

Bridges to Biomedicine: Interventions proposed, and how they address obstacles to minority persistence in biomedical education

Level of primary impact from intervention

Obstacles to minority persistence in biomedical education at Alamo Colleges

#1: Transfer Advising

Biomed students are not encouraged or advised to take all the courses necessary to keep them on-track for efficient transfer. This, they are behind when they transfer, requiring 2+ semesters to get back on track. This discourages transfer and degree completion.

#2: Students' families do not understand value of biomed res.

Students' families do not understand why biomed res is relevant and valuable. Thus, they do not support continuing biomed education. Students are pressured to finish Assoc. and "find a job." Since families support students' studies, this discourages transfer and degree completion.

#3: Students do not understand value and relevance of biomed res.

Students have little understanding of what biomedical researchers do, and do not appreciate its relevance to their lives. Thus, they are not interested in a biomed research career, so do not persist in the educational track leading to it.

#4: Insufficient academic preparation hinders academic performance

Students often have not mastered necessary study skills and have gaps in lower-level science knowledge/comprehension. Thus, they perform less well in foundational math/science courses, either requiring extra semesters for retake or progressing in sequence with lower content mastery. This decreases interest and preparation for 4-yr programs and beyond (see text).

Institutional

Individual Bridges students

Individual Bridges students

Individual Bridges students

Instit'l and Individual Bridges students

Individual Bridges students

Strategy 1A: Instit. change in transfer recommendations and resources

Strategy 1B: Direct advising and connecting to TSU students and faculty

Strategy 2A: Undergraduate research and research skills development

Strategy 2B: Academic development and support

Strategy 3A: Minority Health Disparities course and seminar series

Strategy 3B: Family event with minority health speakers and *promotores*

Information offered by AC will reflect recommendations that appropriately prepare science students for on-track transfer into biomed BS programs. Advisors at all levels

will appreciate the importance of sequencing for successful transfer and degree completion. Bridges students will be specifically and individually prepared for on-track transfer into a biomed BS program at any school. Both of these will reduce wasted time and expenses from catch-up semesters, and increase the ease of transfer into 4-yr biomed programs. On-track transfer will increase the likelihood of on-time BS degree completion. On-time progression and graduation increases the students' sense of science self-efficacy, and increases the likelihood that they will consider post-graduate studies.

Both undergraduate research and target academic support improves science and math skills. Improved study skills and bolstered science and math skills will improve student performance in intro science and math courses, increasing the likelihood of staying on-track in math and science sequences, and facilitating on-track transfer and on-time degree completion.

As students discuss the potential applications of their research projects with their families, the families will better understand the value of biomed research.

Although the course will have no direct impact on the family, we expect the family events will have a significant positive impact on how families view biomed research and its relevance to their lives. The presentations about the application of biomed research in the context of minority health will provide clear, accessible information about the relevance of such research to the families, increasing its perceived value. The peer *promotores* will be a trusted source of information because they have perspectives,

backgrounds, and experiences in common with the parents. Parents will thus be more receptive and more likely to trust information about financial aid, the utility of continuing education in biomed research, and the contributions that such research can provide to the families' communities.

Conversations with upperclassmen and grad student peers about why they persisted are likely to influence student perceptions of biomed research careers

Undergraduate research helps students see applications of otherwise abstract science and math concepts, and is widely recognized for increasing solid awareness of what biomed research is and how it is relevant. We expect these research experiences to increase student interest in continuing studies in biomedicine. Improved academic performance will enhance the research experience.

Particularly the course and seminar series should increase the students' abilities to see the relevance and value of biomed research to the lives of their families and communities. It will also expose them to different career paths within biomedical research.

Connecting Bridges students with support from peer biomedical upperclassmen and graduate students could help Bridges students acquire and develop science study skills.

Undergraduate research has been shown to improve student comprehension and retention of science concepts, so the proposed research experiences will help to improve science mastery and fill in gaps in lower-level knowledge. Developing student study skills, individual tutoring (online and face-to-face), supplemental online resources, collaborative peer academic support, and careful monitoring of academic progress for speedy intervention are strategies that, collectively, will improve student academic performance. Both the research and the academic support strategies (described in the text) have been shown to improve students' sense of science self-efficacy and science identity, helping to add a psychological boost to academic performance and increasing persistence.