



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
 - NIFA MSP funding in 2009 (2009-38413-05243), 2011 (2011-38413-30039), and 2013 (2013-38413-20598)



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.

OSU

College of
Agricultural
Sciences

BioResource
Research
(Major)

Multicultural
Scholars
Program

MSP Students:
2009, 2011,
2013

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

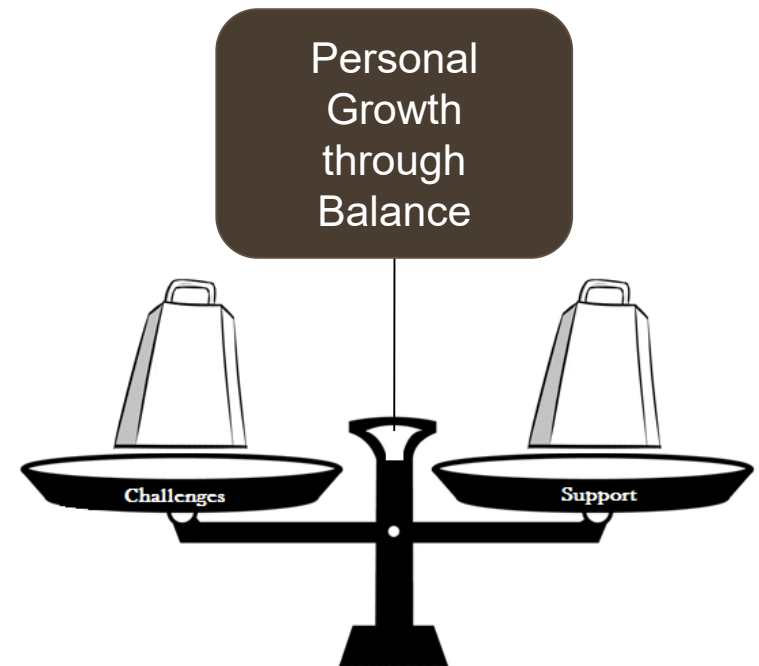
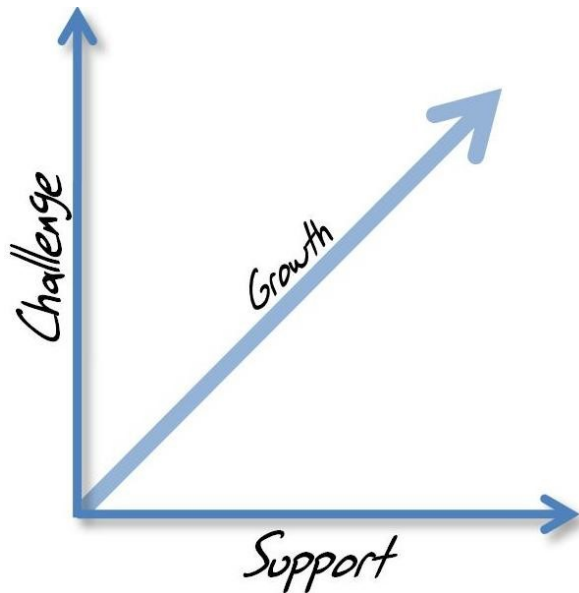
Literature Review—Multicultural Students

- 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

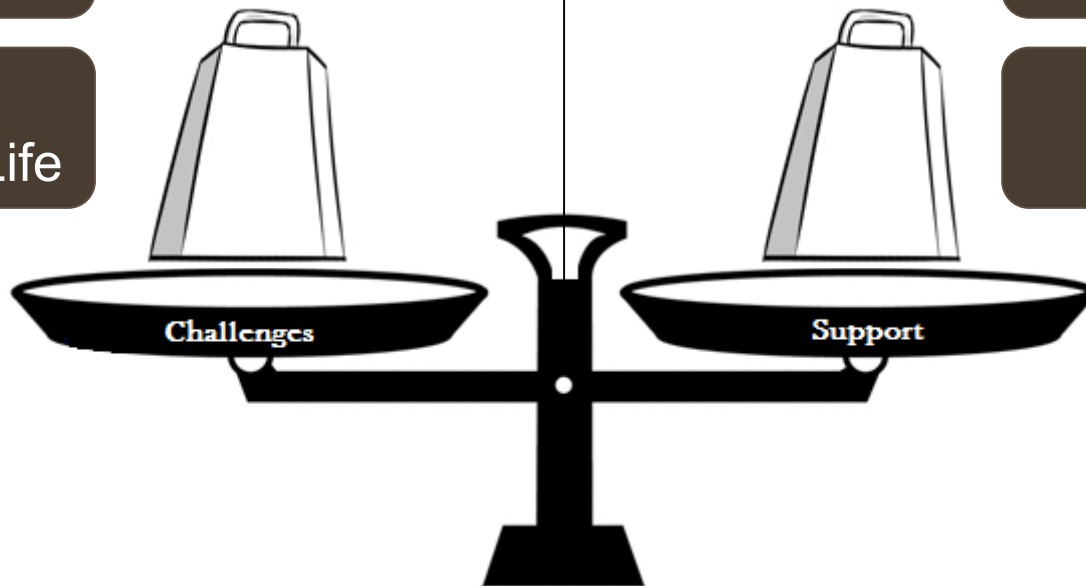
Balancing
School and Life

Personal Growth and
Resilience through
Balance

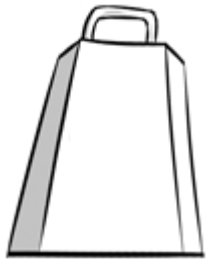
Peer
Support

Academic
Advisor

Financial
Support



Findings - Challenges

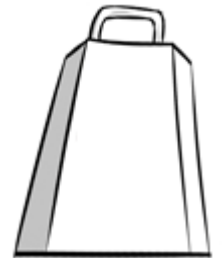


Academic Rigors

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

“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.”

Cultural Dynamics

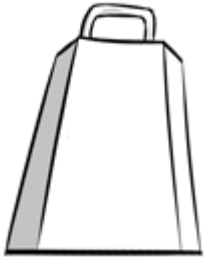


Balancing School and Life

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



Findings - Support

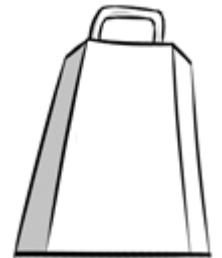


Peer Support

"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



Financial Support

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

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.”

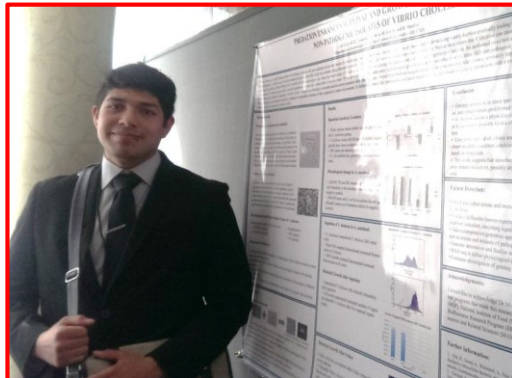
“I can do anything I set my mind to.”

“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.”



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?