USU Engineering Faculty Receives Prestigious NSF CAREER Grant | College of Engineering

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News Release – Dec. 26, 2016 – A Utah State University professor who specializes in the emerging field of engineering education has been selected to receive a major grant from the National Science Foundation for her ongoing research into improving engineering teaching practices.

Quick Read

• USU Assistant Professor Dr. Idalis Villanueva will receive a National Science Foundation CAREER Award – a $722,779 research grant that will help her and her team of researchers better understand the effects of ‘hidden curricula’ in engineering programs.

• The term ‘hidden curricula’ (HC) refers to academic rules and social norms that are known among faculty, students and administrators, but not to individuals from diverse social or cultural backgrounds. The effects of HC often impede the academic success of under-represented engineering students.

Dr. Idalis Villanueva, an assistant professor in the Department of Engineering Education at USU, will receive a NSF CAREER Award, one of the organization’s highest honors in support of junior faculty who exemplify the role of teacher-scholars.

Assistant professor of engineering education Dr. Idalis Villanueva will receive the prestigious NSF CAREER grant for her research into improving engineering teaching practices.

Villanueva is part of a growing group of engineering education experts trying to understand why a significant portion of undergraduate engineering majors struggle to complete their academic programs. Part of her research will explore the effects that ‘hidden curricula’ have on students, particularly Hispanics and other under-represented students.

“Hidden curricula means academic rules, social norms, or other knowledge that is known to dominant social actors in a particular setting, but not necessarily to individuals from diverse social or cultural backgrounds,” she explained. “My long-term vision is to help engineering faculty and students reveal and navigate hidden curricula (HC) in engineering.”
HC has been studied in other areas of education and social science but is relatively untouched in engineering education. Villanueva says if HC can be better understood, traditional power dynamics can be removed. By doing so, faculty and students from a range of backgrounds will have a broader understanding of what is expected of them in an engineering degree program.

“Inadvertently withholding information creates a power imbalance,” Villanueva added. “But by revealing HC, knowledge becomes democratized. When HC is revealed, it loses its power since it is no longer available to only the students or faculty who are in ‘the know.’”

Over the next five years, Villanueva will develop mentoring and training materials designed to reveal the underlying causes of HC at colleges and universities across the country. A portion of the $722,779 grant will fund graduate student researchers. Another portion will fund awards that incentivize engineering faculty and students to reveal and eliminate HC at their institutions.

The research has the potential to reach about 11,000 undergraduate students and 570 engineering faculty around the U.S. Villanueva says her work will be the foundation of a new engineering culture built around sharing integral academic rules and information that helps all engineering students succeed regardless of culture, race, ethnicity and gender.

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UPDATE: On November 01, 2018, this article was updated to reflect the increase in NSF funding for this award from $560,658 to the current award amount of $722,779.00.