

Theory-Driven Interventions in Bioscience PhD Programs: Shouldn't the playing field be level by then?

Richard McGee, Steven P. Lee, Denise Drane, Karl Keller and Gregory Light

For the past 30+ years, the primary focus of interventions to address underrepresentation of certain ethnic and racial groups in the sciences has been on increasing their numbers entering PhD programs. In most PhD programs, the assumption has been that admitted students all are, or should be, on par with other students so that 'special' programs in graduate school are unnecessary. Unfortunately, this assumption is flawed. In fact, it is illogical to expect all have magically caught up with their more highly advantaged peers during college. But great caution is needed in attempts to address this continuing inequity because efforts might, in fact, draw unwanted attention and further stigmatization.

We have addressed these issues in the Collaborative Learning and Integrated Mentoring in the Biosciences (CLIMB) program at Northwestern University with the support of the NIGMS Initiative for Maximizing Student Development (IMSD). Most importantly, the CLIMB program has evolved over the last four years from activities intuitively thought to be helpful, to a carefully crafted developmental strategy, drawing on multiple social science theories.

CLIMB activities occur during the first two years of the PhD. (Details of the program will be described in a separate poster.) The theoretical basis for CLIMB starts from four core concepts: 1) students from underrepresented groups and disadvantaged backgrounds, which we collectively term 'atypical' students, often start the PhD with diminished Cultural Capital (knowledge, skills and norms) with respect to success as a graduate student and as a scientist; 2) because of their atypical backgrounds, it is more difficult for them to identify with faculty and other students, and balancing multiple identities can extract a toll on their energy and sense of belonging; 3) their sense of research self-efficacy is often lower than their peers as are the expectations that faculty and peers have of them, due to institutionalized assumptions and biases; 4) like all students, the ultimate success and trajectory of atypical students depends on interactions within their lab communities, influenced by how others see them, but the unspoken keys to success are more difficult for atypical students to understand and navigate. With these core concepts in mind, the likelihood of these students excelling is lowered if one simply relies on traditional mentoring to guide student development.

CLIMB addresses these principles through a coordinated series of activities that require limited student time. We focus on: 1) supporting the multiple cognitive and emotional transitions that students go through in the first fall of the PhD to enhance identity development and self-efficacy, and create a positive early impression among faculty and peers; 2) explicitly deconstructing for students the varied lab communities they encounter in early lab rotations; 3) developing effective oral communication skills from day-1 to offset biases and stereotypes, and enhance self-confidence and self-efficacy; 4) developing sophisticated writing skills within the context of research proposal writing to enhance external and internal judgments of scientific ability; 5) creating a supportive expanded student community; 6) creating a safe environment for practice of new skills with feedback from CLIMB leaders and peers; 7) demystifying the process of becoming a scientist, revealing it as a sequence of definable steps and learned skills.

Initially, CLIMB was advertised only to students of color and negative stereotyping occurred. Beginning two years ago, all CLIMB activities were opened to any student in the five bioscience PhD programs, acknowledging that CLIMB activities are of value to all. This change led to a rapid rise in the number of students who voluntarily join CLIMB, eliminated negative stereotyping, and dramatically increased the quality of the student community and learning environment. Extensive evaluative feedback and other evidence support the positive impact of the CLIMB program on student success, particularly for atypical students.

Supported by: R25 GM079300 and R25 GM079300-03S1