

Using Systems Theory and Collective Impact Approaches to Increase the Retention and Success of University Student Stem Majors

Authors : Araceli Martínez Ortiz

Abstract : An educational research effort is analyzed using systems theory to document the power of collective impact when addressing multiple factors contributing towards the retention of students majoring in science, technology, engineering and mathematics (STEM) academic programs. This research promotes understanding on how networked communities may work effectively toward a shared vision and mutually aligned activities that result in sustained, large scale change. The actions of a team of researchers in their third year of collaboration are presented to describe a model that positively aligns work efforts resulting in greater total gains. The goals of the multiple programs managed by the funded program team are to: 1) expand the number of students who choose to study a STEM field of study; 2) promote student collaborative learning; 3) support faculty understanding of the funds of knowledge of diverse students and 4) establish innovative and robust STEM education research that will lead to the development of nationally replicable, scalable models for broadening participation in STEM. The impacts of this research effort are measured through quantitative statistical analysis of the changes in second-year STEM undergraduate student retention rates and representation rates of women, Hispanics and African American STEM majors.

Keywords : collaborative impact, diversity, student retention, systems theory, STEM education

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