Supporting the transition into college for underrepresented students in STEM: The role of bridge programs

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Learning Outcomes

• Understand challenges underrepresented minority students pursuing STEM degrees might face during their first year of college.

• Identify additional strategies or programming that can be implemented to improve the academic outcomes of underrepresented minority students.

• Understand the role of bridge programs in buffering against challenges commonly faced by underrepresented minority students in STEM.
Let’s Discuss!

• What challenges do students face as they transition into college?

• What factors might impact these challenges?

• What role does students racial and ethnic background play?
Challenges for URM STEM students

- Lack of representation
- Limited early exposure to STEM learning experiences (inside and outside of school)
- Neurobiology of learning from additional stress (high cortisol)
Lack of representation

• Limited visibility of successful STEM individuals with similar backgrounds
  • Showing a lack of community, empowerment, and a sense of belonging

• Examples:
  • Faculty, Peers, TA’s, workforce personnel, parents, family, etc.
  • Readings, examples, etc. are not representative of URM students
  • Projects, assignments etc. do not tie into impacting their communities (“meaningful” work)
Limited Exposure to STEM learning Experiences

• Low-income and low resourced homes, communities, and K-12 schools

• Examples:
  • No STEM programs, clubs, competitions, etc.
    • Often pre-requisites or impressive items on an application into STEM college programs
  • No STEM related projects at home, museum visits, access to books, etc.
Neurobiology of learning from additional stress

• High cortisol - impacts the ability to evaluate and make decisions (test-taking etc.)

• Cultural Competence – stereotype threat, oppression, racism, sexism, micro aggressions and implicit bias

• Examples:
  • Inside classroom experiences that impact academic performance
    • Faculty deficient-thinking - URM students being treated like they are not competent because of race or gender
    • One women student working with a group of 5 men students on a class assignment - women feeling isolated, not valued or welcomed
AUTUMN 2018: NEW FIRST YEAR STUDENTS

- White: 65%
- International: 13%
- Asian: 8%
- Hispanic: 5%
- American Indian/Alaska Native: 0%
- African American: 5%
- Native Hawaiian or Other Pacific Islander: 0%
- Two or More Races: 4%
AUTUMN 2018: TOTAL ENROLLMENT

- White: 69%
- International: 9%
- Asian: 7%
- Hispanic: 4%
- African American: 7%
- American Indian/Alaska Native: 0%
- Native Hawaiian or Other Pacific Islander: 0%
- Two or More Races: 4%
Underrepresented Minority Students in STEM

- STEM Doctorates working as Full/Assoc/Asst Profs in 2yr & 4yr institutions in 2008: 7.3%
- STEM Doctorates awarded in 2010: 8.3%
- STEM Masters degrees awarded in 2010: 12.6%
- STEM Bachelors degrees awarded in 2010: 14.7%
- 2010 US Population (all ages): 29.3%

(Estrada et al., 2016)
“Change begins by recognizing the fields of influence in a situation and identifying the points at which there are ‘gatekeepers’ that impede the flow of change in a system” (pp. 2, Estrada et al., 2016)
Solutions?

How can we support groups of students who might face these types of challenges?
The Louis Stokes Alliances for Minority Participation Program

- National Science Foundation program
- Congressionally mandated in 1991
- Named after former congressman from Cleveland
- LSAMP Impacts
  - 400,000 alumni
  - 47 alliances
  - 650 institutions
LSAMP’s Goal

Assist universities and colleges in their efforts to increase underrepresented minority student recruitment, retention, persistence, and attainment of STEM degrees.

Social integration  Academic integration  Professionalism
Eligibility

• Be an underrepresented minority (African American, Hispanic, American Indian, Alaskan Native, Native Hawaiian, Native Pacific Islander)
• Be a U.S. citizen, U.S. national, or permanent resident of the U.S. or its possessions
• Be enrolled at a participating institution in an undergraduate major in a STEM discipline
The Ohio LSAMP Alliance

- Columbus State Community College
- Cuyahoga Community College
- Cincinnati State Technical and Community College
- Sinclair Community College
- The Ohio State University
- Cleveland State University
- University of Cincinnati
- Miami University
- Central State University
- Wright State University
LSAMP Programming

- Faculty mentor
- Peer mentor
- Success coaching
- Academic resources
- Personal and professional development
- Undergraduate research
- Early arrival bridge program
What is a bridge program?

A program that works to bridge the gap between the initial skills of students and the skills required to enter and succeed in postsecondary education and career-path of employment.
Program Objectives

• Increase participants’ sense of belonging by helping students establish a peer network of students with similar interests and backgrounds

• Provide students with skills for academic success in STEM courses

• Help students explore STEM disciplines and expose them to professional opportunities

• Connect students to critical campus resources aiding their academic integration, social integration, cultural experiences, and disciplinary socialization

• Provide students with the tools and skills to navigate STEM courses through faculty-led laboratory experiences
The OSU LSAMP Bridge Program

• Residential Program
• Started in August 2015
• 2.5 weeks
• 20 participants
Leveraging Resources Through Partnerships

• Summer 2018 – Total cost? $50,000
  • Honda Grant
  • Undergraduate Research
  • Students Program Fees ($150-200 per student)

• Collaborations with units across the university, including:
  • Dennis Learning Center, Department of Mathematics, College of Engineering, Minority Engineering Program, Engineering Education, Department of Chemistry, College of Food Agricultural and Environmental Science, College of Arts & Science, Residential Life, Career Counseling Center, Wellness Center, and the Young Scholars Program.
Staffing

- 3 Scholar Mentors (junior/senior LSAMP Scholars)
- $10/hour
- 38 hours/week
- Training starts the week before bridge program
Bridge Program Schedule

- Welcome Brunch & Move In
- Courses
- Study Tables
- Lunch & Learns
- Trips/Tours
- ODI Resources Session
- Closing Banquet
Courses

• Problem Solving (Mathematics)
• Technical Communications
• Study Skills Systems
• Integrated Sciences & Stone Lab Wetlands
Lunch and Learns

- Beating Anxiety
- Financial Wellness
- Career Planning
- Identity and STEM
- 2nd year LSAMP student panel
- 30 second elevator speech
Trips and Tours

- Cedar Point tour
- Stone Lab Research
- Planetarium
Summer 2019 Schedule (updates)

• Welcome Brunch & Move In
  • Breakout Session 1 (Guests)
  • Breakout Session 2 (Scholars)

• Courses
  • Problem Solving (Mathematics)
  • STEM Identity
  • Study Skills S4
  • Integrated Sciences & Engineering/Wetlands

• Lunch & Learns
  • Beating Anxiety
  • Financial Wellness
  • Career Planning

• STEM Faculty Panel
  • 2nd Year Research Panel
  • 30 second elevator speech

• Trips/Tours
  • Weekend in Sandusky (Cedar Point & Stone Lab Research)
  • Planetarium
  • Honda Plant
  • Wexner Medical Center

• ODI Resources Session
• Closing Banquet
Recruitment

2018
• Applications opened in May. Students are recruited once they decide to attend OSU
• Emails advertised through different colleges

2019
• Applications open in March before admitted to OSU
• Emails advertised through different colleges
• ODI common application
• ODI Admissions Travel Representative
• OSU EAP Working Group
Application Process

• Enrollment Form (race, ethnicity, parents education, major/minor)
• Application (short answer & Likert scale questions)
• Financial Need Assessment (ODI Scholarships & Grants)
• Phone Interview
• Rank
• High School GPA
• Resume
• Cover letter
• Deposit Payment (can be waived)
Thank you!

Questions?

go.osu.edu/ohiolsamp