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Looking beyond the Obvious: power, epistemic culture and student migration in the knowledge-based economy

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ABSTRACT The emergence of the knowledge-based economy revived the brain drain debate of the 1970s, calling for the recruitment of scientists and researchers in the interest of national development. International students find themselves in the middle of this debate, as developing countries struggle to address the growing number of those choosing not to return home after graduation. While most researchers explain student migration in terms of economic opportunity and incentives, this article argues that this approach ignores the epistemic culture of graduate training and the differential power of academic institutions in developed and developing nations. Based on a sample of Filipino PhD students in science, technology, engineering or math (STEM) fields, this article shows how international students internalize research practices and values that encourage them to remain in the USA. I also discuss how these values contradict the research culture within developing countries, making it difficult for students to imagine continuing their work if they returned home. Consequently, this article challenges how the brain drain narrative describes knowledge as an intellectual product, easily transferred across national borders. Rather, the article emphasizes the need to recognize knowledge as a process of production, where shared norms define how new scholars are expected to contribute to their fields.

Introduction

The emergence of the knowledge-based economy highlights the need for nations to invest in a citizenry of educated workers. Replacing traditional forms of capital such as industries or natural resources, scientists and researchers are now regarded as the key elements in maintaining a nation's competitiveness in the global marketplace (Thorn & Holm-Nielsen, 2008; Martin et al, 2009). These changing demands have led to a 'war for talent' (Brown & Hesketh, 2004, p. 84) where countries are driven to attract the 'best and the brightest' in the interest of national development (Robertson, 2006). Yet, as wealthy countries increase their recruitment of highly skilled migrants, there has been little regard for the effects of these policies on the migrants' countries of origin (Skeldon, 2008). Developing nations are then left to struggle with massive emigration of skilled professionals, a phenomenon otherwise known as 'brain drain' (Spring, 2008).

While researchers have long debated the implications of brain drain in the context of specific professions (see Iredale, 2005; Scheffler et al, 2008; Luthra, 2009), the permanent migration of international students has become of special interest to government officials and policymakers (Guile, 2006; Alberts, 2007). In the context of the knowledge economy, student migration is supposed to offer developing nations an opportunity to gain the skills and professional competence needed in today's globalized world (Brown & Hesketh, 2004; Auriol et al, 2010). Yet, these foreign students are also sources of highly skilled labor for the countries which offer opportunities for advanced education (Tremblay, 2005; Ziguras & Law, 2006). While officially regarded as

temporary migrants, huge numbers of international students change the status of their visas after graduation and settle in their host countries (Rizvi, 2000; Collins, 2008). In fact, US statistics indicate that from 2002 to 2005, 74% of foreign-born science and engineering PhD recipients did not return to their home countries after graduation (National Science Foundation, 2008). This issue has been commonly attributed to the inability of developing nations to compete with the high wages associated with job opportunities in first world countries (Alberts & Hazen, 2005; Pyvis & Chapman, 2007; Angel-Urdinola et al, 2008). In response, policies geared towards mitigating the effects of brain drain focus on increasing domestic employment opportunities and developing competitive pay scales for highly skilled professionals.

While economic incentives definitely influence students' decisions to become permanent migrants, policies based solely on these tend to ignore many other social and cultural factors. In this article, I discuss one factor that is notably absent in the migration literature: the politics of knowledge production within academic institutions in the USA. Based on a sample of Filipino doctoral students majoring in science, technology, engineering or math (STEM), I use Karin Knorr Cetina's (1999) concept of epistemic culture to discuss how Filipino students internalize research practices and values that make it more likely for them to remain in the USA after graduation. My larger argument is that the concept of epistemic culture challenges the definition of knowledge as a mere product to be carried across national borders and calls for a re-examination of policies on student migration.

The Obvious Factors: career opportunities and wages differentials

While international students are considered vital resources in the knowledge economy, few studies have looked into understanding their motivations for migration. Existing research tends to regard international students as another group of skilled professionals, leaving their home countries in search for better economic opportunities (see Gungor & Tansel, 2008; Murakami, 2009). Therefore, like professional migrants, they are seen as agents who aim to capitalize on their earnings and the duration of their stay overseas, indicating that higher education is mainly seen as means of attaining economic goals (Currie, 2004; Spring, 2004). As a result, most policies driven to attract or retain international students have been limited to this kind of economic logic, where a potential increase in socioeconomic well-being is seen as the deciding factor in permanent migration. For example, US immigration policies favor the distribution of work visas to foreign students in desired fields such as information technology and engineering (Kapur, 2005; Karoly & Panis, 2009). Mexico and China encourage repatriation through job offers linked to lucrative contracts with government bodies and local industries (Angel-Urdinola et al, 2008). Meanwhile, poorer states such as the Philippines rely on international collaborations and returnee programs that appeal to students' sense of nationalism, encouraging them to return and share the knowledge they have gained overseas (Macaranas, 2008; Morales, 2008). However, research shows that the effects of these programs are limited (see de Haas, 2007) and while some students do return, a majority of these students eventually leave the country (Thorn & Holm-Nielsen, 2008). The inadequacy of these programs then raises the question of what other factors influence student migration.

Beyond the Obvious: education and the politics of knowledge

Moving beyond the framework of economic costs and benefits, a growing number of research studies have explored other reasons why international students' decide whether or not to permanently remain in their host countries. For example, Liu-Farrer's (2009) study looks at how the students' permanent migration is linked to the type of credentials they pursue (e.g. bachelor's, master's or doctorate), their motivations for studying abroad and their areas of study (e.g. arts, science or technical). Other researchers investigate how the value given to American credentials pushes developing states to send their best students the USA in spite of the risk of permanent migration (Rizvi, 2000; Guruz, 2008; Wildavsky, 2010). They believe that by only focusing on wage differentials, we ignore the fact that American universities, along with the professors and students within them, have a considerable advantage when it comes to the power of their work.

However, there continues to be a lack of research on how education shapes international students' decisions to remain in their host countries. This gap in the literature is concerning, given that doctoral students can spend more than six years completing their degrees (Gravois, 2007). According to sociologist Karin Knorr Cetina (1999), all academic disciplines have an 'epistemic culture' that defines how knowledge is created and warranted (p. 246). The patterns that define an epistemic culture include how researchers go about their work, relate to their colleagues, validate their results and, more importantly, train students to become experts in the field. Therefore, doctoral students are acculturated not only into their host societies but also the epistemic cultures of their respective disciplines. Professors and students form a community of knowledge workers, where common norms and practices define how new scholars are expected to contribute to the field. Using Knorr Cetina's concept of epistemic culture, this article complicates the brain drain narrative by investigating how students' experiences of graduate school affect their decisions of whether to return home after graduation.

Research Design and Methodology

I conducted semistructured interviews with 27 Filipino graduate students pursuing doctoral studies in 13 universities found in different parts of the USA (see Table I). I decided to limit my interviewees to students in STEM fields because of the perceived value of scientists and engineers in today's knowledge economy. At the same time, I wanted to investigate the notion that STEM knowledge is easily 'transferred across national borders' (National Science Foundation, 2008) and supposedly independent of cultural context or social relations (unlike the social sciences and the humanities). By focusing on Filipino students in STEM fields, I could explore how students considered 'bringing back' their knowledge to the Philippines and what obstacles prevented them from doing so.

	Number of students
Discipline field	
Biochemistry	3
Chemistry	6
Cognitive science	1
Engineering	7
Environmental science	2
Molecular biology/biotechnology	3
Neuroscience	1
Physics	4
Total	27
Number of years in the PhD program	
1st year	5
2nd year	5
3rd year	4
4th year	3
5th year	4
6th year	5
7th year	1
Total	27

Table I. List of STEM disciplines pursued by research participants.

I gathered participants using the snowball method, where I asked interviewees to connect me to other Filipino international student communities in the USA. Interviews went on for one to three hours, during which I asked students how they thought about their future goals, perceived the value of their future degrees, and mulled over the idea of returning home. A number of interviewees also asked me about my future plans, my research interests and the differences between science and social science disciplines. Through these informal conversations, I realized that while I was an 'insider' in terms of my nationality and status as a student, as a sociology major

there were many things I did not know about being a graduate student in the sciences. This became an important aspect of my research study.

I also conducted 20 hours of participant observation within a Filipino student community in a university in the northeastern USA. I observed students during informal parties and get-togethers where they would commiserate with each other by asking for advice, reflecting on their career plans and venting their frustrations about work. Observing how these students supported each other helped me understand some of the factors that framed their decisions about the future.

Why Filipino Students?

This study is limited in that my findings are based on a small sample of Filipino PhD students studying in the USA. As compared to Chinese and Indian international students, Filipinos are considered a minority in the foreign student population and the arguments I present in this article are drawn from their specific experiences. However, I also believe that Filipino students serve as an important case study in complicating the economic logic that defines research on student migration. Given the high rate of poverty in the Philippines and the large number of Filipinos who seek overseas employment (Asis, 2006; Rodriguez, 2010), the permanent migration of Filipino students can easily be attributed to better economic and career opportunities in the USA. Yet, I found that most of my interviewees did not initially intend to remain in the USA after graduation. Unlike other Filipino professional migrants such as nurses and accountants, the Filipino students in my study did not go abroad to seek better employment opportunities. Many of them were already working as instructors or researchers in Philippine universities and they decided to pursue graduate school in the USA in order to develop these careers. In fact, several of the students I interviewed entered their doctoral programs with their own research agendas, shaped by issues and concerns in the Philippine context. Yet, these students changed their minds about returning to the Philippines after the first few years of their PhD programs. This shift indicates that there were aspects of their graduate experience that influenced them to remain in the USA.

Research Findings and Discussion

Out of the 27 students who took part in this study, only three indicated that they would return to the Philippines after graduation. The rest had already made plans to settle in the USA or move to other developed countries like Canada and Australia. Money – or more specifically, the lack of it – seemed like the most obvious reason. These students knew that obtaining a US degree allowed them to access wages far above those they would receive back home. When talking about other Filipino students who decided to remain in the USA, they often cited the material comforts available in the USA, and the need to provide a 'better life' for the family. Yet, these same students also said that they would not return to the Philippines even if they received the same pay as professors in the USA. When asked to explain why, students said that going home would make it hard for them to continue their research, indicating that their decisions were not just determined by the opportunities available after graduation, but their experiences *during* their doctoral training. In this section, I discuss the epistemic culture of doctoral education in the USA and its disjuncture with the epistemic culture of research work in the Philippines.

The Epistemic Culture of US Academia

In debating the issue of brain drain, policymakers have come to regard STEM knowledge as an intellectual product that is easily 'transferable' and free from the contextual issues surrounding the university. This section discusses how this assumed 'transferability' ignores the epistemic culture of US universities that shape international students' research projects and professional identities. In particular, I focus on two aspects of this epistemic culture: the politics of funding and the values of academic competition.

National interests and the politics of funding. For Arnel, a third-year student in plant science, the option of long-term migration came during his second year of graduate school. He arrived in the

USA with a master's degree in forestry, hoping to do research on propagating resilient varieties of trees. Yet his adviser's lab was studying proteins in pine trees, a species prevalent in the northeastern USA. Unlike propagation, protein research is conducted within the field of biotechnology, where knowledge production depends on the use of expensive machines to analyze objects that human senses are unable to detect. Given the massive resources needed to do this research, Arnel felt it was unlikely that he could continue his work in the Philippines. It also didn't help that pine trees rarely grow in tropical climates, making his dissertation inapplicable in the Philippine context. He explained:

> When I came here, my plan was to go back home. My plans had to change because my field of study changed ... Sometimes I think to myself, 'If I stuck to propagation, I would have been able to bring something back home.' But now that I'm in protein research, I can't do it anymore. Even if I went home and got a professorship or something, I still wouldn't be able to work on the research I want. So now, I guess [I just need to stay] I'm just open to whatever will happen.

Arnel was mainly concerned about being able to continue doing the research he was trained to do. It was for this reason that he decided to remain in the USA after graduation. As in typical doctoral programs, students are expected to graduate as experts in their chosen research fields and it is through their academic training that they realize the careers they will build once they graduate. While Arnel could imagine returning home as an expert in tree propagation, he could not imagine doing so as an expert in protein research

Arnel's case is typical of most STEM programs, where new students are required to join laboratory teams (or 'labs') led by a professor whose interests determine the direction of the lab's work. In this sense, the lab is where doctoral students interact with their academic colleagues and mentors, who in turn introduce the epistemic culture of their discipline (Knorr Cetina, 1999). According to the Filipino students who took part in my study, their labs also defined what research questions they pursued for their dissertation projects. Given that US government agencies and private corporations funded the big research studies in STEM fields, most labs pursued 'hot topics' that easily obtained financial support. As stated by Edgar, a fifth-year student in chemistry:

> The biggest government funding agencies are NIH [National Institute of Health], NSF [National Science Foundation] ... DOE [Department of Energy], Department of Defense. So it's good if your project has anything that will benefit the soldiers, anything related to preventing terrorism. With NIH, they're focused on anything that will cure diseases, cancer, aging, diabetes, *mga problema ng Amerika* [the problems of America]. Cancer is good. Any [research] that might cure cancer is good.

Edgar's statement showed that research projects in US universities were often defined by the needs of powerful funding agencies. As a result, many laboratories were geared towards investigating topics that were 'popular' or relevant in American society. Most of the Filipino students in my study took this system as a 'normal' part of doctoral training, stating that they were interested in their labs' projects and were happy with their advisors. However, they also admitted that this system made it 'impractical' to do research relevant for the scientific problems found in the Philippine context. If they wanted to pursue a research question beyond the scope of their lab, they would have to find another lab or their own source of funding. This was the case for Bong, a seventh-year student in agricultural engineering, who did research on the production of biofuel from corn. While he was not particularly interested in his research topic, an American company had given his professor a lucrative grant to study enzymes that could efficiently convert corn to biofuel. Now that he has built his reputation as a 'corn expert,' Bong felt that it would be better to remain in the USA, where corn is a subsidized crop and the main feedstock for biofuel production. As he explained, '[In the USA], there's an industry that's waiting for my research results.' In contrast, Bong shared that biofuel industries in the Philippines only use feedstock such as sugar cane and coconut, making it less likely that his knowledge will be 'needed' in local industries.

Given that American interests fund the development of PhD students' expertise, it is no surprise that there would be more demand and appreciation for their knowledge in the USA. Bong and Arnel's experiences show that the longer they worked on their research, the more they felt that their knowledge was too advanced and inappropriate for the Philippines, making it difficult to conceptualize local applications of what they learned in graduate school. This contradicts the

common brain drain narrative, where the movement of students is assumed to signify the circulation of knowledge as well.

Publications, prestige and academic competition. While Arnel regretted having to change his research interests, a majority of my interviewees were happy to adapt to their professors' projects. They believed that US universities 'led the way' in terms of new scientific findings and following the faculty's interests allowed them to 'progress' as scholars and researchers. This does not mean that there are no practicing scientists in the Philippines. All but one of the students I interviewed obtained their undergraduate degrees in Philippine universities and most of these students said they were proud of their education. However, they believed that coming to the USA exposed them to a broader community, where they could gain access to the 'leaders' of their respective fields. Ernesto, a second-year student in geophysics, believed that this is what set the USA apart from other developed nations in Europe and Asia:

> [Our university] has external seminars where we have professors who are in the area, they come and give a talk. If there's one aspect of going to grad school in the US that I'm particularly thankful for, I mean, something you will not really get if you don't go to grad school here ... are those external seminars. I mean, in the last three months, we were visited by professors from Berkeley, from MIT, from Cambridge. Big names in the field! And they talk about things that are sometimes not even published yet ... One professor came with a new plot and he had just done it the night before the talk! *Yun ang hindi mo talaga makukuha sa Pilipinas* [This is something you will never get in the Philippines].

Ernesto's statement reflects the prestige given to US universities, not only because of their academic programs but the professors who work within them. When I did my interviews, several students were already applying for postdoctoral positions in universities ranked higher than the ones they were currently in. They wanted to enter labs led by well-known professors who could help them publish and gain recognition in the field. Returning to the Philippines meant cutting off one's access to these opportunities and having to build a reputation 'from scratch.' Therefore, the Filipino students in my study were still likely to remain in the USA even if Philippine institutions allotted funds to support their research.

At the same time, Filipino students were acculturated into an environment where status depended on one's ability to publish in highly ranked journals, most of which were run by prestigious universities in the USA and United Kingdom. Due to high subscription fees, the students I interviewed felt that they would be unable to keep up with the latest research findings if they returned to the Philippines. Marco, a third-year student in physics, shared that his former professors would often email him from Manila, asking if he could send them electronic copies of journal articles. Ernie, a fourth-year student in chemistry, recalled taking his master's in a top Philippine university, where they were only allowed to read the abstracts of research articles. He felt that this lack of access was even 'more crippling' than having no laboratory equipment. Celia, a fourth-year student in biology, explained the problems this created for researchers hoping to make 'original' contributions to their field:

> [Without journal access], you won't realize that the project you've been working on, the one that you're toiling on for five years, is something that was done two years ago. If you don't keep up-to-date with the literature, then you don't know if what you're doing is worth publishing, you don't know if there's a paradigm shift in the ideas that everybody's working on ... That's the worst thing that you could do, waste your time on something that wasn't worth it.

In this sense, Filipino students' learned that in order for research to be 'publishable,' it had to offer unique findings that have not yet been discovered. Such criteria for excellence placed US universities at the center of knowledge production because these standards were often enforced by US academic programs, professors and publications. Celia admitted that her professors in the Philippines did publish their work in Southeast Asian journals. However, she felt that their contributions were not significant because 'no one in the USA read them.' In this sense, returning to the Philippines ran the risk of not just being financially insecure but marginalized within the scientific community.

This section shows that while most Filipino students did not leave their country with the intention to migrate, this changed as they became immersed in the epistemic cultures of their academic programs. However, the Filipino students' decisions to migrate were also shaped by the perceived disjuncture between the epistemic cultures of their academic training in the USA and the epistemic culture of the institutions they left behind. The next section discusses this issue.

The Epistemic Culture of Philippine Institutions

The brain drain narrative leads us to believe that developing countries desperately need the knowledge of international students, yet are unable to provide enough economic incentives for them to return. While this narrative may be partly true, the Filipino students in my study were actually less concerned about monetary benefits than they were about fitting into the Philippine academia. This section discusses how students saw a lack of fit between their academic training in the USA and the epistemic culture that characterizes knowledge production in Philippine higher education institutions. I argue that this perceived disjuncture heavily influences whether students decide to return home after graduation.

The Purpose of Research

While the knowledge economy regards international students as vital resources of knowledge for their home countries, the Filipino students in my study actually wondered whether there was 'a place' for their work in the Philippines. Many of the students I interviewed lamented that Philippine institutions were 'too focused on applied research and product development,' often sacrificing ideals of scientific discovery that they learned in the USA. Beth, a third-year biochemistry major, complained that biochemistry research in the Philippines was 'too medical' and that local researchers were only concerned about treating diseases. Meanwhile, other students felt that the priorities given to 'useful' research limited local scientists to topics that were 'only' important for the Philippine context. Celia explained this by referring to the research studies conducted in her former university:

> I think a lot of Filipino researchers do things that are interesting for the Philippines, specifically. Like, there's this one lab that was doing research on bacteria that kills shrimp. So, for the shrimping industry, that's very important. I mean, in the US, no one really (pause) studies that stuff. Or, they were doing molecular taxonomy to figure out native species. I mean, we have a lot of that in the Philippines, it's a very species-rich country. So, you know, it's very Filipino-specific research.

It was ironic to note that Celia did not make the same criticism about research in the USA, where studies also address US-specific topics such as military weaponry for soldiers in Iraq. When pressed to elaborate, Celia explained that even if US studies were driven towards real-life applications, researchers were still encouraged to make contributions to scientific theory and emphasize the generalizability of their work. She believed that this was something that researchers in the Philippines failed to do because they were mainly focused on addressing local concerns.

In a way, this tendency towards problem solving reflects the lack of resources available in developing countries. Unlike the US government, the Philippine state considered research for 'knowledge's sake' a luxury and was more likely to value studies that would lead to immediate practical results (Bernardo, 2006). Scientists who wanted to do more theoretical work had to either find alternative sources of funding or focus on areas that were not resource-intensive. True enough, two of the Filipino students who decided to return to the Philippines also specialized in fields that fit the Philippines' research culture. Fred, a second-year student, chose to focus on theoretical physics because it did not require expensive equipment. He explained:

> One of the reasons why I was making a conscious effort to avoid experimental labs, aside from them not being in my interests, is because I knew these would not be transferrable to the Philippines. Like, for instance, there was a point when I was looking for advisers to fund us, then one particular name came up and I thought, 'Oh he has this experiment that fits in a room.' It's not a large hadron collider [laughs]. So, it's a tabletop experiment. I thought, 'Ok. Maybe *this* I

> can transfer back home.' Then I actually saw the machine and no [laughs], it could not be transferred back.

On the other hand, Trina, a fourth-year student, entered the emerging field of ecological engineering because she felt this was more useful for her home province. While Trina's study was funded by the US government, she believed that her research – building a model on the use of trees to remove air pollutants – can be accepted by local researchers and eventually implemented to benefit local communities. She said:

> If I go back and present my study in the Philippines, people will ask me, 'How useful is that here?' If it's not useful, they'll just cross it off their list. My study will have no point ... That's why I like ecological engineering. You can always start small. If you can just convince a *barangay* [village] or even our university [to adopt your research], you can share the results and maybe another *barangay* will be convinced and the whole city will get into it.

In many ways, Trina felt that the epistemic culture of ecological engineering complemented the applied research culture in the Philippines: it emphasized the use of natural elements, encouraged problem-based research, and did not require expensive equipment. Like Fred, Trina could imagine herself continuing her research even after she leaves the USA. In making the decision to return to the Philippines, the question of finding a place for one's work was more important than receiving higher wages.

Building Scientific Communities, Negotiating Local Politics

The Filipino students in my study were also concerned about the dearth of fellow scientists in the Philippines. If US universities exposed students to a bigger and more competitive academic community, Philippine universities required students to work with a very small group of scholars. Several of the Filipino students in my study worried that a small scientific community would make it hard to find 'people to talk to,' an important aspect of their professional well-being. Pia, a third-year student in cognitive science, experienced this when she returned to do a summer internship in one Philippine university. While she had found an academic department willing to host her stay in Manila, there were very few graduate students enrolled in the college and even fewer professors who related to her research. Lonely and bored, this experience reinforced her belief that she would need to stay in the USA after graduation. Several Filipino students also felt that the small number of professors in STEM fields made Philippine universities much more politicized and difficult to navigate. Jose, a fifth-year student in chemistry, shared that if he 'made enemies' in one major Philippine university, it would be very hard to establish a career elsewhere because of the power held by certain professors. Offending one 'big name' in the field could blacklist a junior scientist and prevent him or her from getting funding opportunities in the future. In contrast, Jose thought that this was less of a problem in the USA, because of the larger scientific community and the many research institutions within the country.

Filipino students in my study also worried that not all of their colleagues would recognize their achievements in the USA. While they knew their US degrees would be highly regarded at home, they believed that other Filipinos who do not have foreign credentials could also perceive them as a threat to job security. Anna, a seventh-year student in environmental science, encountered this issue when she tried to gather data from Philippine government agencies in Manila:

> You know how it is in the Philippines, once you tell them you're doing your PhD in the US, they'll raise their eyebrows at you. Suddenly, they don't want to give you the data anymore! My friend told me that these people are threatened by me. They think, 'Oh here's another person coming from America. I might lose my job ... Why did she get a scholarship? I've been working in this field longer than she has.'

Anna's experience contradicts the assumption made by proponents of the brain drain narrative, that students' home countries will always welcome their return with open arms. While their US credentials provided students with prestige and perceived credibility, it also made them targets of jealousy and intrigue. The Filipino students in my study knew that if they returned to the

Philippines, they would be forced to negotiate the established hierarchies of Philippine universities, where research publications were often unnecessary in order to move ahead (Bernardo, 2006). During informal gatherings, I observed that Filipino students would often exchange stories about young academics who did not get promoted in spite of returning to the Philippines with foreign credentials. While no one really confirmed whether these stories were actually true, the Filipino students in my study felt that such news provided them with little incentive to return home. Randy, a Fulbright scholar, was especially reluctant to leave the USA, even if his scholarship required him to return to the university where he used to work. While Randy did worry about economic issues, his biggest fear was being forced to teach the same undergraduate classes he taught before he came to the USA. The small number of graduate students in his university meant that faculty spent most of their time teaching undergraduate courses and the few advanced classes were usually allocated to 'senior' faculty. Given the time and effort needed to obtain their doctoral degrees, many of the Filipino students I interviewed were unwilling to 'downgrade' their work or deal with the politics of Philippine academia. Having spent years working within US universities, they also felt it would be difficult to adjust to the different standards and practices that characterize the epistemic culture in the Philippines. In this sense, the decision to remain in the USA was not only due to economic factors but the anxiety that years of academic training would be wasted in an environment that did not have a place for their work.

Conclusion

Previously ignored in the migration literature, the movement of international students has sparked new debates on brain drain and its subsequent effects on developing countries. In this article, I've sought to complicate our understanding of students' migration decisions by moving beyond the obvious reasons of economic costs and benefits. Rather, I refer to the cases of Filipino PhD students to show how the decision to become permanent migrants is formulated in the course of graduate education, where the epistemic culture of students' fields define their professional identities, future expertise and the standards that guide their work. Because most academic research in the USA is funded by national government agencies, students' dissertation projects are geared towards US interests, making it difficult for students to imagine continuing their work in the Philippines. The dominance of USA institutions in academic research also encouraged students to internalize their epistemic cultures as the benchmark of advanced knowledge production. As a result, many of these students quickly moved away from the action-oriented research more prevalent with in the Philippines. Coming to the USA encouraged students to compete with fellow academics and establish their careers through academic publications. This was something students felt they would be unable to do if they had to work with the limited resources and funding of Philippine institutions.

While this study is based on the experiences of Filipino PhD students, questions of epistemic culture highlight broader issues concerning the movement of international students from developing to developed countries. By only asking where students should bring their knowledge, researchers and policymakers have failed to interrogate how such knowledge is produced. This study shows that while international students may pursue foreign education with the intention of 'bringing back' knowledge, this is unlikely to happen if there is a disjuncture between the epistemic cultures of their host universities and the universities in their home countries. Policymakers and researchers then need to explore other ways developing countries can deal with brain drain – especially in the context of a global 'war for talent.' What kind of epistemic cultures can developing countries support with their current resources? What academic programs and fields are more likely to encourage student migration? Should developing countries limit scholarships to fields characterized by epistemic cultures that complement local needs? By recognizing the role of epistemic culture and the politics of knowledge, we can define a more complete perspective of student migration beyond the factors of wage differentials and economic disparity.

References

Alberts, H.C. (2007) Beyond the Headlines: changing patterns in international student enrollment in the United States, *Geojournal*, 68, 141-153. http://dx.doi.org/10.1007/s10708-007-9079-7

Alberts, H.C. & Hazen, H.D. (2005) 'There are Always Two Voices …': international students' intentions to stay in the United States or return to their home countries, *International migration*, 43(3), 132-153. http://dx.doi.org/10.1111/j.1468-2435.2005.00328.x

Angel-Urdinola, D.F., Takeno, T. & Wodon, Q. (2008) Student Migration to the United States and Brain Circulation: issues, empirical results, and programmes in Latin America, in A. Solimano (Ed.) *The International Mobility of Talent: types, causes, and development impact*, pp. 168-201. Oxford: Oxford University Press.

Asis, M.M.B. (2006) The Philippines' Culture of Migration. http://www.migrationinformation.org/Profiles/display.cfm?ID=364 (accessed February 28 2010).

Auriol, L., Felix, B. & Schaaper, M. (2010) Mapping Careers and Mobilities of Doctorate Holders: draft guidelines, model questionnaire and indicators. Paris: Organisation for Economic Cooperation and Development. http://dx.doi.org/10.1787/5kmlfbn2ddtd-en

Bernardo, A.B.I. (2006) An Analysis of the Explicit and Implicit Policies on Research and Higher Education Development in the Philippines, in A.B.I. Bernardo, M. Munoz & M. Valencia (Eds) *Research and Higher Education Development: Asia-Pacific perspectives*, pp. 105-113. Manila: Lasallian Institute of Development and Educational Research.

Brown, P. & Hesketh, A. (2004) *The Mismanagement of Talent: employability and jobs in the knowledge economy*. New York: Oxford University Press.

Collins, F.L. (2008) Bridges to Learning: international student mobilities, education agencies and inter-personal networks, *Global Networks*, 8(4), 398-417. http://dx.doi.org/10.1111/j.1471-0374.2008.00231.x

Currie, J. (2004) The Neo-liberal Paradigm and Higher Education: a critique, in J.K. Odin & P.T. Manicas (Eds) *Globalization and Higher Education*, pp. 42-68. Honolulu, HI: University of Hawai'i Press.

de Haas, H. (2007) Turning the Tide? Why Development Will Not Stop Migration, *Development and Change*, 38(5), 819-841. http://dx.doi.org/10.1111/j.1467-7660.2007.00435.x

Gravois, J. (2007) In Humanities, 10 Years Might not be Enough to Get a PhD, *Chronicle of Higher Education*, 53(47), A1.

Guile, D. (2006) What is Distinctive about the Knowledge Economy? Implications for Education, in H. Lauder, P. Brown, J.-A. Dillabough & A.H. Halsey (Eds) *Education, Globalization and Social Change*, pp. 355-366. New York: Oxford University Press.

Gungor, N.D. & Tansel, A. (2008) Brain Drain from Turkey: an investigation of students' return intentions, *Applied economics*, 40(23), 3069-3087.

Guruz, K. (2008) *Higher Education and International Student Mobility in the Global Knowledge Economy*. Albany, NY: State University of New York Press, Albany.

Iredale, R. (2005) Gender, Immigration Policies and Accreditation: valuing the skills of professional women migrants, *Geoforum*, 36, 155-166. http://dx.doi.org/10.1016/j.geoforum.2004.04.002

Kapur, D. (2005) *Give Us Your Best and Your Brightest: the global hunt for talent and its impact on the developing world*. Washington: Center for Global Development.

Karoly, L.A. & Panis, C.W.A. (2009) Supply of and Demand of Skilled Labor in the United States, in J. Bhagwati & G. Hanson (Eds) *Skilled Migration Today*, pp. 15-52. New York: Oxford University Press.

Knorr Cetina, K. (1999) *Epistemic Cultures: how the sciences make knowledge*. Cambridge, MA: Harvard University Press.

Liu-Farrer, G. (2009) Educationally Channeled International Labor Mobility: contemporary student migration from China to Japan, *International Migration Review*, 43(1), 178-204. http://dx.doi.org/10.1111/j.1747-7379.2008.01152.x

Luthra, R.R. (2009) Temporary Immigrants in a High-Skilled Labour Market: a study of H-1Bs, *Journal of Ethnic and Migration Studies*, 35(2), 227-250. http://dx.doi.org/10.1080/13691830802586237

Macaranas, F.M. (2008) Winning Brains Back to the Philippines, *Inside Science*. http://blogs.inquirer.net/insidescience/2008/09/26/winning-brains-back-to-the-philippines/ (accessed June 29 2011).

Martin, S.B., Lowell, L. & Bump, M. (2009) Skilled Immigration to America: US admission policies in the 21st century, in J. Bhagwati & G. Hanson (Eds) *Skilled Immigration Today*, pp. 131-152. New York: Oxford University Press.

Morales, I. (2008) DOST: more Filipino scientists to come home soon, *Inquirer.net*. http://blogs.inquirer.net/insidescience/2008/10/29/dost-more-filipino-scientists-to-come-home-soon (accessed June 29 2011).

Murakami , Y. (2009) Incentives for International Migration of Scientists and Engineers to Japan, *International migration*, 47(4), 67-91. http://dx.doi.org/10.1111/j.1468-2435.2009.00564.x

National Science Foundation (2008) *Science and Engineering Labor Force*. http://www.nsf.gov/statistics/seind08/c3/c3s4.htm#c3s44

Pyvis, David & Chapman, Anne P. (2007) Why University Students Choose an International Education: a case study in Malaysia, *International Journal of Educational Development*, 27, 235-246. http://dx.doi.org/10.1016/j.ijedudev.2006.07.008

Rizvi, F. (2000) International Education and the Production of Global Imagination, in N.C. Burbules & C.A. Torres (Eds) *Globalization and Education: critical perspectives*. pp. 205-227. New York: Routledge.

Robertson, S.L. (2006) Brain Drain, Brain Gain and Brain Circulation, *Globalisation, Societies and Education*, 4(1), 1-5.

Rodriguez, R.M. (2010) *Migrants for Export: how the Philippine state brokers labor to the world*. Minneapolis, MN: University of Minnesota Press.

Scheffler, R.M., Liu, J.X., Kinfu, Y. & Dal Poz, M.R. (2008) Forecasting the Global Shortage of Physicians: an economic- and needs-based approach, *Bulletin of the World Health Organization*, 86(7), 516-523. http://dx.doi.org/10.2471/BLT.07.046474

Skeldon, R. (2008) Of Skilled Migration, Brain Drains and Policy Responses, *International Migration*, 47(4), 3-29. http://dx.doi.org/10.1111/j.1468-2435.2008.00484.x

Spring, J. (2004) *How Educational Ideologies are Shaping Global Society*. Mahwah, NJ: Lawrence Erlbaum.

Spring, J. (2008) Research on Globalization and Education, *Review of Educational Research*, 78(2), 330-363. http://dx.doi.org/10.3102/0034654308317846

Thorn, K. & Holm-Nielsen, L.B. (2008) International Mobility of Researchers and Scientists: policy options for turning a drain into a gain, in A. Solimano (Ed.) *The International Mobility of Talent: types, causes, and development impact*, pp. 145-167. Oxford: Oxford University Press.

Tremblay, K. (2005) Academic Mobility and Immigration, *Journal of Studies in International Education*, 9(3), 196-228. http://dx.doi.org/10.1177/1028315305277618

Wildavsky, B. (2010) *The Great Brain Race: how global universities are reshaping the world*. Princeton, NJ: Princeton University Press.

Ziguras, Christopher & Law, Siew-Fang (2006) Recruiting International Students as Skilled Migrants: the global 'skills race' as viewed from Australia and Malaysia, *Globalisation, Societies and Education,* 4(1), 59-76.

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