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### Integrating Social Justice Theory into Engineering Practice

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## [Post 23. Letitia Thomas: Integrating Social Justice Theory into Engineering Practice](#)



*LSAMP Poster Symposium, 2019. Photograph by Holly M. Evert, courtesy of UB Engineering. See photo galleries, [here](#).*

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Engineering education has historically been limited in developing students' awareness of social justice issues, even though research tells us that students who are underrepresented (by class, race, gender, etc.) can be empowered and retained when participating in social justice projects related to engineering (Lucena & Leydens, 2015; Mejia, 2017). My goal is to integrate social justice theory into engineering practice, to empower UB students to make a lasting, collective impact in their community. I want students to study and learn social justice themes while becoming more socially and critically conscious about their own influence, as creators of technology. Students can analyze problems and ask questions such as:

- *Who gets to use our technology and who does it benefit?*
- *Do engineers and scientists consider culture in what they do as engineers?*
- *Are the developed technologies equally suited for marginalized communities?*
- *Do engineers and computer scientists consider cultural differences in what they do as technical experts?*

Social justice perspectives can increase students' sense of belonging in STEM and student success in technical courses (Hurtado et. al, 2010; Carpi et al, 2016; Peters et. al, 2019). The goal is to encourage students to use their skills to broaden and improve the impact of engineering and computer science technologies on humanity. A key component in achieving these goals is a commitment to engage students in undergraduate research. The literature identifies research as a key strategy for broadening participation in STEM and as a high impact educational practice (Kuh, 2008), increasing student engagement and retention. Undergraduate research is important in helping students pursue scientific discovery and begin to engage in critical thinking and inquiry. To that end, reinforcing undergraduates' self-confidence and belonging in STEM and strengthening their academic skills through hands-on learning approaches is an important feature of my work.

In my position as Assistant Dean for Diversity in the UB School of Engineering and Applied Sciences (UB SEAS), I am responsible for ensuring our commitment to building a pathway for the next generation of engineers and scientists. My research interests include STEM education, socially responsible engineering, social media, and qualitative research methods. In a previous role, I taught a *Social Justice* course which allowed me to offer students a set of critical examinations about what is "just" for society and lead discussions on the problems, possible solutions, and action items for change. I wanted to prepare students to understand, examine and challenge the roots of oppression and injustice; and begin to think as citizens invested in collaborative action, not just college students here temporarily, and thus disconnected from local issues. My expanded areas of interest include graduate engineering education, addressing the shortage of underrepresented students in computer science, faculty/student mentoring relationships and, more recently, the social determinants of health (with respect to the intersection of engineering and medicine).

I believe that increasing the diversity of students pursuing research careers in engineering, computer science, biosciences, public health, etc. is an important step toward mitigating these issues. The COVID-19 pandemic has exposed both a stunning lack of public health preparedness and pre-existing healthcare inequities, resulting in tragically fatal consequences for nearly 650,000 Americans. The pandemic has been especially difficult for people of color, who have historically experienced systemic health disparities. Students from communities that suffer disproportionately from inequities in medical care are more likely to become engaged in health disparities research (Vazquez, et. al, 2017). Our ultimate goal is to create a UB center for social justice in engineering, that will unite students, faculty, professionals, and community members, in solving social justice problems.