Creating a STEM Identity: Investment with Return

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The Idaho STEP program at Boise State University is led by an interdisciplinary team of engineering, mathematics and science faculty who have established a sense of STEM community at Boise State University for students, faculty and staff. Grant funds are focused on increasing the first-time, full-time freshman retention in STEM. Strategies used include STEM faculty development, STEM summer orientation, STEM Summer Adventure, STEM research opportunities and STEM first year courses. This poster is focused on how the creation of a “STEM Identity” benefited students, helped faculty and staff to realize commonalities and how this led to an increased university-level awareness of science, technology, engineering and mathematics.

Benefits to Students
- Students feel a sense of community
  - Able to engage in STEM activities; receive STEM newsletters and opportunities
- Students see the commonalities in the STEM curricula
- The STEM identity helps students unsure about a specific major get started in a generic STEM curriculum

Benefits to Faculty & Staff
- Professional development opportunities
- Sense of community
- Education of STEM students viewed as a collaborative effort (mathematics, science and engineering faculty are all on the same team)

Benefits at Administrative Level
- Colleges of Engineering and Sciences have a common goal: increasing the success of STEM students; this leads to prioritization of programs that support STEM students.
- Advisory Board meetings led by the provost (motivated by this award) create a focused awareness on the retention and graduation of STEM students within the university and the region.
- Shared vision of importance of STEM
- Efficiency of systems, including block registration, orientation, advising, and data reports

Methodology
Changing the culture involves a team approach; this requires community building among students and faculty.

Building STEM Communities

I: Creating a Community of STEM Students
- STEM Summer Orientation (2010-present)
  - Engineering, mathematics and sciences merged summer orientation activities
  - A common first-year STEM curriculum was created and presented to students
  - Learning Communities for all STEM majors were created

STEM Co-Curricular Activities
- STEM Summer Adventure math-science enrichment program (2011-present)
- STEP Undergraduate Research for first-year STEM students (2011-present)
- Calculator and research workshops

Results:
- An increase in STEM FTFT retention by 6% from the start of the grant.
- An increase in number of STEM graduates from 197 (07/08) to 354 (12/13).

II: Creating a Community of STEM Instructional Faculty
- Faculty Learning Communities (2010-present)
- Faculty participation in fellow STEM instructors’ classes
- STEM summer orientation; shifting from college specific focus to STEM specific focus

Results:
- A culture shift results when faculty engage with constituent departments
- Partnering STEP efforts with other grants/initiatives on faculty development yielded return on investment

Conclusions
- Intentionally thinking about STEM students, faculty, and programming in a holistic manner has created a STEM identity on this campus.
- This grant focused attention on STEM majors as a group requiring focused effort to improve retention.
- The Idaho STEP Advisory Board raised campus awareness of the growth in STEM enrollment and the investment needed to support the growth.
- This grant provided a basis for another major grant focused on pedagogical reform (NSF-WIDER, 9/2013).
- The critical advocacy and action to reform mathematics provides a model for changes in pedagogy of other academic disciplines within STEM.
- Integration with other NSF partners via STEM Station (I^3) expanded reach and diversity.

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