Perspectives on Diversity: Examining Perceptions of Campus and Departmental Climates amongst Domestic and International Computing Graduate Students

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***Abstract*—This study explores whether domestic and international students differ in their perceptions of institutional environments, particularly as it relates to issues regarding diversity. In general, the findings suggest that domestic students 1) have less favorable impressions of the overall campus climate and 2) generally reported that the campus and department climates for diversity were less accepting of different demographics. Implications for research, policy and practice are discussed with a focus on creating more equitable institutional environments for underrepresented groups.**

Keywords— campus climate, diversity, department climate, institutional environment, graduate computing education

I. Introduction

Students' campus experiences and perceptions of the environment can positively impact their academic development, as well as other important outcomes [1], [2]. Conversations about campus climate, STEM and diversity are increasingly prominent; however, the focus is often at the undergraduate level and there is a need to better understand graduate students' perceptions. While diversity can be discussed within multiple domains (i.e., racial/ethnic, economic, etc.), one important aspect of diversity discourse within graduate STEM context is students' country of origin. Compared to domestic students, it is plausible that these students may have a different perception of campus climate issues given their different backgrounds. This study provides preliminary insights about differences in domestic and international computing students regarding key aspects of the institutional environment related to diversity and inclusion. From an equity perspective, the findings provide an interesting lens for also understanding the peer-networks that traditionally marginalized students within STEM navigate given the limited number of these students in many graduate programs, and the often-high representation of international students.

This material is based upon work supported by NSF Grant No. 1833908

II. Literature Review

Campus climate represents "students' perceptions of their experiences both in and out of the classroom" [3]. In this study, department climate represents similar perceptions within students' departments. Scholars have studied these aspects of institutional environments and how they shape students' experiences [4], [5]. Literature indicates that many international students experience discrimination on US college campuses, with variations emerging based on their country of origin [5]. Within STEM, studies illustrate the complexity of campus climate-related experiences for different groups. Some STEM literature suggests that international students have more favorable perceptions of campus climate than their domestic peers [4], and in some instances are perceived to be smarter and harder working than native-born students [5]. Research on Black international students underscores race-related stereotypes about inferiority that many of these students encounter in STEM [5], as well as other condescending experiences that suggest a toxic academic climate [6]—experiences that are somewhat similar to other Black students, but different in that foreign-born Black students are often perceived as smarter than their native-born Black peers [5].

III. Conceptual Framework

The Bowman Role Strain and Adaptation Model (BRSAM) [7] provides the study's conceptual lens. It is a strength-based framework which underscores the importance of students' strengths and strains on their academic and career outcomes. Along with strain (i.e., challenges), BRSAM emphasizes the social and psychological strengths that students can use to promote successful outcomes [7]. Key social strengths include a positive institutional (i.e., ecological) environment and positive social interactions or supports—each of which speak to the campus climate. This study employs the BRSAM to underscore the importance of ecological and social factors on students' success, with an emphasis on students' perceptions of the institutional climate and the climate for diversity.

IV. Research Design

In Fall 2019, survey data was collected from graduate students in a computing department at a large, research-focused institution. Twenty-three domestic students and 42 international students are in the sample. Survey questions inquired about students' perceptions of the campus and department climates in general, as well as the climates for diversity using the Rankin general campus climate scale, and a modified Rankin racial-ethnic campus climate scale [8]. Overall descriptive statistics were examined, along with differences in perceptions between domestic and international students using t-tests to determine if those differences were statistically significant.

V. Limitations

The survey reflects students' perceptions before recent incidents within the US regarding racial injustices, and the potential impact of the pandemic on immigrant communities. Results may differ given recent events which have created unsafe environments for immigrant populations.

VI. Findings

Table I includes our results. In general, domestic students had less favorable perceptions of the overall campus climate. Also, students indicated the campus and department climates for diverse groups were at least somewhat accepting, but differences emerged when comparing domestic and international students' perceptions. International students perceived the institutional climate to be more accepting in both instances.

Our findings examine institutional climate for students from traditionally underrepresented racial/ethnic groups in computing. In general, domestic students perceived campus and department climates to be less accepting to these students than international students, with the largest difference resulting from perceptions of the campus climate for Black or African American students.

Interesting patterns emerged with regards to low-income students and those with disabilities. Amongst the demographics considered, perceptions about campus and department climates were the lowest for these two groups, although the general perception from all students was that the climates were at least moderately accepting. Again, differences emerged between domestic and international students with domestic students' perceptions being substantially lower.

VII. Conclusion

Our findings illustrate how many international and domestic students perceive institutional environments differently. Students bring aspects of their backgrounds to campus which colors their perceptions and may not operate from the same sociological frame when making sense of these environments. Also, because race is a social construct [9], international students may have a different understanding of racial issues within the US given the degree to which (or whether) they engaged questions related to race in their countries of origin. Each of these factors could shape students' climate perceptions.

As institutions seek to diversify computing, it is important to understand the social landscape that students encounter. Students from underrepresented racial/ethnic groups often experience biases in STEM contexts [1], [2]; however, many of their peers' perceptions of the climate may differ from their lived realities. Hence, as we focus on broadening participation in computing, we must also understand the ways in which the environment may render the experience of certain groups invisible—even as it relates to their interactions with peers.

TABLE I. PERCEPTIONS OF INSTITUTIONAL CLIMATES

Measure	All		International		Domestic		Difference	
	Mean	SD	Mean	SD	Mean	SD		
Overall Campus Climate (a)	1.94	0.75	1.66	0.65	2.43	0.66	-0.77	***
Overall Department Climate (a)	2.01	0.86	1.87	0.90	2.26	0.75	-0.39	~
Campus Climate for Diverse Groups (b)	4.28	0.83	4.53	0.67	3.86	0.90	0.66	**
Underrepresented Racial/Ethnic Groups								
Campus Climate for Diversity- Black or African American	4.30	0.94	4.61	0.68	3.78	1.09	0.82	**
Campus Climate for Diversity- Native Hawaiian or Other Pacific Islander	4.33	0.89	4.53	0.76	4.00	1.00	0.53	*
Campus Climate for Diversity- Native American, American Indian, or Alaskan Native	4.34	0.93	4.58	0.72	3.96	1.11	0.62	**
Campus Climate for Diversity- Chicano, Latino(a) or Hispanic	4.43	0.74	4.66	0.53	4.04	0.88	0.61	**
Other Groups								
Campus Climate for Diversity- Non-Residents (i.e individuals from other countries)	4.29	1.01	4.44	0.91	4.04	1.15	0.39	
Campus Climate for Diversity- Asian American	4.41	0.93	4.55	0.88	4.17	0.98	0.38	
Campus Climate for Diversity- Low-Income Individuals	4.02	1.09	4.38	0.85	3.39	1.20	0.99	**
Campus Climate for Diversity- People with Disabilities	4.16	1.12	4.54	0.85	3.52	1.24	1.02	**
Department Climate for Diverse Groups (b)	4.45	0.72	4.67	0.53	4.08	0.85	0.59	**
Underrepresented Racial/Ethnic Groups								
Department Climate for Diversity- Black or African American	4.50	0.78	4.67	0.66	4.22	0.90	0.45	*
Department Climate for Diversity- Native Hawaiian or Other Pacific Islander	4.44	0.90	4.67	0.62	4.04	1.15	0.62	*
Department Climate for Diversity- Native American, American Indian, or Alaskan Native	4.42	0.88	4.67	0.62	4.00	1.09	0.67	*
Department Climate for Diversity- Chicano, Latino(a) or Hispanic	4.44	0.84	4.64	0.63	4.09	1.04	0.55	*
Other Groups								
Department Climate for Diversity- Non-Residents (i.e. individuals from other countries)	4.55	0.84	4.69	0.69	4.30	1.02	0.39	
Department Climate for Diversity- Asian American	4.74	0.54	4.85	0.37	4.57	0.73	0.28	*
Department Climate for Diversity- Low-Income Individuals	4.26	1.01	4.62	0.71	3.65	1.15	0.96	***
Department Climate for Diversity- People with Disabilities	4.27	1.04	4.56	0.88	3.78	1.13	0.78	**

~ p<0.10; * p<0.05; **p<0.01; ***p<0.001
(a) Higher scores indicate less favorable perceptions
(b) Higher scores indicate more favorable perceptions

Acknowledgment

This material is based upon work supported by the National Science Foundation under Grant No. 1833908. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. Also, we would like to acknowledge the hard work and efforts of the research associates with the Education Policy & Equity Research Collective (Ed_PERC) STEM Equity Research Team.

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