On creating and nurturing mathematicians among the Underrepresented

Challenges and Opportunities: The Case of Medgar Evers College

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CBMS 2012: Unitary Representations of Reductive Groups
University of Massachusetts Boston

July 21, 2012

Queens College, Guyana

- Common Entrance Examinations
- Queens College, 1979
- Start of my life in mathematics-Walterine Matthews
- Ordinary Level Exams
- Advanced Level Exams
- John F Kennedy Library–Brooklyn College

Queens College, Guyana

- Institution acts in the interest of the students.
- Particularly adept at responding to the needs of its students
- Community of Scholars
- Vice President of the NY Chapter of the Queens College Alumni Association
- Recording Secretary of ICQC

Brooklyn College, CUNY

- First Registration-Weston
- A correction-Snow-Grades Calculus III
- NBSSO-Academic Coordinator
- Ford Colloquium-John Van Sickle
- Lisa Goldberg & John Velling
- Course in Dynamical Systems-Bob Devaney

Brooklyn College, CUNY

- Graduation Brooklyn College with a degree in mathematics.
- Job as a stockbroker
- Dr. Susan Hom -Math Work Shop
- Family College at Kingsborough Community College
- CUNY Math Placement Exam
  1. 20 questions in Arithmetic
  2. 20 questions elementary algebra
- One Student Fails

Family College at Kingsborough Community College

- Why do I need mathematics now?
- Can I really do this?
- How do I do this?".
- This image of a mother, tearful, bitterly frustrated and disappointed over the lack of success on what was essentially an eight grade mathematics exam made evident for me that my future lay not only in solving interesting problems in mathematics but also in addressing questions of "mathematics and the community", i.e., questions related to the place and the role of mathematics in the culture.

The Mission

- Articulate a coherent emotional and intellectual response to this challenge
- facilitate meaningful access to mathematics of the highest quality to the “disadvantaged” and in particular
- Shape this endeavor within the contours of the African American an other underrepresented community

The Graduate Center

- First Two years
- Black Student Alliance
- Comprehensive Exams
- Oral Exams
- Harish Chandra Research Institute
- Dissertation
  - Stefan Lemurell
  - Mount Holyoke College
  - Boston University

Mount Holyoke College

- Five College Fellowship, Donal Oshea
- Pioneer Valley Number Theory Seminar
  - John Voight
  - David Cox
- Aframath 2008
  - Kenneth Elmore
  - Roscoe Giles
  - Don King
  - Donald St. Mary
  - Floyd Williams
  - William Massey
- CAARMS 2008

Boston University

- Aframath Conference
- Boston University math department:
  - Emma Previato:
  - Steven Rosenberg
  - David Fried
  - David Rohrlich
  - Tom Gilmore

Medgar Evers College, CUNY

- Established in 1969.
- Medgar Wiley Evers (1925-1963)
- Central Brooklyn community.
- Senior college–City University of New York System.
- Center-development-Community-based solutions to the challenges of urban education in New York City.

Medgar Evers College, CUNY

Female, African American, Full-time Employed

- 93.9 % African American
- 75.3 % Women
- Average age: 28.6 years (range 16-50)
- 62.5 % Employed full-time
- 20.1 % Remediation: Reading, Writng and Mathematics,
- 63.6% Math, 50.7% Writing, 29.6% Reading
- 1441 in Math courses, 181 (12.6%) take Calculus or higher

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[1] http://www.mec.cuny.edu/institutional$_r$esearch/pdf/2010$_2$011$_M$EC$_S$napShot.pdf

Medgar Evers College, CUNY

Thirty One Students over Twelve Years

- 2003 (2)
- 2004 (4)
- 2005 (3)
- 2006 (3)
- 2007 (9)
- 2008 (2)
- 2009 (1)
- 2010 (6)
- 2011 (1)

Medgar Evers College, CUNY

(i) mentor-ship programs that are research driven;

(ii) mentor-ship programs that are characterized by service to community;

(iii) emphasis on creating and sustaining of communities of minority/African American scholars; and

(iv) the effective integration of available technological tools as a means of enhancing overall instructional effectiveness.

Challenges

- 20.1 % Remediation: Reading, Writng and Mathematics,
- 63.6% Math, 50.7% Writing, 29.6% Reading
- Little expression of confidence in our mathematical abilities.
- Low visibility of role models in mathematics.
- No sense of belonging in science and mathematics.
- Lack of nurturing environments and supportive communities.
- Financial needs

What works?

- Preparing youth to study mathematics
- Focus on transitions
  - Developmental to Credit Bearing Courses
  - From the Calculus Sequence To Upper level courses

Recruitment of majors by faculty and students

“Community building”

- Tutorial
- Math Club
- Conference Visit
- Conversation Series
- Colloquium
- GRE Prep

Advising and mentoring by faculty

Scholarship programs

Participation in REUs and conferences

Supporting women

Challenges

- Faculty
- Departmental
- School of Science
- College
- Community

Opportunities

- Faculty
- Department
  - A cohesive vision for the department that fulfills its aspirations in education and research
  - Substantial grants that affords the department the means to build a program that the entire faculty can rally around that connects students to meaningful opportunities in STEM related areas
- School of Science
- College
- Community

Contributions of Historically Black Colleges and Universities (HBCUs) to the Making of Scientists

- HBCUs enroll 10% of all African-American students.
- HBCUs produced, at the baccalaureate level, one-third (31.4%) of the African Americans who earned doctoral degrees in science and engineering during 2004-08.
- HBCUs produced, at the baccalaureate level, one-third (32.1%) of the African Americans who earned doctoral degrees in mathematics during 2004-08.
- Eleven (11) HBCUs appear among the top 15 producers of African American scientist and engineers during 1997-2006.

Closing Thoughts

- What can I do to create a mathematical community of the future which is more representative of those who are now underrepresented in it?
  - K-12 Initiatives
  - Undergraduate
  - Graduate
  - Post Graduate
- What can we do together to create future mathematical scientists among those now underrepresented in the mathematics community?
  - Faculty–Faculty Collaboration
  - Departmental Initiatives
  - School/Institutionally Based Collaborations
- Thank You. This presentation has benefited immensely from a close reading of the references which follow. I recommend them strongly to the listeners/readers

References

- HYMAN BASS,*MATHEMATICS, MATHEMATICIANS, AND MATHEMATICS EDUCATION*, BULLETIN (New Series) OF THE AMERICAN MATHEMATICAL SOCIETY Volume 42, Number 4, Pages 417–430
- HYMAN BASS, *The Carnegie Initiative on the Doctorate: The Case of Mathematics*, Notices of The American Mathematical Society, Aug 2003
- SYLVIA BOZEMAN, *Cox-Talbot Address of the National Association of Mathematicians*, Joint Mathematics Meeting 2012
- ALLYN JACKSON, *NCSU Math Department Wins AMS Award*, Notices of The American Mathematical Society, Aug 2003
- WILLIAM A. MASSEY, *Mathematics is four dimensional*, Council for African American Researchers in the Mathematical Sciences: Volume III, eds., Alfred G. Noel, Earl Barnes and Sonya A. F. Stephens