

EXPANDING UNDERREPRESENTED MINORITY PARTICIPATION (CROSSROADS)

National Research Council Report

CROSSROADS

- Emphasizes the efficacy of inquiry-based learning or engineering design activities in engaging underrepresented students in activities through which they
 - use and create scientific and technical knowledge
 - learn how to generate evidence
 - develop the sense of competence that is critical to identification with a field of endeavor such as STEM.
- Shows how the traditional design of introductory courses tends to weed out underrepresented students rather than encourage them to begin to see themselves within a STEM community of practice.
- Highlights the importance of engaging underrepresented students in rich research activities that stimulate interest in STEM fields and socialize students within a discipline.
- Calls for a campus culture in which underrepresented students feel socially and intellectually integrated, and part of a larger community.

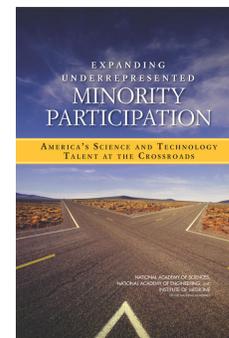
ABOUT CROSSROADS

This provocative report presents transforming the STEM learning environment as a societal challenge to be addressed at the institutional level.

The title of the report signals the need to ensure the persistence and success of all STEM learners in a time of significant demographic change, when no talent should be lost in the service of the nation, noting that those groups that are most underrepresented in STEM are also the fastest growing segment of the U.S. population.

It is recognized by all that students moving in and through our nation's classrooms, labs, and other learning spaces are increasingly diverse, coming from varying K-12 backgrounds and possessing differing expectations for their undergraduate years and careers.

This report calls on colleges and universities to pay greater attention to the experiences of these students on their campuses as well as across the higher education community. It highlights approaches that work for all students, including that of empowering the learner, emphasizing that motivation is a key ingredient for success.



WHAT WORKS

Beyond a supportive administration and an institutional entrepreneurial spirit, what works is:

- Being familiar with the literature solidly validating that learning is enhanced with student involvement, literature based on research on how learning happens.
- Taking time to audit the current reality, documenting the persistence, retention, frustration, and failure of students in introductory chemistry.
- Taking time to identify the problem. For us, it was the space that was the problem—the dimly lit, cavernous, steeply-ramped lecture hall was the major impediment to deep, engaged learning.
- Taking time to take risks. For us, it was repurposing an old game room in the University Center into an “active learning” space for Introductory Chemistry.
- Taking responsibility—personally and as a department to observe what is working and why. For us it was an epiphany about how learning happens when there is no front of the room—reducing the tendency to lecture.

— from the NSF presentation by UMBC

REPORT CITATION

- National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. 2011. *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12984>.

