Broadening Participation in COSEE: Increasing Underrepresented Minority Undergraduate Students in STEM

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Why Broaden Participation?

- U.S. Bureau of Labor and Statistics reports that the labor market is projected to grow faster in science and engineering than in any other sector.
  - In 2006, underrepresented minorities, including African American, Hispanics/Latino Americans, and Native Americans constituted only 9% of the nation’s science and engineering labor force, while accounting for nearly 30% of the population.
  - Non-U.S. Students (particularly form China and India) account for almost all of the growth in U.S. STEM doctorates awarded in the past 15 years, but many eventually return to their own countries, taking their talents with them.
  - At present, only 6% of all 24-year-old Americans hold an undergraduate degree in STEM disciplines, for URMs, the percentage hovers at 2 to 3%.
U.S. College Enrollment Predictions

- According to the Institute for Higher Education Policy (IHEP), between 2007 and 2018, it is predicted that college enrollment will increase:
  - 38 percent for students who are Hispanic
  - 32 percent for students who are American Indian or Alaska Native
  - 29 percent for students who are Asian or Pacific Islanders
  - 26 percent for students who are Black
  - 14 percent for international students
  - 4 percent for students who are White
A National Model for Success

Meyerhoff by the Numbers
Since 1993, the program has graduated over 700 students. As of February 2011, the program has achieved the following results:

• Alumni from the program have earned 81 Ph.D.s, 25 M.D./Ph.D.s, 92 M.D.s. Thirty-eight of the Ph.D.s have been awarded between 2005 and the first half of 2008.

• Over 85 additional alumni have earned graduate degrees in engineering, and nearly 300 alumni are currently enrolled in graduate and professional degree programs.

• An additional 230 students are currently enrolled in the program for the 2010–2011 academic year, of whom 51% are African American, 26% Caucasian, 18% Asian, 5% Hispanic, 1% Native American.

• The program is having a dramatically positive impact on the number of minority students succeeding in STEM fields; students were 5.3 times more likely to have graduated from or be currently attending a STEM Ph.D. or M.D./Ph.D. program than those students who were invited to join the program but declined and attended another university.

http://www.umbc.edu/meyerhoff/progr am_results.html
Meyerhoff - Lessons Learned

- **Recruitment and Selection**
  - Comprehensive process (President, administrators, faculty, parents, and Meyerhoff alumni).
  - *Special Note:* build alliances with K-12 schools/STEM programs; develop programs to attract 1st-year students; outreach is the key – go to them...don’t wait for them to come to you.

- **Collaborative Classroom Learning**
  - Emphasis on small group exchange/critical mass and group accountability

- **Undergraduate Research Opportunities**
  - Participation of all students in undergraduate research beginning in their first year.
  - *Special Note:* the NSF funds 25+ REUs that are Ocean Sciences-focused.

- **Faculty Engagement**
  - Address the issues of faculty support and culture (i.e., this is not just a student issue).
  - Engage faculty in recruiting and mentoring.

- **High Touch**
  - Very intrusive and mandatory advising model; Meyerhoffs do not slip through the cracks.

- **High Expectations**
  - Meyerhoffs know that they are exceptional and that the campus community supports them.
  - Start with the End in Mind (Meyerhoffs are selected for the program with a PhD in mind).

- **Financial Aid and Merit Scholarships**
  - Meyerhoff offers substantial extrinsic rewards in the form of scholarships.
  - Reduce financial burden and pressures (students can focus on academics).
Recruitment is Important -- RETENTION is Critical
## Principles for Capacity-building in COSEE

<table>
<thead>
<tr>
<th>Principle</th>
<th>Evidence</th>
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<tbody>
<tr>
<td>Institutional leadership</td>
<td>Commitment to inclusiveness across the campus community</td>
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<tr>
<td>Targeted recruitment</td>
<td>Investing in and executing a feeder system, K-12</td>
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<td>Engaged faculty</td>
<td>Developing student talent as a rewarded faculty outcome</td>
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<td>Personal attention</td>
<td>Addressing, through mentoring and tutoring, the learning needs of each student</td>
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<td>Peer support</td>
<td>Student interaction opportunities that build support across cohorts and allegiance to institution, discipline and profession</td>
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<td>Enriched research experience</td>
<td>Beyond-the-classroom hands-on opportunities and summer internships that connect to the world of work</td>
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<td>Bridging to the next level</td>
<td>Institutional relationships that help students and faculty to envision pathways to milestones and career development</td>
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<td>Continuous evaluation</td>
<td>Ongoing monitoring of process and outcomes that guide program adjustments to heighten impact</td>
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source: *A Bridge for All, [www.bestworkforce.org](http://www.bestworkforce.org)*, 2004