

# Demographic characteristics of participants in graduate college professional and sociocultural development programming

Demographic characteristics of participants

Laura N. Schram and Emma M. Flores-Scott

*Rackham Graduate School, University of Michigan, Ann Arbor, Michigan, USA, and*

Paula Clasing-Manquian

*Faculty of Education, Pontifical Catholic University of Chile, Santiago, Chile and  
Millennium Nucleus Student Experience of Higher Education in Chile:  
Expectations and Realities, Santiago, Chile*

Received 3 May 2022  
Revised 9 September 2022  
18 November 2022  
Accepted 7 December 2022

## Abstract

**Purpose** – The USA's higher education leaders and professional organizations have called for increased professional development programming at graduate colleges to better prepare US graduate students for their future careers. This study aims to investigate the demographic characteristics of graduate students participating in co-curricular professional development (PD) and sociocultural development (SD) programming at a graduate college at a large, selective and research-intensive public university in the Midwestern USA.

**Design/methodology/approach** – Using institutional data from six semesters, the authors examined the characteristics of students that attended the graduate college's programs at one university. The authors analyzed which students were most likely to attend PD and SD programs using multinomial logistic regression models.

**Findings** – Female students, students from US historically marginalized racial groups, and US Pell Grant recipients (low-income students) were found to have a higher likelihood of attending both PD and SD programs at the centralized graduate college.

**Practical implications** – The findings will be of interest to graduate deans and educators who support graduate students. Further evaluative research on the usefulness of such programs at other institutions would help graduate colleges better understand the role they play in meeting graduate students' needs.

**Originality/value** – The findings contribute to the understanding of the important role of the US graduate college in the development of graduate students. To the best of the authors' knowledge, it is the first study to evaluate the backgrounds of graduate students who pursue co-curricular PD and SD opportunities.

**Keywords** Professional development, Graduate school, Graduate college, Master's and doctoral students, Sociocultural development

**Paper type** Research paper

We acknowledge the critical contributions of Kristen Jensen and Maureen Leonard, who carefully tracked and managed student participation data as Event Planners at the graduate college. In addition, the support of John Gonzalez and the Rackham Institutional Research team was critical to analyzing these data. We also want to thank several colleagues for their critical feedback on this paper, including Allyson Flaster, Chris Golde, John Gonzalez, Matt Nelson, Maresi Nerad, and Shoba Subramanian. Finally, we are grateful to Michael J. Solomon, Dean and Vice Provost for Academic Affairs–Graduate Studies, for his continued support.



## Introduction

Graduate degrees in the USA have traditionally signaled deep knowledge and mastery in a particular field and have played a critical role in the training of the US workforce. The doctorate was commonly seen as preparation for scholarly careers, whereas the master's degree was seen as preparation for professional careers (e.g. social work, business and education) in the USA. However, over the past twenty years, trends in employment for doctorate recipients in the USA have changed dramatically. The 2020 report from the US National Survey of Earned Doctorates found that 40% of all doctorate recipients with definite employment commitments (excluding postdoctoral positions) reported that their principal job would be in academe, down from 49% in 2000 ([National Center for Science and Engineering Statistics, 2021](#)). Among those with definite employment commitments beyond the professoriate, 40% reported securing jobs in industry, and another 20% reported jobs in government, nonprofit or K-12 education. In the past 20 years, the rate of academic employment commitments declined in all fields except for education ([National Center for Science and Engineering Statistics, 2021](#)). In other words, over the past two decades, national career outcomes data shows an increasing number of PhD's secure jobs beyond the professoriate upon completion of their doctorate, suggesting a national need for more intentional preparation for a broad range of career outcomes for doctoral students. While the USA does not have a national career outcomes survey of master's degree recipients, national labor statistics suggest that professional and master's degree holders earn more on average than bachelor's degree recipients ([US Bureau of Labor Statistics, 2022](#)). Yet, professional and master's degrees are typically costly for students, and scholars have critiqued the lack of career preparation for many master's degree recipients, particularly in fields like the humanities, where professional career paths are less obvious ([Cassuto, 2015](#)).

Universities in the USA have been criticized for their failure to recognize the broad range of career outcomes for those who earn graduate degrees ([Denecke \*et al.\*, 2017](#); [Golde and Dore, 2001](#); [McCarthy, 2017](#); [National Academies of Sciences, Engineering, and Medicine, 2018a](#); [Nerad, 2020, 2009, 2004](#)). In recognition of the diverse range of careers that doctoral students pursue, many professional organizations and government agencies in the USA have convened working groups of university leaders, employers and recent graduate students to make recommendations for improving professional development (PD) in graduate education. The National Science Foundation funded project (2014–16) to improve PD for US graduate students in Science, Technology, Engineering and Mathematics (STEM) and the National Endowment for the Humanities (NEH) funded Next Generation Humanities PhD Consortium (2016–2017) found that many graduate programs do not adequately prepare their graduates with the skills required to translate their scholarly knowledge to be successful in multiple careers ([Denecke \*et al.\*, 2017](#); [McCarthy, 2017](#)). The need for improved career preparation also has been addressed by professional organizations in countries around the world, including the European University Association ([Hasgall \*et al.\*, 2019](#)) and the Australian Council of Learned Academics' Review of Australia's Research Training System ([McGagh \*et al.\*, 2016](#)). In 2017, the US Council of Graduate Schools (CGS) launched the PhD Career Pathways Project to investigate career trajectories of doctoral students across disciplines. A key finding from this project was that many PhD recipients change jobs several times in both early and mid-careers, like professionals in other sectors of the workforce, contradicting the widely held belief in US higher education that PhDs pursue tenure track positions and do not change career paths. [Okahana \(2019\)](#) concluded, "this underscores the importance of preparing PhD students not only for their first job searches but also for preparing them to navigate different job opportunities and careers as a whole" (p. 2). In response to these issues, the National Academies of Sciences, Engineering and Medicine (NASEM) appointed the Committee on Revitalizing Graduate STEM Education for the 21st Century and recommended that students be given the time and resources to explore a broad range of careers ([NASEM, 2018a](#)). Similarly, for master's students, CGS noted in their 2019 report

---

on the organization and administration of graduate education in the US that master's students often do not receive financial support for their graduate studies and that PD opportunities can assist these students in better understanding "how graduate school can lead to better post-graduate careers" (Council of Graduate Schools, 2019, p. 63).

Supporting career diversity and offering multiple PD opportunities is seen as valuable for all students, but how does this impact historically marginalized graduate students in the USA? While evidence suggests that all PhD students have decreased interest in pursuing the professoriate as they proceed through their graduate programs (Mason *et al.*, 2009), this diminishing interest in faculty careers is significantly higher among women and graduate students from historically marginalized racial and ethnic backgrounds (Feldon *et al.*, 2017; Gibbs *et al.*, 2014; Golde and Dore, 2001; Mason *et al.*, 2009). Several studies have shown that a strong sense of belonging does have an impact on graduate student retention and success (Pascale, 2018; Strayhorn, 2018) and on students' career interests (Haley *et al.*, 2014; O'Meara *et al.*, 2017; Ostrove *et al.*, 2011). In order for graduate students from historically marginalized backgrounds to explore the full range of careers available to them as their career interests evolve, there must be accessible and inclusive career and PD programming (Subramanian *et al.*, 2022). To ensure that graduate education career diversity efforts are successful, there is value in pairing professional development (PD) and sociocultural development (SD) programming to ensure that these programs are culturally adaptive and foster a sense of belonging for students from all backgrounds.

With this increased pressure to expand PD opportunities and attend to the needs of diverse students, the key question is where should these opportunities be offered? While graduate programs and departments play an essential role, other units across the university, like teaching and learning centers, career centers, writing centers and graduate colleges, are well-positioned to offer this type of programming (Cassuto and Weisbuch, 2021; Subramanian *et al.*, 2022). Some have argued that spaces for career exploration should be created outside of students' departments because many doctoral students find it a "taboo" topic with their advisors (Nerad, 2015b). Others have noted that career and PD educators have critical expertise that complements faculty research mentors' expertise (Subramanian *et al.*, 2022). Similarly, with regard to SD programming, Pontius and Harper (2006, p. 55) assert that student affairs practitioners are well positioned to "engage graduate students across departments, provide improved campus services and foster a campuswide graduate community". Institutions with centralized or hybrid graduate schools and graduate affairs services have also been called to support and coordinate PD programming for graduate students because of their administrative and educational roles (Cassuto and Weisbuch, 2021; Gardner and Doore, 2020; Golde and Dore, 2001; NASEM, 2018a; Nerad, 2015a; Nerad and Bai, 2021; Okahana, 2019; Subramanian *et al.*, 2022).

There is evidence to suggest that many graduate colleges have led in the creation of PD and sociocultural engagement programming. By "graduate college," we mean the office that oversees university-wide graduate studies at a particular university. Brandes (2006), in her review of what she refers to as "graduate student centers", which include what we refer to as "graduate colleges", noted that these centers are increasingly providing professional and sociocultural development programs. A more recent survey of graduate deans, academic college deans, PD program directors and faculty program leaders in the USA by the Council of Graduate Schools (2019) found that 60% of respondents reported that their graduate college provides PD programs for graduate students. PD offerings typically include transferable skills frameworks, career-related workshops and boot camps, skills-based online tutorials and resources and professional certificate programs. SD programming tends to include orientations and retention programs, particularly for students from historically marginalized backgrounds.

Nevertheless, participation in these programs is typically co-curricular, meaning that they are offered as supplemental to the formal curriculum and students are not required to participate

---

(Subramanian *et al.*, 2022). Unfortunately, little is known about the types of students that participate in co-curricular programming offered by graduate colleges. Despite the national calls for better PD support, including SD programs that attend to the needs of historically marginalized graduate students, there is a lack of substantial evaluative research on the programs that graduate colleges have developed in response. In the following study, we address this research gap by analyzing three years of graduate student participation data in the PD and SD programs at the graduate college at one large, selective and research-intensive public university in the Midwestern USA.

---

### Study setting

The following research study, with a practical focus on one graduate college, draws on attendance data to explore the demographic backgrounds of students who are most likely to engage and participate in events hosted by the graduate college. On this institution's campus, there are many other units that also provide PD and SD programming (e.g. the teaching center, the career center, the writing center, the international center, etc.), but we did not have access to participation data from other campus units, as the campus has no centralized data management system for co-curricular programs. In the period of study that we explored, academic years 2017–2019, the average fall term graduate college-wide enrollment was 8,626 graduate students (an average of 36% master's and 64% doctoral students). During this period, the demographic characteristics of the graduate student body were as follows in terms of average percentages: 44% female; 60% US citizen and 40% non-US citizen students [1]; 18.7% US citizen historically marginalized students (this includes those students who self-identify as Black, Latinx/Chicanx/Hispanix and/or Native American); 19.4% first-generation college students; and 20.8% Biological and Health Sciences, 48.3% Physical Sciences and Engineering, 22.4% Social Sciences and 8.5% Humanities (Table 1).

The graduate college offers programming to support graduate and professional students in both their PD and SD, and students are welcome to attend regardless of what stage of their program they are in. Graduate college educators (professional staff at the graduate school, many with PhDs themselves) developed a core skills framework for the PD curriculum. This framework includes eight transferable skill areas the graduate college sees as essential to graduate student development, including content expertise; career development; collaboration; diversity, equity and inclusion (DEI); leadership; teaching; communication; and personal well-being. The PD programs offered by the graduate college help students to develop their skills in the majority of these areas to supplement the traditional curriculum in departments. Examples of typical PD offerings at the graduate college include training on topics related to career exploration, job search within and beyond academe, mentoring, DEI and public engagement.

In addition to PD offerings, the graduate college provides SD programming. These programs are designed to help create inclusive spaces at the graduate college, teach students about academic norms and culture (including common challenges) and foster students' sense of belonging. This is accomplished by supporting students during key transitional points, celebrating students' successes and organizing affinity-based programming. Some examples of the types of programs include an orientation workshop series for first-year students on transitioning to graduate education, a ceremony to celebrate students who achieve doctoral candidacy, graduate and professional student appreciation week activities and affinity group programs for several groups (first-generation graduate students, parents, students with disabilities, LGBTQ+ students, etc.).

### Methods

#### *Data*

We used institutional data from students enrolled in this institution's graduate college between winter 2017 and fall 2019 (six semesters) to identify the types of students who were

Variable	Full sample ( <i>n</i> obs. = 49,411) (%)	US citizen students ( <i>n</i> obs. = 29,782) (%)	Demographic characteristics of participants
<i>Event attended</i>			
None	91.4	89.7	
Professional Development Event (PD)	3.9	4.6	
Sociocultural Development Event (SD)	3.7	4.6	
Both	1.0	1.2	
<i>Overall demographics</i>			
Male	56.0	51.2	
Non-US citizen	39.7		
URM		18.7	
First generation college	19.4	20.1	
Pell grant recipient		28.4	
First generation citizen		12.0	
<i>Academic level</i>			
Master	36.1	30.3	
PhD precandidate	25.8	28.5	
PhD candidate	38.1	41.2	
<i>Academic field</i>			
Bio and health sciences	20.8	25.2	
Physical sciences and eng.	48.3	37.8	
Social sciences	22.4	26.4	
Humanities	8.5	10.6	
<i>Term</i>			
Fall 2017	17.2	17.0	
Winter 2017	15.6	15.8	
Winter 2018	16.0	16.1	
Fall 2018	17.3	17.3	
Winter 2019	16.1	16.2	
Fall 2019	17.9	17.6	

**Table 1.**  
Percentage of  
observations by  
graduate college  
event attended and  
overall students'  
sociodemographic  
characteristics

participating in the graduate college's workshops and programs. This institutional data, which contains student demographic information, was merged with graduate college event attendance data. Graduate certificate students ( $n = 77$ ), nondegree students ( $n = 1$ ) and students in Independent Interdepartmental Degree Programs ( $n = 120$ ) were excluded from the analysis because there were few cases in these categories, which are challenging to analyze [2]. In addition, 92 students were removed because their demographic information was incomplete. In total, 49,411 enrollments (this includes students multiple times across enrolled semesters) in six terms were considered for the analysis. Depending on the term, 4%–11% of all enrolled students attended a program during the period of observation (Table 2 for enrollments and attendance at events by term).

Two types of events were included in our analysis: PD and SD events. We separated these two types of events because their purposes are distinct. Programs included in our analysis were open to all graduate and professional students and were advertised both in a weekly digital newsletter emailed to all enrolled students and on the graduate college website.

*Measures*

*Dependent variable.* The outcome of interest was attendance at a PD event, an SD event or both or not attending any events in one term. [Table 1](#) presents the overall distribution of observations by each category.

*Explanatory variables.* We used institutional data to generate demographic, academic and disciplinary characteristics. Among the demographic characteristics, we included in our analysis the variables of sex (male or female), citizenship (US citizen or non-US citizen), first-generation college status, US underrepresented minority (URM) status (as defined by the US federal government, URM includes those students who self-identify as Black, Latinx/Chicanx/Hispanix and/or Native American), US Pell Grant [[3](#)] recipient during undergraduate education and first-generation US citizen status. All these demographic characteristics, with the exception of citizenship, are based on self-reports in students' graduate college applications. Unfortunately, our registrar does not gather data on self-reports of gender or gender identity. In addition, respondents were only given a binary option for the sex variable; intersex was not listed as an option. Therefore, we only report on self-reported sex categorized in a binary way in this study. The last three characteristics (URM, Pell Grant and first-generation US citizen) apply only to US citizen students. Recognizing that master's and doctoral students in different stages in their programs have distinct needs, we included the student's academic level in each term (master's, PhD precandidate or PhD candidate). Finally, we included the academic field (Biological and Health Sciences, Physical Sciences and Engineering, Social Sciences, Humanities and the Arts). The graduate college's classification of academic fields is based on the National Sciences Foundation's program classification scheme (see [Table 1](#) for the distribution of observations).

*Control variables.* We included the term (i.e. semester) of attendance to control for possible differences in event programming (winter 2017 through fall 2019).

*Analytical strategy*

The main aim of this study was to identify the characteristics of graduate students that are correlated with the likelihood to participate in the graduate college's programs. As our outcome variable, event attendance includes four mutually exclusive categories (attending a PD event, attending an SD event, attending both and not attending either event during a given term); we used multinomial logistic regression to identify student characteristics associated with event attendance. A multinomial logistic regression fits separate binary logistic regressions for each pair of outcomes (e.g. attending a PD event vs not attending any event and attending an SD event vs not attending any event) using all the sample, and therefore, is more efficient than fitting separate models ([Long and Freese, 2014](#)). As some of the explanatory variables were only applicable to US citizen students, we first performed a

**Table 2.**  
Graduate college  
enrollment and  
attendance to events  
by term

Term	(%) Graduate students attending events	Total graduate students enrolled
Winter 2017	7	7,717
Fall 2017	4	8,483
Winter 2018	9	7,879
Fall 2018	11	8,555
Winter 2019	10	7,937
Fall 2019	10	8,840
Total Fall 2017–Winter 2019 Enrollments		49,411

---

model for the full sample considering students with US citizenship and non-US citizenship. Then, we performed a second model restricting the sample to US citizens and including URM, Pell Grant recipients and first-generation US citizens as explanatory variables. All models cluster standard errors at the student level because the same students may exhibit patterns of behavior across terms, which could cause autocorrelation. An assumption of a standard regression model is that errors are uncorrelated, so to account for the data structure and the possible correlation of errors of the same student over time (i.e. repeated students in different terms), we clustered standard errors. Finally, we calculated predicted probabilities of event attendance at the sample mean covariate values to interpret the multinomial logistic regression results.

## Results

[Table 3](#) presents the results of two multinomial logistic regression models of the likelihood of attending PD and SD events compared to not attending those events. The first three columns present the estimates for the model that includes all students (US citizens and non-US citizens), whereas the last three columns present a model that considers only US citizen students. Overall results in [Table 3](#) indicate that several demographic characteristics are associated with attendance at both PD and SD events, whereas academic and disciplinary characteristics differentiate which students are more likely to attend PD compared to SD events.

Regarding the demographic characteristics, in our first model of all students, we found that being a female, a US citizen or a first-generation student is associated with PD and SD event attendance. To have a sense of the magnitude of the association, we calculated the predicted probabilities for attending PD, SD and both events by student characteristics ([Table 4](#)). As indicated by the predicted probabilities for the model of all students reported in the first three columns of [Table 4](#), an average female student has a predicted probability of attending a PD event of 0.050, whereas an average male student has a predicted probability of 0.024. In other words, female students were roughly twice as likely to attend an event as male students. A similar association is found for SD events and attending both types of events. As shown in [Table 3](#), non-US citizen students are statistically significantly less likely to attend both PD and SD events compared to US citizen students. In terms of predicted probabilities, non-US citizen students have a predicted probability of attending both PD or SD events of 0.029, whereas the predicted probability for US citizen students is 0.036, holding all other variables at their means. Finally, first-generation college students were more likely to attend both PD and SD events.

Looking at the US citizen student multinomial regression model in [Table 3](#), we found that females, URM students and students who received a Pell Grant are more likely to attend PD, SD or both types of events. Once we controlled for these additional variables (URM status, receipt of a Pell Grant and first-generation US citizenship) for US citizens, unlike in the model of all students, we no longer found a statistically significant relationship between first-generation college status and attendance at PD events ( $p > 0.05$ ). For SD events, on the other hand, we did still find a statistically significant relationship between first-generation college status and SD event attendance ( $p > 0.05$ ). As shown in [Table 4](#), holding other variables at their means, the predicted probability of attending PD programs is 0.052 for URM students and 0.036 for non-URM students. Similarly, the predicted probability for attending PD events is 0.044 for Pell Grant recipients compared to 0.037 for nonrecipients. We found similar associations for attending SD and both types of events.

In terms of the differences between the types of students who attend PD or SD events, we found that they differ in their academic levels and disciplinary fields. While PhD students

**Table 3.**  
Multinomial logistic regression of graduate students' likelihood of attending graduate college events on covariates (log odds)

Variable	All students (n = 49,411)		Ref. Cat. No attending		US citizen students (n = 29,782)	
	PD	SD	Both	PD	SD	Both
<i>Demographics</i>						
Male	-0.777** (0.0591)	-0.517** (0.0577)	-1.061** (0.118)	-0.805** (0.0730)	-0.574** (0.0694)	-1.033** (0.143)
Non-US citizen	-0.248** (0.0603)	-0.540** (0.0633)	-0.295* (0.129)			
First generation college st.	0.180** (0.0650)	0.361** (0.0627)	0.561** (0.126)	-0.0404 (0.0872)	0.188* (0.0797)	0.170 (0.164)
URM				0.414** (0.0804)	0.539** (0.0758)	1.005** (0.164)
Received Pell during undergraduate				0.180* (0.0788)	0.261** (0.0749)	0.381* (0.154)
First generation citizen				-0.120 (0.0981)	0.0448 (0.0956)	0.273 (0.182)
<i>Academic characteristics</i>						
Graduate precandidate (vs Master)	0.153* (0.0756)	0.902** (0.0713)	0.417** (0.146)	0.129 (0.0938)	0.865** (0.0847)	0.407* (0.173)
Graduate candidate (vs Master)	0.730** (0.0645)	0.492** (0.0700)	0.717** (0.134)	0.714** (0.0813)	0.413** (0.0837)	0.614** (0.164)
<i>Academic field</i>						
Bio and health sci (vs Phys. Sci. and eng.)	0.0903 (0.0738)	0.127 (0.0728)	0.0484 (0.153)	0.110 (0.0903)	0.0174 (0.0849)	-0.0811 (0.177)
Social Sciences (vs Phys. Sci. and eng.)	0.269** (0.0713)	0.0756 (0.0730)	0.115 (0.143)	0.245** (0.0870)	-0.0827 (0.0866)	-0.0414 (0.174)
Humanities and the Arts (vs Phys. Sci. and eng.)	0.395** (0.0964)	0.0585 (0.0990)	0.119 (0.192)	0.262* (0.113)	-0.0827 (0.112)	0.0833 (0.217)
Constant	-3.895** (0.100)	-4.128** (0.110)	-5.452** (0.209)	-3.879** (0.121)	-4.303** (0.134)	-5.861** (0.269)
Control by Term	X	X	X	X	X	X

**Notes:** Standard errors in parentheses and clustered at the student level. \*\*p < 0.01, \*p < 0.05



Variable	All students ( <i>n</i> = 49,411)			US citizen students ( <i>n</i> = 29,782)			Demographic characteristics of participants	
	PD	SD	Both	PD	SD	Both		
<i>Demographics</i>								
Female	0.050	0.039	0.014	0.057	0.050	0.014	<p><b>Table 4.</b> Predicted probability of attending a professional development (PD) or a sociocultural development (SD) event by student characteristics. All students and US citizen students only</p>	
Male	0.024	0.025	0.005	0.027	0.030	0.005		
Non-US citizen	0.029	0.029	0.007					
US citizen	0.036	0.036	0.009					
<i>First generation college st.</i>								
No	0.032	0.029	0.007	0.039	0.037	0.008		
Yes	0.038	0.040	0.012	0.038	0.044	0.010		
<i>URM</i>								
No				0.036	0.035	0.007		
Yes				0.052	0.057	0.019		
<i>Received Pell during undergraduate</i>								
No				0.037	0.036	0.008		
Yes				0.044	0.046	0.011		
<i>First generation citizen</i>								
No				0.040	0.038	0.008		
Yes				0.035	0.040	0.011		
<i>Academic characteristics</i>								
Master	0.025	0.021	0.005	0.029	0.026	0.006		
PhD precandidate	0.028	0.049	0.008	0.031	0.059	0.009		
PhD candidate	0.049	0.032	0.011	0.056	0.038	0.011		
<i>Academic field</i>								
Bio and Health Sci	0.032	0.033	0.008	0.039	0.040	0.008		
Phys. Sci. and Eng.	0.030	0.029	0.008	0.035	0.040	0.009		
Sociale Sci	0.039	0.031	0.008	0.044	0.036	0.008		
Humanities and the arts	0.044	0.031	0.008	0.045	0.036	0.009		

**Notes:** Covariates set at sample means. Term was included as control variable

are more likely to attend both PD or SD events compared to master’s students, doctoral students who have achieved candidacy are more likely to attend PD events, whereas PhD precandidates are more likely to attend SD events. As shown in [Table 4](#), in our model of all students, the predicted probability of attending a PD event is 0.025 for a master’s student, holding all other variables at their means. The predicted probability increases by 0.024 if the student is a PhD candidate. For SD events, the predicted probability for master’s students is 0.021, whereas the predicted probability for PhD precandidates is 0.049. These academic level differences are similar to the model of US citizen students, as well. Finally, in both models, Social Science and Humanities students are modestly more likely to attend PD events than Physical Science and Engineering or Biological and Health Sciences students. The relationship between discipline and the likelihood of event attendance is not statistically significant for attending SD or both types of events.

## Discussion

The model of graduate education reform enacted through the implementation of PD and SD programs is based on the assumption that “if you build it, they will come.” Our findings

---

showed that in the semesters we observed, 4%–11% of the overall graduate student body attended at least one event hosted by the graduate college. We recognize that the majority of students at the university did not attend any co-curricular programming by the graduate college in each of the semesters we observed. It is difficult to say whether this rate of participation is low or high, as no other US graduate colleges have published comparable data. Additionally, we recognize that as we do not have participation data from other units on campus that serve graduate students, we do not know the full participation of graduate students in a co-curricular PD and SD programming across campus. Among the students who did attend, females, students from US historically marginalized racial groups and US low-income students (i.e. Pell Grant recipients) have a higher likelihood of attending both PD and SD programs at the graduate college. This suggests that graduate colleges have the opportunity to play an important role for these students and their development, assuming the programs meet their learning objectives. There are several systemic factors that may help to explain why these populations are more likely than others to seek out support beyond their departments.

We know that racial and gender inequities in higher education foster different developmental experiences and distinct career interests for students who identify in these groups (Brandes, 2006; Gardner and Barnes, 2007; Gardner and Holley, 2011; Gibbs *et al.*, 2014; Golde and Dore, 2001; Griffin *et al.*, 2012; Haley *et al.*, 2014; Posselt, 2018). For example, for several decades now, studies in the USA have shown that the desire for faculty careers varies by gender and race, where white women, women from historically marginalized racial groups and men from historically marginalized racial groups are less likely to report high interest in faculty careers at research-intensive institutions relative to white men (Gibbs *et al.*, 2014; Golde and Dore, 2001). Research in the Australian higher education system has similarly found that Indigenous doctoral students have unique developmental needs (Hutchings *et al.*, 2019; Moodie *et al.*, 2018). One potential explanation for our findings is that the increased challenges for historically marginalized groups and social inequities compel students from these backgrounds to seek professional and sociocultural support outside of their programs. A recent cross-institutional study found that graduate students, particularly from historically marginalized groups, find the graduate college and graduate educators (i.e. professional staff at graduate colleges) to be valuable resources for conversations and training related to DEI; “staff members at the graduate college provided support and encouragement for minoritized students that may have been absent or insufficient at the department level” (Perez *et al.*, 2020, p. 9). A recent research brief analyzing descriptive statistics gathered by the Council of Graduate Schools (Garcia and Zhou, 2022) found that among PhD students from select science fields, persons of color and women participated at a higher rate than nonminoritized counterparts in academic PD offerings. They suggest that while participation in PD activities provides skill-building, it can also provide “support in forming a professional identity, and a sense of community among minoritized students.” (Garcia and Zhou, 2022, p. 4) This aligns with our findings, where the graduate college’s diverse offerings may be meeting a critical developmental need for students at the margins. Further, given that affinity groups often cluster together to build community, students from similar backgrounds may share word of mouth with each other about the value of these programs, driving up attendance from certain populations.

The variable that was most robust in predicting an increased probability of event attendance was sex. We offer two possible explanations for this phenomenon. First, it is possible that women are facing challenges that impact their career interests and therefore are more likely to look for other PD opportunities. Women face challenges in graduate education, such as inequitable allocation of opportunities for authorship (Feldon *et al.*, 2017),

---

greater concerns about the work–family conflict in academe than men (Mason *et al.*, 2013) and gender bias and sexual harassment (Clancy *et al.*, 2014; Mason *et al.*, 2013; NASEM, 2018b). As noted above, women – and women of color in particular – show diminished interest in faculty careers compared to white men (Fisher *et al.*, 2019; Gibbs *et al.*, 2014; Golde and Dore, 2001). One 2006–2007 study of doctoral students at the University of California found that while both men and women change their minds about pursuing a faculty career during graduate school, women are more likely to decide not to pursue a faculty career and, unlike men, often attribute this decision to work–family conflict concerns (Mason *et al.*, 2013). One study of the National Institutes of Health Broadening Experiences in Scientific Training program, designed to provide career exploration and internship opportunities, found that at their institution, roughly 70% of their sample of graduate students and postdocs who completed an internship for careers beyond the professoriate were women, suggesting women may be more likely to consider nonfaculty careers (Chatterjee *et al.*, 2019). The challenges facing women doctoral students appear to impact women’s career interests and may help to explain why sex is the strongest predictor of which students are most likely to come to graduate college events for professional and sociocultural support. Second, our results could also be explained by factors related to men and socialized masculinity. For example, we know men exhibit less help-seeking behaviors in general, especially help-seeking to support their mental health (Vogel and Heath, 2016). Attending co-curricular PD and SD events is a form of help-seeking behavior in the professional realm, and the differences we see by sex may be analogous to sex differences scholars find in other forms of help-seeking behaviors.

The lower likelihood of non-US citizen student attendance at our events stands in stark contrast with our findings for US historically marginalized groups. We know that non-US citizens face additional challenges in US graduate education. Among these challenges are access to visas and restrictions around citizenship for many fellowships and employment opportunities (McDowell and Bankston, 2018). In addition to these legal barriers, non-US citizen students are very diverse in terms of race, language and culture. Depending on their nationality, non-US citizen scholars studying in the US may face xenophobia, acculturative stress, social isolation and English language-related social and academic challenges (Erichsen and Bolliger, 2011; McClure, 2007; Prieto-Welch, 2016; Trice, 2007; Williams *et al.*, 2018). Given the challenges non-US citizens may face in US higher education, one might expect their participation to be consistent with females, students from US historically marginalized racial groups and low-income students.

Several factors may explain this puzzling result. First, similarly to the gender patterns with help-seeking behavior described previously, studies on mental health have demonstrated that international students studying in the USA are less likely to seek mental health services than US citizens (Prieto-Welch, 2016). For example, one study found that international students use counseling center services at lower rates than US citizen students (Masuda *et al.*, 2009). Therefore, it may be that non-US citizen students are less likely to seek help than US citizen students due to cultural barriers to help-seeking behavior. Second, some international students may not plan to remain in the USA, potentially limiting the value of attending workshops that are geared to the US job market and US higher education culture. Third, a confounding factor in our study is that our campus has an International Center that sponsors a wide array of sociocultural and PD programs, an English Language Institute that provides supplemental programming for English Language Learners, as well as an active international graduate student affinity group that organizes its own programming. Non-US citizen graduate students may attend the professional and sociocultural programming offered by these other campus units that support international scholars on our campus.

---

Finally, while previous scholarship has shown that doctoral students who identify as women and those from historically marginalized racial groups are more likely to be interested in careers beyond the professoriate, not enough is known about how non-US citizen students' career interests evolve during US graduate studies. One study of doctoral graduates between 1982 and 1985 in six fields found that 40% of international scholars were not working in the USA 10 years after graduating (Gupta *et al.*, 2003). More recent studies of doctoral career interests either only looked at US-citizen doctoral students (Gibbs *et al.*, 2014; Haley *et al.*, 2014) or had too few non-US citizen respondents to report differences between US-citizen and non-US citizen students (Golde and Dore, 2001). Further exploration of the differences between US-citizen and non-US citizen graduate students' professional and sociocultural development is clearly needed both at our graduate college and nationally to understand why this particular population was less likely to attend graduate college programs on this one campus when other marginalized communities are more likely to attend these programs.

### *Limitations*

Our study has some important limitations. First, we used administrative data sets to identify student demographic and academic characteristics as explanatory variables, and therefore, we were limited to the information collected by the institution. It is possible that other characteristics not measured by the demographic data captured by this institution are also associated with attending events at the graduate college (e.g. sexual orientation, ability, etc.). For example, little work has been done looking at the relationship between students' prior work experiences and career outcomes after graduate school. We do not have institutional data on the career experiences of graduate students prior to their graduate education. It may be that certain groups, such as socioeconomically disadvantaged students, have different pregraduate school work experiences that shape their career interests and engagement in career and PD programming. This would be a promising future area of study.

Second, our institution is a Predominantly White Institution (PWI), a selective research-intensive university and located in the Midwest of the USA. The patterns of participation in graduate college offerings at other PWIs with different campus climates and cultures and at institution types with more diverse student bodies, such as Minority Serving Institutions (MSIs), may be very different.

Third, our study reflects patterns of participation in programming at just one institution. Further, this research does not capture all graduate student programming available at the institution but rather is limited to one unit (the graduate college). Our institution does not have a uniform mechanism to collect or share participation data across all units that serve graduate students. Therefore, we cannot generalize our results. Importantly, to assess the impact of co-curricular PD programming to address broad structural problems within higher education, the graduate education community should collect and share data on PD and SD programming participants both within and across institutions to understand whether these patterns of participation are typical. Until this happens, single-institution studies such as this one are the best source for providing initial insights. If educators are not reaching the majority of graduate students with these current reform efforts, higher education leaders may need to consider alternative strategies for supporting students in their professional and sociocultural development.

Fourth, our study does not examine trends in students' participation patterns over time, as we are limited to three academic years of data with students at a range of points in their graduate career. It would also be useful to explore how student participation evolves over

time, as this type of analysis could help us better understand the differences we saw in participation among PhD precandidates and PhD candidates. A future study could follow a cohort of students beginning with their first term of enrollment through their graduation to better understand student participation over the course of the graduate student experience.

Finally, we recognize that much has changed as a result of the recent COVID-19 pandemic, and our analysis is pre-pandemic. Higher education institutions and graduate students weathered several severe crises as a result, including significantly diminished mental and physical health, research progress delays and tightening faculty job markets in many fields. Recent studies also suggest that the structural inequities experienced by women and racial minority groups in academia were further exacerbated during the pandemic (Staniscuaski *et al.*, 2021). We may see significant differences in patterns of participation in co-curricular programming offered by the graduate college as a result of these crises. For example, virtual events may allow easier access to some students (e.g. those in the lab sciences or with caregiving demands), whereas it may make certain affinity-based programming designed to build community more challenging given how difficult it is to develop relationships in a fully virtual setting. The graduate college did continue to gather participation data during the pandemic, and this is one potential future direction for this study. It would be valuable for graduate colleges to investigate the impact of the COVID-19 pandemic on student participation in professional and sociocultural development events at the graduate college during such an unprecedented time.

## Conclusion

The mission of the graduate college at this large, selective, research-intensive university in the Midwestern USA is to partner with graduate faculty and programs to advance excellence in graduate education, to cultivate a vibrant and diverse student community and to impact the public good through the scholarship and discoveries of its students and degree recipients. Based on the data collected in our study, we conclude that one way the graduate college cultivates a vibrant and diverse community is to provide professional and sociocultural development workshops and programs that support graduate students, particularly those from historically marginalized backgrounds.

One important implication of our findings is that institutions, especially PWIs, who desire to support students from all backgrounds should consider how the graduate college can play a helpful role in creating an equitable student support infrastructure. The National Academies of Sciences (2018) report noted the value in exploring the interplay between departments and graduate colleges in supporting students, and future work should explore how programs and graduate colleges together can support students in productive ways. Nerad (2015b) found that one significant taboo between doctoral students and their advisors was the topic of their career goals, particularly for doctoral students who no longer wish to be professors. This study was done eight years ago, and some may argue that the climate around career diversity has improved in some fields, such as engineering and some life sciences, but this taboo may still be a challenge in the humanities, social sciences and some physical sciences. More recently, Garcia and Zhou (2022) found that while most science doctoral students participated in PD opportunities sponsored by their own program, career preparation was the one area where students were participating at a greater rate in institution-wide opportunities. They suggest that this could be a direct result of career preparation being more likely to be offered by centralized units versus academic programs (Garcia and Zhou, 2022, p. 4). We argue that the graduate college can provide a space to explore career possibilities for students who find the topic taboo in their programs. Students from historically marginalized backgrounds were more likely to seek

---

support from the graduate college in our study, and it would be valuable to have graduate faculty and graduate college educators collaborate to create inclusive environments at both the program level and in the graduate college to support students' development and prepare them for their future careers.

In their discussion on how to build a better graduate education infrastructure, Cussuto and Weisbuch argued (2021) that "administrative units beyond the individual programs must sponsor these [career diversity] efforts. That's part of the reason it's important to empower the graduate dean and the graduate school" (p. 138). Centralized graduate colleges may also be better able to coordinate campus-wide efforts to partner with other stakeholders, such as industry associations and disciplinary organizations, in large-scale efforts to better prepare graduate students from diverse backgrounds for jobs in a range of sectors. For example, the graduate college in this study frequently partners with employers to co-present sessions on internship and job opportunities in the industry for students from diverse backgrounds. [Subramanian et al. \(2022\)](#) similarly assert that faculty research mentors and career and PD educators in other units can and should work more collaboratively to provide equitable PD opportunities to all graduate students. Many graduate colleges are already sponsoring such efforts, but there is a dearth of research on graduate colleges ([Perez et al., 2020](#)), including the role that they play in supporting students in their professional and sociocultural development ([Nerad and Bai, 2021](#)).

Further exploration is needed at other institutions, including other PWIs and MSIs, to understand whether our results are generalizable and reflect broader patterns in both the level of participation in such programs and the demographic characteristics of students who are most likely to participate in student support offerings provided by graduate colleges on their campuses, especially with regard to historically marginalized students. Several additional areas of needed research would be investigation of patterns of participation in other centralized units (teaching centers, career centers, international centers, etc.) that serve graduate students; cross-institutional comparisons of types of programming being offered at graduate colleges; demographic trends in student participation in graduate college offerings at other institutions; the impact of that programming on students' graduate experiences and development, and the role that partnerships with industry could play in supporting career development and training. The graduate college may play a critical role in reimagining graduate education in the USA to be more equitable and student-centered and in preparing students for their future careers.

## Notes

1. Non-US citizens are students commonly known as international students. We chose to use the nomenclature non-US citizens to make a clear difference to US citizen students or domestic students. Non-US citizens in this sample comprise students from Asia (85%), Europe (5%), North America (4%), South America (3%), Africa (2%) and Oceania (<1%).
2. These students constitute  $n = 198$  or 2% of the average enrollment over the three years observed in this study. The difficulty in adding the Independent Interdepartmental Degree Program students to the statistical analysis is the small size of this population ( $n = 20$  in each semester). In addition, they do not belong to a specific field, therefore, for analysis purposes they constitute a field on their own. Both issues make it very difficult to perform inferential statistics on this population.
3. A Pell Grant is a subsidy the US federal government provides for students who demonstrate a financial need to pay for college.

---

**References**

- Brandes, L.C.O. (2006), "Graduate student centers: building community and involving students", *New Directions for Student Services*, Vol. 2006 No. 115, pp. 85-99, doi: [10.1002/ss.218](https://doi.org/10.1002/ss.218).
- Cassuto, L. (2015), *The Graduate School Mess*, Harvard University Press, Cambridge, MA.
- Cassuto, L. and Weisbuch, R. (2021), *The New PhD: How to Build a Better Graduate Education*, Johns Hopkins University Press, Baltimore, MD.
- Chatterjee, D., Ford, J.K., Rojewski, J. and Watts, S.W. (2019), "Exploring the impact of formal internships on biomedical graduate and postgraduate careers: an interview study", *CBE – Life Sciences Education*, Vol. 18 No. 2, p. ar20, doi: [10.1187/cbe.18-09-0199](https://doi.org/10.1187/cbe.18-09-0199).
- Clancy, K.B., Nelson, R.G., Rutherford, J.N. and Hinde, K. (2014), "Survey of academic field experiences (SAFE): trainees report harassment and assault", *PLoS ONE*, Vol. 9 No. 7, p. e102172, doi: [10.1371/journal.pone.0102172](https://doi.org/10.1371/journal.pone.0102172).
- Council of Graduate Schools (2019), *The Organization and Administration of Graduate Education: A Guide for University Leaders*, The Council of Graduate Schools, Washington, DC, available at: <https://ncses.nsf.gov/pubs/nsf22300/>
- Denecke, D., Feaster, K. and Stone, K. (2017), *Professional Development: Shaping Effective Programs for STEM Graduate Students*, Council of Graduate Schools, Washington, DC.
- Erichsen, E.A. and Bolliger, D.U. (2011), "Towards understanding international graduate student isolation in traditional and online environments", *Educational Technology Research and Development*, Vol. 59 No. 3, pp. 309-326, doi: [10.1007/s11423-010-9161-6](https://doi.org/10.1007/s11423-010-9161-6).
- Feldon, D.F., Peugh, J., Maher, M.A., Roksa, J. and Tofel-Grehl, C. (2017), "Time-to-credit gender inequities of first-year PhD students in the biological sciences", *CBE – Life Sciences Education*, Vol. 16 No. 1, pp. 1-9, doi: [10.1187/cbe.16-08-0237](https://doi.org/10.1187/cbe.16-08-0237).
- Fisher, A.J., Mendoza-Denton, R., Patt, C., Young, I., Eppig, A., Garrell, R.L., Rees, D.C., Nelson, T.W. and Richards, M.A. (2019), "Structure and belonging: pathways to success for underrepresented minority and women PhD students in STEM fields", *PLoS ONE*, Vol. 14 No. 1, p. e0209279, doi: [10.1371/journal.pone.0209279](https://doi.org/10.1371/journal.pone.0209279).
- Garcia, A.L. and Zhou, E. (2022), *Academic Professional Development for PhD Students in Selected Science Fields: Who is Participating?*, Council of Graduate Schools, Washington, DC.
- Gardner, S.K. and Barnes, B.J. (2007), "Graduate student involvement: socialization for the professional role", *Journal of College Student Development*, Vol. 48 No. 4, pp. 369-387, doi: [10.1353/csd.2007.0036](https://doi.org/10.1353/csd.2007.0036).
- Gardner, S.K. and Doore, S.A. (2020), "Doctoral student socialization and professional pathways", in Weidman, J.C. and DeAngelo, L. (Eds), *Socialization in Higher Education and the Early Career: Theory, Research and Application*, Springer, Cham, pp. 113-128, [10.1007/978-3-030-33350-8](https://doi.org/10.1007/978-3-030-33350-8).
- Gardner, S.K. and Holley, K.A. (2011), "'Those invisible barriers are real': the progression of first-generation students through doctoral education", *Equity and Excellence in Education*, Vol. 44 No. 1, pp. 77-92, doi: [10.1080/10665684.2011.529791](https://doi.org/10.1080/10665684.2011.529791).
- Gibbs, K.D., Jr, McGready, J., Bennett, J.C. and Griffin, K. (2014), "Biomedical science Ph.D. career interest patterns by race/ethnicity and gender", *PLoS ONE*, Vol. 9 No. 12, p. e114736, doi: [10.1371/journal.pone.0114736](https://doi.org/10.1371/journal.pone.0114736).
- Golde, C.M. and Dore, T.M. (2001), *At Cross Purposes: What the Experiences of Doctoral Students Reveal about Doctoral Education*, A report prepared for The Pew Charitable Trusts, Philadelphia, PA, available at: [www.phd-survey.org](http://www.phd-survey.org)
- Griffin, K.A., Muñoz, M.M. and Espinosa, L. (2012), "The influence of campus racial climate on diversity in graduate education", *The Review of Higher Education*, Vol. 35 No. 4, pp. 535-566, doi: [10.1353/rhe.2012.0031](https://doi.org/10.1353/rhe.2012.0031).

- 
- Gupta, D., Nerad, M. and Cerny, J. (2003), "The road home: exploring the choice to stay or return of international PhD's", *International Higher Education*, Vol. 31, pp. 15-16.
- Haley, K.J., Jaeger, A.J. and Levin, J.S. (2014), "The influence of cultural social identity on graduate student career choice", *Journal of College Student Development*, Vol. 55 No. 2, pp. 101-119, doi: [10.1353/csd.2014.0017](https://doi.org/10.1353/csd.2014.0017).
- Hasgall, A., Saenen, B. and Borrell-Damian, L. (2019), "Doctoral education in Europe today: approaches and institutional structures", European University Association, available at: <https://eua.eu/resources/publications/809:doctoral-education-in-europe-today-approaches-and-institutional-structures.html>
- Hutchings, K., Bainbridge, R., Bodle, K. and Miller, A. (2019), "Determinants of attraction, retention and completion for aboriginal and Torres strait islander higher degree research students: a systematic review to inform future research directions", *Research in Higher Education*, Vol. 60 No. 2, pp. 245-272.
- Long, J.S. and Freese, J. (2014), *Regression Models for Categorical Dependent Variables Using Stata*, 3rd ed., Stata press, College Station, TX.
- McCarthy, M. (2017), *Promising Practices in Humanities PhD Professional Development*, Council of Graduate Schools, Washington, DC.
- McClure, J. (2007), "International graduates' cross-cultural adjustment: experiences, coping strategies, and suggested programmatic responses", *Teaching in Higher Education*, Vol. 12 No. 2, pp. 199-217, doi: [10.1080/13562510701191976](https://doi.org/10.1080/13562510701191976).
- McDowell, G. and Bankston, A. (2018), "Resources to address challenges for international students and postdocs", *American Society for Cell Biology Careers*.
- McGagh, J., Marsh, H., Western, M.C., Thomas, P., Hastings, A., Mihailova, M. and Wenham, M. (2016), *Review of Australia's Research Training System*, Australian Council of Learned Academies, Melbourne.
- Mason, M.A., Goulden, M. and Frasch, K. (2009), "Why graduate students reject the fast track", *Academe*, Vol. 95, pp. 11-16.
- Mason, M.A., Wolfinger, N.H. and Goulden, M. (2013), *Do Babies Matter: Gender and Family in the Ivory Tower*, Rutgers University Press, New Brunswick, NJ.
- Masuda, A., Hayes, S.C., Twohig, M.P., Lillis, J., Fletcher, L.B. and Gloster, A.T. (2009), "Comparing Japanese international students' and US college students' mental health related stigmatizing attitudes", *Journal of Multicultural Counseling and Development*, Vol. 37 No. 3, pp. 178-189, doi: [10.1002/j.2161-1912.2009.tb00101.x](https://doi.org/10.1002/j.2161-1912.2009.tb00101.x).
- Moodie, N., Ewen, S., McLeod, J. and Platania-Phung, C. (2018), "Indigenous graduate research students in Australia: a critical review of the research", *Higher Education Research and Development*, Vol. 37 No. 4, pp. 805-820, doi: [10.1080/07294360.2018.1440536](https://doi.org/10.1080/07294360.2018.1440536).
- National Academies of Sciences, Engineering, and Medicine (2018a), *Graduate STEM Education for the 21st Century*, The National Academies Press, Washington, DC, [10.17226/25038](https://doi.org/10.17226/25038).
- National Academies of Sciences, Engineering, and Medicine (2018b), *Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine*, The National Academies Press, Washington, DC, doi: [10.17226/24994](https://doi.org/10.17226/24994).
- National Center for Science and Engineering Statistics (2021), "Doctorate recipients from US universities: 2020", NSF 22-300, National Science Foundation, Alexandria, VA, available at: <https://nces.nsf.gov/pubs/nsf22300/>
- Nerad, M. (2004), "The PhD in the US: criticisms, facts, and remedies", *Higher Education Policy*, Vol. 17 No. 2, pp. 183-199, doi: [10.1057/palgrave.hep.8300050](https://doi.org/10.1057/palgrave.hep.8300050).



- Nerad, M. (2009), "Confronting common assumptions: designing future-oriented doctoral education", in Ehrenberg, R. and Kuh, Ch (Eds), *Doctoral Education and the Faculty of the Future*, Cornell University Press, Ithaka, New York, NY, pp. 80-89.
- Nerad, M. (2015a), "Professional development for doctoral students: what is it? Why now? Who does it?", *Nagoya Journal of Higher Education*, Vol. 15, pp. 285-318.
- Nerad, M. (2015b), "Searching for taboos in doctoral education: an exploratory journey", *Die Hochschule: German Journal for Science and Education*, Vol. 24 No. 2, pp. 17-32.
- Nerad, M. (2020), "Doctoral education worldwide: three decades of change", chapter 2, in Yudkevich, M., Altbach, H.P. and DeWit (Eds), *Trends and Issues in Doctoral Education; a Global Perspective*, SAGE, Thousand Oaks, CA, pp. 43-84.
- Nerad, M. and Bai, Z. (2021), "Is it time for a Central campus office to ensure quality in doctoral education in the 21st century?", in Lee, A. and Bongaardt, R. (Eds), *The Future of Doctoral Research: challenges and Opportunities*, Routledge, London.
- O'Meara, K.A., Griffin, K., Kuvaeva, A., Nyunt, G. and Robinson, N.T. (2017), "Sense of belonging and its contributing factors in graduate education", *International Journal of Doctoral Studies*, Vol. 12, pp. 251-279, doi: [10.28945/3903](https://doi.org/10.28945/3903).
- Okahana, H. (2019), *Closing Gaps in Our Knowledge of PhD Career Pathways: Job Changes of PhD Graduates after Earning Their Degree*, Council of Graduate Schools, Washington, DC.
- Ostrove, J.M., Stewart, A.J. and Curtin, N.L. (2011), "Social class and belonging: implications for graduate students' career aspirations", *The Journal of Higher Education*, Vol. 82 No. 6, pp. 748-774, doi: [10.1080/00221546.2011.11777226](https://doi.org/10.1080/00221546.2011.11777226).
- Pascale, A.B. (2018), "Co-existing lives: understanding and facilitating graduate student sense of belonging", *Journal of Student Affairs Research and Practice*, Vol. 55 No. 4, pp. 399-411, doi: [10.1080/19496591.2018.1474758](https://doi.org/10.1080/19496591.2018.1474758).
- Perez, R.J., Robbins, C.K., Harris, L.W. Jr. and Montgomery, C. (2020), "Exploring graduate students' socialization to equity, diversity, and inclusion", *Journal of Diversity in Higher Education*, Vol. 13 No. 2, pp. 133-145, doi: [10.1037/dhe0000115](https://doi.org/10.1037/dhe0000115).
- Pontius, J. and Harper, S.R. (2006), "Principles for good practice in graduate and professional student engagement", *New Directions for Student Services*, Vol. 2006 No. 115, pp. 47-58, doi: [10.1002/ss.215](https://doi.org/10.1002/ss.215).
- Posselt, J.R. (2018), "Rigor and support in racialized learning environments: the case of graduate education", *New Directions for Higher Education*, Vol. 2018 No. 181, pp. 59-70, doi: [10.1002/he.20271](https://doi.org/10.1002/he.20271).
- Prieto-Welch, S. (2016), "International student mental health", *New Directions for Student Services*, Vol. 2016 No. 156, pp. 53-63, doi: [10.1002/ss.20191](https://doi.org/10.1002/ss.20191).
- Staniscuaski, F., Kmetzsch, L., Soletti, R.C., Reichert, F., Zandonà, E., Ludwig, Z.M.C., Lima, E.F., Neumann, A., Schwartz, I.V.D., Mello-Carpes, P.B., Tamajusuku, A.S.K., Werneck, F.P., Ricachenevsky, F.K., Infanger, C., Seixas, A., Staats, C.C. and de Oliveira, L. (2021), "Gender, race and parenthood impact academic productivity during the COVID-19 pandemic: from survey to action", *Frontiers in Psychology*, Vol. 12, p. 663252, doi: [10.3389/fpsyg.2021.663252](https://doi.org/10.3389/fpsyg.2021.663252).
- Strayhorn, T.L. (2018), *College Students' Sense of Belonging: A Key to Educational Success for All Students*, Routledge, New York, NY.
- Subramanian, S., Hutchins, J.A. and Lundsteen, N. (2022), "Bridging the gap: increasing collaboration between research mentors and career development educators for PhD and postdoctoral training success", *Molecular Biology of the Cell*, Vol. 33 No. 2, pp. 1-4, doi: [10.1091/mbc.E21-07-0350](https://doi.org/10.1091/mbc.E21-07-0350).
- Trice, A.G. (2007), "Faculty perspectives regarding graduate international students' isolation from host national students", *International Education Journal*, Vol. 8 No. 1, pp. 108-117.

- U.S. Bureau of Labor Statistics (2022), "Education pays, 2021", *Career Outlook*, available at: [www.bls.gov/careeroutlook/2022/data-on-display/education-pays.htm](http://www.bls.gov/careeroutlook/2022/data-on-display/education-pays.htm)
- Vogel, D.L. and Heath, P.J. (2016), "Men, masculinities, and help-seeking patterns", in Wong, Y.J. and Wester, S.R. (Eds), *APA Handbook of Men and Masculinities*, American Psychological Association, Washington, DC, pp. 685-707, doi: [10.1037/14594-031](https://doi.org/10.1037/14594-031).
- Williams, G., Case, R. and Roberts, C. (2018), "Understanding the mental health issues of international students on campus", *Educational Research: Theory and Practice*, Vol. 29 No. 2, pp. 18-28.

---

**Corresponding author**

Laura N. Schram can be contacted at: [lnschram@umich.edu](mailto:lnschram@umich.edu)