



# ***Broadening Participation in the Geosciences: Observations from Research***

Lorenzo DuBois Baber

Assistant Professor, Education Policy, Organization and  
Leadership (EPOL)

University of Illinois Urbana-Champaign\*

\*Iowa State University starting August 17<sup>th</sup> (ldbaber@iastate.edu)



## Background on Baber, et. al (2010)

---

- This study was part of NSF-funded project *Building and Maintaining a Pipeline for Diversity in the Geosciences* (Dr. Tanya Furman, PI)
- Lead authors (Baber and Pifer) were graduate research assistants on the project for 2006-2007 academic year
- Focused on student experiences in the Summer Experience in Earth and Mineral Science program (SEEMS) and the Summer Research Opportunity Program (SROP) at Pennsylvania State University during summer of 2006



## Conceptual Framework: Self-Efficacy

---

Self-efficacy is defined as “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (Bandura, 1997, p. 171). A strong sense of efficacy boosts personal well-being and allows individuals to approach difficult tasks as challenges to be mastered rather than as threats to be avoided. There are four main sources of self-efficacy:

- Mastery experiences
- Modeling influences
- Social persuasion
- Altering misinterpretations of stress indicators



## Key Findings

---

### Quantitative

- Over a six week period, interest in Geoscience and knowledge about Geoscience careers increased significantly among SEEMS participants.
- Participant reported significant increases in their perceptions of geoscience faculty as role models and affective modeling behaviors related to the Geoscience field.
- Self-efficacy measures among SEEMS participants, *decreased* between the pre-test and post-test (Uh-Oh!).
- Significant differences between first-time SEEMS participants and returning SEEMS participants, including self-efficacy measures.



## Key Findings

---

### Qualitative

- SROP experience served as a vehicle for *increasing* self-efficacy in the Geosciences
- Enactive Mastery Experiences and Role Modeling were the strongest themes across the participant interviews
- Participants valued Social Persuasion from family and peers
- Altering Misinterpretations of stress indicators most challenging



## Background on Baber, 2015

---

- This study was part of the NSF-funded project *STEM Trends in Enrollment and Persistence among Underrepresented Populations* (William Trent, PI; Lorenzo Baber, Co-PI).
- From 2007 to 2012, the project examined STEM diversity programs at 10 research-intensive, public universities in the United States. A total of 76 administrators on the 10 campuses agreed to participate in interviews. This article focuses on data collected from 32 participants who were lead directors of STEM diversity programs at their respective campuses.



## Conceptual Framework: Interest-Convergence

---

The historical advancement of African American interests is a result of being fortuitous beneficiaries of measures directed at furthering aims other than racial equity. Further, Bell states, “Even when interest-convergence results in an effective racial remedy, that remedy will be abrogated at the point that policymakers fear the remedial policy is threatening the superior societal status of Whites, particularly those in the middle and upper classes” (Bell, 2004, p. 69).



## Themes

---

- “Increase the Numbers”: Emphasis on Compositional Diversity
- “Do More with Less”: The Cost-Benefit Approach to Diversity
- “What’s in It for Us?”: Benefits for Faculty from Privileged Backgrounds