Developing changemaking engineers by recognizing engineering as a sociotechnical endeavor

How can we educate students to be the most effective engineers in the workplace when they graduate? How can we attract a broader range of students to engineering? These are important questions for engineering educators. In this talk, we investigate a promising approach to transform who participates in engineering education and what they learn: a cultural shift from positioning engineering as a purely technical endeavor to framing it as sociotechnical. As part of an NSF-funded Revolutionizing Engineering Departments (RED) grant, “Developing Changemaking Engineers,” the Shiley-Marcos School of Engineering (SMSE) at the University of San Diego (USD) is exploring such issues. We are developing a new Integrated Engineering program that incorporates this perspective. In addition, we are developing modules that emphasize the sociotechnical nature of engineering. In this talk, we will describe the examples of a conflict minerals module in Circuits, a gerrymandering module in Statics, and a “Final Straw” module in Materials Science that includes consideration of accessibility for the disabled community. This talk focuses on engineering but many issues are also relevant for Science, Technology, Engineering, and Math (STEM).

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