The Time is Now: A Study Promoting STEM Faculty Use of Culturally Inclusive Teaching

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Abstract

This study aims to inform the conversation of inclusion in STEM. We analyzed nearly 3,000 faculty who shared their experiences with incorporating culturally inclusive teaching in a selected undergraduate course Our study serves as tool to promote discussions about strategies campus leaders may adopt to reinforce inclusion for all students.

Keywords: STEM, Whiteness, Culturally Inclusive Teach, Faculty

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> *The racism embedded STEM learning environments must be disrupted, particularly if the goal is to retain students of color to contribute to more diverse STEM workforce (Patton, 2016, p. 328)*

Introduction

To achieve excellence in inclusive learning, faculty must become experts in how they deliver content to diverse learners (Danowitz & Tuitt, 2011; Williams, Berger, & McClendon, 2005). Unfortunately, in many science, technology, engineering, and mathematic (STEM) fields, it is common for faculty to deliver content to majority white male classrooms, leaving faculty to ignore the importance of culturally inclusive teaching (Salazar, Norton, & Tuitt, 2010). Turning a blind-eye has contributed to sustained whiteness in STEM, though a few educators are beginning to prod their fellow colleagues that the time to reflect on educational practices is now.

A growing body of literature, using critical race theory (Ladson-Billings, 1998; Patton, 2005) and critical whiteness studies (Allen, 2004; Le & Matias, 2018), have revealed that *whiteness* operates in learning environments in a variety of ways. It can affect how disciplinary fields value (or devalue) ways of knowing, content knowledge, or pedagogical approaches (Ladson-Billings, 1998), all of which are used to normalize practices and decisions that protect the dominant group (Allen, 2004).

Calls-to-action within the STEM community are emerging to combat racism in research and teaching (Killpack & Melon, 2016; Pawley, 2017). Despite these calls, and students of color leaving at an alarming rate (NCES, 2014), faculty struggle to weave inclusive teaching in their courses, citing reasons like lack cultural knowledge, time and resources, classroom size and layout, and fear of the unknown (Salazar, Norton, & Tuitt, 2010). Further, many studies on this topic are situated within K-12 settings. Our study aims to broaden the findings to higher education, and more specifically, STEM learning environments.

Guided by the work of critical scholars, we investigate the extent faculty are broadly using culturally inclusive teaching in STEM courses. We analyzed survey responses from nearly 3,000 faculty teaching undergraduate courses from across 30 four-year institutions. Faculty shared the level of frequency they engaged students in culturally rich learning opportunities. These experiences included strategies such as exploring students' background through projects and assignments; working effectively with people from various backgrounds; and learning about other cultures. We also set out to investigate the extent that social background and academic employment of faculty and the course context had a unique effect on faculty use of culturally inclusive teaching. Though the focus of this study is on STEM learning environments, it is important to point out that we examined both STEM and non-STEM faculty. This approach allowed us to hypothesize if pattern results were unique to STEM or the product of higher education norms more broadly.

Literature Review

The norms in higher education, and in particular STEM disciplines, have been long criticized by scholars as being deeply rooted in the values of white male privilege (Allen, 2004; Le & Matias, 2018, Patton, 2016). Applying critical race theory and critical whiteness studies, scholars have exposed how *whiteness* operates to infiltrate institutional norms in ways that have long-lasting effects on student learning. Patton (2016), for example, argues that STEM faculty are not challenged to reevaluate the curriculum and how it is delivered because the reward structure for tenure and promotion is largely based on grant securement and research productivity which are seen as "intellectual real estate" rooted in racist ideologies (p. 327-28). Likewise, color-blind and deficit approaches to educational research is another way whiteness has penetrated educational practices of STEM faculty (Harper, 2010; Jett, 2016; Pawley, 2017).

Pawley (2017) calls out peers in a guest editorial for the *Journal of Engineering Education*, urging peers to stop perpetuating social inequities through STEM education research; particularly by "generalizing" study findings masked with homogenous white male student populations. Those who are engaging in scholarship of teaching and learning studies, and fail to recognize the racial disparities within the learning environment, are inadvertently maintaining white privilege by ignoring the experiences of minoritized students (Le & Mathias, 2017). Furthermore, this approach tends to reaffirm racially embedded assumptions, such as students of color lack academic ability or motivation to succeed (Nasir & Vakil, 2017). Without disrupting the hegemonic norms, Le and Mathias (2017) assert science educators will continue to expose students of color to pedagogies that are rooted in white privilege, and thus, inherently carrying values and tradition to the next generation of learners in the field.

Collin (2018) counters this narrative by sharing a framework understanding STEM identity formation among Black male scholars. Collin urges that a one-size-fits-all approach to teaching does not work. Rather, students must see themselves within the field and believe in their ability to achieve in order to form an attachment to STEM. If their social identity is at odds with the STEM culture, Collin (2018) posits this will lead to feelings of isolation and exclusion. Unfortunately, feelings of exclusion and lack of faculty support are well documented in the STEM community among students of color (Nasir &Vakil, 2017; Johnson, 2012; Griffin, Perez, Holmes, & Mayo, 2010).

To offset the challenges whiteness in higher education has caused, many look towards culturally inclusive teaching as a pedagogical solution to foster feelings of belongingness in STEM, especially among marginalized students. (Milem, 2003; Salazar, Norton, & Tuitt, 2010). Tuitt (2003) describes inclusive pedagogy as using teaching methods and assessments that

consider the "whole student." These practices should not only aim to enhance content knowledge but also students' engagement and motivation to learn. Regardless of content area, this approach is applicable to all faculty. One specific example in STEM comes from biology. Tanner and Allen (2007) challenged fellow biology educators to look inward in ways they contributed to feelings of exclusion and marginalization of students through their informal interactions, formal teaching strategies, and chosen course content. They encouraged educators to seek opportunities that addresses their lack of cultural competence as well as 1) monitor and change ordinary language in the classroom, 2) be aware of patterns of interactions with students, 3) confront stereotype threat, and 4) integrate culturally relevant examples in the curriculum. Tanner and Allen conclude the reason little progress has been made in diversifying student and faculty populations in STEM is that, "we've spent too much effort trying to inculcate diverse populations of students into the culture of science as opposed to changing the culture of science itself to be inclusive of them" (p. 257).

Study Purpose

The purpose of this study is to gain a baseline understanding of the extent STEM faculty emphasize culturally inclusive learning in their undergraduate courses. From a previous study examining emphasis on group work with diverse others, an element of culturally inclusive teaching, we found STEM faculty were 78% less likely to do so than non-STEM faculty (Ribera & Priddie, 2018). Based on this finding, we expect STEM faculty to apply other forms of culturally inclusive practices less often than non-STEM faculty, yet to what? We also set out to investigate if faculty's social identity influence the degree to which they emphasize culturally inclusive learning. As minoritized STEM faculty navigate the political landscape of academia, do they feel pressured to adhere to traditional forms of teaching? We anticipate study results will

serve as starting point for productive discussions about ways whiteness in higher education and STEM influences faculty use of culturally inclusive teaching.

Position Statement and Research Questions

We are three women who have experienced the power dynamics in a STEM undergraduate learning environment as students and are now applying our knowledge as higher education scholars to examine current teaching norms deeply rooted in white male privilege. Additionally, as a Black and two White women scholars working together, we recognize our social identities uniquely shape our worldviews. As a result, we must actively consider our identities while wrestling with how to approach, examine, and discuss the study's results from these positions. We have a common desire to use quantitative methods to critically examine STEM learning environments and use research to disrupt the power dynamics ever-present in these academic spaces. Given our purpose and position, the following research questions guided this study:

1. How much do faculty in STEM, compared to non-STEM faculty, emphasize culturally inclusive teaching practices in their courses?
2. How does the emphasis of culturally inclusive teaching practices vary by socio-demographic, academic employment status, and course characteristics in STEM fields? In what ways do these patterns compare to faculty in non-STEM fields?

Conceptual Framework

The notion of culturally inclusive teaching, as it relates to the higher education context, borrows heavily from our scholar friends in teacher education (Salazar, Norton, & Tuitt, 2010). Two primary frameworks within teacher education research exists: *culturally relevant pedagogy*

by Ladson-Billings (1995a, 1995b, 2004) and *culturally responsive teaching* by Gay (2002). Both aim to address social injustice while empowering students through careful critical/self-reflection, inspiring academic confidence and motivation to learn (Aronson & Laughter, 2016).

Specifically, Ladson-Billings' (1995a) pedagogical approach purposefully does not identify specific teaching practices but instead suggests a broad range of teaching behaviors grounded in critical pedagogy (Friere, 1974). Three common beliefs are present among instructors who apply culturally relevant pedagogy are that (a) students must experience academic success; (b) students must develop and maintain cultural competence; (c) students must develop a critical consciousness (Ladson-Billings, 1995b, p. 160).

Alternatively, Gay (2002) focuses on teaching practices rather than pedagogy, and posits that *culturally responsive teaching* is effective because it deliveries content knowledge in a way that is impactful and meaningful to students' lived experiences. Gay (2002) outlines five similar elements: (1) knowledge development about cultural diversity; (2) build a safe learning community for students; (3) design curriculum that is relevant to students' background and lives; (4) use effective cross-cultural communication; and (5) the apply diverse modes of instruction specific to students' needs.

Aronson and Laughter (2016) synthesized a decade of educational research using Gay (2002) and Ladson-Billings (1995a) frameworks across several content areas (i.e., science, mathematics, social sciences, history). They outlined four unifying themes, which include academic skills and concepts; critical reflection; cultural competence; and critique discourse of power. Our study will apply Aronson and Laughter's (2016) themes to guide our measurement of culturally inclusive teaching. Since this study analyzes data already collected for the purpose of institution improvement and assessment, we mapped relevant survey items to the four themes

(see Table 1). The items are not mutually exclusive--three items are closely aligned with critical reflection and cultural competence.

In addition, works from critical race theory and critical whiteness studies help guide the selection of individual faculty characteristics. For example, since STEM disciplinary and institutional norms are firmly based in the values of white men, we included race/ethnicity and gender identity. We also acknowledge that tenured full rank professors have far-reaching influence on policy and practices in the academy, particularly related to what is valued for promotion and tenure, content knowledge, and teaching approaches. Lastly, we selected course characteristics based on prior research citing reasons why faculty failed to engage in culturally inclusive teaching (Salazar, Norton, & Tuitt, 2010).

Methodology

Survey Data

The data for this study come from the 2017 administration of the Faculty Survey of Student Engagement (FSSE). FSSE, a complimentary survey to National Survey of Student Engagement, asks faculty about their use of educational practices that are empirically linked with student learning and development. In 2017, FSSE was administered to 24,418 faculty teaching lower-division (LD) and upper-division (UD) undergraduate courses at 154 four-year colleges and universities. Institutions can choose from among a variety of additional item sets, called Topical Modules, to append to the end of their FSSE administration. The focus of this study is on the FSSE Topical Module, Inclusiveness and Engagement with Cultural Diversity (ICD). The ICD Topical Module measures the environments, experiences, and engagement of faculty around cultural diversity, more specifically; questions ask faculty how much their courses emphasize various aspects of inclusivity and cultural diversity. This set was administered to 30 FSSE

institutions, resulting in 2,988 faculty responses. See Table 2 for the complete wording of items examined in this study.

Respondents

To be included in this study, faculty had to have responded to the items in the ITP scale and their disciplinary area. Only faculty who taught undergraduates were included in the study. Around three-quarters of faculty in this study (73%) were from non-STEM fields. The largest proportion of faculty (75%) identified as White with smaller proportions identifying as Asian (5%), multiracial (4%), Black or African American (3%), or Hispanic or Latino (3%). Around half of faculty identified as men (48%) and half as women (47%). Nearly all faculty (98%) identified as permanent residents or US citizens. Around two in five (61%) taught mostly upper-division students, and a little over half (53%) taught general education courses. Around a quarter of faculty were Full Professors (28%), Associate Professors (23%), or Assistant Professors (24%) with smaller proportions employed as full-time Lecturers/Instructors (11%) and part-time Lecturers/Instructors (14%). Around two-thirds of faculty taught smaller courses (63%; up to 30 students) with smaller proportions teaching medium courses (22%) and larger courses (14%; more than 50 students). See more details about faculty respondents including their average Inclusive Teaching Practices (ITP) scale score in Table 2.

--INSERT TABLE 2 HERE--

Measures

The primary variables of interest in this study are from the Inclusive Teaching Practices (ITP) scale and component items. These questions asks faculty to focus on a particular undergraduate course section they are teaching and to answer how much that class incorporates

inclusivity and culturally engaging activities. Examples of topics include students sharing their perspectives and experiences, learning about other cultures, and respecting the expression of diverse ideas. The ITP scale's Cronbach's α reliability was .93 and the ICC was .028 indicating that only 2.8% of the variation in ITP scale was at the institution level. This scale is an average of the items listed in Table 2. In addition, the table provides descriptive information for individual items and the scale. Additional faculty demographics and characteristics important to this study include those listed in Table 1.

--INSERT TABLE 3 HERE--

Analyses

To answer our first research question about how much faculty in STEM and non-STEM fields emphasize culturally inclusive teaching practices, we examined descriptive statistics for the ITP scale by the racial/ethnic identities of faculty in STEM and non-STEM fields. To answer our second research question about how the emphasis of culturally inclusive teaching practices vary by faculty and course characteristics in STEM and non-STEM fields, we examined two OLS regression models with the ITP scale as the dependent variable in each. We standardized dependent variables before entry into models so that readers can interpret unstandardized coefficients similar to effect sizes. Independent variables included faculty racial/ethnic identification, gender identity, citizenship, course division, faculty academic rank, if the course was for general education credit, and the size of the course. The only difference between the two models was that one was limited to faculty in STEM fields and the other to faculty in non-STEM fields. We selected reference groups (White, Man, Full Professor, and large course size) based on the lowest ITP mean score within a category. Although data are nested (faculty within

institutions), given the focus on faculty-level characteristics and the low variation at the institution level, researchers used single-level OLS regression models.

Results

To address the first research question, we examine ITP scale mean and standard deviations by racial and ethnic identification among STEM and non-STEM faculty. Within STEM fields, faculty generally emphasize culturally inclusive teaching practices 'Very little' and at most 'Some'. Asian faculty (M=2.13, SD=.91), Black or African American faculty (M=2.02, SD=.82), and multiracial faculty (M=2.00, SD=.83) emphasize these practices more than their White (M=1.70, SD=.73) or Hispanic or Latino (M=1.58, SD=.46) peers. Within non-STEM fields, faculty emphasize culturally inclusive teaching practices at least 'Some' but generally do so 'Quite a bit'. Black or African American (M=3.12, SD=.94), Hispanic or Latino (M=3.10, SD=.80), multiracial (M=3.09, SD=.76), and Asian faculty (M=3.05, SD=.91) emphasize these practices more substantially than their white peers (M=2.74, SD=.85). See Table 4 for more details.

--INSERT TABLE 4 HERE--

To address the second research question, we applied OLS regression to model the unique effect of socio-demographic, faculty employment, and course characteristics on the use of ITP. We ran two separate models for STEM faculty and another for non-STEM faculty. The adjusted-R square for both models revealed a small portion of variance in ITP (8-10%) were explained by the independent variables, suggesting other contributing factors were left out of the models.

Within STEM fields, faculty racial/ethnic identity, citizenship, course division, academic rank, and general education course status all predict differences in the emphasis of culturally

inclusive teaching practices. Asian faculty (B = .38, $p < .001$) and multiracial faculty (B = .29, $p < .05$) emphasize these practices more than their white peers. Faculty who are U.S. citizens or permanent residents are more likely to use these practices than those who are not (B = -.36, $p < .05$). Faculty teaching lower-division courses (B = -.34, $p < .001$) and faculty teaching non-general education courses (B = -.23, $p < .001$) emphasize these practices less than faculty teaching general education courses. Full-time lecturers/instructors (B = .22, $p < .05$) and part-time lecturers/instructors (B = .37, $p < .001$) are more likely to use these practices than full professors.

--INSERT TABLE 4--

Within non-STEM fields, faculty racial/ethnic identity, gender identity, academic rank, general education course status, and course size all predict differences in the emphasis of culturally inclusive teaching practices. Asian (B = .31, $p < .001$), Black or African American (B = .38, $p < .001$), Hispanic or Latino (B = .30, $p < .01$), multiracial (B = .33, $p < .001$) faculty, and faculty with another or unknown racial-ethnic identity (B = .36, $p < .01$) all emphasize these practices more than their white peers do. Women (B = .28, $p < .001$) and gender variant (B = .79, $p < .05$) faculty emphasize these practices more than their men peers do. Assistant professors (B = .15, $p < .01$), full-time lecturers/instructors (B = .14, $p < .05$), and part-time lecturers/instructors (B = .15, $p < .01$) emphasize these practices more than full professors. Faculty teaching non-general education courses (B = -.33, $p < .001$) emphasize these practices less than faculty teaching general education courses. Faculty teaching small courses (up to 30 students; B = .14, $p < .05$) emphasize these practices more than faculty teaching large courses (more than 50 students).

-- INSERT FIGURE 1--

Study Limitations

Institutions self-select to participate in FSSE, institutions can select which of their faculty receive the survey, and institutions optionally select the addition of topical modules all of which may result in a loss of generalizability. Additionally, faculty choose one course which they are teaching or taught during the current school year to respond to questions about their teaching practices so these results may not represent all of the courses they teach. Groups of faculty, such as those that identified as American Indian, Alaska Native, Native Hawaiian, or other Pacific Islander were grouped together to create larger subpopulations of faculty. Even a key identifier of our study, STEM versus non-STEM disciplinary fields, consists of an aggregation of a wide variety of disciplinary areas. Collapsing groups together may lead to results that do not apply to all subpopulations of faculty and researchers should further examine these variations within in future research studies. We do not claim that the aggregations of faculty groups emphasize inclusive and culturally engaging teaching practices as monolithic groups, and instead, urge readers to use results to begin conversations that work toward improving pedagogical practice.

Discussion and Implications

Our findings confirm that faculty in STEM emphasize culturally inclusive teaching very little in their selected courses. We also learned that white faculty, regardless of STEM status, are using culturally inclusive strategies less often than faculty of color. This is a troublesome finding as most faculty in the STEM fields are white, suggesting culturally inclusive learning is largely not a priority. We also found less variation among racial-ethnic identity groups in STEM. Faculty who identified as Hispanic or Latino or as African American tended to apply inclusive teaching practices to a similar extent as white faculty. Consensus of knowledge in the hard science might partly explain the lack of variation. A follow-up study is needed to confirm this

notion as well as better understand the motivating factors that lead faculty to employ inclusive pedagogy in STEM.

Leaders often speak of the value of diversity, yet fail to establish policies and practices to fulfill this promise (Williams et al., 2005). Fortunately, we have seen some advances due to changes in accreditation standards. For example, in response to ABET's revised learning outcome developing students' ethical and social responsibility, Hess, Strobel, and Brightman (2017) offered empathetic-based pedagogy as a solution to an engineering course that encouraged open-mindedness and perspective-taking -- skills grounded in a care for others which is a pillar of culturally inclusive learning (Gay, 2002; Salazar, Norton, & Tuitt, 2010). However, more of these innovative practices need to happen for the culture to shift towards a truly inclusive learning environment.

To make a systemic change, it is vital for campus leaders to examine closely their promotion and tenure process. Suchman (2014) argues promotion and tenure (P&T) in STEM does not lend itself to supporting innovations in teaching, thus slowing the adoption of best practices in the field. Many STEM faculty do not engage in the scholarship of teaching and learning or have trouble finding ways for this type of work to "count" in their P&T cases. To complicate matters further, Suchman (2014) states that evaluators of P&T cases feel unqualified to assess education-based studies.

In closing, we propose two strategies for campus leaders to consider. First, campus leaders should consider offering foundational courses in teaching and learning in graduate programs in order to sustain pedagogical advances in the field. Secondly, they must find alternative pathways for promotion and tenue for faculty who engage in culturally relevant scholarship of teaching and learning in STEM. Attending to the reward structure will prompt

more faculty to prioritize innovations in teaching and spend the time necessary to craft inclusive practices that work best for STEM learning environments.

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Appendix

Table 1. Aronson and Laughter (2016) Themes of Culturally Relevant Education (CRE)

CRE Themes	Description	FSSE Survey Item
Academic skills and concepts	Culturally relevant educators use constructivist methods to develop bridges connecting students' cultural references to academic skills and concepts. Culturally relevant educators build on the knowledges and cultural assets students bring with them into the classroom; the culturally relevant classroom is inclusive of all students.	a. Developing the skills necessary to work effectively with people from various backgrounds b. Recognizing students' cultural norms and biases
Critical reflection	Culturally relevant educators engage students in critical reflection about their own lives and societies. In the classroom, culturally relevant educators use inclusive curricula and activities to support analysis of all the cultures represented.	b. Recognizing students' cultural norms and biases d. Exploring students' background and assignments e. Learning about other cultures
Cultural competence	Culturally relevant educators facilitate students' cultural competence. The culturally relevant classroom is a place where students both learn about their own and others' cultures and also develop pride in their own and others' cultures.	d. Exploring students' backgrounds through projects, assignments, or programs e. Learning about other cultures g. Respecting the expression of diverse ideas
Critique of discourses of power	Culturally relevant educators explicitly unmask and unmake oppressive systems through the critique of discourses of power. Culturally relevant educators work not only in the classroom but also in the active pursuit of social justice for all members of society.	f. Discussing issues of equity or privilege

Table 2. Descriptive Statistics of Faculty Sample (N=2,988)

Variables	**Inclusive Teaching Practice (ITP) Mean**	**Standard Deviation**	**Overall Sample %**
STEM faculty	1.77	0.77	27%
Non-STEM faculty	2.81	0.86	73%
Asian	2.64	1.02	5%
Black or African American	2.88	1.02	3%
Hispanic or Latino	2.81	0.96	3%
White [1]	2.46	0.94	75%
Multiracial	2.80	0.92	4%
Other or unknown racial-ethnic identities	2.93	0.95	2%
Preferred not to respond	2.60	0.99	9%
Man [1]	2.34	0.93	48%
Woman	2.71	0.95	47%
Gender variant	3.34	0.77	<1%
Preferred not to respond	2.58	0.95	5%
US citizen or permanent resident	2.52	0.96	98%
Non-US citizen/permanent resident	2.75	0.83	2%
Taught mostly lower division students	2.45	0.97	39%
Taught mostly upper division students	2.58	0.95	61%
Full professor [1]	2.38	0.94	28%
Associate professor	2.46	0.98	23%
Assistant professor	2.58	0.96	24%
Full-time lecturer/instructor	2.64	0.95	11%
Part-time lecturer/instructor	2.75	0.90	14%
General education course	2.68	0.93	53%
Non-general education course	2.40	0.96	47%
Small course – up to 30 students	2.60	0.93	63%
Medium course – 31 to 50 students	2.45	1.01	22%
Large course size – More than 50 students [1]	2.31	0.94	14%
Overall	**2.53**	**.96**	**100%**

Data Source: Faculty Survey of Student Engagement 2017. The sample included instructional faculty from 30 baccalaureate-degree granting institutions that administered the *Inclusiveness and Engagement with Cultural Diversity* optional topical module in addition to the core survey items.

[1] Reference groups for the regression models were selected based on the lowest mean within a category.

Table 3. Inclusive Teaching Practice Item-Components, Scale Properties, and Interclass Correlation

Item prompt: Earlier, you answered some questions based on one particular undergraduate course section that you are teaching or have taught during this academic year. Thinking again about that course, how much does it emphasize the following? (4-point response options; 4=Very much, 3=Quite a bit, 2=Some, 1=Very little)

Item Components	**Min**	**Max**	**Item Mean (SD)**	**Factor Loadings**
a. Developing the skills necessary to work effectively with people from various backgrounds	1	4	2.71 (1.01)	.817
b. Recognizing students' cultural norms and biases	1	4	2.52 (1.14)	.907
c. Students sharing their perspectives and experiences	1	4	2.78 (1.08)	.853
d. Exploring students' backgrounds through projects, assignments, or programs	1	4	2.21 (1.15)	.804
e. Learning about other cultures	1	4	2.35 (1.18)	.845
f. Discussing issues of equity or privilege	1	4	2.29 (1.17)	.841
g. Respecting the expression of diverse ideas	1	4	2.85 (1.13)	.854
				Cronbach's Alpha = .93
				ICC = 2.8%

Table 4. Descriptive Statistics by STEM Status and Racial and Ethnic Identity

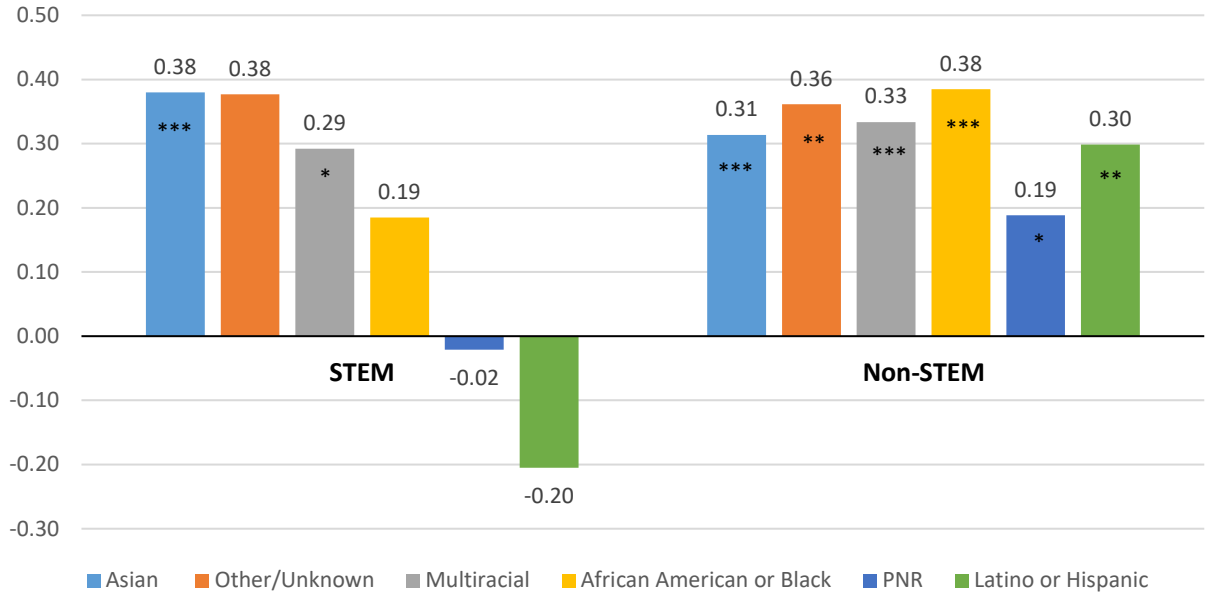
	STEM % *(N=811)*	**STEM ITP Mean (SD)**	**Non- STEM %** *(N=2,177)*	**Non-STEM ITP Mean (SD)**
Asian	9%	2.13 (.91)	4%	3.05 (.91)
Black or African American	2%	2.02 (.82)	3%	3.12 (.94)
Hispanic or Latino	2%	1.58 (.46)	3%	3.10 (.80)
White	74%	1.70 (.73)	75%	2.74 (.85)
Multiracial	4%	2.00 (.83)	4%	3.09 (.76)
Other or unknown racial-ethnic identities	2%	2.09 (1.02)	2%	3.18 (.78)
Preferred not to respond	8%	1.71 (.74)	9%	2.90 (.88)

Table 5. OLS Regression Coefficient ITP Estimates for STEM and Non-STEM Faculty

Independent Variables	**STEM**			**Non-STEM**		
	Unstd. B	SE	p-value	Unstd. B	SE	p-value
Constant	-0.25	0.19		0.25	0.17	
Asian	0.38	0.10	***	0.31	0.10	***
Black or African American	0.19	0.18		0.38	0.11	***
Hispanic or Latino	-0.20	0.20		0.30	0.11	**
Multiracial	0.29	0.14	*	0.33	0.10	***
Other or unknown racial-ethnic identity	0.38	0.21		0.36	0.13	**
Preferred not to respond	-0.02	0.12		0.19	0.08	*
Woman	0.05	0.06		0.28	0.04	***
Gender variant	0.57	0.55		0.79	0.31	*
Preferred not to respond	0.19	0.19		0.07	0.10	
US citizen or permanent resident	-0.36	0.17	*	-0.14	0.15	
Taught mostly lower division students	-0.34	0.06	***	-0.12	0.04	
Associate professor	-0.02	0.07		0.02	0.05	
Assistant professor	0.06	0.07		0.15	0.05	**
Full-time lecturer/instructor	0.22	0.10	*	0.14	0.07	*
Part-time lecturer/instructor	0.37	0.10	***	0.15	0.06	**
Non-general education course	-0.23	0.06	***	-0.33	0.04	***
Small course – up to 30 students	-0.05	0.07		0.14	0.06	*
Medium course – 31 to 50 students	-0.14	0.08		0.07	0.07	
Adjusted R-squared	**0.10**			**0.08**		

[1] Reference groups for the regression models were selected based on the lowest mean within a category.
*p-value ≤ 0.05; **p-value ≤ 0.01; ***p-value ≤ 0.001
Dependent variable was standardized before entry into models so that readers can interpret unstandardized coefficients similar to effect sizes.

Figure 1. Estimated ITP Coefficients for Faculty by STEM Status and Racial-Ethnic Identity



*p-value ≤ 0.05; **p-value ≤ 0.01; ***p-value ≤ 0.001
Note: Reference group is White faculty