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Differences and similarities between U.S. and non-U.S. citizens in graduate school perceptions, experiences and career preparation

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Abstract

International students account for a significant percentage of enrollees in graduate programs in the United States. Nearly 30% of the doctoral degrees awarded in the U.S. go to non-U.S. citizens, and about two-thirds remain in the U.S. for their career. This study compares survey results from 1,000 international and 4,200 U.S. respondents on their beliefs about the value of a graduate degree, the quality and sources of information they received about graduate school and careers, and their job satisfaction after completing their degree. Findings suggest that international students need additional support and information when considering careers related to graduate degrees.

International doctoral and research students make up a quarter of the total graduate population in the United States, including over 100,000 international students enrolled in doctoral programs (Organisation for Economic Co-operation and Development, 2008). While the total number of new enrollments in graduate school has been declining the last few years, the Council of Graduate Schools indicates that the number of admission offers made to international students increased 9% from 2011 to 2012, which is on top of a 9% increase from 2010 to 2011 (Kent, 2012). This continues a long-term trend of increasing numbers of international students enrolling and completing graduate school within the United States. In 1981, 13% of doctoral degrees awarded in the U.S. were granted to non-U.S. citizens, but by 2011 this figure had risen to 29% (National Science Foundation, 2012).

A major benefit to attracting international students to U.S. graduate education programs is that a large number stay and work here after completing their degree, increasing the number of highly skilled employees in the U.S. workforce. In 2005, about two thirds of international students who had obtained a doctoral degree in 2000 remained in the U.S. for five years after completing their degree. Ten years earlier, slightly less than half of these students stayed here five years after graduation (Finn, 2007). Despite the good news about continued growth in international students and their stay rates in the U.S. over the last several years, there is in fact increased competition for these students in other countries. Since 2000, there has been a steady increase in students enrolling in higher education institutions in English-speaking countries other than the U.S. (Douglass & Edelstein, 2009) and the U.S. "market share" of international students is declining. Meanwhile, the European Union has, in an attempt to attract more international students and retain more of its own students, worked to ensure compatibility and clarity in degrees granted among EU member states (European Higher Education Area, 1999).

The reliance on international students to support U.S. graduate school enrollment and ultimately the U.S. workforce means it is imperative to understand if international and U.S. students have similar graduate school perceptions, experiences, and career preparation. Areas where non-U.S. citizens perceptions differ from those of their U.S. counterparts might suggest ways that graduate programs can better attract and support international students.

Data and Method

As part of a larger project that examined the pathways through graduate school into careers (Wendler, et al., 2012), a survey of *GRE*® test takers who had taken the test between 2002 and 2011 was conducted. A random sample of the test takers who had provided an email address at the time they registered for the GRE was sent an email with a link to the online survey. Over 5,500 individuals responded to the survey, approximately 500 to 600 from each testing year. In order to ensure equal numbers of respondents across all years, despite an expected decrease in active email addresses the farther back the test taker sat for the GRE, a greater number of test takers were contacted from the years 2002 to 2006 than from 2010 and 2011. Overall the response rate was around 5%, with slightly over 10% from the 2011 cohort responding and less than 3% in the earliest years. While this sample is not necessarily representative of graduate students in general (due to those who did not take the GRE or those who did not respond to the survey) it does include information on a large number of students from a variety of backgrounds and experiences at various stages of graduate school (considering, enrolled, and completed). Those who did respond had slightly higher GRE scores than the non-respondents. Female and white test-takers were slightly more likely to respond than male and non-white test-takers. For more detail on the data source, refer to Wendler, 2013.

The survey instrument focused on students who were at various stages in the graduate school process. The current study focuses on three stages: prior to graduate school, with a focus on the information they obtained while deciding to attend; during graduate school, with a focus on what their program stressed and what information is/was provided on careers; and after graduate school, with a focus on workplace preparation. Respondents were asked to think retrospectively about prior stages and were not asked questions about a stage they had not yet reached. While the primary focus of the survey was not to compare domestic to international students, responses from over 1,000 non-U.S. citizens allows for an investigation of the differences and similarities between the two groups on many of these issues. Additionally, about 100 respondents identified themselves as Resident Alien/Permanent Resident; however this population was not examined in this study.

The non-U.S. and U.S. samples differ in career fields. Of the non-U.S. citizens, 46% have their highest degree in a STEM related field, compared to 23% of the U.S. citizens. Conversely, 39% of the U.S. citizens have their highest degree in the Humanities, Education or the Social Sciences, compared to only 19% of the non-U.S. citizens. It is acknowledged that differences seen in the responses may be due to career field and not just to citizenship status.

One final note on the sample – for this study, the non-U.S. citizens are treated as a single, homogeneous group. It is possible that student perceptions, experiences and expectations might vary within the non-U.S. sample due to their past exposure to an English based program within the United States or due to their country of origin. However the data available do not allow for distinguishing between non-U.S. citizens who had previously attended an undergraduate program within the U.S. with those who might be attending a U.S. institution for the first time for graduate school. Furthermore, differences in country of citizenship or region of the world cannot

be taken into account. Consequently a potential limitation in interpreting the results is that the non-U.S. sample cannot be further disaggregated.

Results

Since the data reported on in this paper are from self-reported survey results, the results will primarily be simple descriptives of the responses. For the purpose of this discussion, similarities in responses between non-U.S. and U.S. citizens is potentially equally as important as differences in responses.

The decision to attend graduate school

Perceptions as to the importance and value of a graduate degree were similar for both groups based on four questions on the value of a graduate education. The highest level of agreement was with the statement that a graduate degree provided better career opportunities and the lowest agreement was with the statement that graduate school is more important than work experience in their field (see Table 1).

Table 1.
Perceptions of the importance of graduate school

	Non U.S. Citizens (n = 1033)	U.S. Citizens (n = 4225)
	Mean (SD)	Mean (SD)
A graduate degree provides me with better career opportunities.	4.3 (0.9)	4.2 (0.9)
A graduate degree will increase my income potential.	4.1 (1.0)	4.0 (0.9)
The benefit of a graduate education outweighs the cost.	3.8 (1.0)	3.8 (1.0)
In my career, attending graduate school is more important than work experience.	3.3 (1.2)	3.3 (1.1)

(Scale of 1 to 5, with 5 = Strongly Agree and 1 = Strongly Disagree)

Non-U.S. citizens indicated they were less likely to have spoken to faculty members and academic advisors when considering graduate school than did students who were U.S. citizens, but were equally likely to have spoken with peers or current graduate students (see Table 2). Non-U.S. citizens were also less likely to speak with a significant other or an employer, but without knowing the baseline as to the number of respondents who had an employer or a significant other to consult with, comparing those percentages may not be appropriate.

Table 2.
While considering graduate school, who did you go to (or are going to) for information?

	Non-U.S. Citizens (n = 1033)	U.S. Citizens (n = 4225)
	Percentage	Percentage
Friends, students or co-workers	66%	67%
Faculty member(s)	57%	67%
Current graduate student(s)	48%	48%
Academic advisor	35%	43%
Parent(s)	34%	43%
Institutional program	30%	30%
Significant other	17%	29%
Employer	10%	21%
Career counselor	12%	10%

Respondents were then asked to indicate the level of encouragement they received from the various sources. If a respondent did not indicate they had used a particular source, they were not asked to rate the level of encouragement. In general, the level of encouragement was very high from all sources and was similar for both groups (see Table 3).

Table 3.

While considering graduate school, how much encouragement did you get (or are you getting) for attending from…

	Non-U.S. Citizens (n = Varies)	U.S. Citizens (n = Varies)
	Mean (SD)	Mean (SD)
Faculty member(s)	3.7 (0.5)	3.8 (0.5)
Parent(s)	3.8 (0.5)	3.7 (0.5)
Academic advisor	3.7 (0.5)	3.7 (0.5)
Significant other	3.7 (0.6)	3.7 (0.6)
Institutional program	3.6 (0.6)	3.6 (0.6)
Employer	3.5 (0.7)	3.6 (0.7)
Friends, students or co-workers	3.5 (0.6)	3.6 (0.5)
Current graduate student(s)	3.5 (0.6)	3.5 (0.6)
Career counselor	3.5 (0.7)	3.5 (0.6)

(Scale of 1 to 4, with 4 = Strongly Encouraged and 1 = Discouraged)

That international students speak with faculty less often about graduate school, and when they do speak with faculty they report slightly lower levels of encouragement, may be a limiting factor in non-U.S. citizens considering graduate education. A comparison of faculty encouragement by field shows few differences, suggesting this is not due to the higher levels of STEM students in the non-U.S. sample. The highest level of encouragement from faculty overall was seen in Physical and Biological sciences. The slightly lower rate of employer encouragement is also interesting to note and might be tied to STEM fields in general, as the lowest levels of employer encouragement overall came in the fields of Engineering, Math and Computer Science.

Students who were enrolled in or had completed graduate school at the time of the survey were asked about the type and quality of information they received about graduate school and careers. Non-U.S. citizens were more likely to indicate they had received either no information or less information about graduate school than they needed compared to U.S. citizens (40% and

30%, respectively), as well as either no information or less information about careers than they needed (70% and 59%, respectively) (see Table 4a).

Table 4a.
How much information did you receive about…?

	Graduate School		Careers	
	Non-U.S. (n = 871)	U.S. Citizens (n = 3747)	Non-U.S. (n = 861)	U.S. Citizens (n = 3718)
	Percentage	Percentage	Percentage	Percentage
None	3%	2%	11%	10%
Less than needed	37%	28%	59%	49%
As much as needed	60%	70%	30%	41%

When those students were asked to judge the accuracy of the information they received, the non-U.S. citizens were again more negative about the information than their U.S. peers. Regarding graduate school, 5% of non-U.S. citizens said the information was not at all accurate, and an additional 68% indicated the information was only somewhat accurate – this compares to 4% and 59% respectively for U.S. citizens. Regarding careers, only 13% of non-U.S. citizens said the information they received was extremely accurate while 21% of U.S. citizens indicated the same – both percentages are very low, with more non-U.S. citizens stating the information about careers was not at all accurate (19%) then extremely accurate (13%) (see Table 4b).

Table 4b.
How accurate was the information you received about…?

	Graduate School		Careers	
	Non-U.S. (n = 863)	U.S. Citizens (n = 3705)	Non-U.S. (n = 843)	U.S. Citizens (n = 3627)
	Percentage	Percentage	Percentage	Percentage
None	5%	4%	19%	14%
Less than needed	68%	59%	69%	65%
As much as needed	28%	37%	13%	21%

When asked about how helpful the information they received was, there were fewer distinctions between the U.S. and non-U.S. groups. The U.S. citizens were more likely to indicate the information on graduate school was extremely helpful than non-U.S. citizens (40% and 35%, respectively), and also more likely to indicate the information about careers was extremely helpful (19% and14%, respectively) (see Table 4c).

Table 4c.
How helpful was the information you received about…?

	Graduate School		Careers	
	Non-U.S. (n = 864)	U.S. Citizens (n = 3730)	Non-U.S. (n = 852)	U.S. Citizens (n = 3673)
	Percentage	Percentage	Percentage	Percentage
Not at all helpful	4%	4%	22%	21%
Somewhat helpful	62%	57%	64%	61%
Extremely helpful	35%	40%	14%	19%

Despite non-U.S. citizens being more likely to report they entered graduate school without as much information as they needed, or that the information was not accurate enough, there are few differences between them and U.S. citizens when it comes to encouraging others to attend or reconsidering their own attendance. About 63% of non-U.S. and 64% of U.S citizens would be "very likely" to encourage others in their career to attend graduate school; only 6% of non-U.S. and 7% of U.S. citizens say, if they knew then what they know now, that they are not sure or definitely would not attend graduate school. Students who indicated they would attend graduate school but would do something differently, indicated that they would change institutions (39% for non-U.S. compared to 40% for U.S. citizens); would change a degree goal (28% for non-U.S. compared to 27% for U.S. citizens); and/or would attend immediately after college (18% for non-U.S. compared to 20% for U.S. citizens).

Experiences during graduate school

When those either currently enrolled in or had completed a graduate program were asked who they spoke with about career opportunities, a similar pattern as previously seen emerges. In general, non-U.S. citizens were less likely to discuss career options with others, especially faculty, than U.S. citizens (55% and 68%, respectively). One exception to this was discussing with friends, students and co-workers, where the non-U.S. citizens reported doing this slightly more often than their U.S. citizen counterparts (69% and 67%, respectively). The relatively low ranking of academic advisors as a source of information for both groups is worth noting (see Table 5).

Table 5.
While pursuing your graduate degree, who did you (or do you) talk with about your career opportunities?

	Non-U.S. Citizens (n = 871)	U.S. Citizens (n = 3754)
	Percentage	Percentage
Faculty member(s)	55%	68%
Friends, students or co-workers	69%	67%
Current graduate student(s)	47%	54%
Parent(s)	46%	51%
People who work in field	43%	49%
Significant other	27%	44%
Academic advisor	39%	41%
Employer	15%	25%
Career counselor	13%	11%

Those non-U.S. citizens who did discuss careers with faculty reported differing levels of encouragement for certain career options than U.S. citizens, with greater encouragement to focus on research (82% to 70%) and business (35% to 25%) careers and lesser encouragement to focus on academia (71% to 75%). These general patterns exist even after controlling for degree field, so this is not due to the higher levels of STEM for the non-U.S. citizens. In fact, the gap in those

reporting they were encouraged to consider faculty as a career is greatest between the non-U.S. and U.S. citizens for the STEM fields, while for some fields like Health Sciences, Social and Behavioral Sciences, and Education, the pattern reverses with greater encouragement for non-U.S. citizens to become faculty (see Tables 6a to 6c). Non-U.S. citizens also reported less encouragement to pursue careers in the military, government and nonprofit sectors compared to U.S. citizens, although those sectors were not encouraged very often for either group.

Interestingly, despite greater encouragement across the board for a wider variety of career options for U.S. citizens compared to non-U.S. citizens, both groups reported a similar amount of career goal changes during graduate school – with 44% of non-U.S. and 45% of U.S. citizens indicating they have changed career goals. And of those who did change goals, non-U.S. citizens are slightly more likely to indicate they have expanded their goals (56% to 52%) although they were less likely to have discarded their initial goals (15% to 22%).

Table 6a.

Faculty encouragement for a career in faculty/teaching

(Selected fields, for those who indicated they spoke with faculty about career options)

	Non-U.S. Citizens	U.S. Citizens
	Percentage	Percentage
Arts and Humanities	88%	90%
Biological and Agricultural Sciences	71%	82%
Mathematics and Computer Sciences	69%	77%
Physical and Earth Sciences	81%	93%
Health Sciences	81%	63%
Social and Behavioral Sciences	81%	76%
Education	100%	87%

Table 6b.

Faculty encouragement for a career in research

(Selected fields, for those who indicated they spoke with faculty about career options)

	Non-U.S. Citizens	U.S. Citizens
	Percentage	Percentage
Arts and Humanities	76%	56%
Biological and Agricultural Sciences	97%	94%
Mathematics and Computer Sciences	87%	80%
Physical and Earth Sciences	89%	95%
Health Sciences	81%	71%
Social and Behavioral Sciences	90%	79%
Education	87%	47%

Table 6c.

Faculty encouragement for a career in business

(Selected fields, for those who indicated they spoke with faculty about career options)

	Non-U.S. Citizens	U.S. Citizens
	Percentage	Percentage
Arts and Humanities	16%	14%
Biological and Agricultural Sciences	29%	25%
Mathematics and Computer Sciences	46%	45%
Physical and Earth Sciences	37%	35%
Health Sciences	19%	20%
Social and Behavioral Sciences	28%	17%
Education	9%	9%

Careers following graduate school

Those who had completed a graduate degree were asked about their current employment. About 79% of non-U.S. and 78% of U.S. citizens indicated they were fully employed.

When asked to describe what skills were important to their current position – such as knowledge of the field, research skills, communication skills and analysis of data as well as teamwork, organizational skills and ethics - only minimal differences were seen between the two groups. On a scale of 1 to 3, with 1 being not important to 3 being very important, the largest difference between the groups was about 1/3 of a standard deviation, on the topic of preparedness for analysis and synthesis of data (with non-U.S. citizens indicating this was more important in their work).

Similarly when asked about how well prepared they were by their graduate program on those skills, virtually no differences were seen. On a scale of 1 to 3, with 1 being not at all prepared to 3 being well prepared, the largest difference between the groups was about 1/4 of a standard deviation, on the topic of preparedness for writing skills (with non-U.S. citizens indicating less preparation, but still high at 2.5 on the scale between somewhat and well prepared).

Finally, international students report different levels of job satisfaction and responsibilities than their U.S. counterparts. Non-U.S. citizens were slightly less satisfied with practical issues such as benefits (possibly a function of comparing benefits in the U.S. to a home country) and job location (possibly a function of being away from home country). However they were even more noticeably less satisfied with the content of their job, indicating lower levels of

satisfaction than U.S. citizens on degree of independence, contribution to society, responsibility, and intellectual challenge (see Table 7).

Table 7.
Satisfaction with aspects of current job

	Non-U.S. Citizens (n = 419)	U.S. Citizens (n = 1841)
	Mean (SD)	Mean (SD)
Salary	3.2 (1.0)	3.2 (1.2)
Benefits	3.4 (1.1)	3.6 (1.2)
Job security	3.6 (1.1)	3.7 (1.1)
Job location	3.7 (1.1)	3.9 (1.1)
Opportunities for advancement	3.2 (1.1)	3.2 (1.2)
Intellectual challenge	3.6 (1.1)	3.7 (1.2)
Level of responsibility	3.7 (0.9)	3.8 (1.1)
Degree of independence	3.8 (1.0)	4.1 (1.0)
Contribution to society	3.6 (1.1)	4.0 (1.1)

(Scale of 1 to 5, with 5 = Very Satisfied and 1 = Very Dissatisfied)

Discussion

The differences and similarities reported by non-U.S. citizens and U.S. citizens need to be considered and understood by graduate school faculty and administrators as they promote their programs internationally. Many non-U.S. citizens appear to receive insufficient information – both in terms of amount and quality –about graduate school and careers compared their U.S. citizen counterparts. Whether this is due to non-U.S. citizens wanting more information, needing different information, or having more difficulty locating appropriate information is unclear. It is possible, if not likely, that non-U.S. citizens start with less information about U.S. higher education in general. Given that fewer non-U.S. citizens reported speaking with more professional sources such as faculty and academic advisors, graduate schools

may wish to encourage this of their prospective students – and may also need to provide more information to faculty and institutions outside the United States about their programs. Given that this population only includes those who did in fact take the GRE, it is hard to quantify or extrapolate to those who did not take the steps to apply and enroll. However, it is reasonable to assume that even when the international students who did take these steps often did not feel they had enough information, that this lack of information may hinder or discourage many others to not take the needed steps at all. Given the very large commitment needed to study in a country, not one's own, information on what that experience will be like and on the potential benefits is vital.

The results suggest additional support is needed for non-U.S. citizens while considering career options and preparing to enter the workforce. Further study is needed to understand why non-U.S. citizens feel they receive less encouragement than their U.S. citizen peers to pursue certain sectors or careers. The patterns of faculty encouragement suggest that more technical, research and support positions – more "behind-the-scenes" positions – are encouraged for non-U.S citizens. One reason for this might be that language and communication skills in English for non-U.S. citizens might be viewed as not sufficient for some positions (faculty, teachers, health professionals) – without a measure of such skills that could not be controlled for in this study. If this is the case, additional support for English language skills would be appropriate beyond meeting minimal standards needed for instruction and communication. While very few differences were seen in ratings or preparedness, written communication was the largest difference.

However a more problematic reason might be stereotyping of non-U.S. citizens as cognitively/technically proficient but not having the non-cognitive/interpersonal strengths for

some positions. The self-report of job satisfaction in terms of level of responsibility, independence, and intellectual challenge might also be symptomatic of stereotyping in the workforce along the same lines – being given technical responsibility but not creative or leadership roles. This could be a factor of choice of career field as well, or if working in the United States, even the types of positions employers are willing to hire non-U.S. citizens to fill due to visa and hiring restraints. However any long term benefits of having highly skilled non-U.S. citizens added to the U.S. workforce might be lost if there is a perception that career opportunities within the U.S. are limited in terms of advancement. A study of a potential "glass ceiling" for non-U.S. graduate degree holders and how graduate programs can ensure that such a ceiling does not exist might be warranted.

Overall, however, non-U.S. citizens seem to have generally similar experiences in what they learn in graduate school and similar levels of satisfaction with their programs as their U.S. citizen peers.

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