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A SUCCESSFUL MODEL FOR INTERDISCIPLINARY UNDERGRADUATE RESEARCH

Introduction

- The “standard model” of undergraduate STEM research
  - One student linked with one professor
  - Year around research
  - Begins in 3rd or 4th year
  - Leads to a senior thesis or directed study academic credit

- Undergraduate research does
  - Increase graduation rates
  - Increase graduate school attendance

Introduction

- This model works best for traditional college students
  - Students who are retained past their first two college years
  - Students who see the value of a STEM degree
    - "Talking About Leaving: Why Undergraduates Leave The Sciences" - Elaine Seymour
    - STEM major students view early-year gateway courses are hurdles put in their way to make earning a STEM degree difficult

- How to increase diversity and the numbers of students who persist in STEM degree programs?

A New Model

- NSF-REU Site funded **summer** program at NMT
- Interdisciplinary Science for the Environment
  - http://www.nmt.edu/~reu/
  - Atypical program design
    - Multi-disciplinary teams of faculty, graduate students, and undergraduates (2-3 per team)
    - Work together on one project for 8 weeks
  - Projects all have an environmental focus
  - 75 students over last 6 years
  - ~17 NMT faculty
  - Students are provided with a stipend/food allowance, free housing, travel, and free tuition
  - Non traditional students accommodated through family housing and childcare

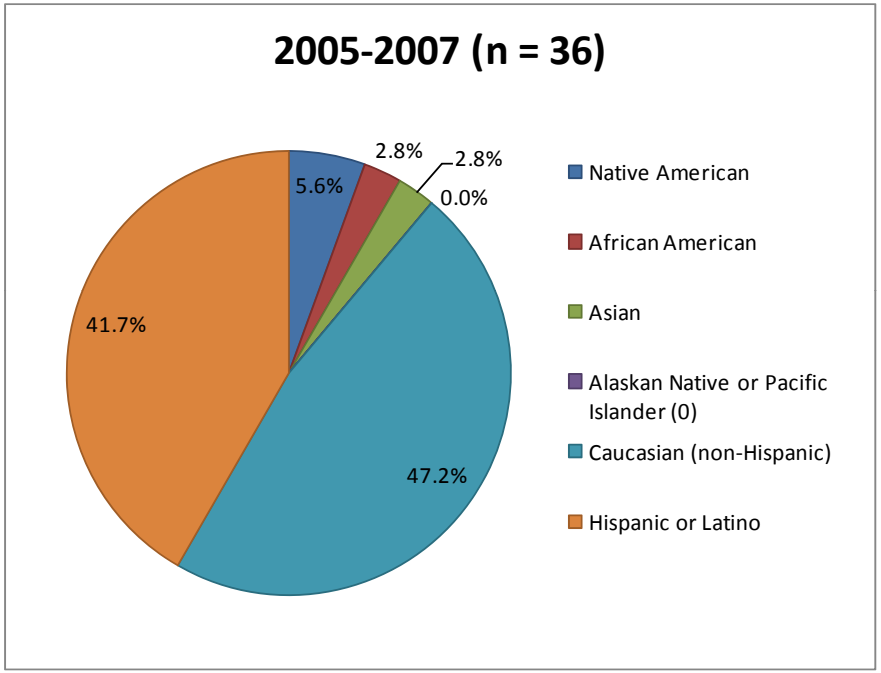
A New Model

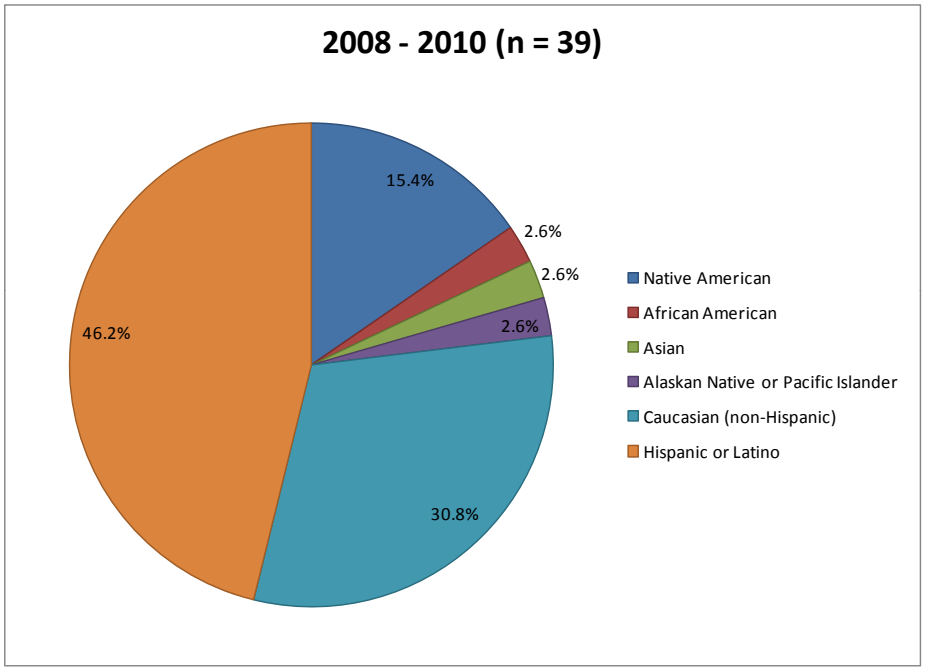
- Focus on recruitment of URM students, mainly Hispanic/Latino and Native American
- Focus on recruitment of students from regional and non-Ph.D. granting institutions
- In second three year funding cycle: include some 2-year degree seeking students

A New Model

- Recruitment
  - Mailings, posters and letters to faculty
  - Webpage
  - Campus visits
    - Seminar style presentations
    - Classroom visits
    - Meet in small groups with faculty-identified students
  - Collaborations with Diné College, New Mexico Highlands University, Northern New Mexico College, and San Juan College

A New Model


2005-2007 (n = 36)
5.6%
2.8%
2.8%
0.0%
41.7%
47.2%
Native American
African American
Asian
Alaskan Native or Pacific Islander (0)
Caucasian (non-Hispanic)
Hispanic or Latino


2008 - 2010 (n = 39)
15.4%
2.6%
2.6%
2.6%
46.2%
30.8%
Native American
African American
Asian
Alaskan Native or Pacific Islander
Caucasian (non-Hispanic)
Hispanic or Latino

A New Model

- Goals
  - Exposure of participants to authentic, interdisciplinary, and collaborative research
  - Encourage participants to attend graduate school

- Assessment results
  - Most students *arrive* with the desired goal of attending graduate school
  - However, few have a realistic view what a graduate student or Ph.D.-level research scientist really does

A New Model

- Goals
  - Exposure of participants to authentic, interdisciplinary, and collaborative research
  - Encourage participants to attend graduate school

- Assessment results
  - Students from Ph.D. granting schools have a slightly more realistic view of academic research than those from non-Ph.D. granting schools
  - Exposure to the program
    - a more realistic picture of graduate school and research as a career
    - increased excitement about obtaining a graduate-level degree
    - Increased confidence about succeeding in graduate school

A New Model

- Goals
  - Exposure of participants to authentic, interdisciplinary, and collaborative research
  - Encourage participants to attend graduate school

- Assessment results
  - Students cite the team approach as one of the major contributors to their success in the program
  - > 90% of participants have moved on to graduate/professional school or a 4-year degree program

Conclusions

- Recruitment of underrepresented minority students requires the development of genuine relationships with minority serving institution faculty
- Bringing early-career students to the research lab works
- Working in interdisciplinary teams is an alternative model that provides a supportive environment for success