Building Inclusive, Supportive Environments for Underrepresented Individuals In STEM

NABI Summit, April 2016, University of Pennsylvania

Kevin Costa, Managing Director, Synberc

Russell Ledet, Founder-Director Clear Direction Mentoring

Barbara Pearson, STEM Diversity Institute, UMass Amherst
Broadening Participation—the toughest of the BI areas, involves much more than how universities are organized.

What are the challenges?

Where are (some) solutions?
Acknowledgements

• Our 4th “speaker”--Shaila Kotadia
  Now Education, outreach, & diversity manager for Synberc
  Genetics and development Ph.D., Policy Fellow at the
  American Society for Biochemistry and Molecular Biology
Focus on understanding the challenges facing underrepresented students by living them, (really) hearing them, and then addressing them.

Building, scaling and sustaining solutions.

• Common denominator: MENTORING
Put together 2 programs and added a case study

- **3 different Scales** Individual program (Russell), A suite of programs at one university (BP), and a suite of programs in a large consortium, Synberc (The Synthetic Biology Engineering Research Center-KC)

- **Target audiences** Programs involving high school students (RL), graduate students (BP), and for scientists, students and professionals together
  - Clear Direction
  - NEAGEP/ STEM Diversity Institute/ NRMN
  - Expanding Potential
Shaila’s questions for the panel:

• How do we best leverage voices from underrepresented populations?
• How do we scale programs in order for them to be sustainable and be integrated into institutional policy?
• How do we change the way each individual thinks in order to create a more inclusive STEM environment?
Kevin Costa, Synberc
Russell Ledet, Clear Direction (A Synberc seed grantee)
Broadening Participation in STEM

Mentoring, Mentoring, Mentoring

Barbara Pearson, Ph.D
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Goals for the talk

• Share my experience with best practices;

• Speculate about best practices, esp. question of moving the needle

– Innovation

– OR

– Effective paradigms
  • My involvement as a staff collaborator, Using my experience with PAESMEM program as a nominator and then participant in PAESEMEM award programs—
Sandy Petersen w/ POTUS, NEAGEP, STEM Diversity Institute, IMSD, PREP, NRMN, PAESMEM
• Basically, creating a **rigid pipeline** with a set of minority serving institutions

• Why the **alliance** with other Research 1 Universities?
  – Gives minority students more options
  – Cooperation in recruiting trips, more flexibility for students when they get to new environment, larger pool of potential mentors, more collaboration (less confusion for the receiving schools) with other diversity/ maximizing student development programs
  – Including in their summer REUs
Elements of the recruiting

- “NEAGEP day” rotating to different institutions
- Annual visits to the MSI
- Participation of current NEAGEP students
- Lots of faculty involvement

UMass elaborations

- Bring faculty from MSIs along with students to work in labs at Umass
- Accept post-bac, led to NIH PREP program (Umass one of first awards)
Summary of ne-agep accomplishments

- **URM enrollment** in STEM doctoral programs at the 10 NEAGEP institutions **doubled** (approximately 400 to 800)

- URM completion of **STEM Ph.D. degrees** at NEAGEP institutions **doubled** (approximately 80 to 160 per year)

- **URM enrollment** in STEM doctoral programs at **UMass Amherst** increased from **23 to 76** (no similar increase in non-URM)

- URM completion of **STEM Ph.D. degrees at UMass Amherst** increased from 2 before NEAGEP to an average of 10 per year
• Total of 60 UMass Ph.D. degrees earned by NEAGEP students, and the trajectory (from 20 in 2003-2008 to 36 in 2009-2014) predicts a continuing increase.

• Persistence of minority student higher than for majority students

• 83% success rate for PREP students continuing to STEM graduate programs

• 1000% increase in faculty involved in NEAGEP mentoring, from just under 20 in 2003 to over 200 in 2013
Testimonials from URM collaborators

- Sandy is a lion in this
- most
- important
- and
- very
- difficult
- area
- of
- academic

I have been engaged in many outreach programs across the country (MBRS, HHMI, LSAMP, COMPACT, AGEP, etc.) either as a participant, mentor or director. I am blowing my own horn to let you know that with regard to minorities in the sciences gaining access, I am very knowledgeable. My contributions to this effort pale in comparison to the work of Dr. Sandra Petersen.
Testimonial --from evaluator

• National AGEP evaluator says, “she stands out even in that company [among other AGEP directors]—and then told this story

Testimonial --from STUDENTS

• She is a good listener, cares about the whole person, emphasizes the responsibilities of the student, and is “helpful in a way that you learn how to help yourself as well.”

• She’s the busiest person I know, but when she’s with you, you feel like you’re the only person in the world.
Story about babies in the river
Three responses

• Rescue babies—start giving them mouth-to-mouth resuscitation

• Start teaching babies how to swim

• See the other person running away, ask: what are you doing? Don’t’ you see we need help here??!

• I’m going up the river to find out who’s throwing babies in the river and I’m gonna get them to stop!
• a mentor,
• a mentor of mentors, and
• an agent of institutional change.
Petersen Roles (taken from recommender letters)

• a trusted source of advice and understanding,
• a cheerleader/ coach,
• a sponsor,
• a facilitator,
• an advocate and a teacher of self-advocacy through roleplay and other confidence building,
• a cultural interpreter, and
• a sensitive and caring friend.
All important aspects of a mentor

• Do you remember Mentor in the Odyssey?

• The goddess Athena, consistent supporter of Odysseus, intervening repeatedly on behalf of the hero and his son

• Appears as MENTOR, in disguise, the family friend and adviser

• A delicate balance—she steps in, but then allows the humans to earn their destinies. Intervenes just enough to encourage Odysseus and help him to turn the tide; then recedes into the background and allows the mortals the victory

• http://www.cliffsnotes.com/literature/o/the-odyssey/character-analysis/athena-pallas
What do UR students need from their mentors

• CONFIDENCE

• COMMUNITY, and

• CULTURE CHANGE
What do UR students need from their mentors

• CONFIDENCE

• Confidence: “We remind them who they are when they forget.”

• Story about not internalizing messages. Do poorly on a test, Majority student says: “It was a bad test.” URM says, “I’m not smart enough.”

• Create leadership opportunities with “off-phase” program. (PREP) Students take a year, starting with a summer REU after the B.S., work in lab, take a course, prepare their applications. When their cohort arrives, they’re already well ensconced, in a position to help the new arrivals.
What do UR students need from their mentors

• COMMUNITY

• A constellation of mentors—peer, same ethnicity, different ethnicity, same field, different field, maintain ties to undergraduate institution.

• From Before Students Arrive Until After They Leave

• Create social and academic networks. The students describe a “family” feeling—(says they care about each other and feel supported. They help each other.)

• APINE—(a PhD is Not Enough) ”mentoring breeds mentoring”
What do UR students need from their mentors

• COMMUNITY
• Develop student professional networks—at conferences like SACNAS, SBE/ SWE
• Involve students in recruiting trips (not a hard sell to go to Puerto Rico Mayaguez in February)
What do UR students need from their mentors

- CULTURE CHANGE

- “When a student is falling through the cracks, she moves the cracks.”

- Strategic readjustment: pregnancy the year she was being a TA. Re-allocated her 5th year fellowship as a family fellowship, to keep her going.

- Program is FACULTY Driven. Increased the participating faculty from about 20 to over 200. [aside: ORD doesn’t do anything without a faculty champion]
What do UR students need from their mentors

• CULTURE CHANGE
• Gets excellent candidates without reliance on GRE
• Match-making with labs. Readjust as necessary.
• Early involvement—at admission times, in school careers
Questions???  Suggestions??
Background and experience

• Barbara Pearson bpearson@research.umass.edu
  – Office of Research Development (ORD)
  – Broader Impacts Specialist ~40-50 grants/year (20 NSF Careers)
  – Faculty Senate Council on Public Engagement and Outreach
  – National Alliance for Broader Impacts (NABI), Charter Member
  – National Org. of Research Development Professionals, Northeast steering committee member
  – (have a research career, myself)

Coming (back) soon http://www.umass.edu/ord/broaderimpacts