How Early Research Experiences Contribute to Student Success: The Mediating Effect of Community-building

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INTRODUCTION

Undergraduate Research Experiences (UREs) ➔ Increased STEM Student Retention

What are the mediating mechanisms that explain this relationship?

- Growth in knowledge and skills
- Exposure to STEM research and career possibilities
- Social Support

Barriers to success among underrepresented minorities (URMs) in STEM undergraduate programs:

- Lack of personal identification with scientific community
- Limited peer support
- Lack of sense of community

Q: How can interventions be intentionally designed to meet the relational needs of URM STEM students?

THE PRISM PROGRAM

Program Components

- Preparatory Mathematical Instruction
- Residential Research Experience
- Academic & Community Activities
- Faculty Mentoring
- Social Support & Sense of Community
- Exposure to STEM Research & Careers

Short-Term Goals

- Growth in knowledge & skills
- Student Retention
- Graduation Rates
- Pursuit of STEM Careers

Long-Term Outcomes

- Social & Professional Development
- Community-Building
- Academic & Career Success
- Global Citizenship

EVALUATION OF PRISM

Participants: Over the course of five years, the PRISM program served a total of 138 students. The program served an approximately equal number of male and female students and the majority of students were Hispanic.

Methods:

- Pre/Post-test survey: Sense of community, outcomes and benefits of research experience
- Between 2011-2015, 108 pre-tests were collected and 83 post-tests were collected (72 match pre/post).
- Student interviews: Program experiences, research and internship activities, career goals
- Semi-structured interviews were conducted with a sample of participants who were still attending the college (N=29).
- Graduate survey: Program experiences & benefits, academic and career activities & goals
- An online survey was distributed to program participants who had graduated from the college (N=37, response rate 66%)

SHORT TERM GOAL: COMMUNITY-BUILDING

Peer social support: 91% of those interviewed and 71% of graduates said PRISM helped them build relationships with other students. These relationships lasted throughout the duration of their academic careers.

Facility Social Support: Students established strong relationships with faculty during summer research experience (100% of those interviewed, 82% of surveyed graduates) 93% of students interviewed reported having at least one individual at the college they considered to be a mentor (45% said their PRISM project facilitator was now their mentor).

"I was invited back to do research with my PRISM mentor. She’s honestly helped me in many, many ways. She’s my adviser so I go to her and talk to her regularly. She’s someone I can trust with my future.

"It’s been 3 years since I did PRISM and I still hold a good friendship with everyone who participated. CSUSB is a commuter campus, it gave us that chance to experience living on campus and see that there’s actually a community within the university.

"My best friends are actually from PRISM and it’s pretty cool too because a lot of us went into similar things after PRISM and we just stayed connected.

PRISM PROGRAM OUTCOMES

Increased Retention

- 78% of PRISM scholars were retained in a STEM major or switched to a STEM major following participation in the program.

Higher Graduation Rates & GPA

- Participants had a higher 4-year graduation rate and GPA (28%; 3.42) than the overall student body (12%; 2.97) and non-participant STEM majors (10%; 2.88).

Pursuit of STEM Careers

- 55% of surveyed graduates were employed in a position related to their degree and 32% were pursuing graduate degrees.

- Among those pursuing graduate studies, 82% reported that the PRISM program had somewhat or greatly influenced their decision

RECOMMENDATIONS

- Conduct a needs assessment to determine the specific challenges faced by your student population.
- Use the data to tailor your intervention to match your students’ specific needs.
- Time the intervention to have the greatest chance for impact.
- UREs that occur early in students’ academic careers can help them persist through challenging gatekeeper courses.

- Make community building a central focus of your intervention.
- Design preparatory coursework to foster peer relationships by implementing active group-based learning strategies.
- Provide opportunities for community building during UREs by hosting them during the summer months and providing a residential dormitory experience for participants.
- Ensure that supportive relationships continue by providing ongoing forums for student and student-faculty interaction.

REFERENCES AND ACKNOWLEDGEMENTS

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