2) Applicability or usefulness of findings; (3) Concepts that are necessary for developing common

understanding; (4) Contextualization of concepts; (5) Logic; (6) Depth; (7) Variation; (8) Creativity; (9) Sensitivity; and (10) Evidence of memos (pp. 305-307).

Bearing these criteria in mind, I employed several strategies to address some of the potential challenges of conducting a grounded theory research. I employed systematic methods in terms of data collection, coding and the constant comparative method that enabled me to remain flexible and open to participant voices while overcoming potential ambiguity (Corbin & Strauss, 2008). When I presented the research findings, I used rich and thick description, with which readers can "gauge both the reliability of the data and the extent to which findings can be generalized to other settings" (Johnson & Waterfield, 2004, p. 128). Also presented were verbatim quotations of the participants to support my interpretation, which are crucial "for revealing how meanings are expressed in the respondents' own words rather than the words of the researcher" (Baxter & Eyles, 1997, p. 508). Importantly, contrary views were included, to provide additional insights or illustrate alternative views of particular themes or categories (Corbin & Strauss, 2008).

Throughout the whole process, I saw myself as an integral part of the study, and my own background played a role in how my data were shaped and analyzed (Angen, 2000; Liamputtong, 2010). Additionally, my own work and overseas study experience provided extra insights, as I attempted to understand the key phenomenon and determine if my findings were logical. Nonetheless, I became very aware of my own bias related to "cultural identity" due to my own identity as

a mainland university staff member working in a Western academy, who sometimes suffers from homesickness, and impending work pressure in a foreign language surrounding. It was important for me to acknowledge these feelings and I discussed them with my supervisor and colleagues. I was able to gain alternative interpretations as a result of my consultations and actively sought to set aside my own bias and analyse 'what was there' in the interview transcripts. Theoretical sensitivity was important as I decided when to stop and as a method of checking the emerging theory for relevance.

Additional challenges to novice researchers who conducted grounded theory research include effectively managing and integrating extensive volumes of data, along with conducting successful interviews. In this sense, my previous Masters project experience using a similar research design helped me gain some understanding of conducting a grounded theory research. More importantly, the research design addressed these concerns by combining in-depth semi-structured interviews with review of written documents that yielded triangulated data sources and methods, reducing potential ambiguity while ensuring the explicitness of the major themes, meanings, and understandings of how the diaspora knowledge networks work. Selecting participants from various disciplines, academic ranks, and age cohort was another way of triangulating data. In addition, much attention was paid to building rapport and trusting relationships with the participants that resulted in truthful and complete responses. Other strategies employed included conducting a pilot and extending member-checking to ensure accurate representation.

3.7 Summary

This chapter describes and explains the research methodology employed for this study. To begin with, the context of the research was delimited. Detailed profiles of the informants (Appendix E) and ethics (Appendix A) were presented. Regarding the aim of this study, qualitative inquiry and grounded theory were considered as justifiable. Then, data collection and analysis were conformed to the principles of the grounded theory approach. Semi-structured, in-depth interviewing and purposive sampling were employed. A pilot study was conducted to ensure the trustworthiness of the research. Finally, a series of coding pertinent to the grounded theory approach were used to generate the emerging middle-range theory from the data, followed by a discussion on the quality of grounded theory research.

Chapter Four   Chinese Knowledge Diaspora in Australia and Their Networks with China

4.1   Introduction

With Mak Sai Ying's arrival on Australian shores more than two centuries ago, the relationship between the two countries has evolved along a broad range of dimensions, from the strengthening trade and investment links that have led China to become Australia's major engine of growth, to the expanding people-to-people links in migration, education, academia, tourism, culture, politics and policy-making. Complementary research priorities and shared challenges manifest that Science, Technology, Engineering and Mathematics (STEM) is an important part of Australia and China's bilateral relationship. Australian international university links continue to be dominated by North-East Asia (25 percent), with China being the No.1 source country for international agreements totaling more than 1,600 (Universities Australia, 2012a). Scholars from China have long graced Australia's institutions of higher learning with their education and with their willingness to share this as they learn new skills and perspectives (Ryan & Viete, 2011, p. 151).

This chapter explores the Chinese knowledge diaspora in a non-metropolitan middle level Australian university, and their academic network with the mainland scholarship. It is mainly divided into three parts. The first three sections contextualize the study of the Chinese knowledge diaspora, and begin with an overview of the development of Australian immigration, with major changes being

highlighted together with its policy influence. A summary of multiculturalism follows that underscores the contested nature of the policy that presents the national characteristics and norm of Australia. A picture of Chinese immigration to Australia is also sketched, with more emphasis on the phenomenon that the newcomers have higher levels of education, qualifications and capital, unlike earlier cohorts of immigrants.

The second part examines the Chinese knowledge diaspora positioned in the Australian university in four main aspects, starting with their decision to stay in Australia in general, and their career decision in this Australian university in specific. Subsequently, their perception of the Australian academic system, substantially different to the indigenous one, which gives them an advantageous position as regards their career development, has been explored. As noted, academic career is challenging, not only because of the qualifications for the profession (basically the highest degree), but also the continuing requirement for satisfactory work performance in teaching and research, and even more demanding when promotion is on the agenda. Detailed discussion on the profession-related challenges is presented with specific consideration of the participants being Chinese. Some other issues that affect their career development as well as their Australian colleagues in general are also displayed.

The third part explores how the knowledge diaspora network between the overseas Chinese scholars with their mainland colleagues performs the bridging function across the two systems. Five subsections are presented to investigate the 'network' from different and sometimes mixed dimensions. For example, publication under

joint authorship with mutual contribution, with one on theory and the other on application, manifests the pattern as well as worth of collaboration. Nonetheless, I attempted to present the conduct of collaboration and the invisible and dynamic network in a delimiting manner. Following the "why" and "who" discussion, the pattern and worth of the collaboration are meticulously elaborated as regards the roles of the actors at both ends. A summary of the influencing factors at different levels within both ends is specified that underscores the effectiveness of the network in-between.

4.2 Australian Immigration Policy

Immigration and migrants contribute to social movement and social change, which Australia and its people have experienced throughout their history. In modern times, people who migrate to Australia contribute to the nation's economic development in many ways, such as satisfying skill shortages; stimulating demand for goods and services; investing in the Australian economy; and fostering international trade through knowledge of overseas trade markets, business networks, cultural practices and languages other than English. Further, with declining fertility and an ageing population in Australia, immigration becomes a more important stimulus for population growth, and helps to boost the labor force (McDonald & Kippen, 1999).

Immigration policies across the world are generally concerned with two related questions: how many migrants a host country should admit, and which migrants it should admit (Borjas, 2010; Cobb-Clark, 2000.) Australia consciously or unconsciously used immigration as part of the process of nation building. Since

Federation, Commonwealth governments have made conscious efforts to select suitable entrants by recruiting, subsidizing or encouraging particular immigrants; they have also provided various state interventions and made immigration a central area of public policy (Castle, 1992a, 1992b). Australia's immigration policies have evolved from focusing on attracting migrants, primarily from the UK, to a focus on attracting economic migrants and skilled migrants (Birrell, 1998; Parliament of Australia, 2005).

4.2.1 Major Development of Australian Immigration Policy

The narrative of immigration in Australia tells an ever-changing story, structured by a different theme initially, and evolving over the years. Prior to Federation in 1901, each state administered its own immigration programs tailored to its needs, competing actively for settlers until the constitutional responsibility for immigration was acknowledged as a matter of national significance (Jayaraman, 2000). The Immigration Restriction Act 1901 marked an official adoption of what became widely known as Australia's 'White Australia' Policy (Klapdor, Coombs & Bohm, 2009). White Australia meant not only an immigration policy that excluded non-whites, but a corresponding policy of 'the deportation or reduction of the number of non-white aliens' (Richards, 2008, p.117). Further, the exclusionary practice of immigration disadvantaged certain non-Anglo professionally skilled people (Bessant & Watts, 1999; Castles & Davidson, 2000). This policy remained virtually unchanged until after the Second World War (Klapdor, Coombs & Bohm, 2009).

Over subsequent years, Australian governments gradually dismantled the policy with the final vestiges being removed in 1973 by the new Labor government (Hafez, 2011). Noticeably, the March 1966 announcement on the criteria as regards acceptance from well-qualified people on the basis of their suitability as settlers, their ability to integrate readily and their possession of qualifications positively useful to Australia by Immigration Minister Hubert Opperman was the watershed in abolishing the White Australia policy. Significant changes occurred after the implementation of the Racial Discrimination Act 1975. The implementation of this legislation led to immigrants arriving from the Middle East, Central and South America, as well as from Asian countries (Jupp, 2007).

What is clear is that the Australian government operates a strict and tightly regulated immigration policy to achieve social and economic goals through the temporary and permanent movement of people and skills. As a reflection of changes in policy emphasis, the latter half of the 1990s saw considerable growth in the proportion of skilled migrants (Richardson & Lester, 2004; Parliament of Australia, 2005). General Skill Migration (GSM) migrants constituted 59 percent of Australia's total immigrant intake from 2004-05 to 2008-09 (Hawthorne, 2011).

Modeled on the Canadian system, the first point system of immigrant selection, called NUMAS (Numerically Weighted Multifactor Assessment System) was implemented in 1979 (Hawkins, 1988; Walsh, 2008). The system was revised in 1982 to make today's Australian point system more similar to Canada's practice. The strengthening of the points test requirements relating to skills, age, and English ability, introduced from July 1999, manifests the increased emphasis on skills

adopted by the Australian government (Richardson & Lester, 2004). Further, the Department of Immigration and Multicultural and Indigenous Affairs (DIMIA) maintains a Migration Occupations in Demand List (MODL) which is updated on an annual basis so as to target and attract migrants with skills in demand. Applicants with skills in demand are allocated extra points under the points test system.

Immigration policies introduced under the Howard Coalition Government and the Rudd Labor Government have fundamentally changed the nature of migration to Australia (Koleth, 2010). Among the greatest changes are shifts in the focus from family migration to skilled migration, and in the overall immigration program from permanent migration to long-term temporary migration (Mares, 2009; Markus, Jupp & McDonald, 2009). The underlying fact is that temporary migration has increasingly become the first step towards permanent settlement in Australia. A manifestation can be seen as regards the policy changes in facilitating the rapid growth of overseas student education in Australia by forging links between the overseas student program and permanent skilled migration (Koleth, 2010). It might be pertinent to indicate that Chinese students account for 28.65% of the total international enrollment and 26.87% of commencement in the year 2011, followed by India 13.06% and 11.65% respectively.

The rapid growth of both the skilled and overseas student programs occurred in a climate of intense international competition for highly skilled young migrants and overseas students (Koser, 2009). The underlying rationale is that overseas students were seen as both injecting significant amounts of money into the Australian

economy and having the potential to yield returns by helping to meet Australia's ongoing labor needs (Koleth, 2010). The Australian Bureau of Statistics (ABS) estimated that the international education industry contributed $15.8 billion to the Australian economy in 2008–09, and up to $17.7 billion in the four quarters to December 2009 (ABS, 2009). Further, Hawthorne (2011) observed that the study–migration pathway has had a major impact on the place of application of skilled migrants selected by Australia. By 2005/06 former international students constituted 42 per cent of General Skill Migration Principal Applicants (GSM PAs), with China and India emerging as the two major sources of supply.

A review of the 2005-06 skilled migration depicts challenges as well as benefits associated with the study–migration pathway. Former international students achieved inferior labor market outcomes to those of offshore PAs. It led to successive governments taking steps to refine the skilled migration program and enhance former students' employment readiness, while removing perverse study–migration incentives. From September 2007 (the last 2 months of the conservative Howard government) exemptions from English testing were no longer automatically allowed for former students, given the impossibility of policing education-provider standards (Watty, 2007). Further, skilled onshore applicants were required to sit a 'jobs ready' test to ensure they had the skills being claimed (DIAC, 2010a).

Further changes took place on February 8, 2010 when the Minister for immigration and Citizenship, Senator Chris Evans announced the revocation of the MODL (DIAC, 2010b). A review of the MODL was conducted due to concerns that it was

not supporting the GSM program to meet Australia's medium to long-term future skill needs. Findings supported by stakeholders participating in the review showed that the ineffectiveness of the MODL in delivering a GSM program. After the MODL was revoked, the international students who were currently undertaking study in a MODL and lodge application after that date would not be able to claim MODL points. The underlying rationale was that international students should not make educational choices solely on the basis of hoping to achieve a particular migration outcome. Collectively, the impact of these measures has been profound, and the study–migration pipeline has been utterly transformed.

4.2.2   Who Migrates to Australia?

Even before the first formal and legal immigration policy was introduced, Australia has been a country of immigration, seeking settlers since colonization in 1788. Migration peaked again during the 1850s gold rush when people from the UK, America, China and Europe flocked to Australia, hoping to make their fortune. Indeed, between 1788 and 1861, immigration was responsible for 74 percent of the increase in population; and during the period 1861-1939 the increase in population due to net immigration was 23.3 percent (Borrie, 1944).

The history of immigration in Australia has been closely associated with world events, which has contributed substantially to greater diversity in Australia. More than 650,000 people have arrived under humanitarian programs, initially after the Second World War as displaced persons from war-torn Europe, from Hungary after the 1956 Soviet invasion, from Chile after the 1973 coup, and from Vietnam after

the end of the war in 1975. In 1989, several thousand Chinese students were allowed to remain in Australia, after the Tiananmen crackdown. Later, people arrived after the conflict of civil war in Yugoslavia in the 1990s and more recently as refugees from war-torn countries in Africa, Asia and Middle East (Hafez, 2011).

Through migration, Australia's population has developed into one of the world's most culturally diverse societies (DIAC, 2008, p. i). According to the 2006 Census, Australia's population totaled an estimated 19.8 million people, about one quarter of whom (22.2%) were born overseas. Data also shows that persons born in the United Kingdom continued to be the highest populations of overseas-born residents, accounting for 5.4% of Australia's total population, followed by people born in New Zealand (2.4%), then China (1.6%), India (1.4%) and Italy (1.0%) (ABS, 2010).

The recent period has coincided with extraordinary growth in skilled migration to Australia, through both permanent and temporary entry. In 2009/10 Australia allocated 59 percent of its permanent migration places to skilled applicants (108,100), 33 percent to Family Category entrants (60,300), and 8 percent to Humanitarian Category entrants (13,750), out of a program total of 182,450 (Hawthorne, 2011). The rise of Chinese migration, particularly of high-skilled migrants (Welch, 2010b, pp. 156-159) is a significant phenomenon, of particular relevance to this thesis.

4.3 Multiculturalism in Australia

The Australian model for managing its ethnic diversity has had three main stages: the White Australia Policy from 1901 to the late 1960s, overlapping with assimilation from 1945 to the late 1960s, and multiculturalism, which began in the early 1970s (Hafez, 2011). Australia has been living with the historical legacy of a systematic practice based on the belief in a 'white Australia as the dominant culture' (Bashford, 2002; de Lepervanche, 1984; Vasta, 1993, 1996). The growth of ethnic and cultural diversity after the Second World War prompted a rethink of the viability of the White Australia Policy, and the assimilation policy and practice that neither addressed nor resolved issues related to cultural diversity and in particular ethnic minorities. The shift to multiculturalism was gradual, as was moving towards non-discriminatory nation building.

Multiculturalism, based on respecting and valuing cultural diversity while encouraging participation in, and identification with, the Australian community, was seen to be more effective. The meaning of multiculturalism has changed enormously since its formal introduction to Australia. Originally it was understood as a need for acceptance that many members of the Australian community originally came from different cultures and still had ties to it (Allan, 1983). Later, it came to mean the rights of migrants within Australia to express their cultural identity. The overarching fact is that very many people in Australia have, and recognize, multiple cultural or ethnic backgrounds (Ang, Brand, Nobel & Sternberg, 2006). There is the concurrence that multiculturalism is part of the intrinsic character of Australia as a nation (DIAC, 2011a).

4.3.1 From White Australia Policy to Multiculturalism

Unlike the US experience of a radical rupture from its colonial power, Australia represented a transformation and transplantation of British culture, with Australian democracy inspired by the British model. The Australians saw themselves, and were seen as a group of new, transplanted, predominantly Anglo-Saxon emigrant societies during the 19th century – an island of white culture in a sea of diverse, and alien Asian cultures (White, 1981, p. 47-56). This underpinned the principle behind the White Australia Policy that remained legally in force until 1973, and left a powerful legacy. The White Australia Policy applied the criteria of race and ethnicity as the basis for inclusion and exclusion, excluding racially undesirable (i.e. non-white) groups, and on occasion also groups deemed undesirable because of ethnicity (white Eastern, Southern and South Eastern Europeans).

After the creation of the Department of Immigration in 1945, Australia embarked on a project of mass immigration in order to populate the country. The main purpose was to continue implementing the Immigration Act 1901, to gradually accommodate other European and white immigrants, and the prevailing attitude to migrant settlement up until this time was based on the expectation of assimilation (DIAC, 2011b). Representing a break from the White Australia Policy, assimilation further became a way of governing non-Anglo European ethnic minorities arriving after the Second World War.

Although the preference was still for British migrants, other migrants were accepted on the understanding that they become culturally and socially absorbed

into the mainstream dominant population (DIAC, 2011b; Zappalà & Castles, 2000). As Sauer-Thompson puts it, assimilation, expressed conservative ideas and beliefs of a sense of belonging to the nation-state. It was historically premised on an Australian character comprising an ethnic white nationalism of British social and political origin (2003, p.11). During the 1960s, there was the recognition that immigrants were being unfairly treated, despite upholding Australian laws and making significant contributions to society. Many migrants and their families, particularly those who did not speak English, experienced hardships as they settled in Australia, and required more direct assistance (DIAC, 2011b).

Multiculturalism's gradual development was established by a number of influential social research reports, highlighting the need for change (Hazel, 2011). This included a report by Polish-born Professor Jerzy Zubrzycki, one of the 'architects of multiculturalism in Australia'. He pursued the development of multiculturalism while chair of the Social Patterns Committee of the Immigration Advisory Council to the Whitlam Labor government, arguing that Australia had to move towards recognition of cultural diversity (DIAC, 2007; DIMIA, 2003). It was Al Grassby, the then Minister for Immigration, who introduced 'multiculturalism' as a policy for Australia in 1973. A major factor in legally abolishing assimilation was the Racial Discrimination Act 1975, which outlawed discrimination based on race and ethnic origin. Legally, equal treatment for migrants became official policy (DIAC, 2007).

Arguably, Australia has become one of the most ethnically and linguistically diverse countries (Cope & Kalantzis, 2000; Dugan & Szwarc, 1984; Vasta, 2005) in

the 40 years since implementation of multicultural polices. Australian multiculturalism appears to have evolved from mass immigration and growing cultural diversity, which eventually led the state to re-examine social policy, and to address the needs of diversity.

4.3.2 Understanding multiculturalism: the Australian context

Multiculturalism was shaped by Australia's growing integration with Asia, which hinges on deepened cultural linkages and on the success of non-racist and non-colonialist image-building in the region (Cope & Kalantzis, 2000; Kalantzis & Cope, 1997). In the Australian context, multiculturalism refers to a set of norms that upholds the rights of all Australians to maintain and enjoy their cultural heritage while respecting the law and democracy, and principles derived from liberal political values such as equality, justice, social inclusion and mutual respect (Inglis, 1995).

Therefore, it has been seen as differing from other countries' approaches to multiculturalism, including that of Canada, which can be described as a bi-cultural society with reference to the French and English speaking provinces (as explained later); on the other hand, in the US, the term primarily refers to racially distinct 'others' such as people of African origins (termed African Americans), Asian Americans, or Latinos (Beck, 1996). Today, the concept is used foremost as a way of officially acknowledging the cultural and ethnic diversity of contemporary Australia.

As a national policy accommodating migrants from diverse cultural backgrounds,

multiculturalism is significant and merits special attention, stressing that multiculturalism functions as a 'claim' to the actual or preferred character of the Australian people and its national and cultural identity (Galligan & Roberts, 2004). With the emphasis on cultural diversity, it promotes the development of identities that enhance the development of a strong Australian national character, rather than being considered an impediment to it (Jupp, 2007).

Since its inception, the concept of multiculturalism has been subject to a variety of interpretations in the hands of politicians, academics, and the public at large (Jayaraman, 2000). There was the concern that migrants would be seen as problems due to their migrant status, their language and other cultural characteristics, rather than basing analysis on the structural disadvantage to which they were subject. Vasta and Castles (1996) brought together a number of researchers whose work revealed that, despite anti-discrimination laws and multicultural policies, racism was alive and well in Australia. Despite the fact that multicultural policy was definitely a step in the right direction, institutional racism continues to this day and academic research continues to highlight problems brought about by racism and racialization (Vasta, 2005), and more in a covert way.

4.4   Chinese Migration to Australia

Chinese migration to Australia spans more than two centuries, with Mak Sai Ying being the first recorded settler. The first significant Chinese immigration to Australia came in the 1850s during the gold rush era (Choi, 1975; Guo, 2005; Hugo, 2005). The consensus is that the Chinese immigrants experienced considerable

hardship and struggled in their new country, with considerable discrimination that sometimes resulted in violence against Chinese settlers (Jayaraman, 2000; Welch, 1997, 2007). Immigration policies began with the *Immigration Restriction Act* 1901 including the 'Dictation Test' enabling Australia to eliminate non-European migration. For the next half century, the Chinese population continued to decline as the older immigrants died and restrictions reined in immigration (Pan, 1999, p. 256).

Only after the establishment of diplomatic relationships between Australia and China in 1972, and the introduction of China's Open Door policy in 1978, did more and more mainland Chinese immigrants come to Australia. Concurrently, the Australian Prime Minister Bob Hawke in the 1980s and early 1990s made substantial efforts to link Australia with Asia, including the formation of the Asia Pacific Economic Cooperation (APEC) group. He argued that Australia as part of this region should boost trade and develop business within the region (Guo, 2005). Bi-lateral synergies have made the population flows from China to Australia grow at unprecedented levels (see Figure 4.1).

Figure 4.1 Population of China-born (thousands), Australia, 1981-2006
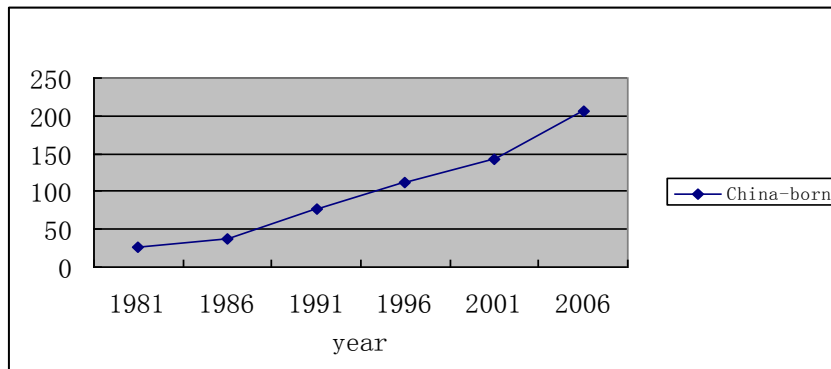
Sources: 1981-1996 data are drawn from DIMIA (2002) and 2001 and 2006 data from the relevant Censuses.

With the 1989 Tiananmen Square incident presented in the media with vivid and emotional detail, some 29,500 Chinese students and visiting scholars and their dependents in Australia at the time were granted temporary protection visas, which were later converted to permanent residency following PM Hawke's intervention (Hugo, 2008a; Shu & Hawthorne,1996). Guo (2005) noted that a total of 27,373 China-born residents in Australia had received permanent residence visas within four years after the incident. Since then, particularly in recent years, there has been a huge increase in the number of settlers; China (excluding Hong Kong and Taiwan) has been the third largest contributor of settler arrivals in Australia after the United Kingdom and New Zealand (ABS, 2010).

Of particular significance is that the Chinese students and scholars abroad earn degrees and conduct research that constitutes an integral part of China's policy of upgrading its educational systems and obtaining the highly skilled manpower

necessary to meet the goals of China achieving a 'moderately prosperous' society, proposed by Hu Jintao in his report to the 17th National Congress of the Communist Party (as discussed in an earlier chapter). Although it is somewhat difficult to identify the occupational sub-group from China to Australia—that of university teachers and academics, Hugo (2005) has predicted that the opportunities for Chinese academics and researchers in Australia will increase, due to the ageing of the local workforce, the expansion of the system, and pressure on student-staff ratios.

The Australian government has been actively promoting its educational programs abroad. As one of the major global destinations of students from the global South, (Abella, 2006; Tremblay, 2004), Australia has provided many educational opportunities to students from China. China has been the largest source country during the past decade. Also notable is that the Chinese students mainly enrolled at university level, with their Indian peers in the vocational education sector (as discussed earlier). The advantages to Australia are apparent, as the applicants for migration have an Australian qualification, familiarity with the Australian labor market, good English language, and experience of living in Australia. This raises issues of brain drain and the loss of human capital in China. Evident however, in the burgeoning literature spanning over three decades, is that the Chinese diaspora, or more particular to this study, the Chinese knowledge diaspora, have kept close and conducive relations with their mainland counterparts, for various reasons and through various channels.

4.5 Participants

Eleven Chinese overseas academics working at ARU were recruited for the study. In terms of gender, although every effort was made to include more female participants, only 2 women were ultimately secured. This, again, reflects the general scenario of the Chinese knowledge diaspora which has been dominated by men. Among the 11 participants, 6 were aged in their 30s, 4 in their 40s, and 1 in his 50s. In terms of academic ranks, seven of them were at level B (lecturer), two at level C (senior lecturer), and two at level E (full professor). Seven of them obtained their doctorates from Australian universities, with one from Germany, Japan, Mainland and Hong Kong, respectively. Their length of stay in Australia varied, with the longest being 23 years, the shortest 4 years, and an average of 10.5 years. Of the 11 respondents, 7 started their academic career with ARU. Also notable was the length of their work with ARU. The senior scientists (ARU11) reported the longest working history with the university, at about 17 years, while the two academics (ARU2 and ARU3) in social science revealed the most recent start; within the last two years.

4.6 The Chinese Knowledge Diaspora: Positioned in the Australian Academia

4.6.1 Why Australia

At the beginning of the interviews, each academic was asked why they came to Australia. It was not surprising that all respondents listed studying overseas and receiving the best education as a persistent academic priority. This echoes the observation that being Chinese meant having 'serious' attitudes towards education

(Tsolidis, 2001, p. 117).

When reflecting on his decision to come to Australia about twenty years ago, the senior professor (ARU1, Social Science) termed it "following the Master"; someone whose expertise is closely related to his research interest:

> I met my supervisor, a world-renowned expert in this field at an international conference. We had a good talk and he never expected to discuss those pivotal issues with a mainland postgraduate. Then, he helped me with the scholarship application.

This mindset was shared by the youngest respondent (ARU2, Social Science) who started his PhD with a German scholar. He described his supervisor as "a world top expert in the area." To him, his supervisor was a mentor who provided him with skills, knowledge, and networks for him to become acclimated to the chosen profession. He held a very positive view of his PhD training in Germany and indeed went to Australia due to his supervisor's professional network. He further explained, "My supervisor knew I like Australia…He told me he has a colleague in Australia who had a post-doc position available. That's why I came to Australia."

For others, financial support was the main consideration that influenced their decision to travel to Australia. It was during the 1980s and 1990s that most respondents pursued their study in the overseas universities. At that time, China's economy was still in the immediate post Open Door era, with the difference between the then China and developed countries such as Australia being mountainous. The female academic (ARU4, Social Science) admitted that she gave

up the offer from an American university and finally came to Australia due to affordability. Later, she decided to stay on and pursue her PhD degree, though she saw an opportunity to make her fortune in China with her Australian Master's. She explained that the then China started the new legal system and there was a shortage of legal practitioners who were educated in two systems, and with good English.

> There was a great market for me. But I got the scholarship so I decided to finish my PhD first…You can always make money, but you cannot always get your best education. (ARU4)

In terms of career decision, most interviewees reported that it was more like going with the best opportunities, coupled with many other factors, such as family considerations, cultural surroundings and geographic conditions. It was closely related to their personal lived experience.

A female academic (ARU6, Engineering) described her successive movements from China to Australia and within the country using an old Chinese saying: "The bird selects its tree". Her first stop was a post-doc position in the State of New South Wales and two years later an associate lecturer in Queensland and eight months later a lecturer in her current institution. Another academic (ARU3, Social Science) had been working in a bank for ten years, before moving to Australia. He compared his life as a bank manager in China and admitted that he preferred the life in Australia. As he explained,

> Here, I can choose to do whatever I like and not do whatever I dislike. I will harvest the result if I persist. Also, my wife preferred to live here.

So I looked for jobs before I submitted my thesis.

However, for the two senior academics, the then political instability and turmoil in China affected the decision to stay on in Australia. The Tiananmen Square incident in 1989 was a turning point, leading them to lose confidence in the Chinese government and decide to stay on in Australia.

If not for this position, the situation would have been different. There might have been two options: First, going back. Since I was already Australian, it was not that possible. Second, I looked for job elsewhere. But I was lucky and I stayed on in the university. (ARU11, Science)

Irrespective of their initial intension to pursue an academic career in Australia, the interviewees agreed that the main reason for them to be employed by this university was due to their research capacity and potential. The academic (ARU2, Social Science) considered himself lucky, because he was given the privilege to teach one semester, with the other being focused on his research. He explained it by saying that ARU has a policy to emphasize research due to its not-so-strong research capacity.

There is no such policy in A1 (a major Australia university, one of the Go8). Why? Because it does not need to. If you don't come, it is fine. Teaching that much is part of responsibilities as an academic.

Their experiences to some degree corroborate Pang and Appleton's (2004) findings on the immigration path for Chinese students and scholars, with the pull factors

being the desire for more education; educational preparation; availability of financial support and the hope to escape an unpleasant situation in China. Nonetheless, it is also evident that the decision to stay or immigrate is not separate from the decision to come to Australia as a student, and this is influenced by the possibility for a post-study permanent settlement in Australia (Gribble & Blackmore, 2012; Hugo, 2008a; Labi, 2010; Mishra, 2011). The findings broadly corroborate the empirical studies on Mainland knowledge diaspora in the prestigious Australian universities (Welch & Zhang, 2008a; Yang & Welch, 2010) that reveals a large number of mainland Chinese intellectuals work at universities abroad, often after having taken their PhDs in such countries. An interesting dimension regarding their decision to stay-on is the research environment in Australia, and doing research in the Australian academy is considered the primary source of satisfaction as compared with their mainland colleagues, though acknowledging that the institute they work at is not top tier.

4.6.2   Advantages of pursuing an academic career in Australia

Being situated in the system, the participants described those aspects they perceived as appealing and advantageous in terms of their decision to pursue their academic career in Australia. For some, their identification with shared academic norms in Australia academia, and more broadly world scholarship, gave them an advantage over their mainland colleagues. For others, the intrinsically enabling Australian academic system as compared to the Chinese, contributed greatly to their professional achievements, albeit acknowledging the ranking of their institution as mediocre. Also evident in the interviews was the acknowledgement of

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the contribution of their previous learning and working experience in China to their career success, while recognizing the development of the Chinese scholarship and their being Chinese as offering them an opportunity.

A shared academic norm

Experiences of a shared academic norm were closely connected to the differences in doing research and academic evaluation across the two systems, according to the respondents. Largely, interviewees expressed their identification with Australian academic norms, since it represents the more recognized mainstream in the West, and world scholarship. The differences in doing research can range from the more general as how to conceptualize the research, to the more specific, such as the research methodology employed for a specific research project. ARU3 (Social Science) noted differences in how to do research work within the two systems. He observed that mainland scholars often do research in a standardized way. If they believe their hypothesis, they will provide a lot of non-empirical evidence to prove it. Therefore, he observed, "A majority of the research work done by the mainland scholars is sort of repetition with less value."

Similarly, two academics, ARU9 (Engineering) and ARU11 (Science) perceived that the lack of critical thinking resulted in the low quality of the mainland colleagues' work. The engineering academic noted that education in China is producing rote learners, and they are more likely to accept rather than challenge. He further explained,

> We as scholars in the West think differently. We challenge those long

held conventional ideas. If you break those down, you will be set free

and show your originality. (ARU9)

The science professor noted that most papers from Chinese sources are presentations of enormous basic data sets, but with less theoretical value. Most of the synthetic review papers are from Europe and North America. Based on his past experience of being an external reviewer of the NSFC grant applications, he commented that the ability of the mainland colleagues to synthesize and generate theoretical ideas from data and existing information was weak:

From their applications, I can see that (1) they have not read enough

literature, especially the latest ones; (2) they are not very clear about

how to write literature review, or the overview of the field. (ARU11)

Specifically, ARU1 (the senior professor in social science) was more concerned about the research methodologies employed by the mainland colleagues. He said the generalizability of research results in his area is among the greatest concerns in the West scholarship. Therefore, he suggested experimentation to his mainland colleagues, who responded, "We already have too much on the agenda. It is your luxury in the West…We don't have the time and money to do experimental research."

Another aspect of shared academic norms in Australia discussed was the academic evaluation for purposes of promotion and publication. Generally held views revealed a clear distinction between the two systems. ARU4 (Female, Social Science) believed that the Australian standards as regards promotion are much

higher than those in China. She noted that the books, even textbooks could come first, and then journal articles. But in Australia, it's in the opposite order.

> Only monographs count, and publications in the top journals are more important. Now, China is changing and pays more attention to publications in good journals.

At same time, one academic (ARU9, Engineering) reflected that, although his former classmates in China have lower-level publications, their professional titles are much higher. He described the situation as follows: "Most former classmates are now full professors. But I have more and better publications. I don't think their profile is higher than mine." Nonetheless, he admitted that he felt much more comfortable with the Australian system, where he could focus on research and pursue excellence.

Commonly cited, too, was the respondents' perception that, undergirding the phenomenal increase of Chinese names in the top journals, was that a majority of such publications were produced via co-authorship with a scholar in the West, an overseas Chinese or non-Chinese. A common acknowledgement was that, while mainland colleagues are making progress, their work still cannot compete with that of Western colleagues. ARU9 (Male, Engineering) noted that it was likely that papers from mainland scholars would be rejected after the reviewer had a quick look at the references. He explained that the academic network is situated in the West and the reviewer can easily justify the relevance and quality of the work of a mainland colleague.

Similarly, ARU3 (Male, Social Science) observed the difficulties in publication for the mainland colleagues. He thought the difficulty was attributable to the different research paradigm the mainland colleagues used, as well as the awareness in the West that publication in high-quality journals constitutes recognition of the contribution to the field:

> In fact, it takes one year or two to understand how to do and write a research work, and even longer to master the literature in the field and position your research. Then, your contribution to the field will be recognized.

While many referred to the limits for mainland colleagues to publish in the West, ARU1 (Male, Social Science) noted that it is not easy for him either, and his papers had often been rejected. But he appreciated this practice very much because it kept him polishing and re-polishing his work, which brought about improvement. "That's how we survive in Australian academia. And that's part of the professional training," he said. In contrast, he felt uncomfortable with the immediate and easy pass granted to his paper in China. "It is the rejection that offers me opportunity to refine my research," he explained.

Interestingly, the respondents' account on their identification with the Australian academic norms in terms of the way of doing research, challenging conventions, and evaluation criteria echo the findings of recent studies related to the issue of innovation capacity in China (see for example OECD, 2008b; The Royal Society, 2011; UNESCO, 2010). As a complicated social process of value creation, in the

fields of science, technology, culture, the economy, and society, innovation concerns activities range from scientific discovery, technological invention, methodological innovation, and their applications as well as social diffusion (Mu & Fan, 2011). China has made phenomenal progress, but it is very challenging for China to build up a good institutional framework for innovation (Abrami, Kirby & McFarlan, 2014).

The enabling Australian system

Beyond the academic norms they shared in the Australia scholarship, participants also pointed out that the intrinsic values of the Australia academic system enable them to pursue professional success in their academic career. Most cited from the interviews is the lack of much *Guanxi* in Australia as compared to China. *Guanxi* means 'relations' or 'relationship' but is often used to signify useful personal connections or social networks, which are an integral part of social customs in China. Although in common usage, *Guanxi* doesn't necessarily imply a relationship based on favors, nor does it necessarily refer to an asymmetric tie, *Guanxi* carries a hierarchic motif from its origin which is strongly present in 'modern' *Guanxi* as well (Chen, 2004; McNally, 2011; Vanhonacker, 2004; Yang, 2011). For them, Australia at large provides a fair playground. It was evident in the case of the senior professor in social science (ARU1), who said, "When I applied for the position there were five applicants, including one local who worked for the parliament. He was high profile in research and social status." In his opinion, the story would be totally different in China where there was much complication due to the long held *Guanxi* in hierarchical system; but it was not happening in Australia. "I guess the

university recognized my potential, and my age advantage over him who was in his late forties," he explained. Similarly, ARU4 (Female, Social Science) noted that it is the very reason she prefers to live in Australia, because it provides the opportunities. "Here, basically, whether or not you can be successful depends on how you work. So I don't have to worry about *Guanxi*," she concluded.

Equally important were their perceptions on freedom and autonomy in regard to their academic career development in Australia. ARU4 revealed the constraints of the Chinese system by comparing her previous work in China and her present work in Australia. She said, "In China, I worked as a public servant, but here, an academic. I lost social status and prestige. In return, I got my freedom." She explained that this connoted the freedom to do what she likes and to achieve the goals she wants to achieve. She noted a clear distinction between the two systems and explained further, "In China, there are many things you cannot do, and many goals you can't achieve because of the system, not your ability." Another female scholar in engineering (ARU6) revealed similar views:

> I feel more comfortable here. In China, you are asked by your boss to do this, and not to do that. If there are meetings, you must show up. Here…it is fine that I do not attend those meetings. I have the freedom to do what I want to.

Several made observations on the lack of academic freedom and attributed it to the fewer breakthroughs presented by Chinese scholarship. For example, ARU9 (Male, Engineering) noted that mainland scholars within the system cannot enjoy

academic freedom. He argued that a more liberal academic environment will make the person think in a different way: "When the domestic scholars have access to new ideas, they will be kept away from the conventional ideas that restrict them from being innovative." The senior professor in social science (ARU1) recalled one overseas Chinese scholar whose stand point in work was no longer independent after being back in China. He underlined the different outcomes, resulting from remaining in one or the other system: "If he had remained here, he would have been a writer with independent and innovative thinking."

Another advantage of the Australian system consists of its recognition of multiculturalism. Most respondents indicated that the multicultural environment provided possibilities for them. The diverse ethnic communities moderate the hegemonic Anglo-Australian impression in people's mind (Yang & Qiu, 2010). For example, the senior social scientist (ARU1) noted that one of his strong points as regards his ARC grant application is that he can produce bilingual publications with influence in the Chinese academic community as well. With the expanding population of international students, especially those from a Chinese cultural background, interviewees perceived their advantage over their local colleagues due to their better cultural understanding and previous experience as a non-English speaking international student struggling in the Western academic environment. As expressed byARU3 (Social Science),

> That is the cultural difference. Here, my responsibility is to supervise you, but no more than that. I think that's why the mainland students prefer overseas Chinese academics, because we want to help them even

without the declaration of the contribution.

Chinese background

In addition to the description of a shared academic norm and the enabling system in Australia, the interviewed scholars' accounts outlined various aspects of their Chinese background that played a part in their success in the Australian academic setting, including the comparative lens, a solid education foundation, and the ethos of hard work.

For social science academics, their Chinese cultural background allows them to conduct comparative studies in their own field. The female academic ARU4 (Social Science) noted she was better placed to conduct research from a comparative perspective than most colleagues in the department. She explained,

> I not only know Australian Law a lot, and also Chinese law, and some aspects of American law because I was visiting scholar there twice. I'm more international than many of my colleagues. I speak not only English, although I cannot speak English as well as the native speakers do, I also speak Chinese.

As for scholars in hard science and engineering, they thought their previous education in China laid a solid foundation for their further study overseas and their continuing research work, which requires the sophistication of advanced mathematic skills. For example, ARU9 (Engineering, Lecturer) regarded his high school education as solid preparation for college and his later on research work. He

explained, "During my senior high the textbooks were those for college students and we were taught calculus in that year."

It is not surprising that most respondents noted the ethos of hard work helped them build up their career in Australia. The architecture academic ARU5 recalled his very successful supervision of a mainland PhD student who finished his degree in two years. He described, "For the writing he gave me in the late afternoon, I would give him my feedback the next morning. When he finished, he got eight papers published in good journals." He attributed having no difficulties in handling with the work at ARU to the solid fundamental training and the ethos of hard work he gained in China. Likewise, the engineering scholar ARU9 was confident to make further achievements:

> Yes, they are native speakers. But I have an advantage over them, in that I can work with both languages. Plus, I work harder. They work eight hours per day, and I can work 12 or even 16 hours per day. Surely, I will achieve more.

Overall, the respondents agreed that the Australian system allows them more focus and concentration on their research, and therefore subsequent professional fulfillment. Several reported that doing rigorous research is intrinsic to their professional pursuit and a valuable element of their academic career. For example, ARU1, a well-known scholar in the field, attributed his success in this system to his obsession with the research that he was interested in and thus enjoyed the process of academic inquiry and researching. He shared the feeling,

It IS sometimes very difficult. But my research is entertaining and develops intellectual capacity so it is never a burden. To some extent, research is my RELIGION.

When resuming academic trajectory, respondent ARU8 (Engineering) was already in his late 30s. He shared somewhat similar perceptions of research with the social scientist, firmly believing that it was persistence that influenced strongly the quality of research work. He commented, "I don't care about professional title. What I care about is whether I have a good environment to do research. And the significance is the idea, rather than how big the research grant is."

4.6.3 Challenges in the Academic Profession

All the participants completed their undergraduate education in China, and a majority went overseas after obtaining their Master's degree. They identified both advantages (as discussed above) and disadvantages caused by their Chinese background, as regards their career development in Australia academia. Most cited a particular challenge faced by the Chinese knowledge diaspora as being the lack of English proficiency, since English dominates the world scholarship. Compared with native English speakers, the overseas Chinese academics often struggle with the language and its related culture, although the threat is much less for those in the hard sciences and engineering.

For those respondents who began their career at this institution, they experienced a transition period since this university emphasized teaching. The participants stressed the enormous demands of teaching and the resulting somewhat negative

impact on research activities, especially during the early-career phase. As ARU1 (the senior professor) expressed it,

> When I started as a lecturer, I almost spent most of my time teaching. At that time, my English was poorer and I spent a lot of time writing lecture notes. After I got more experience, I spent less time preparing (ARU1, Social Science).

Likewise, the engineering academic ARU7 noted much of his effort in the first three years had been devoted to teaching, what he described as "a painstaking process". In his view it affected his research output, since he did not have enough energy to do research. He reported that after reaching a certain level in teaching, his focus shifted to research. He reflected,

> In the five-score/level assessment scale, the average is about 3.6-3.8. We Chinese academics get a bit higher score. Since 2007, I have shifted from teaching to research, and I get some quality work in research.

Albeit difficult at the starting stage, they felt comfortable and secure in their teaching, after becoming more experienced. Nonetheless, the interviewees shared the feeling that it was their responsibility to teach well. For the senior social scientist (ARU1), he found incorporating teaching with research was conducive and rewarding to his postgraduate students as well as him as a researcher.

> The content I teach is related to my research. I read more to teach and the reading is related to my research. Now, I teach one course per week.

I need one whole day to figure out how to make clearer explanation to

the students on the research.

The engineering academic ARU9 chose to teach students in line of their strength to make sure his students learn something. He explained, "If the student has solid background knowledge, I push him to learn by himself. Otherwise, I tell him how to build the foundation. Mostly, I teach the students in a mixed way."

Arguably, among the prominent challenges facing the overseas Chinese academics is to get promoted and established in the system. Some noted that their Chinese background, specifically their lack of language proficiency, put them in a disadvantaged position. As the senior professor ARU11 (Sciences) put it,

We have to work extra hard to catch up. Right? Once we have reached

the level like everybody else in the department, we are on the same

playing field.

Consequently, the participants concluded that it is a prerequisite to be strong in research with solid publication records, in order to get promotion. For example, the academic ARU7 (Engineering) explained there were basically two factors included in promotion, the quality of teaching and research. Referring to the two, for Chinese-background academics, he explained,

You must be outstanding in one aspect, with others being average. It is

not because we are foreign we focus more on research. It is because we

can never be outstanding in teaching.

Talking about promotion in this institution, the majority of interviewees were keen to comment on the influence of their being Chinese even in other segments of the interviews, without being guided by direct questions. Many felt that they have played on a level field since they have been treated fairly to a large degree, despite the fact they needed to outperform their local peers, and meritocracy is self-evident and to a large degree the only criteria, albeit with some nuances and complications. The engineering academic (ARU9) thought the working environment here is fair. "They will not deny my promotion because of my Chinese background. I have been working very hard not to compete with others but for my own development," he noted.

This was further exemplified by the senior professor in social science (ARU1) who achieved an unusually successful career in Australia, from lecturer, to full professor and then Chair professor in different universities within ten years. He said he had never been denied or turned down, even though he followed his own path. As he explained,

> I don't care what counts for promotion in Australia. It has never restricted me from doing the research that I'm interested in. I published from my own interests and from my instinct about the importance of the issue. So I get more publication than my colleagues, and with good quality. I always focus on significant issues and my work has some impact in my field.

Although most respondents described their promotion experience as positive, some

noted that there were certain limits that were less visible. Most evident was that they reckoned that, like others, there is a degree of internal politics in the Australian system. This could affect their chances, at times. For example, two participants (ARU2 and ARU3) agreed as to the likelihood that a native speaker might get promotion, as compared to a Chinese academic with the same level of research achievements.

> With good publication records, there will be no problem for me. But if say we both have mediocre publications, and he is not Chinese, it is very likely that he will get it. It is mainly due to his better teaching skills. (ARU2, Social Science)

The two senior professors (ARU1, Social Science and ARU11, Science) touched on the topic of the glass ceiling and thought there were the limits for overseas Chinese academic to move into a senior administrative position, irrespective of their professional title. At this stage, difficulties in networking among the international Western-dominated academic community and inadequate knowledge of local culture and customs were perceived as major disadvantages for their career development (Yang & Qiu, 2010). As ARU11 (Sciences, professor) put it,

> However, …for a leadership position, your communication skills, organizing and networking ability are also important. You are expected to lead other people, and you cannot be addicted to your own research with door closed every day. In this sense, there are the limits for many overseas Chinese colleagues.

Notably, the female academic in social science (ARU4) expressed somewhat negative views on promotion in a strongly dominant Anglo-Saxon context and departmental environment. She admitted that both her English language proficiency and her background expertise formed some sort of limits to promotion. As she put it,

> The common excuse [reason] for them not to promote you is that they believe your communication skills are not good enough. That's VAGUE! It can be how you deal with your students, and your colleagues, and how you express and present yourself.

In terms of expertise, she noted that they would not say it directly but indicate or hint as, "Your first degree is from China and China has a different system. China is a communist country and you know nothing about Australia."

While some are outspoken about the glass ceiling as an indicator of institutional discrimination, a majority do not view the glass ceiling as racial discrimination. Most reject seeing it as intentional discrimination or a practice of institutional prejudice. They take an individual approach and attribute it to their immigrant background. Thus, they make efforts to overcome barriers of this sort by individual self-improvement and hard work. Their reflections on barriers to career development corroborate the findings of previous research on job satisfaction among Chinese professionals in the US (see also Saxenian, 2003, 2006; Shinagawa & Kim, 2008; Wong, 2006)

4.6.4   Other Factors Influencing Career Development

The lack of resources

On average, all participants had very positive views of the Australian academic system, which is situated closer to the global center; a more advanced and liberal system as compared to the Chinese system. However, most noted that the lack of quality research students and research funding may affect their research work, and more broadly, the transition of the institution from more teaching oriented to research intensive. This was regarded as more of an issue for the engineering academics. For example, the engineering academic ARU7 reported difficulties in recruiting students with a solid foundation who could start doctoral research directly. ARU9 (Engineering) was very aware about differences in student quality as compared with those of the top universities, due to his previous teaching experience there. He described clearly,

> The university is ranked around the middle in Australia. The entry score
>
> for the students in Engineering is about 70, 10 points lower compared to
>
> G8. As for students at postgraduate level, the gap is of course huge.

Many respondents explained that the shortage of quality research students is mainly due to the meager financial support for research students, especially at PhD level. They believed that their university needs to provide more scholarship opportunities for PhD students who would otherwise be attracted by the major universities or those that provide them the full scholarship. As ARU2 (Social Science) put it, "Without scholarships, there will be no good student interested in doing PhD with

us since we are not a university with international fame."

For others, the research capacity of the local students in the university is much lower than that of the Chinese PhD students. The reason for this was attributed to is the university making cuts to both mathematics and physics departments, since their student enrolments were quite low. ARU8 (Engineering) thought it was short-sighted to remove basic science courses that were indispensable to train a higher degree research student.

> There is no longer a mathematics or physics department, which means the students do not need to learn the subjects. Then how can the students do advanced research?

Following on from the lack of quality research students, some observed the lack of adequate research input in Australia as compared to China. The senior professor (ARU11) in science noted that the research platform of his mainland collaborator has been much better than his:

> There are research grants at various levels, including the provincial level, ministerial level and the national level in China. So his research grant is much bigger. Although I have the ARC grant, the support is far less. He has a bigger group with very advanced equipment.

ARU7 and ARU9 both also noted that the limits on research capacity comprised the lack of good students and research grants in Australia that impeded their career development. To them, collaboration with the mainland colleagues proved an

effective solution (as discussed in the section on the worth of collaboration).

Gender differences

The gender issues were addressed somewhat differently by each of the two female academics, when asked about the influence of their being female on their professional development. Each thought it significant. The respondent based in the social sciences noted the challenges for her to integrate an academic career, wifehood and motherhood. She reported that she did not have weekends, and worked all the time.

> I need to spend a lot of time looking after my children, especially last year when my husband was working in the UK, and work full time, teaching and research. I have to sacrifice my holidays. (ARU4, Social Science)

In addition, the younger one (ARU6, Engineering) expressed the contrasting feeling of being a female Chinese academic, as compared to her male counterparts:

> The colleagues are nice to you, with not so high expectations. If you do your work well, they say you do a good job. But they may not choose to work with you for a big project. I think I need to publish more for real collaboration.

The under-representation in the academic arena and even fewer who hold positions of responsibility tends to give women less bargaining power and limited opportunity to influence decisions or other initiatives to promote gender equality.

Thus many of them prefer to work on their research projects and in isolation, therefore rendering their contributions less significance. Specifically, McBrier (2003) suggests that the publication gap could be due to women's heavier domestic responsibilities; to job segregation that disproportionately places women in jobs, such as skills-related teaching, with high teaching demand but fewer publishable topics; to more time spent by women than men on class preparation; and/or to female teachers' greater service-related labor for schools, including service on committees as well as in their capacity as unofficial counselors to students (Apel, 1997).

4.7 The Knowledge Diaspora Network: Bridging the Two Ends

4.7.1 Motivations for collaboration

Participants were asked about reasons for collaborating with China. This question prompted many discussions of cultural affiliation and their familiarity with both systems. Not surprising to the researcher, herself a mainlander, the interviewed scholars regarded themselves as Chinese, regardless of the length of time residing in Australia, citizenship, age, gender, and disciplines. They expressed their hopes for China's prosperity, and wished to do something for their motherland. As ARU4 (Social Science, Female) reflected,

> Geographically, I live in Australia sort of separate from China, but I have never been apart from it and I know what is exactly going on in China. And every year I go back to China, and usually twice a year.

Although lacking concrete collaboration with mainland colleagues, the youngest respondent (ARU2, Social Science) expressed his feelings as follows:

> I lived in China for more than 20 years. Psychologically, I am Chinese. I am happy and ready to work with the mainland scholars.

The academics in hard sciences expressed definite confidence in a stronger China and closeness to "home" as being psychologically satisfied. Comparing his previous sojourn in Japan and Great Britain, the architecture academic ARU5 described proudly,

> With China's rise, our life here is easier. Unlike those earlier years, it seemed that I needed to work very hard to prove something. Now, I feel the honor is with me because I am a Chinese. China is a strong patron for us.

Likewise, ARU7 (Engineering) expressed his feeling more comfortable at home:

> Our life here is not that easy. When in Rome, do as the Romans. But when I am back, I feel it's more like home. When I lectured there, the students and the younger colleagues, and sometimes the Dean showed their respect and appreciation.

The engineering academic ARU9 equally believed that China has great potential to surpass the West in terms of the S&T development. As he put it, "It is not a fantasy. China is leading in some areas such as Aerospace. " To him, it was a matter of time,

due to times lost in the past, especially the Cultural Revolution.

Most obviously, the fact that participants shared the same cultural and linguistic backgrounds contributed to a greater closeness in their scholarly communications. Along with China's improved research environments (Suttmeier & Cao, 2006; The Royal Society, 2011), the interviewees' familiarity with both systems presents them with opportunities. A common theme in the interviews was China's substantially enhanced research system, coupled with a transition to a more international/global one (See also Adams, King & Ma, 2009; Tang 2011). Most respondents noticed that there was increasing demand from the mainland colleagues to publish in good journals. However, it was not easy for those indigenous scholars to publish by themselves (as discussed earlier). Thus, their mainland colleagues were much motivated to collaborate and specifically to co-author, according to the respondents. For example, ARU6 (Female, Engineering) referred to the publication pressures at the top (985) mainland universities as her collaborator at a 985 university in Shanghai gave her a list of top journals and highlighted the numbers of publication as required to survive there.

The respondents' accounts on their motivations to collaborate with the mainland scholars enrich the existing literature in three aspects. First and foremost, the cultural/ethnic affiliation to some degree trumps the geographical location and the past experience (see also Zhu, 2009). A more subtle dimension is their feeling of being undervalued in Western academia (which echoes the existing study on minority professionals). More obvious is the rise of China that may provide them more opportunities in terms of professional fulfillment (see also Cai, 2011).

4.7.2   Who to Collaborate with

Following on from their motivation to collaborate with and make contributions to their motherland, the respondents were asked to reflect on the nature and scope of the scholars and institutions with whom they collaborated. From the researcher's perspective, it helped gain a better understanding of the nature and dynamics of the diaspora knowledge network between the overseas scholars and the domestic academic. In general, according to the respondents, their collaborators fell into two categories, with one group being "natural", and the other "selective". The first group can be interpreted as the ones with a shared past and strong emotional affiliation, while the second are more research-oriented who mostly share a similar academic background, or a common language of research. In most cases, the respondents reported that they maintained collaboration with mainland colleagues in both ways, though to different degrees.

When talking about their mainland partners, alumni networks, and relations with former colleagues' were enduring themes. A recurring term in the interviews was "My Alma Mater". Several respondents noted that "it is part of me" and described their collaboration with their mother university as "natural". For example, the youngest respondent (ARU2, Social Science), an early career academic, strongly expressed his willingness to work with or help colleagues from his mother university, despite not having established any form of concrete research collaboration. He recalled his previous experience in helping with access to the latest journal articles for his former classmates and teachers, due to China's lack of a complete electronic database. After he settled down in Australia, he maintained

close bonds with his former teacher and paid regular visits there. When his former university organized an international conference on Quantitative Economics, he helped review the papers and made suggestions on how to make an international conference. Although e-commerce was not his area, he helped purchase their state-of-the-art facilities and shared the ideas of what an advanced research lab looks like when his Alma Mater bided for a provincial-level key research lab. "I am ready to help and it is part of me," he explained.

The two veteran professors (ARU1, Social Science and ARU11, Sciences) shared similar observations on the beginning of research collaboration with their Alma Mater. With the ARC grant on China research, they believed that to work with their Alma Mater was their first option because of the mutual trust and credits. ARU1 showed appreciation of his Alma Mater's help with his research. As he put it,

> In 1988, I got an ARC project and needed to collect data in China. Without collaborators from my Alma Mater, it would be very difficult and complicated for me to get the approval for data collection.

Understandably, at the most basic level, it is people who collaborate, not institutions. Alumni relations and colleagues have become more important for professionals than traditional kinship or hometown origin ties in the academic world. In this sense, the social networks with their native countries turn out to be important assets for immigrant scholars (Sun, 2009).

Also evident in interviewees' accounts was that they set up their collaboration with mainland colleagues in a professional way, with likeminded collaborators. For

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some respondents, their positioning in Western academia provides them possibilities to work with the sojourning mainland colleagues, with whom they share academic pursuits. They set up a good relationship which can be extended until they return to China. For example, the academic (ARU9, Engineering) noted that he knew most of the mainland collaborators at the renowned universities in Hong Kong, and South Korea, where he received his PhD and post-doctoral training, respectively. Additionally, the ARU5 (Male, Architecture) said that his collaboration with C university (within the 211 category) was due to his former PhD student at ARU, who finished his degree within two years and was Associate Professor there.

For others, some academic activities, including international conferences and publications, could be avenues for further communication and collaboration. Noting the need for *Guanxi* before collaboration in China, the senior social scientist (ARU1) argued that "it worked if you tried to build up collaboration with someone you did not know previously." For example, he recalled how he started collaboration with Professor Huang (a domestic scholar with no overseas study or work experience before he worked with the senior social scientist (ARU1)) from a 985 university in Wuhan. As he put it, "I happened to read his paper and found out that it was good, and wrote him a letter. He showed his interest in collaborating with me and invited me for a visit." He further explained,

> Professor Huang got all his training in China, but there was the professional need to have a better understanding of the research in the West. We fit in easily with each other.

The participants' reflection on their selection of collaborators substantiates the recent studies on international research collaboration. They tend to collaborate with indigenous scholars with overseas work experience who may share a similar conception of collaboration and how to do sciences. According to Jonkers and Cruz-Castro (2013), work experience in an overseas research system and improved language skills may also facilitate the expansion of a scientist's international tie, and positively influence his/her research productivity.

4.7.3   Patterns of Collaboration

In addition to descriptions of their motivations for collaboration, and their collaborators, various patterns of collaboration were discussed by some respondents. Patterns of collaboration referred to the interviewed scholars' reflections upon the difference in the approaches, and actors' role in terms of transmitting knowledge, communication and collaboration more generally. Much cited were respondents' accounts of differences in patterns of collaboration with the mainland colleagues as compared to the local or Western scholars. When they recalled their collaboration with the mainland colleagues, the recurring terms were "easier" and "less demanding." By contrast, they described their collaboration with local colleagues as "reasonable" but "cold". Again, the underlying fact was a shared culture and sense of Chinese being and identity.

Specifically, ARU8 (male, Engineering) noted that collaboration with local colleagues was hard because everything was clear and calculated. Comparing his collaboration with the local colleagues, he commented, "With Chinese

collaborators, we share a common culture so we understand each other better and tolerate more. So it is easier to build trust between us." Likewise, the senior scientist (ARU11) commented, "We understand both languages, spend a lot of time improving the paper and care less about whose name appears the first." That was a prime reason why the collaboration between the mainland scholars and the overseas Chinese scholars was more productive. In addition, the academic (ARU10) made an interesting observation on networking among people of Chinese background,

> It is easier for me to read through a paper whose author is a Chinese. When I notice the author is a Chinese, I hope to set up contact with him. If I have problem in research, I'd like to email a HK professor for suggestions. When I contact the Chinese IEEE (Institute of Electrical and Electronics Engineers) fellows in the States for sabbatical, they are very supportive.

Another aspect of the patterns of collaboration discussed was closely connected to the roles of the collaborators located in different systems. Mostly, the respondents commented that, regarding collaboration, "I'd like to contribute more". As the senior scientist (ARU11) put it, "We go to the field and collect the data together. My mainland colleagues finish the first draft and I spend a lot time and energy refining it. Generally, they are the corresponding author and it's fine with me." Likewise, the engineering academic (ARU7) recalled his painstaking experience in building up his collaborators' profile to win a national grant. He explained that his collaborators were not strong enough to compete for the grant so he helped polish their previous work thus leading to their papers being published in top journals,

followed by the grant the next year.

Interestingly, ARU1 (Professor, Social Science) described his role in the collaboration as "contributing the idea". He once suggested a colleague from a 985 university in Beijing doing research in the area of international aerospace law. As he explained,

> With China's rise, it is important that the Chinese have a say in that emerging area. If the Chinese can make a march, China's voice can be heard at least. China will be among the contributors who define the rule, rather other the one who follows.

Two engineering scholars reported that their mainland colleagues generally worked on an equal footing. For example, ARU9 (Male, Engineering) described their collaboration as each did his work, with his mainland colleague (985) doing the experiments and he developing the numerical model. They tested each other's results and worked together on papers. He said, "His only drawback is English language proficiency. So I intend to contribute more." He further explained, "But I am very strict with co-authorship. I do not need to flatter anyone with adding his name on the paper. Publication is merit-based, and it has nothing to do with *Guanxi*." Similarly, ARU8 (Engineering) noted his collaboration with a colleague from Peking University (985). As he put it,

> Based on my ideas, they buy the necessary equipment to run to see the result. The support is from his side and he has a large group working for him. Mostly, the writing is finalized by me and we get our paper

published in a top journal.

Also notable were two participants' experience (ARU6, Engineering and ARU11, Science) of being included under the mainland research schemes that support collaborative research with overseas mainland colleagues. Another dimension corroborates China's huge input into the development of higher education and the S&T sector. For example, the senior professor (ARU11, Sciences) noted that he gained a selective national fellowship, due to the already-existing collaboration with mainland colleagues, and their strong support. The first round was the document review, with 20% proceeding to the oral defense stage. After the oral defense, only 10% of applicants were left. "I think it is a very serious process," he concluded.

4.7.4 Worth of Collaboration

Experiences of the worth of collaboration were closely connected to their active role in bridging the two academic systems and the reciprocal benefits of the collaboration to actors at both ends, according to respondents. For one thing, the respondents commented on their collaboration with mainland scholarship as a means to accelerate the domestic disciplinary development, and to mentor mainland students and academics. For another, most respondents noted that their collaboration with the mainland colleagues helped them establish themselves in the Australian academic system.

Specifically, ARU1 (Social Science, Male) described his collaboration with mainland colleagues as more for "the promotion of the development of this field in

China." As a renowned scholar in the field, he was aware of a ten-year difference between research in Australia and that of China. When he introduced the concept and research practice to mainland colleagues, there was no proper translation. Building on the Chinese context, he chose a term that was meaningful and accepted by the Chinese. He explained the research work in his area shall be empirical, rather than an empty talk. "The experiment was carried out in Australia in 1996-97, and China ten years later," he concluded.

Another aspect of the worth of collaboration listed by respondents was the training or mentorship offered to mainland students and sometimes the visiting scholar who sojourned with them at ARU. A majority of respondents reported much experience in student and staff exchanges with the mainland institutions, except the two who were comparatively new to ARU as well as Australia (see Appendix E). The common view shared by the ARU scholars was, "If our collaboration helps their students, we feel very satisfied". For example, the engineering academic (ARU7) told about his co-supervision of three Masters students of his mainland collaborator via distant module. As he put it,

> We have a specific time for online meeting each week. My ARU PhDs
> and the Chinese Masters work together, interact and learn from each
> other. When the Chinese Masters graduated, their publications were
> stronger than the staff there.

He noted that one would proceed to a PhD under his supervision at ARU. "When I see I have done something good for their career development, I feel very pleased,"

he commented.

For the two veteran professors (ARU1, Social Sciences, and ARU11, Science), they described their hosting of mainland visiting scholars as year round process. As ARU1 put it, "I host at least one or two each year and there is a specific office over there for my visiting scholars." Likewise, the science professor recalled very positive experience in this regard. He explained that CSC had different schemes to sponsor mainland scholars to be trained overseas and the mainland colleagues would contact him for sojourning. "My Chinese colleagues call my office here 'Whampoa Military Academy' (*Huangpu Junxiao*)," he concluded jokingly.

Strongly evident in the interviews was a common understanding among the participants that collaboration with China was not only what they wanted but also what they needed. For example, the senior professor in Science (ARU11) described his collaboration with mainland colleagues as "happy" and "necessary". He said that two thirds of the faculty from the department he collaborated with visited him and their stay could be as long as a PhD training or a several-day visit. "Most importantly, my ARC project is much on China research. Sometimes, I go to Tibet for fieldwork. Without them, I cannot get the first-hand data."

Several academics shared the observation that "China" was an important component of their research and therefore collaboration with mainland colleagues was a necessity. When reflecting on his collaboration with the 985 university in Wuhan, the senior social scientist (ARU1) commented that the collaboration dated back to the 1990s and there was the perfect match in research interest since in

China the university was among the top in this area, and then the successive academic communication and collaboration. "Of my research here in Australia, 60-70 percent is China research. In doing so, I have kept good collaboration with mainland colleagues," he concluded. Interestingly, ARU4 (Female, Social Science) explained that collaboration was based more on considerations of her research interest, because her research was mostly done through a comparative lens. She noted that her Australian colleagues showed no interest in doing research on China.

For others, the improvement in Chinese academia provided more opportunities for them to build up their career in Australia. It is clearly illustrated by the case of engineering academic ARU7, who described his collaboration with mainland colleagues as a "base" which helped substantially in building up his career at ARU. Although there are ARC grants, he admitted that he needed to be much stronger to get these. Therefore, he discussed with his mainland collaborators whether they were interested in cooperating on his projects. He showed great appreciation of his collaboration with mainland colleagues and concluded, "My collaboration with mainland colleagues guarantees the quantity and quality of my publication."

4.7.5 Influencing Factors

Although all the participants expressed their interest in academic collaboration with mainland colleagues, the extent of actual academic collaboration varied significantly. There are many reasons for both variations in research collaboration, both with mainland Chinese, and overseas Chinese, scholars. The variation might be attributed to three reasons: (1) personal factors; (2) institutional factors at each

end; and (3) systematic differences.

Personal-level factors

My collaborator

The collaboration between the knowledge diaspora and their mainland colleagues was basically inter-personal, with the actors being at the centrality of the collaborative activities. In general, most respondents reported positive experiences regarding collaboration with their mainland colleagues, notwithstanding some nuances, due to the differences across the two systems. For some respondents, the collaborators' understanding of benefits and responsibilities of a collaborative academic conduct is of great importance. That was the reason why most overseas scholars chose to collaborate with their friends or alumni. For example, though the architecture academic ARU5 defined his collaboration as "happy" and "smooth", he admitted that some problems remained. He believed "discussion" and "understanding the rule" were good strategies. As he put it,

> We will discuss together, because we do not want to spoil our future
> collaboration. As for the authorship, we follow the rule that who writes
> up the paper makes the decision.

Nonetheless, the academics pointed out it was not that easy to work with mainland peers due to issues of "mutual contribution", "promise keeping" and "mutual benefits." ARU3 (Social Science, Male) confessed that he had more collaboration with Chinese scholars in Singapore and Hong Kong. The main reason was that joint

authorship meant mutual contribution and effort. As he explained,

> Joint authorship stands for the same contribution in my area. So I need
> to consider the contribution of my partner. The publication process in
> our area is much longer and sometimes (involves stress). Co-authorship
> means we can rely on each other to keep the ball rolling.

The engineering academic (ARU8) recalled an unsatisfactory experience of the
grant application for the Sino-Australia Special Scheme on Research Collaboration.
He said his collaborator gave his promise, but he was so busy with getting a much
bigger strategic project that he missed the deadline. The scholar was a bit upset, and
explained,

> My collaborator complained that the grant application was so
> complicated with that small amount of money. Sometimes, the mainland
> scholar talks mightily and they do not keep their promise. For me, this is
> the No. 1 limit.

Academic status and research interest

The two younger academics in social science (ARU2 and ARU3) reported a lack of
concrete collaboration with mainland colleagues. When the interview was taken,
they had worked at ARU for two years, and at tenure-tracked stage. When asked
about the relevant factors, they told corroborating stories, sharing the view that it
was important for them to build up their career at ARU first. As the youngest
academic (ARU2) put it,

As a starter here, I collaborate more with my PhD and post doc supervisors to build up my career. I guess I probably need three years. Then, I can be more qualified to collaborate with the mainland colleagues.

Another factor discussed was divergent research interests. ARU3 attributed the difficulty in collaboration to his research interest.

Though my area is a branch of economics, it is more finance. Economics is a broad discipline and there are huge variations among different streams. There are few mainland scholars in this area.

Similarly, ARU2 (Social Science) reiterated that he needed to follow his own research interest for the consideration of career development. As he put it,

There is the difference in research interest. I do not have time and energy to bridge the gap. It is from practical consideration. I need to build up my career here. If there is no result from the collaboration, it does not help.

Institutional-level factors

The issue of ranking

Prevalent in the literature, and also evident in the researcher's previous work (Welch & Zhang, 2008b) was the observation that the mainland Chinese colleagues paid much attention to academic status and ranking when selecting their partners.

The senior professor (ARU1, Social Science) reckoned that his collaboration with mainland colleagues was becoming easier and easier. He attributed this trend to his accumulated impact in the field. Also, he found out that the mainland colleagues not only paid attention to the professional title of the overseas Chinese but also the ranking of the university with which the academic is affiliated.

Likewise, respondent ARU3 (Social Science) pinpointed the issue ironically, "The mainland colleagues would welcome very much the Nobel Laureate or a very senior professor from a world top university to give a lecture." He noted their only interest was to enhance the reputation of their university rather than conducting substantial research collaboration. However, the engineering academic (ARU8) understood the issue differently. He noted that the mainland colleagues became more practical in international collaboration and wanted the collaboration to be worthwhile. As he put it, "I guess the mainland scholars will be very interested in collaborating with A2 (one of the Go8) in medical sciences, and with A3 (one of the Go8) in ovarian cancer".

Here, again, the respondents' accounts suggested the Australian higher education system is a hierarchical one (see also Marginson 2006a), with the top-tier disciplines attracting more focused attention of mainland colleagues.

Leadership

Leadership or administrative power at institutional level at both ends was experienced as both a positive and a negative factor. That is, it could not only facilitate but also constrain effective scholarly contacts between Chinese expatriate

scholars and the home country. Specifically, female academic ARU6 (Engineering) related a frustrating experience with administrative colleagues of the 985 university in Shanghai. Based on her experience at ARU, she expected that the administration would prepare the necessary working conditions for her as a visiting scholar, including computer, workspace and access to the internet. She felt upset when she saw nothing was there. As she put it,

> There was no standardized administration, and mostly there was the human relationship (*Renqing*). I mean it is a good university, but its administration and management cannot compete with that at ARU.

Interestingly, when asked about whether their university emphasized collaboration with China, some respondents reported that ARU was more interested in recruiting Chinese students rather than substantial scientific collaboration.

> I don't think the university or the school has made major progress on research collaboration with China. They are interested in recruiting Chinese students. The funding in Australia varies greatly across the disciplines. (ARU10, Engineering)

> Of course, if they want to promote this university in China, our Chinese faces can help a lot. For those mainland students, they may feel much closer with us. (But) I don't think we as Chinese have been extra valued. (ARU3, Social Science)

A recent study highlights the importance of effective support and leadership among

institutions and governments on both sides regarding the effectiveness of the diaspora knowledge network (Yang & Welch, 2010). The interview data largely corroborates the two scholars' research on Chinese professors working in a prestigious Australian university. The Chinese migrant professors are keen to forge such links and can contribute significantly to both scientific collaboration and strengthened cultural ties; but without basic support and recognition from both sides, such intentions may well remain unfulfilled (Yang & Welch, 2010, p. 604).

System-level factors

Difference in research environment

Also evident in the respondents' accounts were differences in the two research systems. According to the ARU scholars, a significant factor influencing their collaboration with the mainland colleagues was the quick result ethos of the Chinese research system regarding the "publish or perish" syndrome and zero tolerance to "failure" in research terms. The pressure to rack up publications in high-impact journals could exert detrimental influence on the integrity of the domestic scientific community (Qiu, 2010; Wickham, 2012). In a system that does not tolerate failure, there are few incentives for scientists to risk exploring the unknown (Cao, 2013d).

Mostly, the respondents described mainland colleague's lives as "more stressed" and "busier"; much busier than their life at ARU. The academic (ARU10, Engineering) reflected that his Peking (top in China) colleague said that he needed to pay for any research facilities, as well as the pressure of publication. However, "The main reason for the mediocre research quality is that there is too much

pressure for publication, especially the top universities," he concluded. ARU6 (Engineering, Female) made an equivalent observation; that her former classmates working in the 985 university in Shanghai often talked about how to make publication in top journals. As she put it,

> My collaborator is much busier. She is required to have more and better publication. Otherwise, she would lose her current position within three to five years when the university recruited more *Haigui* (sea turtle, returnee) with strong publication.

Some respondents indicated that the mainland colleagues would be rewarded substantially with publication at prestigious journals, like Nature and Science. This monetary reward system has been documented. It is often based on the impact factor (IF) of the journal. For example, the reward system of Zhejiang Chinese Medical University is: papers published in *Nature* and *Science*, 100,000 RMB ; SCI papers with IF > 3, 6,000RMB (Shao & Shen, 2011). There has been the concern that the skewed research effort may bring about devastating effects on China's research process (see also Qiu, 2010; Wickham 2012).

Stratified development

As arguably one of the most clearly stratified higher education systems worldwide, tremendous disparities are evident between the top-tier of scholars, and the long tail, in terms of involvement in and contribution to the international knowledge network, and specifically the huge gap in terms of development between the hard and soft disciplines in China. The undergirding rationale the global knowledge network is

still weighted towards the more-developed economies, largely English-language environments (Altbach, 1994, 2002; Crystal, 1997; Welch & Zhang, 2008a). Nonetheless, China is progressing tremendously in terms of science output and visibility (Adams, King & Ma, 2009; NSF, 2012, 2014; OECD, 2008; The Royal Society, 2011; UNESCO, 2010). A case study on Tsinghua reveals that rates of co-publication with international partners, with Tsinghua researchers as first author, are rising (Yang & Welch, 2012).

Most evident were respondents' accounts of the more visible contribution of the mainland scholar to the international knowledge network. Two academics were highly appreciative of the work conducted by mainland scholars. For them, the top scholars were doing research in an international way, including the accessibility of their recent research work and the quality of their publications.

> The top groups in China are the international top. They have their own website and make their research work online. You can refer to their work free of charge. The way they are doing research is international. (ARU7, Engineering)

> There are a handful of Chinese universities that are quite strong in my area. There are the returnees working in those universities. The way they work is exactly international and they have published in the top journal. (ARU5, Architecture)

Interestingly, the social science academic (ARU2) made an observation on the differences of doing research between the top mainland scholars and the mediocre

ones. He noted that top scholars put great effort into making their research rigorous and valid. He further explained,

> As for those mediocre ones, they try to simplify the data model, though they know they should not do so. I can see that's the maximum they can do. They understand that the data model in their paper does not make sense, but they do not know how to make a more sophisticated one.

According to the interviewed scholars, unbalanced development existed between different disciplines in Chinese higher education. ARU3 (Social Science, Male) noted there were the differences across the disciplines as well as levels of mainland institutions.

> China is very strong in sciences, including physics and mathematics. But in social sciences…I can show an example. The mainland PhD students suffered a lot because their previous training was quite inadequate, with outdated textbooks. Only the top universities, such as Tsinghua or Peking, use the textbooks we use here.

Likewise, the senior professor (ARU1, Social Science) perceived it as a constraint for collaboration with the mainland colleagues. He thought it was easier for academics with science and engineering backgrounds to collaborate with China due to the need for such specializations in China. "For us as social scientists, it is harder for some political considerations".

Although there was the recognition of mainland scholars' contribution, several

respondents clarified that the American scholars, the Cambridge scholars and European scholars dominate the fundamental contribution to the scholarship. ARU2 (Social Science) revealed the uneven positioning,

> In my field, the States is still the No.1 in publications in top journals, with Europe being the next, mostly Germany. In Australia, we are not the center but there are a few universities which produce good papers. In China, they do not teach students how to do quantitative research.

The engineering academic (ARU9) noted the inadequate quality of their work since China was always running after the developed world research:

> There is a word popular in China: Copycat (*Shanzhai*). The mainland scholars have been copying all the time. There is hardly any new idea or new phenomenon in their work. There are a few *Nature* and *Science* publications by academics from CAS. But it's very rare in China.

In addition, the science professor (ARU11) viewed language as a limit for mainland scholars. As he put it,

> Although some mainland scholars produce very good papers, they are still not world top scientists. World authority in a particular field is determined by many other factors, including English language skills.

Two social scientists (ARU1 and ARU3) cited China's socio-economic development rather than their professional achievement, as an important factor contributing to the greater recognition of some mainland scholars' work:

There are several domestic scholars who are world-top in this field, some not for purely academic reasons. Under the context of the rise of China, the Western scholars have to listen to the voices of the Chinese scholars. (ARU1, Social Science)

4.8 Conclusion

The ARU study shows that the diaspora group can make substantial contributions to both China and Australia, and with strong motivations. With their past education and experience from China, post-graduate degrees from overseas, and posts in a system that is better positioned in the global knowledge network (Altbach, 1998; Yang & Welch, 2010), they can not only help mainland scholars enter the international knowledge system, but also maintain broad contacts with other scholars in the world and conduct various international research collaborations. The uniqueness of their identity at the cultural and professional dimensions makes them potential bridges in integrating China with the international scientific community.

Cultural/ethnic affiliation underscores the motivation to collaborate with mainland scholars, and to contribute the home country, regardless of the length of time residing in Australia, citizenship, age, gender and disciplines. Nonetheless, the notion of the culture self has been complicated by concerns about children's education, and concerns about re-integration, especially into the Chinese research system that recur throughout the interviews. More importantly, they feel more comfortable in Australian regarding career advancement, though there is the understanding of the glass ceiling overhead. For one thing, the multicultural

dimension in the social and profession settings mitigate the Anglo-Saxon dominance. For another, they regard highly the opportunity to engage in sciences in the hostland, where they can pursue an academic profession with no strings attached.

Also notable is the gendered dimension in terms of positioning and positioned in the Western academia, and forging transnational knowledge network. Although there has been a proliferation of literature in highly skilled mobility, knowledge diaspora and minority faculty, there is reticence in discussing women's participation and lived experience. Women are at a considerable disadvantage in terms of establishing an academic career in the host-land, and forging and sustaining international research collaboration with the homeland. While many factors impact upon gendered patterns of identity within academia, age and length of service also contribute to issues of professional identity in higher education (Sonnert, 1995). Further study will be required in this dimension for a complete understanding of the phenomenon.

Highly evident is the respondents' mixed feelings about the Chinese research system. There is the pride and desire for China's rise in science and technology, which makes international research collaboration worthwhile. On the other hand, there are the concerns about its integrity and robustness which have been deemed as major obstacles to further development. The mainland scholars have been urged to publish in highly respected English-language journals, being offered promotions and other rewards as incentives; and many Chinese universities have attempted to boost their places in different ranking systems, for example the Shanghai Jiao Tong

University's league table, which is weighted heavily towards articles published in *Science* and *Nature*.

Another aspect which requires attention is the stratification in both the Chinese and Australian higher education system. A differentiated or a stratified system of higher education has developed within China, with a small number of elite institutions and a large mass of non-elite institutions (Tilak, 2013). This has been triggered by the Chinese government's emphasis on what were earlier known as the 100 universities covered by Project 211 since the mid-1990s, more particularly the top 39 universities covered under the project 985, launched in 1998, and very recently the C9 League. An interesting finding is the segmentation of Australian universities, with Go8 being on top of the national league. ARU, according to the respondents, is undergoing a major transition from a teaching university to a research-intensive institution. The stratification has had significant influence in terms of research income and recruitment of quality postgraduate candidates.

Chapter Five Chinese Knowledge Diaspora in Canada and Their Networks with China

5.1   Introduction

Canada and China have a long history of cooperation in education and it is a vital and growing area of Canada-China bilateral relations. There are deep existing education links with over 475 active agreements between Canadian and Chinese institutions. Both countries have committed to expand academic exchanges, aspiring to reach the goal of 100,000 students studying in each other's countries by 2017. There are 45 Canadian Studies Centers and programs at Chinese universities which continue to support bilateral academic relations. Canada and China renewed the Canada China Scholars' Exchange Program in 2012. Since its inception in 1973, the program has supported over 900 Canadian and Chinese scholars study in the other country. In 2012, the number of Chinese students studying in Canada grew to over 81,000, representing over 30% of the 265,000 international students studying in Canada. China is increasingly a favored destination among young Canadians with over 3,000 Canadian students studying in China in 2012 (Government of Canada, 2013). Canada is now China's 5th research partner, after the US, Japan, UK and Germany (UNESCO, 2010).

This chapter explores the Chinese knowledge diaspora in a regional Canadian university, and diaspora knowledge networks with the mainland scholarship. This chapter is composed of three main parts. The first part delineates the context of the

study in terms of Canadian immigration policy, Canadian multiculturalism and Chinese migration to Canada, with a reference to the comparisons between the two countries. The second part examines the Chinese knowledge diaspora, and their perceptions of being an academic positioned in a Canadian university. Generally, their accounts can be categorized as decision to stay-on in Canada, advantage of career advancement, academic profession challenges regarding their being non-native minority professors, and other influencing factors that may affect their career development.

The last part explores and investigates the dynamics instead of with effectiveness of the knowledge diaspora networks between the overseas Chinese scholars with their mainland colleagues. Five dimensions have been examined with scrutiny to help with a better understanding of the invisible knowledge network. In practical terms, the respondents conceive the transnational knowledge network as research collaboration networking. The main themes including their motivations for collaboration, who to collaborate with, pattern and worth of collaboration, and the factors on both sides that affect the effectiveness of collaboration regarding their mainland collaboration, have been illuminated. As well, similarities and differences have been highlighted for further discussion.

5.2   Immigration Policy of Canada

Like Australia, Canada is one of a handful of countries where immigration has traditionally been a major shaping factor in society and culture. From confederation in 1867 until today, nation-building has been a theme underlying Canadian

immigration. Unlike Australia, the Canadian Constitution requires federal and provincial governments to share responsibility for immigration. Over its history, immigration priorities and strategies have changed significantly, from an open border approach in Canada's early history, to policy characterized as explicitly discriminatory, to an economically focused approach.

Once a country dominated by migration from European nations, today the most significant flows come from Asia, including the Middle East. With its ethno-cultural diversity reflected in over 200 ethnic groups, Canada is considered as one of the world's most diverse countries. Along with a demographic and ethno-cultural revolution, the mix of the nation's skills, education and productivity is increasingly determined by the attributes of foreign-born individuals (The Chamber of Commerce, 2009). Canada's high level of immigration seems to be favored by its development strategy as a satellite nation in North America and the relatively low Canadian fertility rates that today increase immigration's demographic importance (Reitz, 2004).

5.2.1   Major Developments in Canadian Immigration Policy

Historical perspective

Immigration regulations have played a central role in shaping immigration to Canada, which reflects a managerial stance. Under the Constitution Act, 1867, responsibility for immigration matters is a concurrent power divided between the provincial and federal governments. Throughout its history, specifics of immigration policy have evolved with the Canadian economy, and efforts to

harmonize immigration with the social and cultural fabric have changed along with social issues (Reitz, 2004, p.100-101).

Following Confederation in 1867, immigration policy was a priority of the new federal government. The emphasis was on immigrants of Caucasian ethnicity, and preferably of European or American nationality. One of the most blatant forms of discrimination was the 1885 Chinese Head Tax and Exclusion Act that an institutionalized pattern emerged in Canada whereby a distinction was made between preferred and non-preferred immigrants (Kruger, Mulder & Korensic, 2004). The immigration Act of 1910, amended in 1919, finalized the basis of the White Canada policy. Based on the 1919 amendment, the subsequent Chinese Immigration Act of 1923 barred all Chinese immigrants except for diplomats, Canadian-born Chinese, merchants and students. Also evident in the White Canada policy is the denial of the franchise. Eventually all Asian immigrants lost their votes both at federal and provincial levels.

Following the Second World War, Canada experienced unprecedented economic growth. Immigration was again viewed as a tool for economic growth. Since then, Canada has resumed an expansionist immigration policy (Reitz, 2004). This renewal of immigration developed into what became the Immigration Act of 1952. This law manifests the change of the direction of Canadian immigration away from ethnic concerns and back to economic concerns and selective immigration. However, it didn't address issues of discrimination on the basis of national origin or establish how to determine which immigrants were economically beneficial for Canada.

In the 1960s, partially due to a labor shortage in the country, there were significant changes in Canadian immigration policy (Boyd, Goldman & White, 2000). Later codified in the Immigration Act of 1976, this new system focused on the ability of potential immigrants to assimilate into Canadian society and points were given for specific attributes such as education and language. In 2001, the federal government introduced the Immigration and Refugee Protection Act, replacing the previous 1976 Immigration Act. The Act placed much greater emphasis on human capital and post-graduate experience as criteria of immigrant selection (Statutes of Canada, 2001) and tightened eligibility requirements for refugees, skilled immigrants, and business immigrants.

With an aging population and a low fertility, Canada, like most of the developed world is increasingly reliant on immigration to enhance and grow its workforce. Canada's birth rate declined 25% in 1980-1998, and natural population growth has been predicted to cease by 2020 (Fougere & Harvey, 2006). A workforce is needed to replace aging baby boomers since Canada's growth is now a function of immigration, primarily of visible minority persons. Immigration now accounts for more than 70 percent of net growth in the labor force and Statistics Canada predicts that by 2011 it will account for 100 percent of that growth (The Chamber of Commerce, 2009).

Points-based system

As a major immigrant-receiving country, Canada is most famous for its point system in selecting skilled migration. In 1962, the conditions for a person to be

admitted to Canada had been defined as those "who by reason of his education, training, skills or other special qualifications is likely able to establish himself successfully in Canada and has either sufficient means to support himself or has secured employment" (Kelley & Trebilcock, 1998, p. 332). This statement made Canada the first of the largest countries in international immigration to eliminate immigration policies that discriminate on national origin (Garciadiego, 2010). Formal discrimination was effectively removed from immigration policy when the "Norms of Assessment Points Scheme" was introduced in 1967 and became effective on October 1 of the same year (Hawkins, 1988).

Since its inception, the points system has remained at the core of assessing which Independent (or Economic) class immigrants will obtain entry visas. The system has been designed and renewed to ensure maximum employability in an economy in which skilled labor is an emerging priority. The underlying assumption seems to be that immigrants most successful in employment make the most positive contributions to the Canadian economy and society (Reitz, 2004, p. 106).

Since the nineties, specific occupational needs were reduced while education, age and official language proficiency were weighted more heavily. Further, the Immigration and Refugee Protection Act of 2001 placed much greater emphasis on human capital and post-graduate experience as criteria of immigrant selection (Reitz, 2004, p. 106). The underlying rationale was that the higher prospective immigrants scored in these three categories, the more easily they would adapt to their new home country and hence the more rapid their ascent to earnings parity with similarly placed native-born workers (Beach, Green & Worswick, 2006, pp. 9-

10).

The points system as a potentially powerful tool for steering the composition of the inflow towards those occupations and skills in high demand in Canada reflects a concrete form of immigration policy goals (Green & Green, 1995). For example, the average educational level of immigrants exceeds that of the general population with immigration selection being a form of human resource management (Reitz, 2004, p.100). Li concludes that, "the cumulative difference between what immigrants contribute in taxes and what they receive in benefits represents a net benefit to native-born Canadians" (Li, 2003, p. 88). Equally important, the practice is changing the source country composition of the inflow (explained below).

5.2.2 Who Migrates to Canada

The British reached Newfoundland in 1497, while the French went further up in the St. Laurence River to reach Quebec in 1534. As Canada's first ethnic settlers and Charter group members, the British and French dictated the laws and circumstances that determined ethnic entry and settlement (Lian & Matthews, 1998). Like Australia, in Canada, gold mines were discovered in 1857 in Fraser River Valley. Gold rush did not significantly change total immigrant flow, but the qualitative impact was substantial. Thousands of men including several thousand Chinese and several hundred Africans migrated to Canada for gold (Kelley & Trebilock, 1998). Again like Australia, the Gold rush and subsequent railroad construction boom increased Chinese immigrants, as well as anti-Chinese sentiment.

Canada's immigration policy had been highly discriminatory regarding certain

races and religions (Kelley & Trebilcock, 2010). Introduced by the Liberal Government in 1967, the point system that based the selection of immigrants on their "education, skills and resources" (Whitaker, 1991, p. 19) signaled the elimination of any form of discrimination in immigration policies. As a result of reforms to Canadian immigration policy in the 1960s-80s, the nature of Canadian immigration has changed significantly.

Educational levels of immigrants are higher in Canada. The 2006 census listed 4,076,700 persons born outside Canada between the ages of 25 and 64, of whom about one-third (32%) had a university degree. Of recent immigrants, those who immigrated between 2001 and 2006, 51% had a university degree. This proportion was more than twice the rate of native-born Canadians (20%) and much higher than the proportion of 28% among immigrants who arrived in Canada before 2001. Although 23% of Canadians in this group were born outside Canada, they accounted for nearly one-half (49%) of doctorate holders in Canada, and 40% of adults with a master's degree. The two top source countries for master's degrees for recent immigrants were India (14%) and China (10%). The most popular field of study among recent immigrants aged 25 to 64 having a university degree in 2006 was Engineering (Statistics Canada, 2008a).

The new Canadian Experience Class (introduced September 2008) is designed to facilitate two-step migration from former international students and temporary foreign workers. The process of two-step migration is well under way in Canada, as in Australia. In 2010, for example, 71,559 temporary migrants converted to permanent resident status (compared to 47,584 in 2001). Forty-five percent did so

as foreign workers, while 12 percent did so through the study–migration pathway. Like Australia, Canada is now cultivating international students as a future source of supply. In December 2010, 218,161 international students were residing in the country, including 96,157 entries that year. China (17,934), India (11,543), the Republic of Korea (10,527), Saudi Arabia (6,941) and France (5,656) were the major sources. Their enrolment (as in Australia) was mostly in the university sector (39.1 per cent), followed by other post-secondary courses (24.4 percent), schools (20.6 percent) and trades (9 percent) (CIC, 2011).

Overall, Canada is an immigrant-rich nation. Major waves of immigration to Canada corresponded to economic needs (Green & Green, 1999), from the late nineteenth century's economic expansion in North America (Avery, 1990; Kelley & Trebilock, 1998) to the increasingly ferocious competition for the highly skilled in a more interconnected globalized economy. Canada represents a major global competitor in the attraction and retention of skilled migrants (Hawthorne, 2011). It suggests that the comparative success of Canadian immigration policy, at least over recent decades, reflects both the external environment of society and its distinctive economic, cultural, and institutional structures (Reitz, 1998, 2004).

5.3   Multiculturalism in Canada

Canada has been considered one of the world's most diverse countries, whose ethno-cultural composition is a product of three cultural drivers: Aboriginal peoples; the English and French "Charter" groups; and immigrants from around the world. With the Aboriginals and descendants of English and French heritage rounding out the ethnic

makeup of the society, Canada has had a rich experience in dealing with race relations and ethnicities (Frideres & Kim, 2010).

Canada's unique multicultural policy (the first of its kind among capitalist democracies) was the result of the 1963 Royal Commission on Bilingualism and Biculturalism (B&B Commission), which was in turn the result of the equally unique dual colonial legacy of French and English "founding peoples" (Jansen, 2005). With Trudeau's landmark "Multicultural Policy", a path of "integration", rather than "assimilation" has been ostensibly pursued in Canada (Gordon-Popatia, 1994) since 1971.

Ever since its adoption, supporters and critics of multiculturalism have debated its impact on the social, economic and political integration of immigrants and visible or religious minorities and their children. More recently, much concern has been expressed about a disconnection between the policy of multiculturalism and the day-to-day reality of multiculturalism (Kunz & Sykes, 2007).

5.3.1 Multiculturalism: A Canadian origin

Canadian multiculturalism developed from a long history of immigration, with many ethnic groups represented by a large number of members. Although the diversification of the Canadian population was underway by the early 1970s, the initial implementation of the Multicultural Policy had little to do with diversifying immigration trends. More importantly, the Trudeau administration's focus on national economic development required a consistent and stable definition of Canadian nationalism to harness the productive capacity and potential of the Canadian labor force, including non-Anglo Canadians (Blad, 2006, p. 230). As such, Canada adopted multiculturalism partially

because of the tradition of having peacefully resolved potential tensions between the two Charter groups, and as a manifestation of the social milieu of Canada with a strong sense of tolerance and peaceful coexistence (Frideres & Kim, 2010).

In 1971, Prime Minister Pierre Trudeau announced a new federal government framework designed to foster a unique and inclusive form of Canadian nationalism: multiculturalism within a bilingual framework. Canada became the first country in the world to adopt multiculturalism as official state policy. Trudeau's policy aimed at the involvement and participation of ethnic minorities in mainstream institutions, without denying them the right to identify with select elements of their cultural past if they so chose (Fleras & Elliot, 1992, p. 73).

The philosophical foundations of multiculturalism in Canada have been influenced by a complex national history and value system. The initiation point of 1971 for multiculturalism meant that the policy was placed in the context of the 1960s and 1970s' emphasis on human rights and justice. In addition, Kymlicka (1998) noted it was introduced to deflect opposition to the apparent privileging of French and English that was implicit in the creation of the official bilingualism policy of Canada. Consequently, multiculturalism is seen as a policy that was initially implemented not so much to recognize the plurality of Canadian society, but rather to defeat the two-nation concept in which Quebecois chose to see themselves as separate within the context of Canada.

Multiculturalism in Canada is a state-initiated enterprise with legal and governing apparatus consisting of legislation and official policies with appropriate administrative bureaucracies (Banneriji, 2000), including the Official Languages Act, 1969, the

Canadian Charter of Rights and Freedoms, 1982, the Employment Equity Act, 1986, and the Multiculturalism Act, 1988. Specifically, the passage of the Multiculturalism Act in 1988 under the government of Brian Mulroney (Cardozo, 1994, p. 30) made Canada the first country to pass a national multiculturalism law. The Act acknowledged multiculturalism as a fundamental characteristic of Canadian society with an integral role in the decision-making process. The new law sought to assist with cultural and language preservation, to reduce discrimination, to enhance intercultural awareness and understanding, and to promote culturally-sensitive institutional change at federal levels (Fleras & Elliot, 1992, p. 75).

Like culture itself, multiculturalism is an evolving term. Over the past decades, multiculturalism as a policy has undergone dramatic changes, adapting to the new needs and challenges facing Canada. Table 5.1 reveals the evolution of multicultural policies in Canada since their inception. While with a revised focus, it has stayed true to its original goals (Frideres & Kim, 2010). The underlying ideology is that successful social integration of minorities implies accommodation not only from the newcomer, but from the people and institutions of the dominant society (Gordon-Popatia, 1994).

Table 5.1 Evolution of Multiculturalism Policies in Canada

Types of Multiculturalism				
	Ethnicity (1970s)	Equality (1980)	Civic (1990s)	Integrative (2000s)
Focus	Celebrating Differences	Managing Diversity	Constructive Engagement	Inclusive Citizenship
Reference Point	Culture	Structure	Society Building	Canadian Identity
Mandate	Ethnicity	Race Relations	Citizenship	Integration
Sources of Challenge	Prejudice	Systemic Discrimination	Exclusion	Unequal Access
Solution	Cultural Sensitivity	Employment Equity	Inclusiveness	Dialogue/Mutual Understanding

Source: PRI, 2009

5.3.2 Understanding Multiculturalism: A Canadian context

This policy was officially enshrined in law in the Multiculturalism Act, 1988. This policy of multiculturalism affirms the significant contribution of immigrants to Canadian life. The underlying principle is that the interests and lifestyles of immigrants are as worthy of respect as those of the descendants of the Charter groups (Kymlicka, 1998). In practice, the policy is meant to increase access of immigrants to mainstream institutions, prohibit discriminatory actions of institutions, and improve the sensitivity of mainstream institutions to cultural differences.

During recent decades, the Canadian government has been very open to immigration, admitting more than 200,000 immigrants annually. A vast majority of these "new immigrants" in recent years comprised people from Asia and other developing regions. Twenty-five years earlier, visible minorities accounted for 4.7 percent of Canada's population. South Asians became Canada's largest visible minority group in 2006, surpassing Chinese for the first time (Statistics Canada, 2008b). Moreover, it is expected

that in the next decade, visible minorities will comprise more than 20% of the Canadian workforce (Catalyst Canada, 2007). Demographically, Canada has been considered as a "3M" society: multicultural, multi-linguistic, and multi-religious (PRI, 2009).

Multiculturalism, a commitment to an ideology of cultural pluralism, has been a high-profile, but nonetheless contentious government policy since its inception in Canada. According to Frideres & Kim (2010), one of the major criticisms of multiculturalism is that it encourages social fragmentation and leads to a nation's disintegration by encouraging distinct cultural allegiances (see also Bibby, 1990; Fleras & Elliot, 1992; Gwyn, 1995; Hiller, 1990; Ryan, 2010). To them, multiculturalism encourages a group's cultural awareness and identity and consequently leads to increased ethnocentrism and heightened intolerance of others, and thus there was a contradiction inherent in stressing group identity or cultural maintenance as well as promoting cultural harmony, social integration and national identity.

From a Canadian perspective, multiculturalism involves a process of engaging diversity as different yet equal. Central to the statement is that multiculturalism as a sociological concept incorporates the belief that diversity is valuable in its own right, as well as that all members of society have the right to be part of Canadian society (Frideres & Kim, 2010). Based on the notion of recognition, a more liberal form of multiculturalism has taken shape, i.e., the right to be different, and the parallel redistribution of resources. Therefore, it embodies the belief that diversity should be engaged in a constructive and productive manner (Fleras & Elliott, 2007) and cultural differences should not be promoted at the expense of shared Canadian values (Fozdar, Wilding & Hawkins, 2009; Kunz & Sykes, 2007).

A second criticism is that multiculturalism does not address the problem of ethnic/racial inequality. What is really being implied is a "symbolic multiculturalism" (Pizanias, 1992). A parallel argument about the failure of Australian multiculturalism to address class inequalities of migrants was made by scholars such as de Lepervanche (1991), Jakubowicz (1997), Lever-Tracey et al. (1996), and Rizvi (1996). Moodley (1983) argues that forms of multiculturalism based on a depoliticized and static definition of ethnicity ignore the real needs of ethnic groups. The policy is actually a means of control used to quell dissent in ethno-cultural communities (Pizanias, 1992). Central to the statement is that governments provide "boutique multiculturalism" in that it supports superficial or cosmetic relationships between the majority and the minority, e.g. ethnic restaurants and weekend cultural festivals (Frideres & Kim, 2010). Again, similar to arguments mounted in Australia.

As Canada's visible minority population has grown, the growth has triggered a host of unfavorable reactions against minority participation in educational, social, and other spheres of Canadian society (Multicultural Canada, 2008). Tougas and his associates reveal that a covert type of racism has been triggered along with the visible minority immigrant population growth. White Canadians perceive that visible minorities are demanding too many cultural, language, and religious rights or benefits from the government. Further, many visible minorities do not fully participate in Canadian society because they are deemed to be from alien cultures, and as a result, are denied opportunities to participate in the structures of Canadian public and private institutions (Tougas, Desruisseaux, Desrochers, & St-Pierre, 2004). Many Canadians hold on to certain racial stereotypes that continue to block visible minority integration and

participation (Zhou, 2007). Especially within the educational profession, visible minority teachers' accents, color, and names all contribute to minority marginalization (Zhou, 2007). Similarly, Roy and Cameron (2004) suggested that Caucasians perceive Asians to be unable to assimilate because of their different habits, customs, and standards of living. Asians are essentially barred from effective integration into Caucasian circles. Visible minorities, in particular, have become scapegoats in disputes about economic hardship and cultural issues. Then, as economic conditions turn more favorable and employment rises, hostility to visible minorities ebbs. The hostility shifts from covert to overt when economic competition and immigration increase (Roy & Cameron, 2004).

Despite much investment of time and resources in workplace diversity, few Canadian businesses have successfully attracted, developed, and promoted visible minorities (Baklid et al., 2005). The Conference Board of Canada (2003) recognized that many visible minorities have encountered a glass ceiling, which constitutes a hidden social barrier that mitigates their potential for promotion. Evansand and Adams (2007) asserted that many viewpoints and disagreements regarding the glass ceiling have been discussed among researchers, but ultimately, in the upper-middle management and executive levels, corporate culture usually becomes a culture based on power. As Canada braces for an increasingly competitive global business environment, organizational leadership needs to adapt a new, comprehensive strategy that will capitalize on the potential offered by visible minorities (Appuhami, 2007).

For Canada, the recent demographic shift has intensified pressures to rethink how to live together with differences. Canadian society has evolved from a mosaic to a fusion of

cultures where people of different origins interact and contribute to the communities where they live. Canada's commitment to diversity has profoundly impacted the society-building process in Canada over the past 40 years. This commitment has forced Canada into creating a culturally plural yet socially inclusive society without compromising national interests (Fleras & Elliott, 2007). A recurring theme is that multiculturalism is a means towards an inclusive and equitable society. Therefore, policy tools need to be adapted to the changing dynamics of inter-ethnic relations. In particular, policies need to be communicated and implemented effectively so that Canada may remain truly multicultural (Kunz & Sykes, 2007).

5.4 Chinese Migration to Canada

Migration of Chinese to Canada is a product of discrete pushes and pulls resulting from changing geopolitics in both sending and receiving countries as well as the global economic restructuring process (Guo & De Voretz, 2006; Knowles, 1997; Li, 2005b; Liu & Norcliffe, 1996; Wickberg, 1994). Canada's imposition of anti-Chinese immigration laws between 1885 and 1947 was particularly designed to slow Chinese movement across borders and curtail the rights of those already in Canada. No other ethnic group was ever targeted this way in Canadian history (not for as long perhaps – but, like other countries, Jews were kept out of Canada prior to the World War Two, despite increasingly desperate attempts to flee Germany, Austria, etc). For discriminating against Chinese immigrants in past periods, an official government apology and compensations were announced on 22 June 2006 (Mulgrew, 2006).

Between their initial arrival in 1858 and the passage of the 1923 Chinese Immigration Act, the Chinese in Canada were frequent targets of discrimination and were subjected to many legislative controls. Among the most notable was the Head tax imposed upon Chinese immigrants as a result of pressure exerted by the unions against the competition of Chinese labor. In 1923 the Canadian parliament passed the Chinese Immigration Act. Under that Act, Chinese were denied many basic rights, including the right to pursue a living in many occupations, the right to vote, and the right to travel freely in and out of Canada. The exclusionary policies and discriminatory legislation against the Chinese effectively reduced them to second-class citizens, while making them frequent targets of political demagoguery and social hostility.

Although the Act was repealed in 1947, the only Chinese allowed into Canada between 1947 and 1962 were those whose family members were already Canadian residents. Notwithstanding the removal of legalized discrimination, the Chinese community did not gain full acceptance in Canadian society. As Kruger and his associates put it, the 1952 Immigration Act 'merely reformulated how discrimination was understood by government officials' (2004, p. 74). The Chinese, irrespective of their nationality or political allegiance, were often equated with a foreign race with incompatible values and customs.

Immigration from Mainland has undergone successive increases since 1989, the year of the Tiananmen Square incident. Immediately after the incident, a humanitarian policy which was coded as OM-IS-339, was put into place by the Canadian government (Liu, 1997) to protect Chinese students and visiting scholars

who were in Canada at the time and who participated in demonstrations in Canada in support of the student movement in China (Zong & Perry, 2011). In the following 12 months, a total of 9,800 Chinese nationals applied for humanitarian consideration from within Canada, and another 2,800 applied for refugee status (Liu, 1997; Liu & Norcliffe, 1996). One of the conspicuous changes was the rising level of education among the mainland Chinese immigrants.

Under the influence of globalization and the knowledge economy, the recruitment of highly skilled workers has become a more pressing issue for immigrant-receiving countries like Canada and the US. In recent years, there have been substantial changes in the immigration system to strengthen the admission of skilled immigrants. The PRC has been the leading source country of newcomers to Canada since 2001. According to the 2006 census, 14% of recent immigrants who arrived between 2001 and 2006 came from the PRC. A majority (70.2%) of the foreign-born population in 2006 reported a mother tongue other than English or French. Among these individuals, the largest proportion, one in five (18.6%), reported Chinese languages (Statistics Canada, 2007).

According to Holland (2007), Canada regards Chinese students not as temporary visitors but as potential immigrants who will settle in Canada, raise families, and start their own businesses. As discussed previously, the new Canadian Experience Class is designed to facilitate two-step migration from being a temporary resident, as foreign workers or international students, to permanent resident. China has been among the top contributors of students pursuing higher degrees in Canada during recent decades. In 2010, Chinese students accounted for 26.08% of Canada's total

international student enrolment and 18.65% of the entry (CIC, 2011). Most of the Chinese graduate students are conducting research in scientific and technical areas, the very sectors of the economy with the greatest potential for growth. There is thus a premium on providing incentives to those educated visitors to remain in Canada.

Most recent mainland Chinese immigrants, especially those arriving since the 1990s, have been well-trained and experienced professionals seeking new opportunities. They are among the preferred mainly because of their potential to contribute to the country's population and economic growth. The new wave of Chinese immigrants contributed to the growth of a new generation of Chinese Canadians. They tended to be better educated, more cosmopolitan, and upwardly mobile, while taking up professional, technical and managerial jobs, which historically were denied to the Chinese. These changing characteristics of Chinese immigrants to Canada reflect, and have been shaped by Canada's immigration policies.

5.5 Participants

In parallel with the ARU case, eleven individual face-to-face in-depth interviews with the Chinese overseas academics working at CRU were conducted. In terms of gender, again, only 2 female academics ultimately showed interest in the study despite extensive efforts to increase this number. Among the 11 participants, 2 were in their 30s, 4 in their 40s, and 5 in his 50s. The age cohort of the Canadian interviewees is much older than the Australian cohort. As for their academic ranks, one was an assistant professor, eight associate professors, and two were full

professors. Eight of them obtained their highest degrees from Canadian universities, while one each had been derived from Germany, China and Australia, respectively. Their length of stay in Canada varied, with the longest being 26 years, the shortest 7 years, and an average of 15.9 years. Further, 9 respondents started their academic career with CRU, despite the fact that some had long working experience in the industry before they settled down at CRU.

5.6 The Chinese Knowledge Diaspora: Positioned in the Canadian Academia

5.6.1   Why Canada, Not the U.S.

In the beginning of the interviews, participants were asked a question regarding their decision to come to and remain in Canada. As expected, the Chinese academics in Canada presented very similar intentions regarding their decision to pursue an overseas degree as their Australian counterparts. Regarding the destination for their profession, most respondents indicated that North America was their first option.

To some, it presented more opportunities as the region has been labeled the center of the world scholarship. For example, comparing his PhD training in Australia with his post-doctoral working experience in Canada, the agriculture academic (CRU1, Male) thought Canada is a better place in terms of career development, and further explained, "This is a very strong Agriculture school with a very intelligent and famous professor. So after my post‑doc, I stayed." For others, it involved the optimization of career opportunities at hand. Although they had options at global level, they believed that the CRU offer was the best option among the offers they

received. As CRU5 (Social Science) described,

> There are personal reasons for me to stay here. At that time, I needed to
>
> physically stay in Canada to sponsor my family for immigration. I got
>
> offers from the States but I could not go. But I'm satisfied since this is
>
> the number one university in the province and they offered me a good
>
> deal.

Most respondents expressed their personal views on their decision to stay on in Canada instead of the United States, with many initiating this topic before any questions were asked. For some established academics, it was evident that the issue of a balance between work and life was one of their foremost concerns. The female academic in Engineering (CRU7) described the academic atmosphere in major American universities as "aggressive" and "inhumane". She commented that it is a place where your value is counted in terms of the number of the papers published in top journals and how many graduates you supervise, and therefore you work more like a machine rather than a human being.

Likewise, the senior professor in medical science (CRU11) admitted that he never thought about staying on in the States after his postdoctoral training in a top American university. He expressed somewhat negative feelings about the environment in the US academy. As he put it,

> The competition is sometimes sort of abnormal there. After I lived in
>
> Canada for a while, I had no strong intention to make myself somebody.
>
> Also, I already got PR in Canada and my wife and kids were still here.

So I went back.

For early-career academics, the major concern was the lack of a supportive environment that is of great importance for them to do the research that they are interested in. It is clearly exemplified in the case of the engineering academic (CRU9), a Canadian PhD degree holder, who went back after two years' sojourn in an American university. Comparing his work experience in the States, he thought Canada is better for his career development although there are more funding sources in America:

> In our area, the tools are very expensive. Even with research grant, it is difficult to support the research work. That's why Canada set up a federal funded company that provides products and services.

He found it very difficult for himself because there is no such company in America and his chance of getting a grant was limited because the university where he worked was not a major one. "Specifically in my area, I need a proper environment to do research," he concluded.

Also notable was three participants' comments on the political aspects of the American system. For example, the engineering academic (CRU8) recalled that he refused the offer from the American university that he once worked in for one year. "There is sort of invisible racial discrimination against the Chinese. Here is better," he maintained.

5.6.2 Advantages of pursuing an academic career in Canada

The respondents were asked about their perceptions on the influence of the Canadian system on their career development in comparison to that of China. All participants noted that their position in the Canadian academy presents an advantage, notwithstanding China's substantial development in the S&T sector. They attributed their advantaged academic position mainly to the academic norms and regulations in Canada and the enabling Canadian academic system.

A shared academic norm

The respondents in general defined themselves as a member of the Western academic profession, with a special reference to the North American academia, irrespective of the fact they are Chinese by origin. Although they recognized the rising tide of Chinese scholarship in terms of influence in the global arena, they indicated that the differentiation between the Chinese and Canadian academic systems is still visible. A majority of the respondents believed that Western academia is a set of systems to ensure that, in fact, one can develop and stand alone. This structure probably included recognized academic standards and norms for evaluation, improved atmosphere for research, the way of doing research per se, as well as fair and transparent recruitment procedures, according to the respondents. Detailed discussions on the differences in the above mentioned aspects between the two systems are presented in the following sections.

One of the important differences was the lack of an evaluation system, based on quality and merits in the Chinese system, according to most respondents. For some,

the major concern was the lack of consistency in the assessment standard of one's academic performance. The senior medical scientist CRU11 pointed to changes of evaluation criteria in Chinese academia. He thought there was no standard at the beginning, and everybody believed he did a good job. Then, the attention had been paid to the amount of research output, including the number of publications and the impact factor of the journal rather than working on a major project. Recently, he observed a somewhat reverse trend. "But there is still more emphasis on where you have your paper published and what the impact factor is," he concluded.

The agriculture research chair (CRU1) shared his unsuccessful experience in grant application in China that was not so much the application denial but the quality of review made by the grant agency, a national major grant source in hard sciences. He recalled that, although the grant application received four approvals, it was denied because of the fifth reviewer's comment on the applicant's background with his name in English on the form. The scholar was very upset about the result and wrote to the grant agency to express his views on the review, but he got no formal feedback. Comparing the shared grant application procedures in Canada with the disappointing experience in China, he commented that the Natural Sciences and Engineering Research Council (NSERC) will organize a re-examination if an appeal is made through a formal channel. This was not the case in China which "is like when they said it, it has been decided". Therefore, he concluded, "It is pretty fair in Canada. The assessment is based on your achievement and contribution. I'm not quite clear about the assessment in China and what the criteria for grant approval are."

Following the noted differences in research environments, participants pointed out some differences in the research conduct, either modes of doing research or the rigor of the work, across the two systems. Of notable importance was the common observation in the interviews that mainland scholars' contribution to the world scholarship is increasingly visible (see for example The Royal Society, 2011; Yang & Welch, 2012). As CRU10 (Female, Engineering) described it,

> Their work is even at the international level. It is common for the Chinese to publish in the core journals in my area, either the mainland scholars or the overseas Chinese. It is almost a Chinese name on each paper. Also, there are some mainland colleagues on the Editorial Board of the core journal.

Nevertheless, the participants suggested there could be a clear distinction when referring to China's position as "catching up", and defined themselves clearly as Western scholars.

For the participants in social science, they were more concerned about whether the research work of their mainland colleagues is under the mainstream paradigm. Being in the field for over 15 years, the senior professor in social science (CRU4) maintained very good relations with mainland academia and noted two major issues in the research conducted in China, as compared that in Canada. He thought one was the greater stress in China on empirical research leading to large scale surveys and numerous interviews, with the paper mostly presenting descriptive analysis rather than theorization. The other is focusing on the theoretical framework, with

the lack of empirical practice.

According to CRU5 (Male, Social Science), the most significant difference was that the domestically trained scholars are more qualitative. He also noted that scholars with overseas training are more quantitative. "Of course, it is not a matter of right or wrong, but a matter of what the mainstream research is," he concluded. Another social science scholar (CRU6) stressed that the methodology applied by mainland scholars is not rigorous. He described their research as "storytelling" and the way they conducted research was as "I asked somebody a question and he told me what". Even though he believed that interview is a very important research method, "it is necessary that a research work is composed of generalization and theorization," he concluded.

The research paradigm was not such a serious issue for the scholars in hard sciences. In these areas, much of the research work was conducted in more or less similar ways at global level. Those are the areas where the mainland scholars make substantial contribution. Nonetheless, building on the earlier discussion of differences in research environment, the hard science academics tended to be more concerned about the rigor of the mainland colleagues' work.

The senior professor (CRU11, Medical) noted China has done well in technologies that can be applied in mass production, and surpassed the West in gene sequencing, which relies heavily on computation. However, the fact was that China remains weak in research that requires painstaking efforts, according to the scholar. He attributed the weakness to the lack of commitment and dedication that he put into

research. He firmly believed that it is not a matter of equipment, nor a matter of top students. As he put it,

> Our research condition is not good, sometime even worse than that in China. We do not have top students here. But we work every day with our students on the research work and we can produce in-depth work.

Likewise, the female academic (CRU7, Engineering) commented that the Canadian scholars are more serious about their job as compared to the mainland scholars. She expressed the feeling, "I hope I can do a good job here and it has nothing to do with assessment." She characterized the difference in terms of a sense of responsibility and that she needed to be responsible for her students. "Some mainland colleagues may not be very serious about their work, and they pay much attention to, and run after, fame and gain" she observed.

Another aspect of academic norms involved the differences in the recruitment procedures. Most cited was the observation that the recruitment in China has not reached the common level of the international academic system. It is not surprising that most of the CRU participants identified more with the Canadian practice in recruitment, perhaps due to their average overseas stay of sixteen years. The agriculture academic's (CRU2) comment was not atypical: that the recruitment process in Canadian universities is straight forward and transparent. As he explained,

> If we want to recruit a professor here, we make sure of the budget and advertise the vacancy in the good journals to attract international

candidates. A shortlist for job interview will be made, based on the document review. If we decide to hire you, we will give you the offer later. It is a fair competition.

However, it was not common that the Chinese university advertises the vacant position. CRU6 (Male, Social Science), who expressed strongly an intention to return, complained he had never seen any advertisement for vacant position in mainland universities. "If say the good Business School in China wants to recruit someone with the overseas PhD degree, I definitely would be interested," he concluded.

Moreover, the female academic (CRU7, Engineering) attributed her unsuccessful job hunting experience in China to the then backwardness and isolation of the university. She contacted a provincial 211 university due to its geographical closeness to her family. She reported that there was an assessment of her academic performance based on her resume and publication, but in general, suspicion was evident towards an outsider, especially an overseas degree holder. She was a bit upset, exclaiming,

> I don't think the returnees were given enough recognition. Since there were too many returnees, the mainland universities had the impression that the returnees were not competent (enough) to get a position in the West.

However, she shared later her extremely positive experience in terms of getting a start with her current (Canadian) institution. Due to her pregnancy, she began in

2005 though her offer started from 2004. "They permitted me to take maternity leave first. I was so lucky," she concluded.

The academic (CRU8, Engineering) shared his not-so-successful intension of relocating in a top Chinese university years ago. He reflected that the Chinese university was interested in those who had academic positions in North America and noted the very reason for his decision to stay on was that it took the mainland university too long to give him confirmation. "I think they spent a while tracking my family history. Isn't it a common practice in terms of recruitment in China?" he explained jokingly. Although the university ultimately became very active and provided an attractive offer, he expressed that he was no longer interested because the enthusiasm was gone, and his child was by then old enough to attend primary school.

The enabling Canadian system

Talking about their career development in the Canadian system, all participants positively described experiences closely related to the enabling academic environment as compared to the Chinese system. Of notable importance was the lack of much *Guanxi*, relative to China, the existence of academic autonomy and freedom, proximity to the center, as well as the multicultural element of the Canadian system. *Guanxi*, use of interpersonal relationships to improve or advance oneself in society, work and/or academia, is part of an enduring cultural practice in China that takes time to change (Chao, 2013). In parallel with their Australian counterparts, most respondents from this Canadian institution recognized the lack

of much *Guanxi* as a strong advantage for them to pursue their academic career there, notwithstanding acknowledging that there was *Guanxi* in Canada. Mostly, they described *Guanxi* in China as "inclusive" and "complicated", while *Guanxi* in Canada was "simpler". For example, the senior scholar (CRU4, Social Science) commented it is easier because he feels free to say and do what he wants, without careful calculation. As he described it,

> I do not have to think about whether it is appropriate for me to say it, or what others think about me if I say it that way. Here, there is no such complication. It is fine that I say it directly.

The female academic in Engineering (CRU10) compared the role of *Guanxi* in the grant application and accumulation of social status across the two systems. She commented that you need the *Guanxi* to get the grant and academic title no matter how strong you are in China. Therefore, *Guanxi* is important in China because it brings personal benefits. As she described it, "when you become famous, money is flowing in as well as your research funds, and you do not need to do any detailed work." However, it is not the picture in Canada:

> The most famous professors work painstakingly everyday; there is no differentiation. Even if you were a Nobel Laureate, you would have to do your work conscientiously. There is no car, nor a driver for you.

Also evident in the interviews was the observation that the Canadian academic system enables them to work and think as intellectuals without strings attached. For some respondents, especially academics in hard sciences, the autonomy and

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freedom could be interpreted into more concentration on their own work without the interference of administration, or without following a senior boss. For example, the senior professor (CRU11, Medical) noticed the lack of routine in terms of the academic life in China and attributed it mainly to the interference of the administration. He believed academic freedom and working environment in Canada allow him to work at his own pace and schedule. He defined his life as "busy" but "very routine". He thought he would not be able to concentrate on research if he were in China since there were too many things that he could not decide by himself. Even without any administration responsibility, there was still some interference. "If you do quite good research in the field, you will be asked to review others' work. You have to do that," he concluded.

Comparing her previous working experience in China, the female academic (CRU7, Engineering) noted there is less *Guanxi* and administration (*Xingzheng*) here. She described her work style in Canada as "concentrated" as well as "relaxed". She explained, "Mostly, I feel tired here because I work too much to produce more quality paper and to improve my teaching. I spend much less on tasks other than teaching and research." Although she did some administration work, it was very close to her own research. Therefore, she believed that there are more and freer opportunities for professional development in the Canadian system.

Two other academics (CRU2, Agriculture and CRU8, engineering) reiterated the importance of academic freedom and autonomy to their career development as independent researchers, especially at the early career stage. The Engineering academic (CRU8) showed great concern about the negative influence of the issue

of "academic inbreeding", the Chinese practice that a younger academic is required to follow a senior professor. "There is the policy to guarantee our freedom to do the research we are interested in," he commented. Likewise, the agriculture professor (CRU2) thought that the tenure system in China would make a difference. In the Canadian system, even an assistant professor can be a principal investigator (PI) and enjoy the same treatment as a full professor, notwithstanding salary differentials. "But in China, there is the huge waste of talent, especially the young talents," he lamented.

Academics in the social sciences laid more stress on the ideology that meant researchers are encouraged to do the research they are interested in. The academic (CRU6, Social Science) defined speech freedom and academic freedom as "Bible" in North America. He noted that he could investigate on any topic that he was interested in. For example, his current research was on how to balance profit making with less worker exploitation. "My research is more communist," he concluded jokingly.

Interestingly, comparing the practice in Canada, the senior scholar (CRU4, Social Science) regarded the Chinese ideology as the major obstacle to the further development of social science in China. For one thing, he noted that the Chinese statistics told the good news, since it represented the official achievement - but seldom the bad. The concern was that the statistics could be utilized by foreign scholars to criticize the government. For another, many Chinese sociologists had great ideas and comments on issues related to China's policy and system, but they chose to become more careful and less challenging when they wrote for publication

or public lecture. "So the reality is that China is open to a certain degree. China needs to take it as it is: that is, if there is the problem, then there is," he maintained.

Equally important, a majority of the respondents reported that previous or continuing work or research experience in the United States had helped them build up their career in the Canadian system. Among them, there was an indication of somewhat negative feelings towards the giant neighbor; to a large degree, because of the ferociously competitive and less supportive academic environment. To some degree, this contributed to their decision to stay on in Canada, as discussed in the earlier section. Nonetheless, in terms of research *per se*, there was the recognition that the US academia is the center of world scholarship, while noticing some regional centers such as Japan. They indicated the proximity to the center in Canada presents them with an advantage in terms of career development.

The agriculture research chair (CRU1) reported regular visits to the US, once every three months, and that he worked in the world renowned research institute under the US Ministry of Energy where the Chinese-origin Nobel Laureates did most of their work. "They are doing leading edge research with advanced technology at world level," he commented. Likewise, the early career scholar (CRU9, Engineering) noted that it is easier for academic communication and collaboration with NASA colleagues. He attributed this convenience in North America to the advanced disciplinary development in the US as compared to China. As he explained,

I heard that the Chinese government has prioritized the development in

this area. But there are some colleagues in NASA who have done the research for a while. We often get together and discuss about research. So it is easier for communication and collaboration.

Also notable in the interviews was the perception that the multicultural environment of the Canadian academy provides them a sound grounding in terms of career development. The female academic (CRU10, Engineering) had years of work experience in Europe and Japan before she settled down in this university. Naturally, she compared her previous experience and she said, "Europe has a long history. You always have the feeling of being an outsider. In Japan, the feeling is similar. It is never like that you feel free as if you are at home."

She described Canada as a "different" country with a "different mentality", and the proportion of the international faculty was much higher in CRU. As she put it,

> In our department, more than half of the faculty is foreign-born. I don't think you will be particularly discriminated against because of your origin. Here, you will be judged by your performance.

Specifically, the two female engineering academics (CRU7 and CRU10) responded very positively when they were asked about the influence of being a female, as well as a minority academic, working in a traditionally white male-dominated department. They both acknowledged that they had not been discriminated against because of their gender or origin. One academic (CRU7) noted the colleagues would specifically ask for her suggestions because she was not that quick to express her ideas. She felt quite comfortable and satisfied with her work and life

due to this collegial environment. "The environment will be pretty fair to you, if you have devotion and commitment to your job, respect your colleagues no matter where they are from, and maintain openness to collaboration."

This echoes a study on job satisfaction in terms of institutional leadership and mentoring (Bilimoria et al., 2006), and has been reinforced by the respondents' lack of satisfaction on the institutional recognition of their mainland collaboration for professional purposes.

5.6.3 Challenges of the Academic Profession

Following the listing of the advantages of the Canadian system, participants talked about their experiences in terms of the challenges of the academic profession in Canada. As perceived, the Canadian respondents shared with their Australian colleagues the observation that the biggest issue is the English language and teaching, especially in the initial stages. According to the science professor (CRU3),

> I cannot speak English as well as a native speaker in my life time as the
>
> first generation immigrant. I spent tremendous time in teaching,
>
> especially when I started and all the courses were new to me.

Although admitting that the English language is a limit, the academic (CRU6, Social Science) noted that it was not the whole story, but also included the professor's education capacity, and the ability to interact with the students.

Nonetheless, some respondents' accounts outlined various factors closely related to their being Chinese that could influence their teaching in the Canadian academy.

For example, the senior scholar (CRU3, Science) noted the lack of presentation skills training in China as compared to the practice in Canada. He admitted having difficulties in that aspect and spent quite a lot of time thinking about what to teach and how to teach. Similarly, the academic (CRU6, Social Science) commented that the Chinese character could be a limit. Since there was the emphasis on the entertaining component of teaching, he thought the extrovert and talkative people would naturally fit. Jokingly, he explained, "As Chinese, we have been forbidden to challenge the teachers since primary schools. If we challenged our teacher, the school would ask our parents to come."

The agriculture professor (CRU1) provided a corroborating observation on the influence of culture. He noticed that all the candidates, during the presidency campaign, tried to convince the audience how good they were. By contrast, "however, our Confucianism teaches us respect the seniors, not to show off ourselves, nor to compete with others. We Chinese are much more reserved." Interestingly, the youngest scholar (CRU5) in social science made an observation from a different angle. He commented that research work in his area was mostly writing a story, with 30% empirical work, and 70% writing-up. "It is due to the disciplinary differences. But it is English that really makes a difference to the quality of the research work in my area," he confessed.

Likewise, the agriculture professor (CRU1) admitted language affected more than teaching. He noticed that there were more than 30 mainland research scientists working in PBI (Plant Biotechnology Institute), but only one being the chief. As he explained, "they have the expertise, but when they apply for the position, especially

during the job interview, their English language proficiency affects much".

As discussed in the Australian case, there was acknowledgement among the interviewees that they needed to rely on research, since it was very difficult to surpass the local colleagues in teaching. "If we want equal treatment, we need to make at least equal performance. There is no discount here," the academic (CRU6, Social Science) maintained.

Another aspect of professional challenge the respondents experienced was promotion and being positioned in the Canadian system. Although a majority of the respondents were quite established in the system, 10 out of 11 at Associate Professor level and eight or above with tenured positions, they admitted, "It is hard, very hard". This was the similar to the Australian case. For example, the female academic (CRU7, Engineering) confessed that as a minority academic, she needed to work harder in order to stand out. She said, "It is an undeniable fact that I spend double time overcoming the language problem, put x times' efforts to make equivalent achievement with the locals." She explained that the pressure was less heavy when the recognition from the peers and credits accumulated. In addition, she thought it was very challenging with various requirements, including teaching, research and administration work. "Your position associates with your responsibility," she concluded.

Although prevalent in the interview accounts that there was a level field, two academics (CRU3, Science and CRU8, Engineering) noted that some limits existed in terms of promotion. According to CRU3, foreign faculty needed to work extra

hard in order to be outstanding among the peers and get promoted. Although they could not work with the language and the culture as skillfully as their native peers, it generally did not affect promotion prospects. However, he noted, "if the native colleagues regard it as an issue, it is difficult for you to defend." The engineering academic (CRU8) shared his interesting observation as,

> You have either way to go. One, you need to be outstanding and work very hard. The other, you need to be good at *Guanxi* here. There is an English expression, "know what buttons to push". So you see *Guanxi* is important here as well.

The senior professor (CRU11, Medical) noted that the pressure in this university was not that heavy, as compared to the major universities. He described the situation as "one radish, one hole", which meant when you were recruited, you were expected to gain tenure, unless there was substantial evidence of unsatisfactory performance.

Of particular interest is the respondents' reflection on the perceived limits as regards giving full credit of their potential in the Western academy (see also Saxenian, 2002a, 2003, 2006; Shinagawa & Kim, 2008; Sun, 2009; Wong, 2006). The comment of CRU2 (Social Science) is highly illustrative, as he put it,

> I admit that it is more difficult for us as foreign faculty. But generally speaking, we can get promoted as full professor, and enjoy the equal treatment as the local…I don't think that a Chinese can exert his full potential in the West. It is in China that his talent can be fully utilized.

Among the returnees, I admire Rao Yi very much. If he were a professor in the West like me, his voice and influence would have been much weaker. The reason is that this is not our culture. If we really want to do something significant, it is better that we come back to China.

5.6.4 Other Factors Influencing Career Development

When asked the question what other factors influence their career development in Canada, most respondents indicated that their mainland colleagues were richer and more resourceful in terms of quality research students and research grants at different levels. Some provided corroborating accounts that paralleled the Australian case. Interestingly, however, proximity to the center, seen by some respondents as an advantage research-wise (as discussed earlier), could influence negatively their recruitment of quality research students, with a special reference to the mainland students whose number one destination is always the United States, and a major university.

It was clearly exemplified in the case of the engineering scholar (CRU8) who shared his disappointment at recruiting a top student from a top University in China. He said that he once asked his master supervisor to target a good PhD student and he chose the best one from his class. Then, he negotiated with the school to provide the student a full scholarship. Often, the scholarship would be given to current students instead of prospective students. The school concern was that if the candidate did not come at all, the scholarship would be wasted. He lamented,

The student said 'sorry' to me until the last minute, and he went to a

major American university under full scholarship. I'm not complaining

since the student followed his best opportunity. So it is difficult for us to

get good students.

Research funding or grants are necessary for researchers in the field of hard sciences to conduct quality research. It is not surprising that the respondents of the interview noted the huge input of research from the Chinese government as another driving factor for its S&T development. A strong discourse within the interviews was that China is catching up quickly in terms of research *per se* and regarding research funds. This observation was more evident in the hard sciences rather than the social sciences. As the female academic (CRU10, Engineering) put it, "The development of my area in China is very fast. The research expenditure of China in this area is larger than that of the Canadian government. They have more and better equipment". Interestingly, the academic (CRU8, Engineering) indicated that the federal research fund was shrinking in Canada. His observation was made due to the meager approval rate of grant applications to NSERC. The scholar noted that Canadian government did not stress research, nor is it easier to get funding from industry because industry focuses on strategic, shorter-term benefits and profits. "The federal expenditure on research is limited as compared to that of America. So Canada now is not leading in science and technology."

This information has been triangulated by other sources, such as the media (see for example Seidman, 2014) and the research performance measured in natural sciences and engineering, and social sciences and humanities (see for example Jarvey & Usher, 2012). Canada's egalitarian system could be holding it back, and

other countries — like the UK and Germany — are starting to have success with a more stratified approach that gives more money to leading research institutions to help them make further advancements.

Gender Differences

The gender issues were discussed, and addressed differently by the female academics (CRU7 and CRU10), when asked for their reflection on their being Chinese as well as female working in a Western university, and their collaboration with the mainland colleagues. With regard to academic advancement, the two colleagues showed their satisfaction positioned in CRU. As CRU10 put it, "They care less who you are, but more of what you do. If you work hard, you will get recognition from your colleagues here."

On the other hand, they both admit that family obligation as wife and mother complicates their life as an academic. They attribute their lack of mainland collaboration to "the need of children rearing", and "the constraint to overseas travel as a married mother".

> I want to collaborate with my Alma Mater and former classmate, and
> they want me too. But sometimes, there are just too much to do here,
> correcting papers of the students, writing papers of my own, plus being
> a mother of two. It is not easy for me to travel and stay in China for
> more than one week (CRU10).

Geographic mobility as the commitment to career over personal life (Kauffman &

Perry, 1989) is of paramount importance in many professional labor markets, especially in academia. On average, academic women are more likely than academic men to place geographic limits on their careers, suggesting an indirect nature of the negative effect of geographic constraints on women's versus men's career mobility. Family responsibility or husbands' careers could constrain the geographic mobility of married academic women (Bielby & Bielby, 1992).

5.7 The Knowledge Diaspora Network: Bridging the Two Ends

5.7.1 Motivations for collaboration

When respondents were asked why they chose to collaborate with mainland colleagues, the sense of cultural belonging and the deep concern about China's development were much evident, in ways more or less similar to their Australian counterparts. They described China as "home", desired that their home experienced "the fastest development", and perceived that they could be back home someday in the future. As the Engineering academic (CRU8) put it,

> Let me put it this way. For the overseas Chinese, we don't feel at home
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> here. For example, their interests are not the same as ours. There is the
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> local politics that we are not familiar with.

An interesting but unintended account was the participants' self-perception as "We are the 77 or 78." This term, that needs to be understood in the Chinese context, refers to the first group of college students after the disastrous decade of the Cultural Revolution (1966-1976). Of eleven respondents, four shared this "77 or 78"

group identity, and they all expressed "a stronger sense of obligation towards China", regardless of whatever hardship they experienced. As the academic in social science (CRU4) put it,

> You know, the overseas Chinese of my age have experienced quite a lot. When we first arrived here, we were poor international students and sometimes worked illegally [that violated the student visa]. And then the family joined us and life was not easy here. After that hardship, we got the tenured position and made some achievement. And now, we want to do something for China. It is the emotion from the bottom of my heart.

In addition to the cultural dimension, the dramatic development in Chinese higher education with special reference to S&T, coupled with the internationalization of higher education systems presented an opportunity, according to some respondents. For example, the academic (CRU4, Social Science) noticed the increasing interest among the mainland universities in collaborative programs including student and staff exchanges, articulation programs and research collaboration. Also, he noted that universities in North America paid great attention to China collaboration in terms of attracting quality research students from China. This was where the diaspora could make a special contribution, he argued, "We, the overseas Chinese academics, can help with both ends".

5.7.2 Who to Collaborate With

Talking about their collaborators in mainland, the unavoidable term is "my Alma Mater." Although a majority of the respondents maintained collaboration with their

alumni, one out of eleven reported substantial collaboration with his Alma Mater. As the science professor (CRU3) put it,

> I was the 77 college student of a 985 university in Hefei and completed my Masters there. It is just natural to me. During the past years, I kept close contact with mainland colleagues and went back to visit my former supervisor and discuss about the research outcome if I got a chance.

Specifically, two academics (CRU6, Social Science and CRU11, Medical) attributed their lack of collaboration with their Alma Maters to the reorientation of their research interests since their overseas study. The medical professor related that he went overseas directly after undergraduate study, and therefore did not have deep roots with his previous institution. "My Alma Mater is an agriculture university, and I moved into medical science after going abroad," he explained.

Nonetheless, among those who were without deep academic roots in mainland scholarship, the youngest academic (CRU5, Social Science) utilized his postgraduate training at a major Canadian university as the locus to meet mainland colleagues, and then build up research collaboration.

> When I studied at X (another Canadian university), the Peking professor paid a visit, and so did the professor from Yunnan. I have collaboration with a mainland colleague working at a university in Hong Kong. We have a project sponsored by RGC [The Research Grants Council of Hong Kong]. We knew each other when we both worked at X.

For others, the staff exchange program under CSC sponsorship played an effective role in setting up collaboration with mainland colleagues, something that again mirrored the Australian interviews. Some respondents noted that this was where the collaboration began. During the mainland scholars' short-term sojourn, they build up personal relations and trust. According to the academic (CRU1, Agriculture),

> My collaborator was once a Visiting Scholar. He knew our research was the frontier and the Canadian government made huge financial investment to set up the research facility here. He suggested that we jointly applied for funding to support collaborative research.

That's why he felt upset when their joint application was denied by the grant agency due to the perceived unprofessional way of grant review in China (as discussed earlier).

Notwithstanding these strong links with mainland colleagues, some respondents, especially those in hard sciences, felt they had more established relations with colleagues in the US. The major reasons were the availability of more and better funding opportunities and the advancing and cutting-edge level of the research conducted there. The academic (CRU9, Engineering) noted that he had more substantial collaboration with NASA (as discussed in the proximity to the center), and said,

> There are more funding sources in America, including the federal funds like NSF, the Department of Defense (DOD), the Department of Energy (DOE) and National Aeronautics and Space Administration (NASA).

Likewise, the engineering academic (CRU8) recalled his sabbatical in a US research lab and subsequent, ongoing collaboration. He explained that he was working on a project sponsored by the US Army Corps of Engineers. As he put it,

> They are doing research of strategic importance and the research work is of high-level sophistication. So they have a lot of research money. I'm strong in modeling and that's why we collaborate.

5.7.3 Patterns of Collaboration

Following the reflection on motivations of collaboration and their collaborators, more detailed discussion of patterns of collaboration featured prominently in the interviews. Some respondents with longer and substantial experience in collaborating with the mainland community, talked about a transition of their role from "contributor" more to a "collaborator". It was clearly exemplified in the case of CRU3 (Professor, Sciences). His academic interactions with China had shifted over time to the "complementary" mode as China's academic field of his area has been developed significantly in recent years. He reflected,

> At the very beginning, there was a common mindset to help China. But now, it is more like we work complementarily, due to the better research conditions and equipment there.

In terms of research collaboration, he did not think there was much difference. He explained,

> Now, we are developing some diagnostic programs. We spent some time

installing and running the equipment. From last year, we started to collect the data. We hope that we can produce stronger publication later on.

Likewise, CRU4 (Social Science) noticed that the new Dean, who himself was a returnee, brought in an international academic milieu to the mainland university and regarded it as "conducive to the promotion of the domestic research environment". He described the situation,

> He held an international seminar on Social Network Theory when we were there. He invited scholars from the States and Canada, and top Chinese scholars to attend the seminar. I was also invited to stay there to do collaborative research and to teach students.

Unsurprisingly, some respondents described their collaboration with mainland colleagues as "task specific", with their collaborator focused more on "technology" and "the project-based experiment", and themselves on "writing up". The main reason was obvious that their collaborators' English language skills were not strong enough. For example, the agriculture academic (CRU1) said,

> We got one joint paper in a top journal. When he worked with us as Visiting Scholar, he did some experimentation and project work. Based on his results, we co-authored the paper. Of course, I did the major part of writing.

Also evident in the interviews was the respondents' accounts on a more

"reciprocally benefitted" collaboration with the mainland colleagues. They describe the collaboration as "understanding and dialogue" as well as "critique and evolution". Specifically, two academics (CRU5, Social Science and CRU7, Engineering) shared the positive experience in collaboration of this pattern. The youngest academic (CRU5, Social Science) believed that his joint authorship with a Peking professor and a Chinese professor at York University was smooth and productive. He said,

> Actually, we work as a group. It is hard to say who is responsible for what, and we just work together. We have very frequent communication, three or four conference calls each week to discuss about the progress and the issues.

The female academic (CRU7, Engineering) was highly appreciative of the collaboration with her former classmate, and reported that they had produced many co-authored papers. As she put it,

> He is a very active researcher with good publications. We work together to analyze the preliminary results, and write for publication. In terms of research, we feel free to talk about our own ideas and argue, sometimes. There is no limitation or boundary. Our aim is to explore the truth or the theory. It is just like how we collaborate here.

5.7.4   Value of collaboration

Following the discussion about the pattern of collaboration, the respondents'

accounts expanded on various aspects of the worth of transnational collaboration with mainland colleagues. Notably, most respondents saw their role as facilitating the domestic system integrating into the international academic community.

According to the medical professor (CRU11), more collaboration was "needed" for China's faster development. To him, it was the "rigorous research tradition" that made a difference, not technology or equipment. He believed the overseas scholars could bring the Western research tradition back to China. Reflecting on his collaboration with a Chinese Academy of Sciences (CAS) research institute, he commented, "If it were not for our collaboration, their [my collaborators] paper would probably have been rejected. The reason was we explored deeper and questioned ourselves more." Therefore, the collaboration led to a very satisfactory result.

The social science academic (CRU4) recalled his involvement in setting up the institutional collaboration with a 985 university in Xi'an. He noted that the mainland colleagues had no clear idea about what social science research was.

> We helped them build up the Department and a small-scale library. The professors here donated many books. The mainland colleagues wanted to teach bi-lingual courses and their students with more international exposure…Last time, we brought ten boxes of various English books for them.

In terms of student training, having noted that "the major difference was that the mainland students were weak in knowledge background and framework", he

worked painstakingly to set up dual degree programs at both undergraduate and master level.

Also evident was the respondents' accounts of their beneficial role due to their mainland collaboration. According to the respondents, the most obvious fruit were the "publication under joint authorship", the "joint research grant" and "their being included in special schemes for research collaboration". For example, the engineering academic (CRU8) shared his experience in maintaining and consolidating research collaboration with mainland counterparts. He said,

> My collaborator has some national research projects. We worked on his project and got one co-authored paper published, with the impact factor being over two. It is really good in Engineering. When I spent sabbatical there, we jointly applied for research funding from his university. We got the grant and it was under my name. We started a new project and worked towards better publications.

Interestingly, the sciences professor (CRU3) described the transition of his mainland collaboration from "spontaneous" to "formalized". At the beginning, he thought it was "natural" to collaborate with his Alma Mater and he had the research fund for international collaboration. Gradually, the context for collaboration changed. He described,

> Gradually, there were different schemes in China. I was once invited as senior visiting scholar to CAS. Now, our research collaboration has been formalized in that I am a member of their Overseas Innovation

Team, co-sponsored by SAFEA and CAS. We are now more focused on

joint research projects.

5.7.5 Influencing Factors

As discussed earlier, the respondents all expressed their interest in collaborating with mainland colleagues and enthusiasm for doing something for the motherland. Their communication and collaboration with the mainland academia, however, varied greatly (see Appendix F). While some veteran professors reported ninety percent of their international collaboration goes to China specifically, there were the ones who admitted China collaboration occupied a small share in terms of overall international collaborations. In parallel with the Australian case, the influencing factors were discussed at three layers: personal, institutional and systematic.

Personal level Factors

At the core of collaboration was a human relationship linking the overseas Chinese academic and the mainland scholars. The quality of this personal relationship was of primary importance. It requires an investment of time, to allow collaborators to surmount the differences across the systems and conceptual barriers. Personal affinity and trust between researchers was often most important for a successful cross border collaboration, according to some respondents. For example, the engineering academic (CRU8) noted that it would be very difficult to collaborate with mainland colleagues if there was no mutual understanding and trust.

My collaborator and I were classmates and we've known each other for years. It is very simple to work together. But without that, it takes longer to build up mutual understanding. Then the patience is gone if it takes longer.

Likewise, the youngest interviewee (CRU5) recalled the way he and his collaborators worked together, and his willingness to fit into their schedule since they had heavier family responsibilities. As he put it,

For example, there is the time difference between China and Canada. My collaborator has a child while I don't. So it is fine for me to work at night and he works in the daytime. Only friends can work that way.

In addition, the respondents observed that the similarity of the work style between the collaborators played a positive role in maintaining the relationship and resulting in successful collaboration. It was more like birds of a feather. A majority of the CRU scholars reported that their mainland colleagues had international exposure, which ranged from as long as PhD training together with years of working experience in the West, to as short as several months overseas sojourn. For example, the female academic (CRU7, Engineering) described the collaboration with her former classmate as "smooth" and "professional". She explained,

Although he [my collaborator] got most of his training in China, he had various international experiences. He was once a visiting scholar at Harvard. His experiences influence greatly the way he works.

Also evident in the interviews were respondents' accounts that their previous network in China could influence greatly their networking with the mainland colleagues. The academic (CRU4, Social Science) set up substantial collaboration with mainland colleagues, ranging from joint authorship to dual degree program, and reckoned that China accounted for ninety percent of his international collaboration. He attributed it to his network in the field in China, and explained,

> The mainland scholars in the field at my age are either my former classmates or my friends. They are either the department Chair, or the school Dean. The collaboration started from personal connections.

By contrast, the academic (CRU6, Social Science) who reported fewer collaborations with China, shared a negative experience in his effort to set up connection with the mainland colleagues. After attending an international symposium in Beijing, he found out that the mainland colleagues were just not interested although he was given the best paper award. As he put it,

> I planned to exchange with the mainland scholars since my research is on the role of new media in the spending habits of the Chinese consumers. I did not think they were interested in me. They were more interested in the Western faces instead of me. It was fine with me if they were not interested.

Of no less importance was the observation that they needed to "establish before collaboration", a view again echoing the Australian case. According to the respondents, it took an average of three to five years get tenure and promotion. This

was especially true of the two female academics. As the academic (CRU7, Engineering) described it,

> How can you set up collaboration without being established here? If you are not settled here, and you leave in a few years, your collaboration will crash as well. So it is very important that we establish first and then collaborate.

Institutional level Factors

In parallel with their Australian peers, CRU scholars found out that the Chinese academic community paid much attention to "brand" and "ranking" and they chose their collaborators "in the Chinese way". The two academics recalled their schools' not so successful match-making experience with major mainland universities. The engineering academic (CRU8) noted their (Canadian) geographical remoteness and lack of fame was the very reason for the lack of success. As he put it,

> Our new dean visited Tsinghua but Tsinghua showed no interest. We are a small and remote university. Tsinghua always focuses on the top-tier US universities, such as Stanford and MIT. Tsinghua has too many opportunities.

The agriculture academic reported that his school had some collaboration with a 211 university in Inner Mongolia. In accounting for this choice, he said, "This (Canadian) school does not want to collaborate with the top Chinese universities, since they already have so many overseas partners. They just don't care."

Further evidence of the role that raking plays was in the social science academic's (CRU4) response that mainland colleagues tended to collaborate with overseas scholars according to their institutional affiliation rather than on their academic performance. As he put it,

> The mainland colleagues pay much attention to the so-called prestigious universities. But not all the professors from the prestigious universities are top class. In some second-tier universities, there are high-class professors.

Leadership in general, and university or school level administrative power in specific, was noted by the CRU scholars as both a positive and negative experience. It can facilitate but also constrain the scholarly contact between the Chinese expatriate scholars and the home country. An observation that was reiterated was "no follow up" and "they prefer saying to doing". For example, the agriculture academic (CRU1) expressed the apparent enthusiasm to disseminate the leading edge expertise to the mainland colleagues (despite his disappointing grant application experience). But he noted that the mainland delegations were just in Canada for a quick look and there was no real interest. As he put it,

> Sometimes, we had very good conversation, with detailed programs discussed such as staff exchange. But when they came back, nothing happened. We were very surprised about it. When we talked about collaboration in the West, we did mean it. If it was not possible, we would inform our partners directly what happened.

The female academic (CRU7, Engineering) related both her positive and frustrating experiences with the mainland colleagues at the administrative level. She related that she was invited again by the 211 university (which, as indicated above, had turned down her job application years ago) because its new President wanted international collaboration. However, the discussion about collaboration was not fruitful. As she described it,

> I made careful preparations and did the presentation on what the opportunities and possibilities were. But when we talked about collaboration, I knew they were not prepared. They wanted it, but were not prepared. In fact, the control is in their hands since I gave them enough information. They are very slow to act.

Much evident in respondents' accounts was that CRU's emphasis on collaborating with China. Some noted that the university encouraged international collaboration to enhance its reputation. For example, the engineering academic (CRU8) related that their new Dean made two international trips, one to China and the other India. Other respondents related the university's stronger desire to recruit Chinese students. As the academic (CRU1, Agriculture) noted, "They are very much interested in recruiting mainland students, and even more so after the Chinese government implemented the CSC scholarship program."

One striking difference between CRU and ARU in terms of recruiting international students at postgraduate level was that there were more scholarship opportunities at CRU. Comparing the previous admission of and scholarship opportunity for the

mainland student, the medical professor (CRU11) said,

> Now, the discussion here is about how to attract more and better mainland student. The university is willing to provide some first-year scholarships to attract the mainland students due to their comparatively good reputation here.

Also notable, again paralleling the Australian experience, was the indication from some interviewees of the lack of institutional support and recognition, for the additional work entailed in establishing international partnerships. As the academic (CRU4, Social Science) put it,

> We need to teach and do research. We spend a lot of extra energy and time setting up collaboration with the Chinese colleagues. The collaboration brings benefits to this university and the Chinese colleagues as well. But there is no university level recognition or reward for the extra work we do.

System level factors

Most respondents noted a clear distinction in research environments, with one being described as "quick" and "quantity", and the other "steady" and "quality", and that this could affect their collaboration with the mainland colleagues. On one hand, the CRU scholars reiterated the striking development in the Chinese academic and research system. As the medical professor (CRU11) put it, "The research support is huge in China, and almost the same as compared to that in

Canada." On the other hand, they pointed to the unbalanced development of the Chinese research environment, especially at the soft layer, something that they felt would require generations of effort to cultivate and refine. Strongly resonating in the interviews was that the "key issue here is the academic environment in China".

For some, the lack of in-depth research in China was attributed to much more attention being paid to attaining quick results. Comparing the two systems, the female engineering academic (CRU10) noted that the advantage of the Canadian system is that there is no push to publish quickly, so there is concentrated and steady progress. As she explained,

> The huge difference is that the mainland colleagues have paid much attention to publish in certain journals. We do not emphasize that much, even for promotional purposes. Without the pressure of quick publication, it is helpful for us to focus on systematic research and produce better papers.

Likewise, the medical professor (CRU11) noted that more attention has been paid in China to quick results, instead of long-term benefits. He shared his experience in co-supervising the mainland students with his collaborator. There was the awareness that the work of most Chinese students is semi-processed because they work for a quick publication. Therefore, they cannot discover new phenomenon or produce significant results. However, "the practice in Canada is that we discuss, ask more and condense what we already have, and we have a better story," he concluded. Further, he showed great concern that the quick result ethos in the

mainland academia can affect the research performance of the returnees negatively. "In the Chinese system, the newly returned professors could be forced to produce quickly. But they have the capacity of doing good research work".

Another important aspect of the difference was research trends, with the Chinese system labeled as "more commercialized". As the engineering academic (CRU9) put it, "They stress the projects that meet the national need, and their work is more applied engineering and commercialization-oriented." Therefore, many respondents noted that their mainland counterparts were leading a busier life and often running for projects that brought lucrative benefits. The engineering academic (CRU8) gave a vivid description:

> My collaborator in a 985 university in Sichuan is very busy. He is busy with getting the money. I think the most important job for a Chinese professor is to run for money.

Comparing academic life in Canada with that in China, CRU11 (Professor, Medical) thought that life in Canada is more guaranteed and secure, and that salary differences between different academics are less. He pointed out that there is a different picture in China, where their income was partly related to their research output, including extra reward for publications in specific journals and additional income from a percentage of the research grant. In an evident allusion to some of the negative consequences of this more entrepreneurial ethos, he commented, "Here, when we have the research grant, not even a penny can we spend on ourselves. The Chinese rewarding policy causes side effects."

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Beyond differences in the research environment, another aspect of the systematic barrier that influences the effectiveness of academic communication and collaborator was the uneven development of the Chinese higher education system, according to respondents. On the one hand, interviewees observed China's striking development and contribution to the world knowledge network in certain areas, with leading researchers conducting frontier research. For example, the science professor (CRU3) observed that the mainland colleagues produced better work with increasing international influence due to the Chinese government's huge investment in research. He believed that the younger academics as overseas degree holders would contribute more because they knew how to work with the overseas scholars particularly because of their stronger communication skills. As he explained,

> When your work has reached certain level, you need to tell others what you have done and they will be interested in learning from you and working with you. Then, your position is different.

Likewise, CRU7 (Female, Engineering) and CRU5 (Male, Social Science) were highly appreciative of the work done by mainland colleagues in their area. The female academic (CRU7) noticed the upward trend in terms of papers published by the mainland scholars in the core journals in the area. The social science academic (CRU5) commented, "The research work of the Peking colleague is part of an upward trend in terms of papers published by the mainland scholars in the core journals in my area."

Nonetheless, there was the recognition that the frontier of the research has been

dominated by the West, or sometimes Japan, and there is the difference in research quality at mainland universities. This perception could be categorized by the narrative codes from the interview data such as "the underdevelopment of the specialty" and "the limited involvement". For example, CRU1 (Male, Agriculture) commented that colleagues in Japan and the US did similar research, with Australia joining the team soon. He explained that the researchers in the field did research from different perspectives based on the similar core technology. "But there is zero research in China," he concluded.

Similarly, CRU11 (Male, Medical) noted that the research in his area in China was at the initial stage. He explained that he was in DNA repair, and that after the relation between DNA repairs with cancer was substantiated, there was a boom in his area. According to him, "China has been slow in this area, and there are fewer scholars in the field. Hence, they want to recruit someone from abroad to build up this discipline".

Another observation was of Chinese scholars' limited involvement in the world academic community. CRU9 (Male, Engineering) made a comparison between the development of his area in China with that in the US. He thought the gap was "huge", with one system being meager in terms of researchers and publication, while the other one remaining the world core. He explained the situation, "In North America, the research has been developed for nearly four decades. The research began at the same time as they implemented the Apollo plan." He further commented that, while "Development takes time… China is catching up very quickly."

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Likewise, the social science academic (CRU5) pointed out that the refusal rate of the mainland Chinese scholar's paper was still "99.9%". He explained,

> In our area English is very important. I as a Chinese cannot understand their paper. I think they hire the professional translator who did the translation literally.

Interestingly, the female academic (CRU7, Engineering) noticed that the research work of the mainland colleagues was good but the way they presented their work was not that good. "Not only their English was problematic, but also the way they displayed their research result and organized the slides," she explained.

5.8 Conclusion

My interviews with Chinese knowledge diaspora working in the regional Canadian university, largely in parallel with the Australia study, support the conclusions of the previous research on Chinese professionals in the United States (see, for example, Wong, 2006; Sun, 2009) in terms of thickening the connectivity between the two ends, with more density in research collaboration. They continue to identify with their Chinese background despite their legal status in the hostland as Canadian citizens or permanent residents. They maintain the core Chinese cultural values such as being low key and hard-working, and consider their Chinese background as part of their self-identity. They believe that their success is mainly up to their capacity, with an advantageous environment that enables them to advance and excel. When there arises the occasion, and under the right circumstances, they are happy to share their Chinese knowledge and transnational insights with their

colleagues in the homeland as well as the hostland.

Of particular interest across both cases is the senior professors' perspective on contributing to the home country for the reason that they are the generation who experienced the social turmoil in the Cultural Revolution, and thereafter the Tiananmen Square incident that may ensue the loss of confidence in the Chinese government, and the recent two decades of China's striking progress in the economic, social and scientific arenas. A deep affiliation towards "motherland" transcends the interviews, and the keenness to contribute is particularly strong. Again, it is the concerns about children's education, the concern about career stability (there has not been the tenure system in China and the returnees have not been given a continuing contract), and more importantly the concern about the indigenous research system that makes them hesitant to return.

As compared with the ARU study, the female academics at CRU report that their experience might be a less gendered one in terms of collegial support and recognition. CRU7 and CRU10 have been working at CRU for five and seven years respectively. When the interview was conducted, CRU10 was the Canada Research Chair. It might be too harsh to conclude that CRU provides a better environment for female minority academics to grow and excel. Nonetheless, with the respondents being the highly skilled and highly mobile capital, the recognition and respect from the professional settings, including peers, the academic unit, and more of the institution as a whole seem to be of great importance (Bilimoria et al., 2006). Also noticeable are the female academics' accounts on their spending a tremendous amount of time on their research and teaching, with the former being the dimension

where they can excel.

Another aspect requires attention is the less stratified higher education system in Canada, as compared with that in Australia. From the participants' accounts, CRU is a research intensive university, with several of its disciplines performing well at a national level (see the agriculture professor's reflection for example). Also, most CRU academics report they lose quality postgraduates more to the United States, rather than within the country. A more detailed account on the performance of Canadian universities has been presented in a recent report by Jarvey and Usher (2012). Documenting that Guelph is in the top ten in social sciences, Rimouski is in the top ten in science, and Simon Fraser makes the top ten in both, the two scholars conclude the U-15 do not by any means form a monopoly of the top spots in either field. However, the situation is changing with the recognition that academic reputation is the key to attracting international talent, investment and collaborations in a highly globalized higher education sector. The undergirding rationale is that if every institution is funded equally they will sink to the level of mediocrity rather than any rising to the top.

Chapter Six   Discussion and Conclusion

6.1 Introduction

The purpose of the study is to understand the intellectual diaspora, and diaspora knowledge networks between the Chinese intellectual community in Australian and Canadian universities with both the home country and overseas Chinese scholars elsewhere. This purpose dictated the methodological approach used to navigate the contours of the study. Specific techniques used to gather data on experiences of research participants were semi-structured in-depth interviewing. The data-gathering techniques yielded a rich volume of extensive descriptions of experiences of research participants which are categorized and thematically analyzed under the various research questions (as explained in Chapter One).

Information in this concluding chapter is organized as follows: summary of major findings (including cultural identity, professional identity, gendered experience and diaspora knowledge network dynamics), limitations, and recommendations for future research, and conclusions.

6.2 Cultural Identity

The discussion and interviews have illustrated the fundamental role of ethnic background in forming and maintaining an individual's identity and social perspectives. Many participants alluded to their strong sense of cultural/ethnic identity and its persistence in the new cultural context. Their stories illustrated how,

especially when socialization has occurred within another cultural community, cultural background and ethnic identity continue, at least to some degree, to define their perspectives, behaviors and affiliations. The persistence of an ethnic/cultural group's sense of identity, community affiliation and maintenance of language, suggests the powerful force of ethnic/cultural background and strong motivation for building up closer academic ties and contributing to the homeland.

Rather than a pure term, identities are socially bestowed, sustained and transformed, as a product of mixing and fusion (Scott & Marshall, 2005). Chinese is no exception, and Chinese culture is one of the greatest and longest lived civilizations in human history (Tung, 2000). More importantly, China is a unique country that has been strongly influenced by Confucianism for thousands of years, with almost no colonial, and at most a short-term capitalist regime in its recent history. Confucius' theme was one of moral harmony, benevolence, righteousness, courtesy, wisdom, honesty, loyalty, and filial piety (Zhang, 2013). Confucius' philosophy of ethical humanism was rooted in the value of personal virtues based on a hierarchy of superior-inferior relationships: rulers to subjects, father to son, husband to wife, elder brother to younger brother, and friend to friend (Fairbank & Goldman, 2006, p. 52). The Chinese language is also a totally different language from Western languages. Unsurprisingly, when being asked to choose a language for interview, Chinese or English, 21 out of 22 academics chose Chinese because they regarded it as what they are most familiar with.

My research finding corroborates previous research in that, no matter their age, gender, background or past experience (leading, in some cases, to very negative

reflections) in China, the first generation Chinese knowledge diaspora would like to help their motherland. This perception among the participants varied for a number of reasons, from the time spent in China and overseas, to family and children, and the intensity of their connections to China (Yang & Qiu, 2010). In the ARU and CRU, there are interviewees, mainly the senior professors, who reported a mainland-collaboration history of more than two decades. At that time, China was one of the world's economic laggards (Shukla, 2011), and its science community lagged far behind the West, and their role was more a contributor. The major reason for their desire to help has been attributed to their being Chinese, and a sense of obligation to China. Chinese migrant academics of a younger age indicated less substantial mainland collaboration because they feel the need to build up their profile in the Western academia before engaging in too much collaboration.

Very evident in the interviews has been the ethnic pride among Chinese knowledge diaspora, in that they saw their Chinese background as an advantage albeit acknowledging language as a major barrier in the adopted society. They believe in the essence of Chinese traditional culture, such as great respect for age, seniority, and authority. They follow the basic spirit of "truth-seeking" (Confucian advocated "don't pretend to know what you don't know"), "self-improvement" and being "tolerant to diversity" (Han, Xie & Wang, 2012). They report the strong influence of the traditional cultural values on their mentality, and suggest that it played an active role in helping them out in the face of hardships. After studying Chinese professional immigrants in Silicon Valley, Wong (2006, p. 225) comments,

The Chinese Community in Silicon Valley is an American community whose members live in different municipalities and participate in the economic, political and social life of America. This community is composed of people of shared Chinese culture and historical heritage as well as enclaves in which the members usually participate in ethnic business.

Arguably, for one thing, they aspire to become permanent residents and citizens and make efforts to integrate into mainstream society, professionally, socially and politically. For another, they maintain and promote their cultural heritage in their own way.

It is understandable that China's distinguished culture is the most critical force for Chinese knowledge diaspora to build up networks with China. Nonetheless, it was indicated during interviews that the Chinese knowledge diaspora in either country found the cultural integration, more specifically the Anglo-Australian/Canadian dominance that is significantly different from their native culture, the most difficult. With all participants completing their first degree in China, they report that they feel comfortable with academic communication, but uncomfortable to some degree in terms of Australian/Canadian culture. This echoes Yang and Qiu's (2010) research on Chinese migrant professors in Australia. The scholars found that the Chinese academics feel comfortable and confident at work although they do not think they have been fully integrated into the so-called Australian mainstream society. In this sense, difficulties of cultural adjustment would ultimately drive them to maintain certain ties with China.

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Equally important in the current study is the ethnic affiliation to China among the Chinese knowledge diaspora that transcends the geographical choice of place to live and work in Australia/Canada. During the interviews, they express their care for the future of China and Chinese people. They continue to believe that China is home although in some respects they feel more comfortable working/living in Australia/Canada, and feel fine within the multicultural context. As Cohen (1997, p. 517) remarks, "…the space for multiple affiliations and associations that has been opened up outside and beyond the nation-state has also allowed a diasporic allegiance to become both more open and more acceptable". The language of diaspora emphasizes the importance of homeland and entails fluidity, trans-nationality and economic-driven characteristics that emphasize the equal importance of hostland and the social transactions between homeland and hostland (Wong, 2006). A more nuanced understanding of the migrant academics' profound emotional and psychological bonding with their native society indicates that some of their emotional and psychological needs have gone unmet in Australian/Canadian society. In this regard, the study supports largely Sun's (2009, p. 33) research on transnationalism of ethnic Chinese scientists in the United States.

Zhu's (2009) research on the Chinese academic diaspora in the US reveals that cultural identity not only strengthened their motivation for academic ties with China, but also enhanced the intensity and quality of their academic ties. Her study also shows the influence of cultural identity on their academic ties, regardless of their background of discipline, age, life stage, academic rank, or length of time residing in the United States. To a larger degree, this study echoes her findings.

However, there are some practical considerations at a personal level reported that may restrict the implementation of such good will. It is of particular concern for those early career academics needing to establish themselves in the new system before beginning to collaborate. This finding echoes other research work in the field (Choi, 1995; Welch & Zhang, 2008a).

6.3 Professional Identity

Professional identity, as one's professional self-concept based on attributes, beliefs, values, motives, and experience (Ibarra, 1999; Schein, 1978), encompasses how individuals understand themselves, interpret experiences, present themselves, wish to be perceived, and are identified by the broader professional community (Lieff et al., 2012). It does not answer the question of "who am I at the moment?" but "who do I want to become?" (Beijaard et al., 2004; Clarke, Hyde & Drennan, 2013). The concept of professional identity is both individual and social, so that people are not only stronger because of their expertise and their own moral and conceptual frameworks, but also performing a range of roles which are strongly determined by the communities and institutions of which they are members (Kogan, 2000, p. 210). Becher and Trowler, in their influential work, conceived disciplinary cultures and forms of knowledge disciplines as having recognizable identities and certain cultural attributes, which they described as an "academic tribe." Therefore, "being a member of a disciplinary community involves a sense of identity and personal commitment, 'a way of being in the world', a matter of taking a cultural frame that defines a great part of one's life" (2001, p.47). Specifically, academic identity

generally relates to teaching and research activities that are subject or disciplined based (Deem, 2006, p.204). It is commonly located in the academic department where academics work cooperatively on research, curriculum design and teaching (Trowler & Knight, 2000).

Although most migrant academics speak positively about their identity as Chinese Australian/Canadian, defining their relationship with China being special, they appreciate the opportunity to engage in cutting-edge scientific research in the adopted societies. When asked about the underlying reasons for their decision to stay in Canada or Australia, all the respondents listed the opportunity to do science in the West as the greatest attraction. In general, they regard Canada or Australia as a much better place to do science than the domestic system. For the Chinese knowledge diaspora, their professional identity is situated within the Australian/Canadian academic community and plays an integral role in their well-being and productivity. For them, the academic profession in the West possesses a set of common values across disciplinary and institutional boundaries, including "academic freedom, the community of scholars, scrutiny of accepted wisdom, truth seeking, collegial governance, individual autonomy, and service to society through the production of knowledge, the transmission of culture, and education of the young" (Kuh & Whitt, 1988, p. 76; and see also Welch, 2005).

Chinese migrant professors expressed great appreciation for the Australian/Canadian academic system. They consider the Western scientific system, on the whole, fair, transparent and stable. They have a high respect for the mechanism that emphasizes academic performance and meritocracy, rather than

Guanxi and seniority. They feel more secure after they gain tenure and can focus on research without distraction. Being at the center of world scholarship (more the case in Canada), they have easier access to resources, such as relevant databases, the most recent publications, and leaders in the field to discuss research, exchange and provoke ideas. During the interviews, they indicated their academic pursuit can be generally defined as two valued goods: high research productivity, and the scholarly recognition or visibility that hopefully accompanies it (Stephan & Levin, 1992). Even as a minority faculty, they believe that their contributions will be recognized and fairly rewarded if they work hard and give their best, mostly due to the multicultural system and diversified surroundings.

Moreover, most participants suggest that they would not achieve that much in terms of research output if they were in China, though they acknowledge the fast pace of development in science and technology in China, together with huge investment. For them to do science, a sound environment conducive to authentic and rigorous work seems to be of the greatest importance; it is more attractive than financial impetus. Unsurprisingly, the interview data to a larger degree confirm previous research on the comparison of the two research cultures (Cai, 2011; Zhu, 2009), the recruitment and promotion procedures, and the quick-result ethos that negatively affects the Chinese higher education and research systems. These will be discussed in detail later as most participants categorize the above-mentioned issues as hurdles to effective collaboration with the mainland colleagues, and key determinants affecting their return passage.

A successful academic career requires a life-time of commitment, long working

hours, geographical mobility, entrepreneurial skills, and more importantly, sustained research productivity to gain promotion to the highest rank (Baker, 2012; Brooks & MacKinnon, 2001; Jencks & Riesman, 1977; Lucas, 2006; Mohrman et al., 2008; Sagaria, 2007). Discourse on migrant academics is developing. There have been studies investigating the difficulties of surviving in a predominantly white academy due to poor mentoring, disproportionate advising and service loads, an isolating work environment, and the lack of scholarly recognition given to research on ethnic minority populations (Turner & Myers, 2000; Turner, Myers & Creswell, 1999; Washington & Harvey, 1989). A recent study on racial stereotypes of East Asians in North America shows that East Asians are less likely to be promoted to managerial positions compared to Whites and other racial minorities, even in fields in which they are overrepresented such as science and engineering (Berdahl & Min, 2012). According to the two scholars, the reason is that the racial stereotypes are prescriptive and descriptive and are likely to serve to keep East Asians in subordinate organizational positions and undesirable social roles in the workplace.

More specifically, studies on the Chinese migrant professionals in Silicon Valley have revealed the dissatisfaction with their status (Saxenian, 2003; Wong, 2006, p. 23-30). Chinese professionals are disadvantaged in competing with their white colleagues due to their lengthy background in the home country. Their careers are affected by language, cultural and social drawbacks. Complaints about discrimination in the workplace are common among Chinese professional immigrants (Wong, 2006, p.23). Reports show that Chinese professional

immigrants receive less pay and fewer promotions, even though they may be better educated (Shinagawa & Kim, 2008). The "glass ceiling" is recognized as a primary source of frustration among Chinese professional immigrants in the US (Saxenian, 2002a; Wong, 2006). Sun's PhD work on Chinese migrant scientists in the USA echoes the major finding in the literature. He found out that the Chinese migrant scientists are less likely to take up leadership positions at the senior level. The reasons seem to be three-fold: First, their disadvantage in language competence and cultural knowledge prevents them from taking up administrative positions. Second, the Chinese virtue of modesty puts them at a disadvantage when competing with assertive, self-promoting native-born colleagues. Third, they are minorities in the host society, which jeopardizes their social capital and power (2009).

The interview data confirm largely the previous research on Chinese knowledge diaspora and their perspectives on the glass ceiling. In both cases, the Chinese academics admit there is little space for further promotion once they become a full professor or a senior scientist at ARU/CRU. Leadership positions open to them are head or director at departmental/school level. They have mixed feelings in terms of the so-called glass ceiling in their career advancement in Western academia. For higher-level administrative positions, strong communicative and interpersonal skills are required. Such findings rationalize the lack of Chinese faces shouldering decision-making responsibilities.

Also evident is the respondents' reflection on the lack of recognition in terms of their contribution to extending China relations, such as "no university level

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recognition or reward" and "not been extra valued" raised by ARU3 and CRU4 in the previous chapters. The dramatic development in Chinese higher education with special reference to S&T, coupled with the internationalization of higher education systems presented more opportunities in terms of student recruitment, and prestige promotion in the Chinese system. However, their efforts have been undervalued by their home institution. According to many of the interviewees, the subtlety and complexity of the stereotyped perceptions towards their ethnic background plays a role in this. Nonetheless, they largely do not view the glass ceiling as racial discrimination, as they acknowledge the benefits of the multicultural campuses and the Australian/Canadian society at large. Most see the ARU or CRU as a level playing field where they can pursue academic career development. They believe that self-improvement and hard work, the essence of traditional Chinese culture, can be the way out.

6.4 Gendered Experience

"The under-representation of women at the top of the academy is a persistent and fascinating issue, mostly analyzed as a result of women's choices or as an issue of personnel management" (Benschop & Brouns, 2003, p. 194). Although highly skilled migration and its outcomes of brain drain (Potts, 2005), brain gain (Johnson & Hayes, 2004) and brain competition (Abella, 2006) have been widely documented in academia, this phenomenon has been mainly focused on the male experience (Koftman et al., 2000; Sang, Al-Dajani & Ozbilgin, 2013). Likewise, research focusing on migrant academics (Corley & Sabharwal, 2007; Hugo, 2005;

Potts, 2005; Welch & Zhang, 2008b; Yang & Welch, 2010) has been increasing, but remains comparatively small in relation to available studies on other migrant professionals (see for example Saxenian's work on immigrant entrepreneurs). Furthermore, the available literature is often parochial – for example, research that specifically addresses migrant academics specializing in business and management is limited and US-centric (Borjas, 2000; DeAngelo et al., 2005; Ehrenberget al., 2004). While women remain largely invisible in this discourse, a handful of articles addressing migrant women in academia are gaining increased attention (Bailyn, 2003; Czarniawska & Sevon, 2008; Sang, Al-Dajani & Ozbilgin, 2013; Skachkova, 2007).

It is important to note that the academic profession requires large investments of time and energy. Apparent in the current adage "publish or perish", the academic either performs or is out. In this sense, the quantity of scholarly work that academics produce is absolutely critical to success. However, impact on the field through scholarship is achieved not only by sheer quantity of research, but by its quality and its usefulness to others—typically indicated by the prestige of the journal of publication or the number of citations the paper has garnered (Leahey, Crockett & Hunter, 2008; Wanner, Lewis & Gregorio, 1981). Moreover, higher education policy initiatives are heavily structured around teaching quality assessment and research assessment. Therefore, professional identities have emerged that are externally defined through accountability and efficiency. An academic must mostly fulfill multiple roles—teaching, research, and giving service both to the university and to the profession—and that increases the pressure. There

are often long periods before any output appears. Running an experiment, doing a field study, writing a book, are not things that can be achieved quickly, hence by Weick's definition (1974), it is a profession with a very heavy overload. Another aspect of the career that increases the psychological demands is the tenure timetable: needing to prove that you are this expert in the first six to seven years of a career, creates more difficult demand.

Much evident in the literature is that the academic profession is gendered, with the female academics at a disadvantage. It has been argued that the norms which are assumed to operate in academia mean that promotion and mobility opportunities should accumulate more quickly for the most productive workers in terms of contribution to the discipline's body of knowledge, one of the most important measures being research productivity (Longet al., 1993). Especially for academics, these different amounts and types of capital are bound up with family responsibilities (Fox, 2005), geographic moves and constraints (Rosenfeld & Jones, 1986), and institutional locations (Allison & Long, 1990; Xie & Shauman, 2003)—all of which help explain gender differences in career outcomes. Moreover, gender differences are important in relation to access to networks. For women in academic life, professional networks have remained highly gendered, with women experiencing greater difficulty than their male colleagues in establishing and maintaining high-level network ties (Rogers, 2000).

Although in the study the number of the female Chinese migrant academics was relatively low (despite strenuous efforts on the researcher's part), the significance lies in that they had achieved success by adopting the Western traditional career

model, which is dominant within the academy, and had not made steps to challenge it. Since those women academics stood at the intersection of gender and ethnic disadvantage, their lived experience was encouraging, but it took much longer to recruit them and settle upon an interview timetable. The interview data with the four female academics corroborate the previous studies on female academics and those on Chinese migrant academics. During the interview, they admitted that they give total priority to work and family and have no outside interests or responsibilities, and combining parenting with academic profession is extremely difficult. "Sacrificing" (*xi sheng*) and "Come on, or maintaining the momentum" (*jia you*) have been the recurring terms when they talk about wifehood and motherhood.

Interestingly, the female academics report both positive and negative experiences of their work within Western academia. The female academics, as a whole, feel comfortable within their department, and institution. To a larger extent, they believe they have been fairly treated in terms of workload, and promotion. For example, CRU7 (Engineering, Associate Professor) has been very satisfied with the collegial environment in terms of maternity leave, fair treatment and respect from colleagues. However, the senior lecturer in social science (ARU4) reported that her Chinese background and credentials obtained in China have been challenged when she sought the Dean's endorsement for promotional purposes. It is interesting to note that she is located in the social sciences, a discipline that is still predominantly white and male, and requires substantial cultural understanding. Others expressing very positive feelings about the departmental and collegial support are from

science and engineering, and they indicate that their department is very international with foreign faculty from Asia, East Europe and Latin America. The research data corroborates Bilimoria and his associates' (2006) finding in that women tend to derive greater satisfaction than men from academic work where there is an inclusive work environment characterized by respect and appreciation of the contribution of all staff.

Referring to their academic profession, the women indicated that they need to work x times harder compared to their colleagues, mainly the native-speaking males, to get promotion. They have their own survival strategies. They suggest that in-depth knowledge of a topic is helpful in terms of writing efficiency and the likelihood of getting the paper accepted for publication. In terms of teaching, they indicate that their being Chinese put them at an advantage since they can prepare and teach from a comparative perspective. Although language is an obvious barrier, the students will be interested in the content, when they know the teacher is a very serious one. While talking about mainland collaboration, they suggest the factors affecting such collaboration are "building up before collaborating", "family obligation", and more interestingly, "the lack of departmental/institutional recognition". While female academics have made considerable progress, there are still cultural, political, organizational and social obstacles that prevent them from reaching their full potential (Machado-Taylor, 2013).

6.5 Diaspora Network Dynamics

Diaspora knowledge networks are essentially the specific knowledge networks

connecting expatriate intellectuals with each other, and with their home country. Despite their invisibility and intangibility, the significance of these networks in strengthening the innovative capacity of developing countries has been reiterated in the literature (as explained in Chapter two). China is a good example of recent research into the importance of distributed or diaspora research networks (Meyer & Wattiaux, 2006). The underlying fact is that the previous academic networks established in China could have an effective role to play in stimulating research collaborations, especially since the 1990s when China started to boost the integration of its scholarly circle into the international community. The Chinese intellectual diaspora are ideal agents to liaise between Chinese and Western academic communities, and assist the mainland scholars to enter into the global knowledge system by joint projects and publications in international mainstream journals. This has been repeatedly confirmed by a number of participants generally, and by one interviewee who is a highly established professor in Engineering (ARU11). Such knowledge bridges are a significant part responsible for China's rapidly rising scientific stature (Li, 2005).

6.5.1 Why Collaborate with China

This population of China-born doctorates in science and engineering has become well-established in academic careers in Australia and Canada, and is at an average age where its members are highly productive or at a point in their careers where they are building or expanding their institutional bases. They have maintained ties with the mainland universities and institutes, although some report more than others, the 77 and 78 (the year when they began their college), for example. They

have been motivated by a variety of incentives for maintaining and continuing transnational collaboration.

Much evident in the research data has been the cultural and ethnic propensity, non-instrumental orientations characterized by enduring emotional affiliation and desires to see China succeed (Suttmeier & Cao, 2006; Zhu, 2009; and as explained above). Specifically, the senior academics expressed a special obligation to help China's scientific development and assist talented mainland colleagues into active participation in international science. Meanwhile, the younger professors indicate some instrumental concerns for the recruitment of good graduate students and access to low-cost research services, concerns for visibility in China, and access to Chinese financial resources. A younger academic in Engineering (ARU7, Lecturer) indicates his China "base" helped substantially in building up his career in Australia in terms of research grants, and quality and quantity of joint publications.

Another important reason is the feeling of being undervalued and insufficiently connected. The migrant academics established in the West often see their potential as not fully utilized, and their local collaboration as reasonable but cold. However, collaborating with the mainland colleagues and students may afford them a strong sense of personal and professional fulfillment in terms of being needed and respected. The recognition and respect of this sort enable them to utilize fully their human capital in terms of "sum of an individual researcher's professional network ties, technical knowledge and skills, and resources broadly defined" (Bozeman et al., 2001, p. 636).

Interestingly, the migrant professors report the mainland colleagues, mainly from the top-tier (985) Chinese universities, have stronger incentives for identifying collaborators in Australian and Canadian academy, for the improvement of research capability and enhancement of visibility in the international academic community. A majority of the respondents report publication under co-authorship and joint research with the mainland colleagues (as discussed earlier). This has helped operationalize the top Chinese universities' ambition to integrate into the world knowledge system with the encouragement of international collaboration that are necessary to promote excellent, and leading edge knowledge production.

6.5.2 Who to Collaborate with

More evident is that alumni networks produce a future channel of professional communication and research collaboration. Based on this study's interviewees, alumni networks often provide the starting point for a formalized partnership. Importantly, alumni shared the identity of the university. They had a kind of "natural bond" with colleagues from their *Alma Mater*, and were more committed to forming a partnership with these mainland colleagues. Nonetheless, some respondents have mixed feelings regarding building up collaboration with their old universities. For those graduates from prestigious universities such as Peking and Tsinghua University, though typically very proud of their home university, it is not always easy to set up a substantial research relation. The reason is because of the intensely hierarchical "branding" concept among Chinese universities (as explained below).

Another aspect requiring attention is that they are more inclined to collaborate with those mainland colleagues who have previously studied and/or worked in a foreign country. Several respondents identified their collaborators through research training that they gained while studying for their PhD abroad or holding a postdoctoral position. That sometimes occurred when the mainland colleagues worked in the Western academy as a visiting scholar. Specifically, travelling to the scientific center for advanced learning and work experience is thought to have been an important conduit for scientists in semi-peripheral countries throughout the past decades (Jonkers & Cruz-Castro, 2013). Researchers with foreign work experience will tend to publish more and higher impact papers than their compatriots without such experience (Jonkers & Cruz-Castro, 2013). Furthermore, it enables the mainland colleagues to share the common language of sciences and form reasonable expectations when collaborating with the migrant academics (see also Leung, 2013).

Interestingly, several CRU interviews in science and engineering indicate more collaboration with Chinese knowledge diaspora in the US than that with the mainland colleagues, while ARU interviewees tend to indicate more work with the mainland colleagues. Apart from geographical proximity (see for example Allen, 1977; Hagstrrom, 1965; Hoekman et al., 2010; Katz, 1994; Kraut, Egido & Galegher, 1990), the US is still the world's scientific center. It is justifiable that successful collaborations help to deliver publications, which yield recognition (van Rijnsoever & Hessels, 2011). Although the Chinese government has substantially increased its investment in S&T infrastructure and funding to scientists in recent

years (R&D funding has been rising by around 19 per cent annually for a number of years), most Chinese scientists still face significant budget constraints in comparison with their counterparts in industrialized countries such as the US (Leung, 2008). In this sense, the interview data substantiate the previous research on reasons for individual research collaboration, including access to expertise, access to instruments, cross-fertilization across disciplines, improving access to funds, obtaining prestige or visibility, learning tacit knowledge about a technique, pooling knowledge for tackling large and complex problems, enhancing productivity, and increasing specialization of science (Bozeman & Corley, 2004; Katz & Martin, 1997; Melin, 2000; Rafols & Meyer, 2007; Tang, 2011).

6.5.3 How to Collaborate

The pattern of research collaboration between the migrant academics and their mainland colleagues can be categorized by Laudel's (2002, 2001) typology as follows: (1) collaborations involving a division of labor, in which the collaborators share a common goal and divide the creative labor among them, (2) service collaboration, in which one partner sets the goal and performs the creative labor, whereas the other partners perform routine work, (3) transmission of know-how, typically when a researcher requires the help of a colleague, (4) provision of access to research equipment, (5) mutual simulation, involving a free exchange of ideas without focus on a particular goal, and (6) trusted assessorship, when colleagues act as accepted and friendly critics in the publication process.

One interesting finding is the correlation between age and the variation in terms of

their role in the mainland collaboration. The senior professors (ARU1, ARU11, CRU4, and CRU11) in their 50s indicate a gradual transition from being a contributor more towards a collaborator during the past two decades of substantial experience in collaborating with the mainland community. This parallels China's S&T capacity development over the same period, and becoming both an important contributor to the world's science and technology, and the world's largest educator—in quantitative terms—of scientists and engineers (as explained in Chapter Two). The senior professors have witnessed the skyrocketing changes in China's research system. At the beginning of that time, China's research system was dominated by government research institutes operating under a central planning system. University research was weak, research in industrial enterprises was minimal, and notions of competitiveness and meritocracy, and peer-reviewed grant-making were very underdeveloped (Suttmeier & Cao, 2006).

Another aspect requiring attention is that the diaspora knowledge network is reciprocally beneficial, with the migrant academic and mainland colleagues on an equal footing. Some highly appreciate their mainland collaboration due to its effect on quality research and productivity. This concurs with China's determination to build up world-class universities, and designates a key role and focal investment to a handful of its top universities. Through national programs such as 211 and 985, China has been explicitly selecting its best universities for intensive investment, with the expressed aim of making them world-class within the coming decades, and contributing more to overall R&D and scientific development. The latest development was the creation of the so-called C9 (paralleling similar developments

such as the G8 in Australia, the UK's Russell Group and the Ivy League in the States). By 2020, according to its *Medium and Long-Term Program for Education Reform and Development 2010–2020*, several such universities should be at or near world-class level (Yang & Welch, 2010).

Based on my observations, the Chinese knowledge diaspora interviewees had mixed feelings regarding the transnational networks. Interestingly, those who benefitted most from networks placed greater value on the ongoing relationships that they develop with the mainland colleagues, much more so than the short-term, immediate "publication" or "prestige" gains, e.g. an honorary title from a mainland university. This is not because they neglect the impact of prestige in the domestic science community. The more important reason, according to ARU7 (Engineering, Male), is that "Building trust is not easy, and more difficult in developing a collaborative relationship". They view these transnational networks as capital for long-term development, rather than assets to acquire short-term gains.

6.5.4 The Benefits of Collaboration

Empirical research suggests knowledge networks serve as conduits for the flow of global knowledge into local contexts (Stein et al., 2001) and have the potential to solve problems by 'converting the loss of human resources into a remote although accessible asset of expanded networks' (Meyer & Wattiaux, 2006, p. 5). Central to this statement is the bridging role of the scientific diaspora in leveraging the asymmetry of the international knowledge network (as discussed in Chapters One and Two). The Chinese knowledge diaspora presents a major and striking showcase.

Large numbers of Chinese students and scholars have gone abroad for advanced training and are remaining abroad. While constituting a brain drain, increasingly the brain drain is less a zero-sum phenomenon and more of a positive sum experience, as suggested by the concept of brain circulation (Suttmeier & Cao, 2006).

More pertinent to the study are the benefits of transnational networking in facilitating the development of Chinese higher education, the most important of which are that collaboration brings together different complementary assets and knowledge either at the level of individual academics or in terms of subject matter in which the respondents are expert. Many of them built transnational knowledge networks to foster information exchanges, sharing facilities, co-authoring scientific publications, co-supervising postgraduates, informal contacts and even formalized institutional partnerships. Senior professors contribute in terms of constructing the discipline, establishing research norms and mentoring the mainland early-and-mid career academics. This substantiates previous work in Chinese knowledge diaspora:

> Brain circulation is of critical importance to the 'giant periphery' of China, which is increasingly seeing its knowledge diaspora as an important resource that it is keen to deploy, in the interests of the development of the motherland (Welch & Zhang, 2008b, p. 519).

The benefits of international research collaboration have been widely documented in the literature (see above and Chapter Two). Specifically, international collaborative relationships that result from international mobility may also have an

effect on productivity (Defazio et al., 2009). Co-publications are frequently used as a proxy for research collaboration (Katz & Martin, 1997). It is particularly useful as an indicator of international research collaboration, since in contrast to intramural collaboration this is usually acknowledged in co-authorships (Katz & Martin, 1997). Not only is the trend towards a greater number of international collaborations in the production of scientific papers, but evidence also suggests that there is a strong correlation between international collaboration and impact, at least in terms of citations (OECD, 2011c).

Kostoff and his associates (2008) reveal that Chinese scientists produced 18% of the world's publications in nanotechnology in 2005 (not including many "home" or Chinese-written journal papers that were unrecorded in SCI). Over 90% of these research articles from Chinese scientists were coauthored papers. "China-only publications" (research publications with authors from China but no other countries) had a median citation of 4 (which means that only four other scientists cite a Chinese paper on average). In comparison, the median citation was 12 for "US-only publications". For "US-China publications", the median citation was 10. In this way, international collaborations enhance the prestige of Chinese science actors in terms of publication. Specially, bibliometric analysis of co-authored articles supports the importance of ethnic ties on productivity (see also Jin et al., 2007).

Also evident is that the mainland collaboration cannot be defined as contributing, but enjoying and harvesting. A promotion in academic rank can be seen as a reward a researcher receives for his or her research success. Although lacking

causality, it is evident that collaboration and academic promotion co-evolve over time (van Rijnsoever & Hessel, 2011), in terms of conducting the right type of research, engaging in the right type of collaboration and publishing a paper with higher impact. The two senior professors (ARU1, Social Science and ARU11, Science) make a highly illustrative case. They indicate their mainland collaboration started with ARU, and has continued for more than two decades, all the way to full professorship. Higher academic rank often leads to more collaboration, but collaboration is also an important resource in the advancement of an academic career (van Rijnsoever et al., 2008).

6.5.5 Influencing Factors

Based on my study, the reflections and perceptions of those Chinese knowledge diaspora, and their position and positioning in the Western academic system, their collaboration with the mainland academic community and their contribution to the motherland is neither that easy nor predictable. This is, notwithstanding the Chinese governments' unremitting efforts to attract them back home, their deep-rooted emotional affiliation with China, and pronounced intention and interests in contributing to the homeland.

Much has changed in the context in which the diaspora knowledge network now operates, and understanding the implications of this changing context will be important if future achievements from this transnational collaboration are to be realized. Among the more important factors requiring specific attention are the following:

The collaborator

Knowledge/research networks, national or international, are as good as the individual scientists that constitute them, and it is not networks that collaborate, write joint papers and undertake research, but the scientists themselves. Therefore, the roles of the partners influence the process and the results of research collaboration. Not all partnerships produce desirable results. Whether a partnership could be formed and sustained in the first place depends on the perception and position of a particular scientist. Generally speaking, whether at the ARU or CRU, the respondents recognize the value of working with the mainland colleagues, and express their readiness to contribute this network.

Arguably, the participants have mixed feelings about their mainland collaborators in terms of maintaining the density of the transnational academic network. Based on observations made during this study, a significant part of network benefits for the mainland colleagues is the availability of network partners itself. This availability of networks allows them to gradually find out what possible benefits exist, and how these benefits may be materialized. ARU8 (Engineering, Lecturer) makes an observation on the relative virtues of the mainland collaboration and collaboration with overseas Chinese elsewhere.

> Within China, you have a lot of pressure regarding deadlines and tangible results. . . . However, there is more freedom when you collaborate with overseas researchers.

More generally, forming a transnational academic tie may not bring about

immediate benefits. Instead, the mainland colleagues need time to learn more about the network partners after the network has been in place. For most respondents, the quality of inter-personal relations, and shared understanding of benefits and responsibility seem to be important for a successful transnational collaboration experience.

The issue of ranking

Unsurprisingly, one theme recurring in the interviews in both Australia and Canada that may affect the transnational collaboration negative is mainland scholars' obsession with "*rankings*". Despite the fact that the best universities may not be those which best match the criteria established by the different rankings and that the university ranking does not tell the strength of the areas of study, mainland colleagues generally choose the partner on the basis of its standing on the list. According to the participants, both ARU and CRU emphasized the China-collaboration (with special reference to the Mainland) on the dimension of internationalization, mainly due to the interest in recruiting mainland students and enhancing their prestige in China. However, in most cases, the attempts would not lead to satisfactory progress (as detailed in Chapter Four and Five). The participants attributed the not-so-successful experience partly to the Chinese preoccupation with "status" and "ranking".

Status competition is not new in higher education – rivalries have long existed among colleges and universities, particularly in the United States. The starting point for the ranking of universities and higher education institutions is normally

regarded as the early 1980s, when the *U.S. News and World Report* magazine began to publish a ranking of American universities. The expansion of rankings in higher education has occurred in parallel with a very considerable growth in the number of organizations in the higher education sector. Therefore, rankings have become increasingly popular, since they represent a way of organizing and simplifying a complex reality by classifying higher education institutions in terms of one or more measurable criteria (Swedish National Agency for Higher Education, 2009, pp. 11-13).

Given the importance attached to both education, and to hierarchy, within Chinese culture, it is no surprise to find that the most reliable measure of research rankings is now Chinese – the Shanghai Jiaotong Academic Ranking of World Universities (ARWU). This echoes in the current study. Prevalent in the literature (Altbach, 2013; Welch & Zhang, 2008a; Yang & Welch, 2010), and much evident in the interview data is that the mainland Chinese colleagues laid great stress on academic ranking, which therefore affected the selection of their partners. In both cases, the respondents recalled unsuccessful match-making experiences with the prestigious Chinese universities, such as Tsinghua and Peking. For years, Chinese scientific institutes suffered from a perceived low status in the international academic community. More generally, academic institutes sought to raise their status by partnering with high-status ones. In particular, Chinese scientists affiliated with academic institutes of low status had to overcome substantial trust barriers to publish in Euro-American journals and magazines (DiTomaso et al., 2007). Collaborating with a higher-status institute in Euro-American countries is

often regarded as an effective means to raise one's visibility, and global standing (Leung, 2013).

The preoccupation with ranking is also inevitable when consideration is given to the central government's explicit ambition to make a handful of its best universities world-class within the coming decade (*Medium and Long Term Education Development Plan 2010-2020*). Nonetheless, Salmi (2009) suggests three features, i.e. concentration of talent, abundant funding and appropriate governance as distinguishing characteristics in building high-ranking universities. One of the common pitfalls in developing a world-class university is to be too ambitious for quick results (Salmi, 2010). This has been substantiated by Yale University's former President Levin,

> Developing top universities is a tall order. World-class universities achieve their status by assembling scholars who are global leaders in their fields. This times time. It took centuries for Harvard and Yale to achieve parity with Oxford and Cambridge and more than half a century for Stanford and the University of Chicago (both founded in 1892) to achieve world-class reputations (2010, p. 67).

Context compared: Australia vs. Canada

More pertinent to the point is the respondents' reflections on being less resourceful in terms of quality research students and research funding at different levels as compared to their mainland colleagues. Most noted that the lack of resources may affect their research work and career development. Interestingly, this was regarded

as more of an issue for the engineering academics at ARU since the institute was undergoing a transition from more teaching oriented to research intensive (as discussed in Chapter Four).

A more complex picture has been evolving as detailed discussions accumulate. The respondents at ARU indicate obvious disadvantages regarding competing with two major universities (both in Go8) in the metropolitan areas within the state, in terms of recruiting the best research students, domestic and international, and collaborating with the mainland colleagues (as explained in Chapter Four). Somewhat differently, the migrant professors at CRU viewed their status being overshadowed both by the major universities within the country, but even more by the major universities in the giant neighbor to the south. U.S. higher education has been particularly successful in attracting and retaining global talent, and it has been long the No. 1 choice for mainland students to study overseas (as discussed in Chapter Two and Five).

Clearly evident in the accounts is a hierarchy of institutions in both Australia and Canada, and that universities at global level are being exhorted to become more entrepreneurial and attuned to competition (e.g., Clark, 2000). One indicator is the spread of the "ranking mania" in higher education. Established universities are competing ever-more ferociously for 'star' researchers and are mounting ambitious fund-raising campaigns in an effort to improve or cement their high ranks (as explained in Chapter Two and see also Geiger, 2004; Kirp, 2004). The hierarchy of rankings is stiffer in some nations than others, and more powerfully felt in some places than others, but exists everywhere in some form (Marginson, 2006a).

As universities become self-directed corporations responsible for their own outcome, their status and resources are determined by their positions in the national and international hierarchy. Disparities will be widened by ever-increasing competition as suggested by notions of "Matthew effects" in higher education (Trow, 1984). For instance, intermediate institutions, combining some high value scarcity with some low value access places, find it difficult to move up the status ladder because of the limit on the number of prestige producers (Marginson, 2006a). Competition in the Australian system is shaped by federal government policy and financing, including policy-engineered markets.

There are four main groupings of Australian Universities, including the Group of Eight (Go8), Australian Technology Network (ATN), Innovative Research Universities (IRU) and Regional Universities Network (RUN). Specifically, Go8 universities collectively account for over two-thirds of the research undertaken at Australian universities, and attract the highest levels of industry and competitive government grant funding for research. Of the HERDC (Higher Education Research Data Collection) income, Go8 universities received $2,119 million (69.0%). Income from ACGs (Australian Competitive Grants) in 2010 amounted to $1,313 million of which Go8 universities received $972.9 million (74.1%) (Go8, 2012).

By contrast, the Canadian system is less differentiated, with universities being governed by Provinces and funded largely with public money (Jones, 2014). Most Canadian universities assume a comprehensive form, providing a range of programs to general populations, and engaging in broad forms of research.

Furthermore, Canada lacks a set of internationally renowned elite institutions on par with the Ivy League or Oxbridge. The practice of ranking is relatively new to Canada, with the Maclean's rankings originating only in 1991, and the sense of a national-level status competition being relatively novel (Davies & Hammack, 2005). With few world-ranked universities and less extreme concentration at the tip of its hierarchy, the distribution of resources among Canada's universities is less stratified and marked by fewer dominant outliers (Davies & Zarifa, 2012, pp. 145-150). Also noticeable is that there are 23 Canadian universities in the top 500 SJTU-listed HEIs, and 4 in the top 100, with the Australian data being 19 and 5 respectively. Interestingly, CRU rates at 201-300 for 2013, while ARU is not listed as among the top 500 (ARWU, 2013).

Although hierarchy is less evident than in the Australian case, the stratified structure in Canadian higher education has been confirmed in the literature (see also Davies & Zarifa, 2012; SNAHE, 2009). More self-evident is the top slots in the ranking list. For example, Australia still has seven universities in the top 100 of the QS ranking, but several of its lower-ranked institutions have dropped this year. The same is true in Canada, where Toronto has overtaken McGill to become the country's highest ranked university for the first time since QS World University Rankings were launched in 2004 (QS, 2013). Canada's universities have pushed for a strategic investment in excellence to position Canada as a world leader in research and innovation, and they welcomed the government's initiative in boosting support to research (Seidman, 2014).

China's scientific progress

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Most cited are the participants' accounts of the substantially positive role of China's S&T rise on their mainland-collaboration. The recurring theme is that the dramatic development of China's S&T, coupled with the internationalization of higher education systems presented an opportunity (as discussed in Chapter Four and Five), and more so in terms of beginning to right itself after one of the worst global economic crises in recent memory, and after a long history of economic underdevelopment since World War I (Fairbank & Goldman, 2006). Political conflicts and other economic problems within the country, including the Cultural Revolution, have made Chinese political leaders extremely eager to strengthen the country (Ding, 1994). Science and technology development has always been a top priority in China's national developmental plan (Cao et al., 2006). As the Chinese economy prospered in recent years, Chinese political leaders have expressed increasingly strong sentiments to become a recognizable world superpower in high-tech science. Chinese research policy is currently based on two main documents: the *Medium-and Long-term National Plan for Science and Technology Development 2006-2020* (policy guidelines) and China's National *S&T Development Plan for the 12th Five-Year Period 2011-2015* (implementing measures).

The influential MLP represents the Chinese science and technology strategy for the first 20 years of the 21st century, in which promoting scientific and technological development in selected key fields, and enhancing innovation capacities, are the two main priorities. It can be seen as offering a framework for cooperative initiatives especially if the priorities of the plan—basic research and high

technology—are seen as offering particular avenues of collaboration. The five-year development plan sets out the goals for scientific and technological development. It proposes the realization of a national innovation system, highlights the role of innovation as a driving force for development, and underlines the importance of enhancing independent innovation capacities.

The past ten years have witnessed astonishing progress in the science and engineering fields. Investments in scientific research in absolute dollars have increased strongly, (about 19 per cent annually over recent years) (State Statistical Bureau of the PRC, 2006), and China is now the world's third largest producer of peer-reviewed research articles after the European Union and United States. Of the world's 827,705 articles published in 2011, researchers in the combined 28 European Union countries produced 254,482 articles (31%), the United States 212,394 (26%), China 89,894 (11%) and Japan 47,106 (6%) (NSF, 2014). Meanwhile, China has been rapidly raising its research and development (R&D) intensity by devoting more money to science and technology. R&D intensity is the proportion of gross domestic product allocated to scientific research and development. China's research and development intensity—which accounted for 1.98% of GDP—has "increased sharply" and caught up with the combined European Union proportion of expenditure of 1.96% (van Noorden, 2014). While in absolute terms, China's R&D spending is still almost one-third lower than that of Europe, if current rates of increase are maintained, the gap will narrow markedly in the coming years.

Although the reorientation of China's economy displays its soaring ambition, the

simple expansion of research and development does not necessarily indicate innovation (Kigotho, 2014; van Noorden, 2014). Despite success in some areas, notably high-speed rail, solar energy, supercomputing, space exploration, and quantum information processing (Xinhua News, 2013), China's national "Nobel complex" has been coined for the obsession to distinguish itself and being recognized for its scientific accomplishments (Osnos, 2011). A study by the Institute of Scientific and Technical Information of China (ISTIC) investigated the changes in China's scientific power and influence since 2002. According to that report, among the 19 major countries China ranks 4th in national scientific strength, but only 13th in worldwide scientific influence (Global Times, 2010).

Science and Engineering Indicators 2014 identified the quality of higher education in science, technology, engineering and mathematics—STEM—as critical to providing the advanced work skills necessary to strengthen an innovation-based economic landscape. US academic institutions are preparing the next generation of science, engineering, and mathematics professionals, and conduct about half of the nation's basic research, giving them a central position in the nation's research and development system. In this regard, the US awarded the largest number of science and engineering PhDs (33,000) of any country followed by China (31,000), Russia (16,000), Germany (12,000) and the United Kingdom (11, 000) in 2010. But China leads the world when factoring in doctorates in the biological, physical, Earth, atmospheric, ocean and agricultural sciences and computer sciences. Also available are statistics revealing that in 2010 more than 5.5 million first degrees were awarded in science and engineering worldwide, with students in China forming

about 22% against the European Union's 17% and the United States' 10%.

As a major source of new technology, Chinese universities are becoming active participants in regional economic development. They are part of China's science and technology system and a major source of new technology. This is especially the case for China's top universities, particularly for institutions with strength in engineering (Yang & Welch, 2012). Once competing between themselves without looking at their international peers, China's top universities now have embraced a larger international sense of themselves (Marginson, 2006b). This echoes China's obsession for building up world-class universities. China has made steady progress, with 42 universities being listed in the 2013 ARWU top 500, rising from 30 in 2008.

However, the whole picture displayed by the most recent Global Competitiveness Report is not that promising. According to the report, China's competitiveness ranking remains stable at 29th position in 2013. On a more positive note, China's macroeconomic situation remains favorable (10th), and it receives good marks in health and basic education (40th). However, the assessment is more negative when it comes to higher education (70th) because of China's low tertiary education enrollment, the average quality of teaching, and an apparent disconnect between educational content and business needs (54th). Finally, China's innovation capacity (34th) has been improving recently, but much remains done for it to become an innovation powerhouse (Schwab, 2013). The scientific league tables are not just about prestige—they are a barometer of a country's ability to compete on the world stage.

Disciplinary differences

One of the aspects that emerges most clearly from this study is the sharp differences between the views expressed from different disciplinary backgrounds, and more specifically between the social sciences and the natural and technological sciences. Critical to the point is that the development of social sciences is significantly slower than that in natural sciences in China (Zhou, Thijs & Glanzel, 2009), and thus it tends towards under-representation and invisibility in international scholarship.

For social science participants, they were more concerned about whether the research work of their mainland colleagues falls within the mainstream paradigm, the generalizability of research results due to the research methodology employed, and the lack of empirical research/practice (as explained in Chapter Four and Five). The younger social scientist (CRU5) observed that the rejection rate of mainland Chinese scholars' papers in the field was strikingly high. These narrative accounts would mirror the persistence of core-periphery distinctions as regards the development of social science research, but also the greater difficulties of publishing in English for social scientists, as well as the very different intellectual traditions, frameworks and modes of argumentation between China and the West. Despite the globalization of research in general and research collaboration in particular, peripheral regions have not become better integrated in the world social science system over the past two decades (Frenken, Hoekman & Hardeman, 2010, pp. 144-148).

Western dominance in the social science production is not only obvious from a linguistic standpoint. English is the global language of social science, and is used extensively by non-Anglophone academics. Therefore, the linguistic advantage has enhanced their countries' competitive advantage in social science, and in related businesses such as publishing (as detailed in Chapter Two, and see Ammon, 2010, p. 154).

Also evident is that only four countries - the USA, the UK, the Netherlands and Germany - produce two-thirds of the social science journals registered in the most comprehensive databases. In the last decade, North America alone produced more than half of the social science articles registered in the Thomson SSCI database, followed by Europe as the second largest producer, accounting for almost 40 per cent of the world's social science articles (Frenken et al., 2010).

Nonetheless, Jonkers (2010) revealed the increasing internationalization of the Chinese social science research system, with a specific focus on the impact of scientific mobility on this process. More specifically, the returned social scientists are contributing to the enhanced international visibility of the Chinese social science research system. They are also said to play important roles in the financial and insurance sector, as well as in think-tanks (see for example Li, 2006). In this regard, my research findings corroborate the pertinent literature as regards to the role of intellectual diaspora in the enhancement of visibility of the Chinese social science system.

Research culture

Scratch faintly at the surface and the gaping cracks appear. A Royal Society (2011) report on the global science landscape found 70 percent of the 1.06 million Chinese who studied abroad between 1978 and 2006 did not return. The cream of Chinese talent is still hungry for a life overseas. Statistics show that, over the past three decades, Chinese students have been the top foreign recipients of doctoral degrees in science and engineering from the US universities. Upon receiving their PhDs, nearly all the students indicated their intention to remain in the US—more than 90 per cent have managed to stay (as explained in Chapter two). During the interviews, although they commented that they could gain higher professional titles and authority, and more resources if they returned, they enjoyed their stay in the Australian/Canadian system. The key reason is that they believe it offers them a better environment to do research that has nothing to do with fame-and-grant seeking.

It is the Chinese research environment that makes them uncomfortable, and sometimes apprehensive. As true scholars, they are eager for greener pastures in the pursuit of academic integrity and truth. A handsome package is certainly attractive, but is not the top incentive to those who have established themselves in the Western system. It is the research environment that allows them to focus on their research with less administrative interference. They need a more transparent and merit-based system that they know they can succeed in, if they work hard. They know they can get a grant based on what they know, instead of who they know. The Chinese complicatedness and subtlety has been their foremost headache since they have been away for so long, and for some it is the very reason that they

leave the country for a plain and more straight-forward environment.

Guanxi

An item deeply wrought by Chinese culture, *Guanxi* is used to describing complex and subtle personal relationships (Chen, 2004). Literally, *Guanxi* can be translated as relationships or connections (Seligman, 1999; So & Walker, 2006; Su & Littlefield, 2001, p. 199-210; Yeung & Tung, 1996, p. 54-65), though this translation can hardly capture the potential depth of *Guanxi* relations. At the micro level, Alston (1989, p. 26-31) characterizes *Guanxi* as a type of special relationship between two independent persons, entirely committed to each other, and therefore personal and obligation involved. Moreover, *Guanxi* denotes the establishment of long-term reciprocal personal relationships that can create enduring trust (McNally, 2011).

Westerners see *Guanxi* as "using" others which, according to Western morality, is unethical. But in China, "using" a relationship creates an obligation to do something at a later date. As long as you eventually fulfill that obligation, you are considered ethical (Vanhonacker, 2004, p. 53). Something of this is captured in the old cliché, 'it's not what you know, it's who you know'. Highly illustrative is the Agriculture professor's (CRU1) unsuccessful experience in grant application. According to the interviewees, it is true to a lesser extent in Australia or Canada, but in China it's everything—the difference between success and failure, fortune and poverty. They indicate herein lies the root of the ambiguity and complexity surrounding a back passage to success or failure, which is fuelling uncertainty

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within the Chinese knowledge diaspora.

In September 2010, two prominent Chinese scientists, Rao Yi of Peking University and Shi Yigong of Tsinghua University, published an editorial in the journal *Science* that alleged that factors such as personal connections, rather than meritocracy, are often influential in determining who receives large research funding. China remains a society that revolves around personal relations, or *Guanxi*. According to the scholars, after spending a long period overseas, academics are unlikely to have maintained a strong set of personal business relationships, which in turn reduces their access to sources of research funding. Nonetheless, a significant proportion of researchers in China spend too much time on building connections and not enough time doing research, or training students (instead, using them as laborers in their laboratories). Some become part of the problem: They use connections to judge grant applicants and undervalue scientific merit (Shi & Rao, 2010).

Although it is too crude to conclude that the use of *Guanxi* extends to the entire academic and research community (Chao, 2013), there are indications that funding and evaluation systems suffer some distortion in terms of how the grant, notably how the megaproject grants from various government funding agencies, are disbursed. Shi and Rao (2010) warn that the top-down approach in the determination of grant application guidelines stifles innovation and make clear that the connections with bureaucrats and a few powerful scientists are paramount, dictating the entire process of guideline preparation. Chao (2013) substantiated the two scholars' concern, and urged that the rules and dynamics for research funding

application and implementation need to be re-evaluated, revised and enhanced.

The press for instant results

Also evident is the participants' concerns regarding China's technocratic rush, "publish or perish" and its negative impact on the robustness and integrity of Chinese sciences. The underlying driving factor seems to be China's obsession for quick results, and zero tolerance of failure. This observation makes the re-integration of the Chinese knowledge diaspora more difficult and uncertain, since doing science and writing for publication is a painstaking endeavor that needs time.

The extremely competitive environment of contemporary academia and research puts pressure on academics and researchers to perform in a way that values outcomes rather than effort and efficiency. Clearly, not all research projects can have positive outcomes and a negative result can and should also often be considered as a research outcome. However, in a system that does not tolerate 'failure' in research terms, there are few incentives for researchers to risk exploring the unknown. Consequently, Chinese scientists are more likely to conduct research that yields quick and achievable outcomes, rather than fostering grander aspirations for the advancement of knowledge. This situation is improving: a special amendment to the law on the progress of science and technology was passed in late 2007, acknowledging that failure is part of the innovation process. Despite this, however, there remains tremendous pressure on scientists for quick results.

In China, the academic level of a university or an institution is evaluated mainly on the number of SCI (Science Citation Index) papers, EI (Engineering Index) papers,

ISTP (Index to Scientific & Technical Proceedings) papers and the research grants it receives (e.g. "973" from the National Natural Science Foundation, "863" from the National High Technology Research and Development Program) (Shao & Shen, 2011). Many universities and institutions use lucrative rewards to encourage staff to publish more and better papers that reach a top international academic journal (Wickham, 2012 and as discussed earlier). The skewed research effort may result in distortion and corruption of the publication system. There is growing evidence that plagiarism, fraud and manipulation of data are interwoven through China's research process. Qiu (2010) argues that the latest in a string of high-profile academic fraud cases in China underscores the problems of an academic-evaluation system that places disproportionate emphasis on publications(see also Cyranoski, 2012; Wu, 2010).

Clearly, a growing volume of research publications does not necessarily mean an increase in quality. China may be prolific, but the number of papers by Chinese scientists that are published in such top journals as *Nature* and *Science*, while growing, still lags far behind that in the West (Wickham, 2012). One key indicator of the value of any research is the number of times it is cited by other scientists in their work. Although China has raised in the "citation" rankings, its performance on this measure lags behind its investment and publication rate (Shukman, 2011). China has also achieved far fewer citations in papers that result from international collaboration. According to Fu, Frietsch and Tagscherer (2013), the USA ranks first in terms of the difference between citations share and publications share, with a value of 14.6% in 2009, followed by Great Britain and Germany. However, the

reverse applies to China as it produced 8.9% of citations but 12.2% of publications. In terms of the observed citation rates (OCR), China ranked 78th in 2009, the highest point based on the OCR, but it is largely different from the ranks based on publication number and citation number, which are second and fourth respectively (2013, p. 7-8), implying that China's papers have not received the same impact in the international scientific community.

Academic freedom

Also evident are the participants' accounts of how the lack of academic freedom in the Chinese domestic research system constrains the originality and impact of the work done by the mainland colleagues, and may constitute barriers to (further) transnational collaboration. As knowledge producers positioned in Western academia, they feel that academic freedom is a core value and fundamental prerequisite for an effective university, and the higher education community must place academic freedom at the forefront of concern (see also Altbach, 2007; Levin 2010). Although some observed that China is progressing, the issue of academic freedom in terms of the advancement of academic career in the mainland universities has been one of the main determinants that affect their China collaboration, and more importantly their return passage.

The first and foremost dimension, according to respondents, is academic freedom (as revealed in Chapters four and five), which allows them to decide which subject areas they focus their research on, the research methods they adopt, with whom and for what purpose they pursue their research, and the methods and avenues by

which they disseminate, make accessible and possibly commercialize the findings of their research. They need to follow international and national laws and institutional ethical codes (see for example Ren & Li, 2013). Nonetheless, there are doubts that the allocation of research funding is meritocratic (Shi & Rao, 2010) in that there is little encouragement for skepticism towards existing theories, especially when those theories are propounded by senior academics that hold the departmental purse strings (Cao, 2013b).

More importantly, China's attitude to free thinking and obedience to authority is hurting its scientific progress. In China, there is a much higher respect for authority, and in science this is not good. The Chinese academic system binds students to their mentors. Mentors are authority figures as formidable as strict parents, and to challenge them is unacceptable. This blind loyalty discourages criticism of senior academics and the science they advocate (Cao, 2013a). It is universally agreed in China that a significant reform of pedagogy is needed in universities. The old tradition of rote learning and uncritical adherence to established texts, reinforced for millennia by the much criticized examination system, is widely seen as detrimental to independent problem-solving and creative thinking that is central to innovation capacity in the new knowledge economy. Some reforms have been introduced into leading institutions such as Tsinghua, but more needs to be done (Yang &Welch, 2012).

Political considerations in Chinese academia may also act as deterrents. Even though it is understood that China cannot expand its economy without the participation of social thinkers and public intellectuals, certain types of social

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science research are regarded as politically sensitive (Cao, 2013c). In this case, the observation is that the national top-talent recruitment plan, for example, Thousand Talent program (*Qianren Jihua*, 千人计划) and Ten Thousand Talent program (*Wanren Jihua*，万人计划), has put particular weight on natural scientists, rather than social scientists (except economists). The senior socio-political scientist (ARU1), who deemed himself a trouble-maker to the government, is highly illustrative of the lower weighting attached to the social sciences. In a similar vein, CRU4 (Social Science, Associate Professor) noted the difference in the work done by some social scholars after they returned.

Interestingly, when referring to China's obsession with Nobel in science, Cao, a veteran researcher on the Chinese research system, concludes,

> In rewarding those who confer the "greatest benefit on mankind", the Nobel Prize in science embodies an appreciation and celebration of not merely breakthroughs, discoveries and creativity but a universal set of values that are shared and practiced by scientists regardless of nationality or culture. It is recognition of the latter that can achieve the former… These core values of truth-seeking, integrity, intellectual curiosity, the challenging of authority and, above all, freedom of inquiry are shared by scientists all over the world (2013b).

That is to say, the success of government efforts to attract individuals capable of steering China along a path of sustainable development will be judged on whether it can create a robust research culture in which every scientist, both overseas and

home trained, has the opportunity to demonstrate their value.

6.5.6 A nuanced stance

China is a unique country in which studying abroad is closely related to the development and prosperity of the nation. The positive role of the returnees trained overseas (usually in the West) in nation building has been widely documented. The history of Chinese studying overseas largely supports the statement mainly due to China's repeated defeats by Western powers in the 19th century and the attempts of China's intellectual elite to develop a new cultural and national identity. Often cited are those in China's modern history, to illustrate how influential they could be in the historical course of China's modernization (as explained in Chapter Two). However, insufficient attention has been paid to what and how those people failed to accomplish. Central to the point is that they chose Western patterns as the prescription for dealing with the problems of Chinese modernization, and failed to integrate this into the dominant trends of Chinese civilization.

Now, China is being carried to a new stage of modernization. There is the realization that China's many dilemmas in various dimensions of the society are at least partially due to their unsuccessful learning from the West, and partially due to the radical attitude adopted by the intellectual elites towards traditional Chinese civilization and values. The lesson to be drawn from history is to avoid learning from the West in a scattered manner. Only by learning comprehensively rather than one-sidedly from the West can some of the essence of Western civilization be learnt. In a similar manner, returnees from Western societies are double-edged swords.

They could be a quite positive force in China's development, while they could also be a major force to further enhance "Westernization" within China. This observation coincides with the official announcement of "Opinions concerning Further Strengthening and Improving Propaganda and Ideology Work in Higher Education under New Circumstances" (The Central Committee General Office & the State Council General Office, 2015), the latest of a series of documents aimed at imposing stricter discipline and control in China's academia. Arguably, one of the main reasons is that it has internationalized more than any other professional group in China.

6.6 Limitations of the Study

This thesis has some limitations with respect to the sample, which may affect the gerneralizability of findings. The target population did not cover overseas Chinese (*Huaqiao,* 华侨)academics working in prestigious universities in Australia and Canada (although this has been treated as part of a wider project). The sampling frame narrowed its focus to comprehensive, non-metropolitan, middle-ranged universities in Australia and Canada. This study also suffered from a small sample size. In each case, 11 Chinese mainland academics were recruited for interviews. The sample size of Chinese knowledge diaspora positioned in Australian and Canadian universities is quite small, and the findings related to this group of knowledge diaspora, while clearly potent and largely paralleling other research, are not conclusive. While a larger number would probably have made the findings more convincing, recruiting a large number was not feasible in the case of this

study, given the fact that the percentage of the Chinese migrant academics at ARU and CRU was not large. The selection bias in terms of discipline, professional ranking, age cohort and gender has been reduced to some degree thanks to the weighting method outlined in Chapter Three.

Although theoretical saturation evolved from the process of the constant comparative method, a limitation of the study existed in that thorough saturation may not have occurred from the data compiled. One illustration of this putative limitation was reflected in the collection of documents. The documentary evidence used in this study offered richness, yet there were some limitations regarding access to all pertinent documents requested in each case. Data were collected from multiple sources including interviews, scholars' academic resume and publications, and other written documents regarding their experience of scientific interaction with China. Although a majority of the data for this study was obtained from the interviews, information from written documents provided important complementary information in interpreting the perspectives of the respondents.

Thirdly, while gender was an important issue in this study, there was a strong gender bias evident in the participants, particularly so in the overseas participants, the majority of whom were male. Given the discussion in the previous chapters, and that most of the overseas Chinese academics have been working in the natural and applied sciences, it was not entirely surprising to find males outnumbering females. Despite this low proportion of female scholars among all potential informants, two female academics at each institution finally accepted the invitation and shared their experiences of being positioned in Western academia and building

up the transnational research network with their mainland colleagues.

6.7 Recommendations for Further Investigation

Considering the limitations of this study in its sample size and distribution, the following topics for future study are suggested. First, it would be interesting to compare Chinese indigenous scholars' views regarding diaspora knowledge network with Chinese overseas scholars. The main reason is that the mainland collaborators had been conceived by the overseas scholars as one of the influencing factors as regards sustaining successful collaboration.

Second, it is important to investigate the perceptions and experience of the administrative staff, in both the home and host institution, regarding the dynamics of this transnational knowledge network. This would help gain a better understanding of influential factors pertinent to the diaspora knowledge network, and of the wider system and the role of the Chinese knowledge diaspora.

Third, the gendered experience and lived stories in the academic profession in Australia and China requires greater attention. Given the constraints of time and financial cost, only four female scholars were recruited in this study. Although female scholars at the Australian and Canadian institutions of higher education constitute only a small proportion of Chinese overseas scholars, gender differences in terms of understanding the role of knowledge diaspora and the diaspora knowledge network with China could be an important question for further and in-depth exploration.

Finally, while this study focuses on Chinese academics at middle-ranged Australian and Canadian universities, a parallel study could be done in the United States which still attracts and retains the vast majority of top researchers. It would also be interesting to examine to what degree the differences and conflicts of social values in the two giant systems exert an impact on the transnational knowledge network.

The diaspora knowledge network between the Chinese migrant academics and their mainland colleagues are closely surrounded by exchanges and conflicts of academic and culture value of two academic communities that have been deeply embedded in the societies. The context of social, political, economic and educational values tends to affect the transnational knowledge network. However, due to limitations of the interview data, this study was unable to explore relationships between the properties of the diaspora knowledge network and the contextual factors at both ends. Further study on the identity of the knowledge diaspora in the cultural and professional dimension will be required for a better and thorough understanding of this group of highly educated and highly mobile human capital, who are so central to the development of innovation capacity in the knowledge-based economy.

6.8 Final Remarks

The rise of the knowledge economy and the increasing impact of globalization are two often-cited drivers for the recent increases in academic mobility. Academic mobility is to some extent an old wine in a new bottle, and more recently the rise of global knowledge diaspora, and migratory patterns from the periphery to the core,

have been considered a problem for development. This parallels the emergence of a global market for academic talent. It is part and parcel of economic globalization on the one hand, and a race for the best and brightest, fuelled by a greying academic professoriate in many developed countries, and the need for highly skilled human capital in developing countries, on the other (Jacob & Meek, 2013; Wildavsky, 2010). Managing brain drain is basically a matter of leveraging research networks (Turpin et al., 2008). The importance of cultural and social factors inherent in the structure of particular knowledge networks has been highlighted (Varga & Parag, 2009). Meanwhile, the positive effects of highly skilled diaspora on their home country, and transnational knowledge networks have also been explored.

This in-depth study on Chinese knowledge diaspora and the diaspora knowledge networks operating between Chinese intellectual diasporas and mainland investigated the role of the knowledge diaspora, the dynamics of diaspora knowledge network with a special reference to the influencing factors regarding maintaining such transnational knowledge network. The findings show how the Chinese knowledge diaspora perceive self-identity in both the cultural and professional milieu. They suggest the powerful force of ethnic/cultural background and strong motivation for building up closer academic ties and contributing to the homeland. Nonetheless, it is not surprising that they perceive themselves scholars in the West given their expressed sentiments that doing science in the West is their primary source of satisfaction. They contribute their scientific achievements to the Australian/Canadian scientific systems without reservation, although also willing

to contribute to China's scientific development.

The participants' accounts regarding their academic ties were rich and detailed. The interviewed scholars reported a variety of academic interactions they had established with the Chinese academic community, which have been categorized into professional communication, joint publication, joint research, and student/staff exchange, with the level of importance of the channels documented (Appendix F). Specifically, the interactions include attending and organizing academic conferences, running seminars and symposiums in China, educating students and recruiting students from China, collaborating in research projects, establishing joint research centers, and publishing in China, as well as providing peer reviews, working as academic committee members, adjunct faculty and visiting scholars. While some scholars had one kind of interaction, most of the interviewed scholars had multiple types of academic interactions with China.

Depending on their academic fields, professional status, personal experience, and other factors, each scholar developed academic ties with China in a unique way. While some academic interactions might look the same, the motivation behind the interactions varied and the intensity of these networks was different. Consequently, the effort they spent on their academic interactions was not the same, and the resulting impact on the Chinese academic community varied accordingly. Therefore, the same academic interactions are likely to have different effects, and the scholars' academic ties should be categorized differently, considering specific contexts. In summary, much of what they spoke about consisted of their describing, categorizing or evaluating various academic interactions.

The scientific culture in China is quite different from that in the Western academia. Focusing on the issue of research culture in China—almost inescapable themes in discussion about Chinese universities were the issue of *Guanxi*, the pressure for instant results, and a more complicated context for academic freedom. Entrenched political and social barriers as well as financial incentives for publication further hinder progress. Nonetheless, China's scientific progress over the past decades provides a multitude of opportunities to contribute and succeed. Leading scientists can play an important bridging role in leveraging global science for local development when they see a space to give full play to their potential.

This study has contributed to four main themes of knowledge: internationalization of higher education, knowledge diaspora and diaspora knowledge network, world system and development, and cultural discourses with special reference to highly skilled mobility. The abovementioned play an important role in building the understanding of Chinese knowledge diaspora and the diaspora knowledge network. Further study into the impact of knowledge diaspora on higher education and science development in China is still required. Gender experience in knowledge networking is still sparse. The current study of the potential of Chinese female knowledge diaspora adds a dimension to the mobility of the highly skilled. Cultural dimension will require further examination.

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Appendix A: Ethics Approval

The University of Sydney

NSW 2006 Australia

Human Research Ethics Committee
www.usyd.edu.au/ethics/human
Senior Ethics Officer:
Gail Briody
Telephone: (02) 9351 4811
Facsimile: (02) 9351 6706
Email: gbriody@usyd.edu.au
Room 313, Level 3, Old Teachers College – A22

Human Secretariat
Telephone: (02) 9036 9309
(02) 9036 9308
Facsimile: (02) 9036 9310

23 June 2008

Professor A. Welch
Faculty of Education and Social Work
Education Building – A35
The University of Sydney

Dear Professor Welch

I am pleased to inform you that the Human Research Ethics Committee (HREC) at its meeting on 17 June 2008 approved your protocol entitled *The Chinese knowledge diaspora: communication networks among overseas Chinese intellectuals*

Details of the approval are as follows:

Ref No.: 10490
Approval Period: *30 June 2008 – 30 June 2009*
Authorised Personnel: *Professor A. Welch*
Dr. R. Yang
Ms. Z. Zhang

The HREC is a fully constituted Ethics Committee in accordance with the *National Statement on Ethical Conduct in Research Involving Humans-March 2007* under *Section 5.1.29*

The approval of this project is **conditional** upon your continuing compliance with the *National Statement on Ethical Conduct in Research Involving Humans*. We draw to your attention the requirement that a report on this research must be submitted every 12 months from the date of the approval or on completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent for the project to proceed.

Chief Investigator / Supervisor's responsibilities to ensure that:

(1)   All serious and unexpected adverse events should be reported to the HREC as soon as possible.

(2)   All unforeseen events that might affect continued ethical acceptability of the project should be reported to the HREC as soon as possible.

(3)   The HREC must be notified as soon as possible of any changes to the protocol. All changes must be approved by the HREC before continuation of the research project. These include:-

- If any of the investigators change or leave the University.
- Any changes to the Participant Information Statement and/or Consent Form.

(4) All research participants are to be provided with a Participant Information Statement and Consent Form, unless otherwise agreed by the Committee. The Participant Information Statement and Consent Form are to be on University of Sydney letterhead and include the full title of the research project and telephone contacts for the researchers, unless otherwise agreed by the Committee and the following statement must appear on the bottom of the Participant Information Statement. *Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, University of Sydney, on (02) 9351 4811 (Telephone); (02) 9351 6706 (Facsimile) or gbriody@usyd.edu.au (Email).*

(5) Copies of all signed Consent Forms must be retained and made available to the HREC on request.

(6) It is your responsibility to provide a copy of this letter to any internal/external granting agencies if requested.

(7) The HREC approval is valid for four (4) years from the Approval Period stated in this letter. Investigators are requested to submit a progress report annually.

(8) A report and a copy of any published material should be provided at the completion of the Project.

Yours sincerely

Dr P Beale
Chairman
Human Research Ethics Committee

Encl. Participant Information Statement
        Indicative Interview Items

cc. Ms. Z. Zhang Faculty of Education and Social Work, Education Building – A35,
      University of Sydney

Appendix B: Participant Information Statement

The University of Sydney

Telephone (61 2) 9351-3175
Facsimile (61 2) 9351-4580
*Email*a.welch@edfac.usyd.edu.au
*Web*www.edfac.usyd.edu.au/staff/welcha/

Faculty of Education & Social Work
NSW 2006
Australia

Professor Anthony R. Welch

CHINESE KNOWLEDGE DIASPORA.

(ARC DISCOVERY PROJECT)

PARTICIPANT INFORMATION SHEET

You are invited to take part in a research study into communication networks of overseas Chinese Intellectuals. The object is to understand the forms and extent of communication between mainland Chinese scientists and intellectuals working at selected universities in Canada and Australia, and Chinese colleagues both in mainland and other parts of the Chinese diaspora. The study is being conducted by Professor Anthony Welch, of the Faculty of Education and Social Work, at the University of Sydney, and A/Prof. YANG, Rui of the Faculty of Education, Hong Kong University, Hong Kong.

If you agree to participate in this study, you will be asked a series of questions on

your understanding of the significance of such communication networks, their extent and utility, how often you use them, and what it means for you in your work. The interview is unlikely to exceed 45 minutes in duration. We will come to your office, or another place at your convenience, and as far as possible will try to fit in with your busy schedule. We can do the interview in either Mandarin or English, and will ask you on tape if you are willing to participate. You may withdraw at any time.

Analysis of the research will not allow individuals to be identified, and only the investigators named above will have access to information on participants. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Participation in this study is entirely voluntary: you are not obliged to participate and, if you do, you can withdraw at any time.

If, after reading this information, you would like to know more, please feel free to contact Ms ZHANG Zhen, Research Associate, via email zhen_zhang@tju.edu.cn or on 0432 348-911

Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, Ethics Administration, University of Sydney on (02) 9351 4811 (Telephone); (02) 9351 6706 (Facsimile) or gbriody@usyd.edu.au q (Email).

Appendix C: Participant Consent Form

The University of Sydney

Telephone (61 2) 9351-3175
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*Email*a.welch@edfac.usyd.edu.au
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Faculty of Education & Social Work
NSW 2006
Australia

Professor Anthony R. Welch

CONSENT FORM

CHINESE KNOWLEDGE DIASPORA PROJECT

I, _____
[name]

of_____
[address]

have read and understood the information for participants on the above named research study

_____
[signature]

I am aware of the procedures involved in the study, including any inconvenience, risk, discomfort or side effect, and of their implications. I freely choose to participate in this study and understand that I can withdraw without compromise at any time.

I also understand that analysis of the research will not allow individuals to be identified. I hereby agree to participate in this research study.

Signature:_____

 Name: _____

 Date:_____

Signatureofwitness:_____

Name of witness:_____

Appendix D: Indicative Interview Items

Step 1: Greetings and Introduction

Step 2: Brief introduction to this research project. (Refer to Subject Information Statement, Consent Form etc). Gain Consent on tape.

Step 3: Explanation that the interview is not at all a comment on the interviewee's ideas or on her/his school/faculty, but is to elicit the state of intellectual diasporic networks of selected interviewees, as well as their perceptions of their importance, rationale etc.

1: Could you tell me how you came to decide to remain in Australia/Canada? OR What factors influenced your decision to stay in Australia/Canada?

2: What are the advantages of your academic career development here in Australia/Canada in comparison to in China? Are there any disadvantages?

3: What changes have you experienced in scientific communication with Chinese counterparts and international Chinese academic community after you were employed by ……………..?

4: How (by what means), and how often do you keep in touch with scholars in China for professional/academic reasons? What about Chinese scholars in other parts of the world? How did you find them/their names?

5: What kinds of cooperative activities do you employ with counterparts in China and other Chinese intellectual diasporas? (e.g. conferences/cooperative research/student exchanges/staff visits/exchanges/exchange of research papers/ Other?)

6: How do you disseminate academic/professional findings to academics in China and other Chinese intellectual diasporas?

7: Effectiveness of these channels, and reasons

8: How do you obtain academic/professional findings from Chinese counterparts and other Chinese intellectual diasporas? Is it always easy to get the information you need from colleagues in China? Is it becoming easier in recent years?

9: Effectiveness of these channels, and reasons

10: Are there any limits to the communication networks between yourself and colleagues in China? Do you notice any differences of research style, or intellectual standpoint, now that you have been in Australia/Canada for some time? Are there differences in the forms of communication, for example, between your communications with colleagues in China, and with Chinese-background colleagues in other parts of the world?

11: Of your overall international communication and cooperation, how much would you estimate is specific to mainland ? (e.g. most, 60%, 30%, none, etc)

12: Of your overall communication and cooperation with Chinese scholars from everywhere, how much of this communication would you say is devoted to mainland as compared with Chinese-background colleagues in other parts of the world?

13 Any further comments on your linkage with Chinese scientific communities in China and/or elsewhere and/or on this project.

FINAL STEP:

Confirmation of personal detail of interviewee including age, academic rank, place/institution of study in China, academic specialization, the highest degree obtained and the length of stay in Australia/Canada.

Thank you for your assistance!

Appendix E: Profiles of the Interviewees

No	Code	Title	Discipline	Gender	PhD	Age	Length of stay overseas (year)	Tenure
1	ARU1	Professor	Social Science	Male	Australia	50-55	23	Tenured
2	ARU2	Lecturer	Social Science	Male	Germany	30-35	9	Tenure Track
3	ARU3	Lecturer	Social Science	Male	Australia	35-40	5	Tenure Track
4	ARU4	Senior Lecturer	Social Science	Female	Australia	40-45	13	Tenured
5	ARU5	Senior Lecturer	Architecture	Male	Japan	45-50	15	Tenured
6	ARU6	Lecturer	Engineering	Female	China	35-40	8	Tenure Track
7	ARU7	Lecturer	Engineering	Male	Australia	35-40	8	Tenured
8	ARU8	Lecturer	Engineering	Male	Australia	40-45	10	Tenured
9	ARU9	Lecturer	Engineering	Male	Hong Kong	35-40	11	Tenured
10	ARU10	Lecturer	Engineering	Male	Australia	35-40	9	Tenured
11	ARU11	Professor	Science	Male	Australia	45-50	23	Tenured
12	CRU1	Professor	Agriculture	Male	Australia	40-45	15	Tenured
13	CRU2	Associate Professor	Agriculture	Male	Canada	55-60	20	Tenured
14	CRU3	Professor	Science	Male	Germany	50	26	Tenured
15	CRU4	Associate Professor	Social Science	Male	Canada	55-60	24	Tenured
16	CRU5	Associate Professor	Social Science	Male	Canada	30	10	Tenure Track
17	CRU6	Associate Professor	Social Science	Male	Canada	45-50	19	Tenure Track
18	CRU7	Assistant Professor	Engineering	Female	Canada	40-45	14	Tenured
19	CRU8	Associate Professor	Engineering	Male	Canada	50-55	20	Tenured
20	CRU9	Assistant Professor	Engineering	Male	Canada	35-40	12	Tenure Track
21	CRU10	Associate Professor	Engineering	Female	China	45	20	Tenured
22	CRU11	Professor	Medical	Male	Canada	50-55	26	Tenured

Appendix F: Collaboration and Exchange with Mainland

Code	Title	Discipline	Professional communication	Joint Publication	Joint research	Student/staff exchange
ARU1	Professor	Social Science	++	++	++	++
ARU2	Lecturer	Social Science	++	+/-	+/-	+/-
ARU3	Lecturer	Social Science	+	+/-	+/-	+/-
ARU4	Senior Lecturer	Social Science	++	+/-	++	++
ARU5	Senior Lecturer	Architecture	++	++	++	++
ARU6	Lecturer	Engineering	+	+	+/-	++
ARU7	Lecturer	Engineering	++	++	++	++
ARU8	Lecturer	Engineering	++	++	++	++
ARU9	Lecturer	Engineering	++	++	++	++
ARU10	Lecturer	Engineering	+	+/-	+/-	++
ARU11	Professor	Science	++	++	++	++
CRU1	Professor	Agriculture	++	++	++	++
CRU2	Associate Professor	Agriculture	+/-	+/-	+/-	+
CRU3	Professor	Science	++	++	++	++
CRU4	Associate Professor	Social Science	++	++	++	++
CRU5	Associate Professor	Social Science	+	++	++	+
CRU6	Associate Professor	Social Science	+/-	+/-	+/-	+
CRU7	Assistant Professor	Engineering	+/-	+/-	+	+
CRU8	Associate Professor	Engineering	++	++	++	++
CRU9	Assistant Professor	Engineering	+	+	++	++
CRU10	Associate Professor	Engineering	+/-	+	+/-	++
CRU11	Professor	Medical	++	++	++	++

Legend: ++ = very important   + = important   +/- = mixed important   - = not important

Note: The channel is identified as 'very important' when it incurs collaboration. The channel is identified as 'important' when there is successive communication. The channel is identified as 'mixed important' when there is sporadic communication. The channel is identified as 'not important' when there is no communication.