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Surmounting the Barriers: Ethnic Diversity in Engineering Education

**AAES General Assembly Meeting
November 5, 2014**

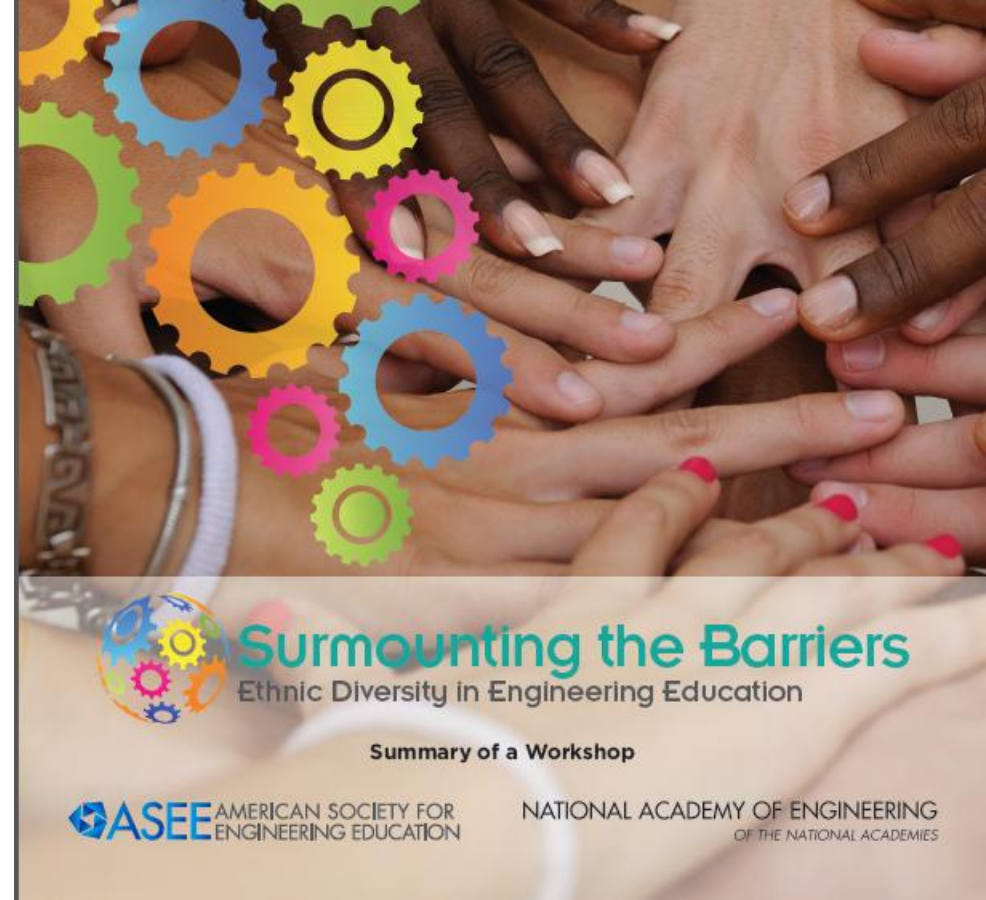
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ASEE

- Founded in 1893
- Spans all engineering disciplines
- Concerned with teaching, research, public service, professional practice, and social awareness
- Voice of academic engineering (400 colleges of engineering and engineering technology)
- Over 10,000 total individual members
- 100 corporations, NGOs, governmental agencies

Outline

- Background
- Methods
- Pre-Workshop Survey
- Workshop Findings
- Post Workshop Activities (TX and FL)
- Personal Thoughts
- Opportunity for a Society Summit



Background

- Since the 1970's we've seen repeated, consistent recommendations for enhancing URM participation in engineering.
- Hispanics and Native American BS percentages have improved while for African Americans trends have been flat to declining for the past 10 years.
- We sought NSF support to understand WHY the recommendations have not been implemented.

Methods

- NSF Grant to ASEE, NAE was a subawardee
- 50 educators, from a variety of institution types, and 20 staff from ASEE, NAE, and NSF.
- Pre-workshop survey conducted
- 2-day meeting with keynote speakers to frame the days issues
- Small group breakouts with plenary report outs
 - Illuminate the impediments
 - Consider concrete steps to overcome impediments
 - Identify local models of success that can be scaled up

Methods (cont)

- Day 1 Small Groups (based on the literature)
 - Inculcating and reinforcing students' academic and professional knowledge
 - Pedagogic improvements
 - Organizational receptivity to diversity
 - Economic enablement
 - Public and community education and institutional engagement
 - Educational research and policy development

Methods (cont)

- Day 2 Small Groups (based on geography)
 - California (state with strong 2-yr/4-yr articulation & laws inhibiting affirmative action)
 - Florida (state with strong 2-year/4-year articulation)
 - Michigan (state with laws inhibiting affirmative action)
 - Texas (state with strong 2-yr/4-yr articulation & laws inhibiting affirmative action)
 - Other States -- Student progression to higher education
Feeders to BS programs

Pre-workshop Survey on Impediments to Implementing Past Recommendations

Importance

- Limited financial support
- Too few students in the pipeline
- Lack of institutional incentives/
will/commitment
- Cultural stereotypes
- Resistance to change

Difficulty

- Resistance to change
- Cultural Stereotypes
- Too few students in the pipeline
- Limited financial support
- Lack of institutional incentives/
will/commitment

Digging Deeper into Lack of Institutional Incentives/Will Commitment Reveals:

Importance

- Limited financial support
- Lack of faculty diversity
- Cultural stereotypes
- Lack of social integration
- Lack of institutional incentives
- Supreme Court rulings

Difficulty

- Lack of faculty diversity
- Supreme Court rulings
- Cultural stereotypes
- Limited financial support
- Lack of institutional incentives
- Lack of social integration

Other questions were also addressed in the pre-workshop surveys.

Workshop Findings

13 Strategies for Surmounting Diversity Impediments

- Link greater diversity to the university's mission
- Make a business case for diversity
- Improve 2YR/4YR pathways
- Revise faculty/staff hiring strategies
- Understand that today's students differ from your generation
- Make engineering approachable
- Make an institutional financial commitment
- Seek industrial partners
- Capitalize on proven successes
- Isolate problem faculty/highlight others
- Seek changes in government policies and support
- Leverage professional societies
- Spread the word

Post-Workshop Activities

Florida

- August 2014 meeting
- Working on a multi-institutional proposal to pilot the 4-year post-doctoral student/industry/academia collaborative program that prepares URM students for faculty positions including industry experience.
- Will collaborate on data collection from individual institutions in order to evaluate our strengths (e.g., top 10 in Hispanic Ph.D. graduates) and weaknesses in terms of ethnic diversity in our student and faculty populations.

Texas

- February 2014 meeting
- 6 attendees including representation of the Texas Higher Education Coordinating Board
- Focus on implementing THECB “closing the gaps” plan to increase African American and Hispanic graduation
- Proposed that 2YR and 4YR institutions leverage existing infrastructure and grants

Personal Thoughts

- Funders should focus on activities that are *institutional*, like ADVANCE; *broad spectrum* like LSAMP; *cross-level*; and with *durations that exceed the standard 3-5 year grant*.
- If we assume that bias exists, then we must not only provide enhancement/remediation, but create opportunities (to destroy stereotypes and build track records).

An Opportunity

- Recall
 - The suggestion to “leverage professional societies,” and
 - The imperative to create opportunities.
- What can we AAES member societies do?
- ASEE suggests a Society Summit focused on what we can do to build capacity via structured opportunities in conferences, workshops, etc.

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