

Understanding the Importance of Diversity Climate and Workplace Inclusion for Engineering Faculty

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Henry Tran is an Associate Professor at the University of South Carolina's Department of Educational Leadership and Policies who studies issues related to education human resources (HR). He has published extensively on the topic, and holds two national HR certifications. He is also the co-lead editor of the book *How did we get here?: The decay of the teaching profession*, co-lead editor of the book *Leadership in turbulent times: Cultivating diversity and inclusion in the P-12 Education Workplace*, co-editor of the book *Leadership in turbulent times: Cultivating diversity and inclusion in the Higher Education Workplace*, editor of the *Journal of Education Human Resources*, and the Director of the Talent Centered Education Leadership Initiative. Prior to his professorship, Tran served as an HR practitioner in both the private sector and in public education. He draws from both experiences in his research and teaching.

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Maria Luz Espino, M.A. is a doctoral candidate in the Higher Education Administration program at Iowa State University. She holds a Masters degree in Educational Policy and Leadership from Marquette University and a Bachelors degree in Community and Nonprofit Leadership and Gender and Women Studies from the University of Wisconsin - Madison. She investigates issues of college access and retention of first-generation low-income students, especially within Community colleges and four-year institutions, through the college students' intersections of gender, race, and sexuality.

Mr. Brian Le, UCLA

Brian Le (he/him/his) is currently a Ph.D. student in the Higher Education and Organizational Change (HEOC) program at UCLA. Brian holds a bachelor's degree in kinesiology & health from Iowa State University and a master's degree in student affairs in higher education from Marquette University. Prior to attending UCLA, Brian worked at Iowa State University for 4 years as a student's program coordinator for the Science Bound program, a pre-college through college program focused on working with scholars from underrepresented backgrounds to pursue a degree in STEM. He has been a research affiliate on multiple NSF-funded projects surrounding equity in STEM. Brian's research interests are college access, retention, marginalized students, community colleges, first-generation, STEM education, STEM identity development and engineering education.

Dr. Spencer Platt, University of South Carolina

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Ruiqin Gao is a doctoral candidate in the program of Educational Psychology and Research in the College of Education at the University of South Carolina. Her research interests include structural equation modeling with survey data, investigations of universal screening for social-emotional/behavioral risk, and classroom assessment.

Ms. Jungsun Go, University of South Carolina

Jungsun Go is a doctoral student in Educational Research and Measurement at the University of South Carolina (UofSC). She received a bachelor's degree in Elementary Education from Gwangju National University of Education in South Korea and a master's degree in Educational Research and Measurement at UofSC. She is interested in structural equation modeling, survey design, and advanced statistical models and applying those methods to explore K-12 school-related issues.

UNDERSTANDING THE IMPORTANCE OF DIVERSITY CLIMATE AND WORKPLACE INCLUSION FOR ENGINEERING FACULTY

Henry Tran, Spencer Platt, Maria L. Espino,
Brian D. Le, Ruiqin Gao, & Jungsun Go



BACKGROUND

- Engineering Department Make-up (Nelson & Brammer, 2010)
- Black and Hispanic Engineering faculty (Li & Koedel, 2017)
- Faculty attrition as a core problem (Whitaker, Montgomery, & Acosta, 2015)

PURPOSE

- The purpose of this NSF funded project is to better understand the relationship between diversity climate and faculty's turnover intention, and to understand the factors that facilitate or impede progress toward tenure for pre-tenured Black and Hispanic engineering faculty (BHEF) at four-year “R1” Institutions.
- Specifically, the objectives are to:
 - empirically explore the linkage between institution's diversity climate and engineer faculty's tenure experiences and turnover intentions
 - better understand the “push/pull” (i.e., promote/impede) factors that affect that relationship for BHEF specifically



SURVEY AND INTERVIEW STUDY

Two Objectives:

Examine the relationship between engineering faculty's perception of their institution's diversity climate and their turnover intentions at R1 universities,

Second is to understand how engineering demographic characteristics are associated with those perceptions of Black and Hispanic engineering faculty (BHEF).

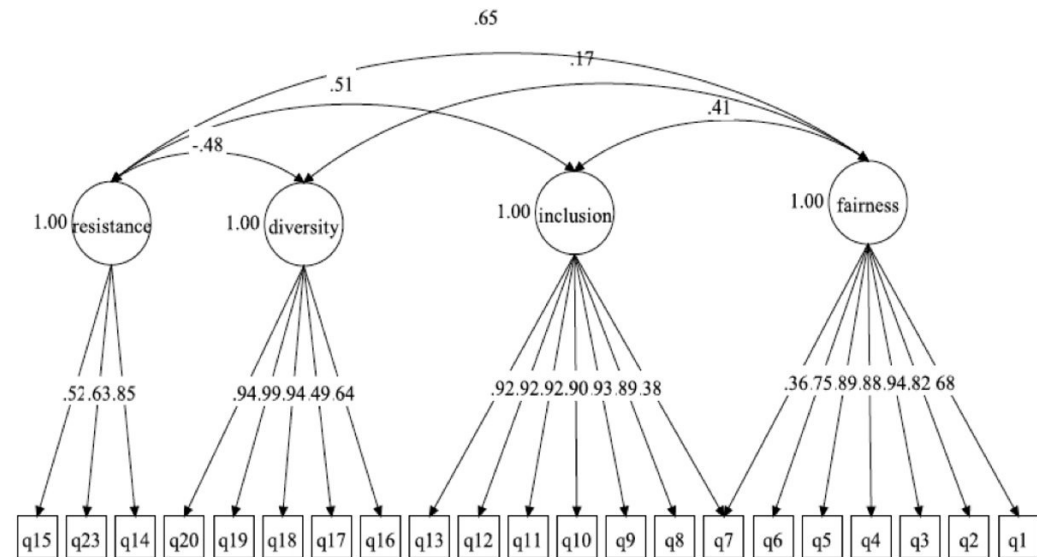
SURVEY FINDINGS

SURVEY METHODS: QUANTITATIVE

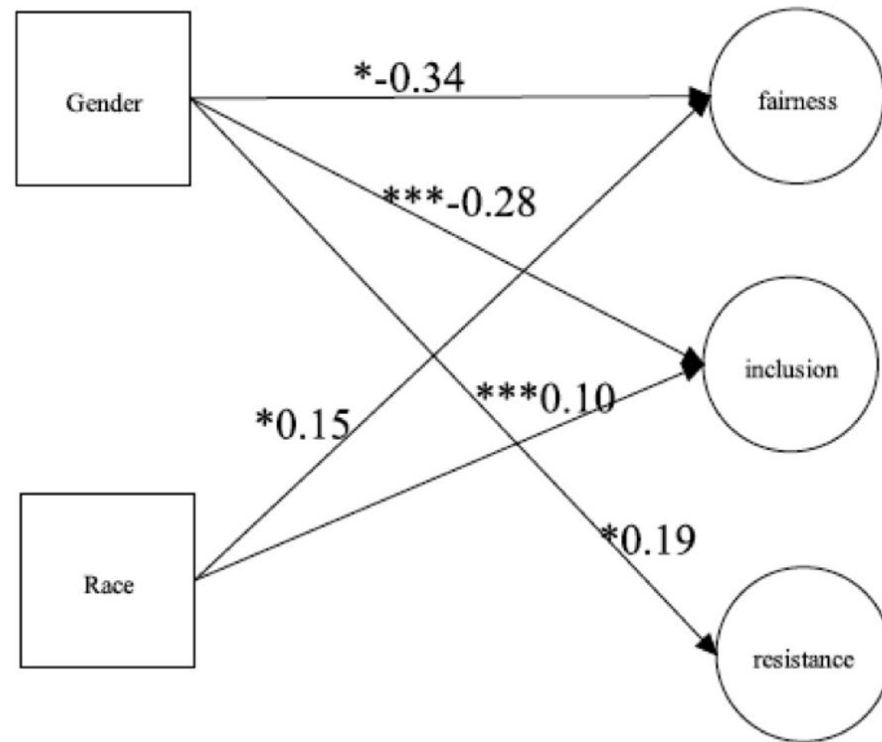
- A national cross-sectional survey of 1,161 engineering faculty.
- Scales:
 - **diversity climate scale** (Barak et al., 1988),
 - **Diversity Climate perception Scale** (Chrobot-Mason, 2003),
 - **Ti-6** (Shore & Martin, 1989)
- Confirmatory Factor Analysis (CFA)
- Multiple Indicators Multiple Causes (MIMIC) model
- Structural Equation Modeling (SEM)

SURVEY FINDING: QUANTITATIVE

- CFA results: We found a four-factor structure of the DCS that had correlations ranging from -0.48 to 0.65 between each other.
- The four factors included:
 - **Organizational Fairness**
 - **Organizational Inclusion**
 - **Personal Value of Diversity**
 - **Resistance to Diversity and Inclusion**



SURVEY FINDINGS: QUANTITATIVE



- MIMIC results:
 - Male faculty had more positive perceptions of their institution's fairness ($b=-0.34, p <.05$) and inclusion practices ($b=-0.28, p <.01$) than the female faculty.
 - Female faculty perceived more organizational resistance to diversity and inclusion than male faculty ($b = 0.19, p <.05$).
 - Black and Hispanic faculty perceived less institutional inclusion ($b=0.10, p <.01$) and fairness practices ($b=0.15, p <.05$) relative to White faculty.

SURVEY FINDINGS: QUANTITATIVE

- SEM results:
 - Faculty with higher perceptions of institutional fairness ($b = -0.52, p < .001$) and inclusion ($b = -0.15, p < .001$) practices, on average, demonstrated lower turnover intentions.
 - The faculty with a stronger personal value of diversity, on average, demonstrated lower perceptions of how their employer institutionally valued diversity ($b = -0.13, p < .01$).
 - Faculty with higher perceptions of institutions' fairness and inclusion practices demonstrated lower likelihood to turn over as moderated by their perceptions of their employers' value of diversity ($b = -0.59, p < .001$).
 - Faculty with a stronger value of diversity demonstrated higher likelihood of demonstrating turnover intentions as moderated by their perceptions of their employers' value of diversity ($b = -0.59, p < .001$).

SURVEY FINDINGS: QUALITATIVE

- Multiple themes developed from the open-ended responses
 - Representation Issues with service specifically with Black and Hispanic faculty
 - There were White faculty that were opposed to diversity
 - Gender issues came up often for women

INTERVIEW FINDINGS

INTERVIEW FINDINGS



Tenure Process



Service Overload



Racial Battle Fatigue

TENURE PROCESS

Some of the areas of concern are highlighted in the external funding expectations of:

- Engineering faculty
- Lack of clear guidelines
- Research bias

TENURE PROCESS QUOTES

"Like I said, I don't know if I noticed anything. Like a general trend, if anything, I guess I would say there may be certain individuals [that have bias], but again, I think given a lot of these cases you know, hearing these individuals, I think it's always difficult to admit that there. But **I think as far as like I said of these implicit bias, I think there's subconsciously doing things that they're maybe not fully aware they're doing...**" - Santos

TENURE PROCESS QUOTES

”...I heard many challenges among assistant professors in some of the departments and some of the departments **many assistant professors would leave before going for tenure.** And I, you know, there is a lot of history she say about that. But I do think that mechanical engineering, more traditional old engineering, they have a hard time adapting to the way that women may be doing research a little differently because it's different times.- Jenny

SERVICE OVERLOAD

BHEF often feels obligated to provide service work even though the institution undervalues it despite its centrality to the mission.



SERVICE QUOTES

"So now this person has all kinds of application records. Not one department committee, one university committee. This person has a **no university committee, no university service**. Nobody cares about it... **I felt like I did a lot of service**. I felt that was not a whole lot. I felt like I visited a lot of high schools. I was pulled into a lot of stuff that had no impact at all. But I'm glad I did those things. You know, **it's part of my not just giving back to the university but giving back to people who poured into my life.**" - Marla

SERVICE QUOTES

"I was asked to be the faculty mentor for the Society of Hispanic engineers. And I actually declined...I actually declined just because I just didn't feel I had the time right. So I had not thought about that since since then. So yeah, and **I think in some cases, sometimes people are afraid to say no to some of those service activities, especially when when we thought to assistant faculty members you know...** - Andres

RACIAL BATTLE FATIGUE

- Participants detailed how various racial and professional pressures tax and overwhelm BHEF.

RACIAL BATTLE FATIGUE QUOTES

- "I hate being there because **I'm the black woman**. I hate because I went to school and I got a degree and I have some level of proficiency. There's some things that **I have to do better than there's still some things that I do**. So I think that part of me that I feel that I've worked really hard to grow, **being underestimated or minimized or not counted at all...**" - Marla

RACIAL BATTLE FATIGUE QUOTES

- "I had this minority tax right where you'll have to do because you're minority you have more work to do. I think it is for me, it's played out too well, but, I wasn't interested. So I didn't have to do this tenure track thing when I was young, so it's a little different... So I'm often reminded people of that because I am in a position to say that would be very hard for the system professors who are female or Hispanic to say no to be on that committee.- Marla

IMPLICATIONS

- Validated the Diversity Climate Survey for the Higher Education Context, specifically with Engineering Faculty at R1 Institutions and linked diversity climate to the turnover intention of Engineering Faculty
- Better understand the challenges to workplace inclusion in Engineering Departments at R1 institutions, to better respond to the needs of BHEF in particular.
- Insights on how to create more inclusive colleges and departments.
- Insights on how to increase BHEF retention and strengthen doctoral student pipeline.

QUESTIONS?

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