From Invisible to Responsible Innovators: Engaging and Retaining Low-Income/First-Generation Community College Students in Engineering

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Increasing accessibility to engineering pathways and innovating engagement and retention strategies for low-income, first generation (LIFG) college students are important aspects of increasing diversity in STEM. LIFG students are overwhelmingly enrolled at community colleges, yet are underrepresented in the STEM transfer programs and in engineering at four-year universities. Low-income and/or first generation is a category which intersects with other underrepresented categories in STEM such as gender, race, ethnicity and persons with disabilities, yet is often an invisible category in most educational programs. Red Rocks Community College, Lakewood, CO, in partnership with Colorado School of Mines, is piloting a multifaceted approach to make this invisible minority *visible* through engineering projects that are relevant to the lives of LIFG students.

This paper describes a larger project to go beyond the deficiency model (lens used to define LIFG students by what they lack) in order to create spaces for LIFG students to validate their funds of knowledge (those skills, abilities and experiences developed through manual labor, military, non white-collar jobs, farming, etc.) and thereby move from a state of "belonging uncertainty" in engineering to *belonging with certainty.* The paper will outline key interrelated activities that support our goal. First, faculty development workshops create faculty as meaningful mentors through pedagogical practices that better engage LIFG students. Second, non-traditional mentoring of LIFG students focuses on opportunities for them to develop social and cultural capital through authentic engineering experiences that are seen as meaningful and impactful to their lives. This occurs in Engineering Club projects, engineering design class (IDEA) and IDEA Lab, and in research experiences at Colorado School of Mines. Through the activities above, the paper will show the piloting of a model of community college and university collaboration to create access and pathways for LIFGs to transfer into engineering.