

## Panel – What Can Be Done to Broaden Participation in the Mathematical Sciences

Jim Lin – U of California San Diego

- He is graduate school vice chair at UCSD
- Most faculty are not interested in diversity
- Two critical points regarding obtaining success in grad programs: 1) passing quals, 2) finding mentors/advisors
- Found the 4<sup>th</sup> and 5<sup>th</sup> year grad students are helpful as mentors
- Main attrition point is passing qualifiers
- He created a summer program prior to qualifying exams. Some incoming students also came to the program which helped them with bonding among older students
- Senior graduate students served as teachers
- Found that Senior faculty were not great advisors
- 3 times a year, the students ran a panel to talk about how to choose an advisor
- AWM chapter was established on campus. Ran by students
- Built a new graduate student lounge and library – let grad students design own office space
- Had a Food for Thought seminar for students
- After they found jobs, students gave workshop to talk about their interviewing experiences
- Started having Town Hall meetings to listen to students' needs
- Developed on-line TA evaluations. Since professors did not have interest in observing TAs, they allowed undergrads to evaluate them.
- Developed a Diversity Outreach Collaboration with other schools to share information about graduate programs, and learn about each others' bachelors programs
- Conducted open house in April for prospective students; included a pot luck dinner for students only – no faculty invited – for students to have an exchange of information with prospective students.
- Retention rate increased 65%

Nathaniel Whitaker – U of Mass Amherst

- Was not satisfied with young son's math curriculum. Investigated different K-12 math programs and found the Singapore Math Program. Began to work with his son and a few other children.
- As more children were added, found space at U of M to do Saturday classes from 9-11 a.m.
- This was not enrichment. These were kids who were doing OK; program merely pushed them to the next level
- When children reached 7<sup>th</sup> -8<sup>th</sup> grade, goal became to get them exempted from Algebra I so that they could either move to Honors Algebra or move on to Geometry
- Now, most of the kids are taking Algebra II
- Totally volunteer program using parents, volunteers from the university and retired professors

- Nathaniel attributed his own success as grad student at UC Berkeley to factor that there was a critical mass of African American students in the program
- Recommends masters program rather than going into PhD directly

#### Roselyn Williams – FL A&M

- Developed a program with Iowa Regent Schools and 4 HBCUs including FL A&M
- Goal to increase number of African Americans with PhDs in graduate programs in the mathematical sciences
- Faculty interchanges for lecturers and to study the climate at each other's schools and to share ideas. Program was NSF funded.
- After 2-3 years, the number of students going to graduate school at Iowa Regent schools doubled
- Two components to program: 1) REUs hosted by each of Regents Institutions, 2) Internships for students to serve as TAs, mentors, lab assistants. Received scholarships for doing so.
- Iowa schools began attracting African Americans outside of the HBCUs
- Now Iowa has expanded the program to four-year schools in the Heartland
- Program has grown to a National Alliance of 20 schools.

#### Christine Stevens – St. Louis U

- Project NEXT – 20 student participants designed to offer professional development for new and recent PhDs in math sciences to help them transition from graduate school to become effective teachers. Also covers research, scholarship and service
- Treat masters as a legitimate goal instead of a consolation prize for not completing PhD
- Involves summer workshops and math meetings. Each person assigned a mentor
- Program has been in place since 1994. Started as professional development, but think most important role is building a community and building a network. Provides information on how to find instructional material, text books, how to find time to do research; to receive encouragement and confidence
- Why has this been successful? 1) Their network is national in scope, 2) Program is grounded in face-to-face interaction, 3) Program is fundamentally non-competitive. Few participants come from same institution so do not feel need to compete for status at their home school, 4) program has diverse participants, 5) program offers a long-term network; the issues change as participants change and progress in their careers

#### Michael Shearer – North Carolina State

- Began a program at NCSU in response to a floundering program
- To boost success of graduate program, needed to bring on board key proactive faculty
- Hosted small meetings with graduate students to find out their thoughts. Students were free to talk openly; found out female students described the math department as a hostile environment.

- Rearranged the physical space to create a more attractive environment for work and study
- Changed the structure of the program. Gave students 2<sup>nd</sup> chances to pass qualifiers.
- Started recruitment weekends on campus. Had current students take prospective students to lunch. Form cohorts among students.
- When faculty travels to do colloquiums on other campuses, make a point of talking to undergraduates
- Involved students early in their graduate careers in research
- Placed emphasis on hiring diversity. Hired more women, younger faculty.
- Held seminars where students could practice presentation skills
- Established a collaborative rather than a competitive atmosphere in department among students
- Developed a niche for their grad school – Applied Industrial Mathematics – with purpose of equipping graduates for work in business/industry
- Developed collaborative opportunities with other sciences such as engineering and science depts..

#### Sylvia Bozeman – Spelman College

- EDGE for women. Designed to bridge between undergraduate and graduate program
- Offered 4 weeks analysis/algebra, mentoring “layers. Students would have exposure to advanced graduate students, the two program directors, EDGE faculty; peers through the electronic bulletin board
- Established geographic mentoring clusters as program grew. Students, junior faculty, senior mathematicians who lived in close proximity in large cities would meet together for “tiered” mentoring
- Made sure they have diversity among program participants. Try to have 50% minorities. Soon found out that being successful with diversity was more than just numbers. Had to build a diversity community. Brought in a faculty from the sociology department to do a workshop called “difficult dialogues” to help students air their preconceived notions about others and to work through issues.