Examining the Challenges and Supports Identified by Underrepresented Minority Students Enrolled in STEM Programs within a College of Agriculture

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Introduction

• Research has documented the need to recruit, train, and retain underrepresented minority students (URM) in STEM related careers (Chen & Weko, 2009; Kuenzi, 2008; Wang, 2012)

• National Institute of Food and Agriculture (NIFA) has provided funding
Background & Context

• Multicultural Scholars Program (MSP) at Oregon State University
  • Overall goal to recruit, retain, mentor, and train multicultural scholars in Agricultural/Natural Resource/Food Sciences at Oregon State University

• MSP students study
  • Toxicology, Animal Genetics, Medical Biotechnology, Marine Resource Management, Water Quality, etc.

• Seek careers in
  • biotechnology and pharmaceutical companies, environmental consulting and engineering, teaching, science outreach, non-profits and governmental natural resource regulatory agencies.
Literature Review—Overall Student Success

• Student retention used as a measure of student success

• Four primary variables:
  • Academic performance
  • Social integration
  • Goal commitment
  • Institutional satisfaction

• Additional variables presumed to influence student retention:
  • Intellectual development
  • Family and peer support
  • High school achievement
  • Environmental factors
Literature Review—Multicultural Students

• Challenges faced by multicultural students
  • The demographic composition and social climate on campus
  • Lack of peer resources
  • Push to abandon their home culture
  • Financial concerns
  • Lack of family support (i.e. first generation)

• Support mechanisms
  • Institutional support for maintaining cultural integrity
  • Positively perceived college experiences
  • Informal and formal student/faculty interaction
  • Institutional peer support
  • Opportunity to established ethnic identity
Theoretical Foundation

Sanford’s Theory of Challenges and Supports

- Based on the idea that challenges are essential for growth, but should be paired with adequate support systems (Sanford, 1966)
- Too much challenge can result in students escaping or ignoring the challenges (Evans, Forney, Guido, Patton, & Renn, 2006)
- Balance is required for optimal growth
Methods

• Participants
  • Ten undergraduate students – MSP and BRR major
  • Range from sophomores to seniors- all were involved in MSP for at least two years
  • Self-identified as Mexican, Vietnamese American, African American, or Mexican American
  • All participants received academic scholarships as part of the MSP program
    • Tuition, travel to MANRRS conference, summer internships, and faculty/peer mentors
Methods Continued

• Qualitative- Phenomenological Research Design
  • Use participant data to determine the core meanings surrounding the phenomena of interest (Creswell, 2012)
  • Phenomena of interest: Participant’s experiences in a STEM major and the MSP program

• Data Collection
  • Individual interviews, student biographical statements, MANRRS newsletter

• Data Analysis
  • Inductive coding
  • Initial open coding
  • Re-examined literature
  • Analyzed and coded for thematic content utilizing Sanford’s theory (Auerbach & Silverstein, 2003)
Methods- Trustworthiness

• Triangulation
  • Three researchers conducted separate analysis of various sources of data (Maxwell, 2005; Merriam, 2009)

• Constant comparisons
  • Regular meetings to ensure reliability among the three researchers and consistent coding
  • Collectively combined each analysis; >75% congruency

• Member checks

• Data saturation
Findings Introduction

Academic Rigors
Cultural Dynamics
Balancing School and Life

Personal Growth and Resilience through Balance

Peer Support
Academic Advisor
Financial Support
Findings - Challenges

**Academic Rigors**

“The curriculum here is so intense and I never would have thought that I would ever be able to take on these challenges.”

**Cultural Dynamics**

“The ethnic identity of a Latino/Latina is not science. I am the only hardcore science person from my cousins and my immediate family; it doesn’t go with the ethnicity background.”

**Balancing School and Life**

“I was taking a great deal of science classes as well as trying to balance research with work.”
Findings - Support

Peer Support

“We experience a lot of things together, going through the same kinds of things, going through the same school curriculum, it really brings you together.”

“I didn’t give up because [my advisor] didn’t give up on me, and after that I just felt like this person didn’t let me quit so why should I quit on myself?”

Academic Advisor

“The weight that I have taken off my parent’s shoulders because they do not have to worry about paying my college is extraordinary.”

Financial Support
Findings – Personal Growth and Resilience through Balance

“I feel like I’m breaking barriers. I can be a role model to younger adults that want to move forward. I want to be a role model to younger Latinos or Latinas in the same field.”

“I’ve learned that I can take on a lot because I’ve had a lot of family issues that have been going on this past year and I’ve had to be the adult, so I think that I’ve grown up a lot and I can handle a lot of obstacles.”

“I can do anything I set my mind to.”
Conclusions

• URM students may experience challenges in a STEM major but can find success through comparable support.

• Providing students with an opportunity for peer support, such as the MANRRS program, is an important component of minority student success (Dennis et al., 2005; Phinney & Haas, 2003).
Conclusions

• It is important for mentors/advisors/faculty members to be aware of the challenges experienced by URM students.

• Depth of knowledge and compassion of mentor/advisor may be more important than breadth of the mentoring network.

• Financial support can be vital for URM students with positive impacts stretching beyond the individual students to family members and future generations.
Conclusions

• It is imperative that college students not be sheltered from challenges

• Challenges are a critical component of college students finding success and developing confidence, resilience, determination, skills, and experience personal growth

• We must remain aware that some multicultural students face additional challenges in the college environment, and therefore may require additional support mechanisms to find balance and succeed
Thank you!

Questions?