Can a deeper understanding of diversity improve engineering? Expanding engineering education through developing Contextual Social Awareness

Presenter: Greses Pérez

The training of engineers often focuses on technical aspects, relegating the role of diversity and social issues to a second place. In this talk, Pérez argues for expanding our notions of engineering epistemologies and what it means to become an engineer. Recognizing the importance of acquiring disciplinary knowledge, she offers educators the merits of incorporating broader context in developing engineering solutions. To exemplify her approach, she presents how the hybrid use of technical and social dimensions in the engineering classroom frames design considerations in students. Drawing on sociocultural theories from the learning sciences, she shows the different aspects that participants ponder in their designs. Data sources include students’ responses to a problem scoping task before and after an engineering course on equity, diversity and culture. Using a mixed methods approach, her results suggest a statistically significant increase in students’ considerations of communities impacted by or involved in their designs (e.g., the role of segregation, the identities of engineers). She offers the construct of Contextual Social Awareness (CSA) to capture these changes. The study highlights the generative potential of contextualizing design and explicitly connecting social and technical aspects. It offers a pathway for students to develop a broader understanding of what it means to know engineering and to be an engineer. This work does not challenge the crucial role of acquiring technical knowledge but seeks to enrich engineering learning by bridging the diverse practices of the field and the communities.

About the Presenter:
Greses Pérez is an Afro-Latina engineer, learning scientist and educator. She is a Ph.D. candidate at Stanford University in Science Education and Learning Sciences. Her research focuses on the role of language and cognition in engineering and science learning, particularly for Black and Brown students. In addition to her ongoing work on culturally relevant VR education, Greses combines interdisciplinary perspectives and mixed methodologies to investigate issues of diversity and inclusion in engineering. Before coming to Stanford, she was a bilingual educator at low-income elementary schools in Texas. Prior to starting her career in education, Greses was an engineer project manager in the Caribbean. She holds a B.S. in Civil Engineering from Santo Domingo Technological Institute, a M.Eng. in Civil Engineering from the University of Puerto Rico at Mayagüez, and a M.Ed. in School Leadership from Southern Methodist University. Her work seeks to improve education for students who experience a cultural mismatch between the ways of knowing and speaking in their communities and those in STEM.