

FREEMAN A. HRABOWSKI, III
President
University of Maryland, Baltimore County (UMBC)

Nominated

by

Elizabeth M. Morgan, Ph.D.
Superintendent
Washington County Public Schools
(Maryland)

for the

2011 Brock International Prize in Education

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BIOGRAPHICAL STATEMENT

Freeman A. Hrabowski, III

Biographical Statement



High-resolution color photo High-resolution B&W photo

Freeman A. Hrabowski, III, has served as President of UMBC (The University of Maryland, Baltimore County) since May, 1992. His research and publications focus on science and math education, with special emphasis on minority participation and performance. He currently chairs the National Academies' Committee on Underrepresented Groups and the Science & Engineering Workforce Pipeline.

In 2008, he was named one of *America's Best Leaders* by *U.S. News & World Report*, which in 2009 ranked UMBC the nation's #1 "Up and Coming" university and #4 (tied with Stanford) for commitment to undergraduate teaching. In 2009, *Time* magazine named him one of

America's 10 Best College Presidents.

He serves as a consultant to the National Science Foundation, National Institutes of Health, and universities and school systems nationally; sits on several foundation and corporate boards, e.g., Alfred P. Sloan Foundation, Marguerite Casey Foundation (Chair), The Urban Institute (and previously the Carnegie Foundation for the Advancement of Teaching); and holds numerous honorary degrees, most recently from Princeton, Duke, Haverford College, the University of Michigan, and Georgetown University

Other recent honors include election to the American Academy of Arts & Sciences and the American Philosophical Society; receiving the *McGraw Prize in Education* and the U.S. *Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring*; being named a Fellow of the American Association for the Advancement of Science and *Marylander of the Year* by the editors of the *Baltimore Sun*; and being listed among *Fast Company* magazine's first *Fast 50 Champions of Innovation* in business and technology.

With philanthropist Robert Meyerhoff, he co-founded the Meyerhoff Scholars Program in 1988. The program is open to all high-achieving students committed to pursuing advanced degrees and research careers in science and engineering, and advancing minorities in these fields. The program has become a national model, and based on program outcomes, he has authored numerous articles and co-authored two books, *Beating the Odds* and *Overcoming the Odds* (Oxford University Press), focusing on parenting and high-achieving African American males and females in science. Both books are used by universities, school systems, and community groups around the country.

A child-leader in the Civil Rights Movement, Dr. Hrabowski was prominently featured in Spike Lee's 1997 documentary, *Four Little Girls*, on the racially motivated bombing in 1963 of Birmingham's Sixteenth Street Baptist Church.

Born in 1950 in Birmingham, Alabama, Dr. Hrabowski graduated at 19 from Hampton Institute with highest honors in mathematics. At the University of Illinois at Urbana-Champaign, he received his M.A. (mathematics) and four years later his Ph.D. (higher education administration/statistics) at age 24.

CURRICULUM VITAE



Elizabeth M. Morgan, Ph.D.
AASA 2010 National Superintendent of the Year

May 3, 2010

Dr. Trent E. Gabert
Chair, Executive Committee
Brock International Prize in Education
Associate Dean, College of Liberal Studies
The University of Oklahoma
1610 Asp Avenue, Suite 108
Norman, Oklahoma 73072-6405

Dear Dr. Gabert:

"The most important thing we do in this life is educate our children. The purpose of the Brock Prize is to identify the best ideas on education in the world and to expose them to our educators, teachers, administrators and politicians."

John A. Brock

"The Brock International Prize in Education recognizes an individual who has made a specific innovation or contribution to the science and art of education, resulting in a significant impact on the practice or understanding of the field of education. This innovation or contribution must have the potential to provide long-term benefit to all humanity through change and improvement in education at any level..."

2011 Brock Prize Program Announcement

Freeman Hrabowski, the son of African American school teachers who for decades taught in the segregated schools of Birmingham, Alabama, has dedicated his life – professionally and personally – to educating American children from all backgrounds. For his creativity and innovative ideas, effective efforts, and inspirational leadership – particularly in educating increasing numbers of underrepresented minority students in science by creating a culture of “inclusive excellence” that has become a national model – I enthusiastically nominate him for the *2011 Brock International Prize in Education*.

Dr. Hrabowski has served as President of the University of Maryland, Baltimore County (UMBC) since 1992. To appreciate fully the impact of his contributions to the education of all children, it is important to “begin at the beginning,” by taking into account his experiences as a child leader during the Civil Rights Movement in his hometown of Birmingham – including participating in a children’s march, being arrested, and spending five days in jail for civil disobedience. Decades later, he chronicled those experiences in *“Reflections on Birmingham: The Role of Youth in the Civil Rights Movement”* (1996).

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The following passages from that piece shed light on the genesis of his extraordinary leadership skills and passionate commitment to education for all students.

"We learned that America, at its best, cares deeply about its children, and that children touch the conscience of adults. The nation's conscience was stirred, and people of all colors came to see this struggle not simply as a racial conflict, but, even more important, as a question of American justice."

"For many of the children involved in the Civil Rights Movement, academic work took on an added dimension. From our exposure to local leaders, like Reverend Fred Shuttlesworth, and national leaders, like Dr. King and Reverend Young, we learned that these leaders were knowledgeable, and that knowledge was power! They had the ability to think clearly, speak eloquently, and act confidently. In so doing, they reinforced what our families and teachers had been telling us all our lives – that education makes the difference between success and failure. In the process, many of us became more committed than ever to becoming the best."

It was this upbringing that led Dr. Hrabowski to commit his career to creating a culture change in American society, focused on the idea that underrepresented groups, particularly African American and Hispanic children, must be encouraged to excel, and that educators should have high expectations for minority children, and subsequently for college students as well, and that educators must provide support in order to ensure their success. This is how I came to know Dr. Hrabowski, when as Chief Academic Officer for the Baltimore City School System in the late 1990s, during a major "turnaround" effort, the City's students became the beneficiaries of programs he developed to encourage black males in the sciences.

Some years later, his work clearly is having a major impact on American higher education, preK-12, and society, in general, as he serves as a thought-leader, university president, researcher, author, national speaker, foundation board member, consultant, and mentor.

I also came to learn that for 35 years, Dr. Hrabowski's research and publications have focused on science and math education, with special emphasis on minority participation and performance. He co-authored *Beating the Odds* and *Overcoming the Odds* (Oxford University Press, 1998 and 2002), focusing on parenting and high-achieving African American males and females in science. Both books are used by universities, school systems, and community groups nationwide. Moreover, he has authored numerous articles and chapters on creative and innovative best practices in education, including leadership strategies to effect change. (Regarding his published research, see both his curriculum vitae and publication samples, attached).

Dr. Hrabowski's ideas about creating an institutional culture of inclusive excellence are rooted in lessons learned over the past 22 years during the development of the Meyerhoff Scholars Program. The program, co-founded by Dr. Hrabowski in 1988 with philanthropist Robert Meyerhoff, is open to all high-achieving students committed to pursuing advanced degrees and research careers in science and engineering, and to advancing minorities in these fields. (UMBC is a predominantly white institution). The program has received major support from the Meyerhoff Foundation and a variety of national agencies, companies, and foundations. Its distinctive components include scholarship support, strong faculty involvement,

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study groups, research experiences, structured mentoring, programmatic values, personal advising and counseling, service to others, family support, and a strong program-evaluation component.

To date, the program has enrolled approximately 825 high-achieving students (most of whom have been minority students), including 225 currently enrolled in the program and 600 who have graduated, including nearly 200 who've completed Ph.D.s, M.D./Ph.D.s, and M.D.s (from such institutions as Harvard, Stanford, Duke, MIT, Berkeley, Yale, Johns Hopkins, and Carnegie Mellon), 100 with master's degrees (chiefly in engineering), and 250 who are still pursuing graduate and professional degrees. The program has become a national model and is being replicated at several institutions, from the University of Michigan, Cornell, and Bates to Louisiana State University and Morehouse College. In the words of William Bowen, in his recent book, *Crossing the Finish Line*, the program "is perhaps the most ambitious and best-known effort to enhance the success of minority students...in earning degrees in science and engineering...[and] has clearly achieved its objectives."

What is truly novel about the UMBC approach is that many of the lessons Dr. Hrabowski and his colleagues have learned from the Meyerhoff Scholars Program are applicable to all students. Endowed special scholars programs were launched for students – including the *Linehan Artists Scholars*, *Dresher Humanities Scholars*, *Sondheim Public Affairs Scholars*, and *Sherman Scholars* (teacher education) – who have benefited from the replication of key Meyerhoff Program components, including building community among students, close student-faculty interaction, student engagement in research activities and internships, and student engagement in service in the larger community.

At no time has Freeman Hrabowski's expertise – building on lessons learned from the Meyerhoff Program – been of greater value to the nation, as America navigates its way in an increasingly competitive global economy, and also as America is on the verge of becoming a "minority-majority" nation. Increasingly, lessons learned from his trailblazing work involving "Inclusive Excellence" are being applied beyond his campus. For the past two years, he has chaired the National Academies' Committee on Underrepresented Groups and the Science & Engineering Workforce Pipeline, and the Committee's report (to be published later this year) will reflect many of these lessons. Moreover, as a current member of the boards of the Alfred P. Sloan Foundation and the Urban Institute, he has opportunities to study and influence educational policy in America; and as chair of the Marguerite Casey Foundation board, he influences decisions on providing direct grant support to organizations throughout the country focused on improving the lives of low-income and working families, and often these decisions involve meeting serious educational needs. He frequently speaks to national and regional groups on best practices related to science and math education, the achievement gap, college access, and leadership. He also works with state school boards associations, public school systems, and four-year colleges, universities, and community colleges (and has traveled to roughly 40 states over the past decade for this purpose).

Dr. Hrabowski's expertise and strong leadership in this area have been central to UMBC's receiving several major grants (for which he serves as the Principal Investigator) involving partnerships with K-12 systems. One such grant is UMBC's long-term, multi-million-dollar, NSF-supported Math-Science Partnership with the Baltimore County Public Schools, one of the nation's largest school systems, to recruit and train new STEM teachers, strengthen performance of current STEM instructors, and create pathways to success for K-12 students. UMBC also connects with area school children through a variety of nationally sponsored, hands-on STEM education programs – from Project Lead the Way, for young

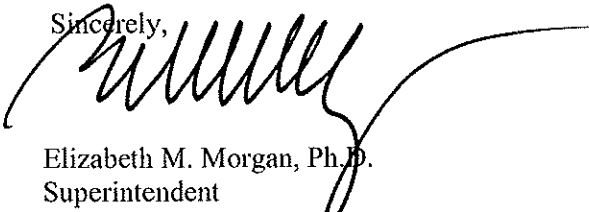
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aspiring engineers, to the FIRST (For Inspiration and Recognition of Science & Technology) LEGO competition.

Not surprisingly, Dr. Hrabowski's campus has attracted considerable attention largely as the result of the Meyerhoff Program's success and creation of an institutional culture of inclusive excellence. Each year, the campus hosts scores of visits from representatives of colleges and universities who are interested particularly in strengthening academic performance in science and engineering for both minorities, and students, in general. UMBC was recognized by the *New York Times* (May 26, 2006) for "rocking the house when it comes to the increasingly critical mission of turning American college students into scientists." *U.S. News & World Report* (December, 2008 and November, 2009), which named Dr. Hrabowski one of *America's Best Leaders* in 2008, tapped UMBC as one of America's top 5 "Up and Coming" national universities in 2008, and in 2009 ranked it the #1 "Up and Coming" school, #4 (tied with Stanford) among all colleges and universities for its "unusual commitment to undergraduate teaching," and one of America's top two dozen institutions for the quality of undergraduate students' creative and research experiences. Moreover, the *Princeton Review* (August, 2008) ranked UMBC's student body the 2nd "most diverse" in the nation, reflecting its diversity both internationally (students have enrolled from 150 countries in recent years) and domestically (students come from every state, and minorities account for more than a third of the enrollment). And in naming Dr. Hrabowski one of America's "10 Best College Presidents" this year, *Time* (November, 2009) credited him with the fact that "almost half of [all UMBC] seniors go immediately to grad school," and with UMBC's becoming "one of the nation's leading sources of African-American Ph.D.s in science and engineering." In fact, latest NSF data show that UMBC is the nation's leading predominantly white university in the number of African American bachelor's degree recipients who go on to complete Ph.D.s in science and engineering. It also is one of the nation's leaders in producing African American graduates who go on to earn M.D./Ph.D.s

Again, I am delighted to nominate Freeman A. Hrabowski for the *2011 Brock International Prize in Education*. His seminal ideas and exceptional leadership are transforming institutional cultures and creating climates of inclusiveness in which many more students, both minority and majority, are succeeding in science and other fields broadly. I truly can think of no one who is more deserving of the Prize!

Sincerely,



Elizabeth M. Morgan, Ph.D.
Superintendent
Washington County Public Schools

FREEMAN A. HRABOWSKI, III
CURRICULUM VITAE

CURRENT POSITION

President
University of Maryland, Baltimore County
1992-present

BOARD MEMBERSHIPS

Current

Alfred P. Sloan Foundation (2007 -)
The Urban Institute (2005 -)
Marguerite Casey Foundation (2002- Member; 2006- Chair)
Maryland Business Roundtable for Education (2000-)
McCormick & Company, Inc. (1997-)
Constellation Energy Group, Inc. (previously Baltimore Gas & Electric Company) (1994-)
The Robert G. & Anne M. Merrick Foundation, Inc. / The Jacob & Annita France Foundation, Inc. (1994-)
Baltimore Equitable Society (Founded 1794) (1992-)

Former

Leadership Enterprise for a Diverse America (2004-2009)
Mercantile Safe Deposit & Trust Company (1996-2007)
University of Maryland Medical System (1992-2006)
Baltimore Community Foundation (1991-2006)
Baltimore Museum of Art (2002-2006)
Corvis Corporation (2002-2006)
Carnegie Foundation for the Advancement of Teaching (2006-2009)
Carnegie Institution of Washington (2002-2005)
American Association of Colleges & Universities (2000-2004)
Education Commission of the States (1999-2003)
Center Stage (1996-2003)
Washington/Baltimore Regional 2012 Coalition (Olympic Regional Committee) (2000-02)
Casey Family Grants Program (2001-2002)
American Council on Education (1998-2001)
Malcolm Baldrige National Quality Award Board of Overseers (1998-2000)
Citizens Scholarship Foundation of America (1998-2000)
Joint Center for Political & Economic Studies (1994-2000)
UNC Inc. (1996-97)
Maryland Academy of Sciences (Maryland Science Center) (1994-97)
Loyola College of Maryland (1994-97)
Governor's Transition Policy Group on Education, Co-Chair (11/94-1/95)
Governor's Maryland Economic Growth Task Force (1994-95)
Greater Baltimore Committee (1993-98)
Citizens Bank of Maryland / Citizens Bancorp of Maryland (1993-96)
Governor's Information Technology Board (1993-95)
Leadership Maryland (1993-94, Participant in First Class)
Leadership Program of Baltimore County, Executive Board (1990-93)
Chancellor's Commission on Mathematics and Science Teaching, Chair
(University of Maryland System) (1990-92)
Partners for Giving, Executive Council, Co-Chair, Central Maryland Coalition for Philanthropy (1990-92)
Maryland Task Force on Mathematics, Science, and Technology, Chair
(Maryland State Department of Education) (1990-91)
Associated Catholic Charities, Baltimore, Maryland, Board of Directors (1989-95)
Maryland Humanities Council, Member (1987-92), Chair (1991-92)

- "Change Institutional Culture, and You Change Who Goes into Science," with K.I. Maton, in *Academe*, American Association of University Professors, May-June, 2009, p.11.
- "Reflections on America's Achievement Gap: A Fifty-Year Perspective," in *Remembering Brown at Fifty: The University of Illinois Commemorates Brown v. Board of Education*, edited by O.V. Burton & D. O'Brien, University of Illinois Press, Champaign, Ill., 2009, pp. 358-372.
- "Enhancing Representation, Retention and Achievement of Minority Students in Higher Education: A Social Transformation Theory of Change," with K.I. Maton, M. Ozdemir, H. Wimms, in *Toward Positive Youth Development: Transforming Schools and Community Programs*, edited by M. Shinn & H. Yoshikawa, Oxford University Press, New York, 2008. *
- "Opening an African American STEM Program to Talented Students of All Races: Evaluation of the Meyerhoff Scholars Program, 1991-2005," with K.I. Maton, Ozdemir, M., in *Charting the Future of College Affirmative Action: Legal Victories, Continuing Attacks, and New Research*, edited by G. Orfield, P. Marin, S.M. Flores & L.M. Garces, pp. 125-156, The Civil Rights Project at UCLA, Los Angeles, 2007. *
- "The Access Imperative," *The Presidency*, American Council on Education, Spring, 2007, pp.12-18.
- "Leadership: A President's Perspective on EDUCAUSE's 'Grand Challenges,'" *EDUCAUSE Review*, July/August, 2007, pp. 6-7.
- "Moral Leadership: Promoting High Achievement Among Minority Students in Science," in *University Presidents As Moral Leaders*, edited by David G. Brown, Praeger Press, 2006, pp. 135-142.
- "Pump Your Patrons," with Larry Wilt, *American Libraries*, April, 2006, pp. 70-73.
- "Preparing Minority Scientists and Engineers," with Michael F. Summers, *Science*, Vol 311, March 31, 2006, pp. 1870-1871. *
- "Presidential Leadership in the Academy: Promoting High Achievement Among Minority Students," in *The Black Professional's Guide to Career Success*, edited by Vernon Farmer, Greenwood Publishing Group, Westport, Connecticut (in press).
- "Fostering First-Year Success of Underrepresented Minorities," in *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College*, edited by John Gardner, M. Lee Upcraft, Betsy Barefoot, Jossey-Bass, John Wiley & Sons, Inc., San Francisco, 2005.
- "University Outreach and Engagement: Responding to a Changing World," in *Journal of Higher Education Outreach and Engagement*, Volume 10, Number 1, Fall 2004, pp. 15-28.
- "Increasing the Number of African American Ph.D.s in the Sciences and Engineering: A Strengths-Based Approach," with Kenneth Maton, *American Psychologist*, 547-556, American Psychological Association, September, 2004. *
- "Leadership for a New Age: Higher Education's Role in Producing Minority Leaders," *Liberal Education*, Vol. 90, No.2, Association of American Colleges and Universities, Spring, 2004.
- "Closing the Achievement Gap in Science and Mathematics," *Educational Leadership*, December/January, 2003.
- "Achieving Academic Success in Graduate School," in Vernon L. Farmer (Ed.), *The Black*

"Coppin State Improves the Odds for Urban Youth," *Educational Record*, Fall 1987-Winter 1988. *

"Competency Testing in Undergraduate Education with Implications for Minorities," *The Urban Educator*, Fall 1986.

"Graduate School Success of Black Students from Black and White Colleges," with E.F. Anderson, *Journal of Higher Education*, LVII, No. 3, 1977.

* refereed

GRANTS

| | |
|----------------|--|
| 1988 - Present | Robert & Jane Meyerhoff Foundation & numerous corporations & national agencies for the Meyerhoff Scholars Program |
| 1992-96 | National Science Foundation "Enhancing the Success of Minorities in Science and Engineering: Outcome and Process Evaluation of the Meyerhoff Program" Co-PI with Kenneth I. Maton |
| 1994-96 | Alfred P. Sloan Foundation Evaluation of Meyerhoff Program for Talented African Americans in Science and Engineering |
| 1996-2010 | National Science Foundation, Alliance for Minority Participation (AMP), P.I. |
| 1996-2005 | Department of Health & Human Services/Public Health Service/National Institutes of Health/National Institute of Environmental Health Sciences, AMP, P.I. |
| 1999-01 | National Science Foundation "Longitudinal Studies of the Meyerhoff Scholars Program" Co-P.I. with Kenneth I. Maton |
| 2003-09 | National Science Foundation ADVANCE Institutional Transformation, P.I. |

HONORS AND AWARDS

| | |
|------|--|
| 2010 | Maryland's "First Citizen" Award |
| 2010 | Frank W. Hale, Jr., Diversity Leadership Award, National Association of Diversity Officers in Higher Education |
| 2010 | Candle in Education Award, Morehouse College |
| 2009 | <i>Time</i> – named one of America's 10 Best College Presidents |
| 2009 | Honorary Doctor of Humane Letters, Georgetown University |
| 2009 | Memorial Sloan-Kettering Medal for Outstanding Contributions to Biomedical Research |
| 2009 | Honorary Doctor of Laws, University of Michigan |
| 2009 | Virginia B. Smith Innovative Leadership Award, National Center for Public Policy & Higher Education and Council for Adult & Experiential Learning |
| 2009 | Honorary Doctor of Letters, Daniel Webster College |
| 2009 | Reginald Wilson Diversity Leadership Award, American Council on Education |
| 2008 | Honorary Doctor of Sciences, North Carolina State University |
| 2008 | Named one of <i>America's Best Leaders</i> , <i>U.S. News & World Report</i> & the Center for Public Leadership, Harvard University Kennedy School of Government |
| 2008 | Frederick Douglass Award, University System of Maryland |
| 2007 | Achievement in Higher Education Award, Washington Center for Internships & Academic Seminars |
| 2007 | Honorary Doctorate, Haverford College |
| 2007 | Honorary Doctor of Letters, Wheaton College |
| 2006 | Honorary Doctor of Laws, Princeton University |
| 2006 | Honorary Doctor of Laws, Goucher College |
| 2006 | Honorary Doctor of Humane Letters, Pace University |
| 2006 | <i>Teachers College Medal for Distinguished Service to Education</i> , Teachers College-Columbia University |
| 2006 | Board of Judges, Harold W. McGraw, Jr., Prize in Education |

OTHER PROFESSIONAL EXPERIENCE**University of Maryland, Baltimore County**

1990-92 Executive Vice President
 1987-90 Vice Provost

Coppin State College**Baltimore, Maryland**

1981-87 Vice President for Academic Affairs
 1977-81 Dean of Arts & Sciences
 1977-87 Professor of Mathematics

Alabama A&M University**Normal, Alabama**

1976-77 Associate Dean of Graduate Studies &
 Associate Professor of Statistics and Research

University of Illinois**Urbana-Champaign, Illinois**

1975-76 Visiting Assistant Professor
 Department of Educational Psychology
 1974-76 Assistant Dean of Student Services
 Educational Opportunities Program
 Director of Project Upward Bound

EDUCATION

| | | | |
|-------|------|--|---|
| Ph.D. | 1975 | University of Illinois, Urbana-Champaign | Higher Education Administration (Educational Statistics) |
| M.A. | 1971 | University of Illinois, Urbana-Champaign | Mathematics |
| B.A. | 1970 | Hampton Institute | Mathematics (High Honors) |
| | | American University (Cairo, Egypt) | |
| | | Foreign Exchange Student, 1968-69 | |

PERSONAL

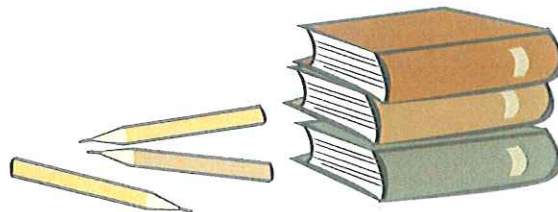
Date of Birth: August 13, 1950
 Place of Birth: Birmingham, Alabama
 Marital Status: Married to the former Jacqueline Coleman
 Children: 1 Son, Eric

PUBLICATION SAMPLES

DIVERSITY

Preparing Minority Scientists and Engineers

Michael F. Summers^{1*} and Freeman A. Hrabowski III²



An undergraduate program involving mentorship, summer and other workshops, and targeting high-achieving high school students improves participation of underrepresented minorities in science.

As international participation in advanced science and engineering (S&E) increases, and as national populations become more diverse (1–3) it becomes even more important to provide quality science education to all children, including those from racially diverse groups (2, 3).

Enhanced online at
www.sciencemag.org/cgi/content/full/311/5768/1870

Despite several decades of federally supported programs, Americans from these groups continue to be underrepresented among Ph.D. recipients and in the S&E workforce (4–6).

Contrary to popular belief (7), many well-prepared underrepresented minority students (URMs)—including men and women of Latino, Native-American, Pacific Island, and African-American descent—are interested in pursuing scientific or engineering careers. In 2005, the same percentage (44%) of African-American and Caucasian college-bound high school students indicated their intent to major in S&E fields (8). Many students with strong SAT scores, impressive grades, and success in high school honors math and science courses leave the college science pipeline, but the loss is disproportionately among women and minorities (9, 10). Thus, factors other than school preparation, science aptitude, and interest must be responsible for the low achievement and low persistence in these subgroups of undergraduate and graduate S&E students. Identifying these negative factors and retaining well-educated students with S&E interests would improve the United States' ability to compete in today's global scientific community.

Factors that keep URMs from persisting with science include academic and cultural isolation, motivation and performance vulnerability in the face of low expectations, peers who are not supportive of academic success, and discrimination, whether perceived or actual (10–15). These factors can have a stronger

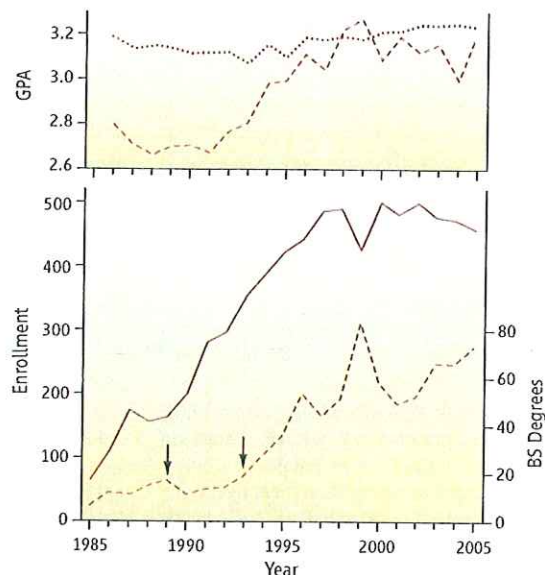
effect at institutions with predominantly majority populations. Such institutions award about 75% of all bachelor's degrees earned by African Americans (16). To address these particular factors, we developed the Meyerhoff Scholars Program in 1989 at the University of Maryland, Baltimore County (UMBC). At that time, the university was graduating fewer than 18 African-American S&E majors per year (see graph below). Typically, fewer than five of these students graduated with a grade point average above 3.0 (on a 1 to 4 scale), consistent with achievement levels observed at other institutions (17, 18).

The Meyerhoff Scholars Program (named after its founders, Baltimore philanthropists Robert and Jane Meyerhoff) focuses on producing bachelor's degree recipients, particularly African Americans, who go on to doctoral programs in science and engineering. Since 2000, an average of 1900 candidates have been nominated each year by high school teachers and counselors. Of those nominated, the 80% who are from Maryland (~1500) represent about 2% of graduating high school students in Maryland. We typically invite about 180 students and their parents to UMBC for interviews, and offer 4-year scholarships to about 100 of them. About half accept. Most students who decline the Meyerhoff program accept other scholarships at UMBC or other institutions. Transfer students, typically not more than two per year, can join the program later.

The program has supported 768 students, 260 of whom are currently undergraduates. Most of the Meyerhoff graduates (435 of 508 students, 86%) earned science or engineering bachelor's degrees (students in good academic standing who leave S&E fields before graduation become supported by other UMBC scholarship programs). Most of the S&E graduates (379 students, 87%) went on to graduate or profes-

sional programs (41% to Ph.D. or M.D.-Ph.D., 22% to master's, 24% to medical or other professional programs, and 13% employed). Meyerhoff students with completed advanced degrees now number 44 with Ph.D.'s or M.D.-Ph.D.'s (most earned in the past 2 years), 72 with master's degrees, and 32 with medical degrees.

The effectiveness of the Meyerhoff program is highlighted by comparing students who entered the Meyerhoff program with those who were invited but declined and attended other institutions (9, 19, 20). Both groups earned similar grades and graduated at similar rates. But students who entered the Meyerhoff program were twice as likely to earn a science or engineering bachelor's degree (9) and 5.3 times more likely to enroll in post-college graduate study (19, 20). In addition, Meyerhoff students were about twice as likely to earn S&E B.S. degrees as Asian, Caucasian, and non-Meyerhoff African-American students with similar preparation and interests (9).



Effect of the Meyerhoff program on undergraduate studies. (Top) Average grades of Caucasian (dotted line) and African-American (dashed line) students at graduation in S&E fields (biology, biochemistry, chemistry, computer science, engineering, mathematics, and physics). (Bottom) African-American enrollment (solid line) and graduations (dashed line) at UMBC for S&E undergraduates. The Meyerhoff undergraduate program was initiated in 1989 and began graduating students in 1993 (arrows).

¹Howard Hughes Medical Institute (HHMI) and Department of Chemistry and Biochemistry, ²Office of the President, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250, USA.

*To whom correspondence should be addressed. E-mail: summers@hhmi.umbc.edu

Toward Positive Youth
Development: Transforming
Schools and Community Programs

Editors

Marybeth Shinn

Hirokazu Yoshikawa

OXFORD
UNIVERSITY PRESS

2008

(natural, teleological (planned), political, life cycle, social cognition, and cultural frameworks (for a further exploration of these change models, see Kezar & Eckel, 2002). To date, within higher education, research and campus change efforts have focused primarily on the natural and planned models for exploring naturally occurring or strategic change initiatives, respectively (Kezar & Eckel, 2002). Even while models of planned change have been critiqued for failing to describe the interrelationships among change strategies and for viewing change as a linear process, others have praised the planned change framework for its usability (Rajagopalan & Spreitzer, 1996). Key strategies of planned change include strategic planning, assessment, incentives and rewards, stakeholder analysis and engagements, restructuring, and reengineering (Kezar & Eckel, 2002). Development of goals, implementation and evaluation of strategies, and modification based on evaluation and lessons learned are also important components of the planned change process (Kezar & Eckel, 2002).

A subset of theorists have made the case for the necessity of transformative change efforts if enduring progress is to be made in empowering marginalized populations in our society (Hurtado, Dey, Gurin, & Gurin, 2003; Milern & Hakuta, 2000). Maton (2000), for example, has argued that deeply embedded features of social environments influence critical risk and protective processes, nullify person-focused programs, make it difficult to sustain and disseminate promising approaches, and prevent the large-scale mobilization of resources necessary for making a substantial difference. Williams, Berger, and McClendon (2005) argue that a series of transformations is required in organizational culture and behavior if campus diversity initiatives are to make a difference; otherwise, possible benefits of such initiatives may fade very easily. Ibarra (2001) makes the case that only a fundamental change in the culture of higher education related to diversity will result in substantive advances for minority students.

We propose a theory of change that is based in part upon a highly successful diversity initiative at the University of Maryland, Baltimore County (UMBC). In the late 1980s, UMBC, a medium-sized research university, was troubled by yearly student sit-ins by African American students, who, along with African American faculty members, perceived the campus as "cold" toward minorities and "racist." African American students in difficult science majors routinely performed very poorly (e.g., prior to the initiation of the diversity initiative no African American student had received above a "C" in a core biology or chemistry course). Change efforts were initiated in the late 1980s to address the negative racial climate. These efforts were spearheaded by Freeman Hrabowski, who began working at UMBC in spring 1987 as vice-provost and since 1992 has been the university president. As part of his efforts to enhance and transform the campus, Dr. Hrabowski initiated data-based reviews of minority student achievement (pinpointing the special low

performance in science), ongoing dialogue within the campus community on issues related to race, a strengths-based rather than deficits-based view of minority students, and efforts to enhance the quality of minority (and non-minority) students admitted to the campus and the numbers of minority (and female) faculty. Of particular note, in 1988, the Meyerhoff Scholars Program was founded—a multifaceted support program to enhance the achievement of African American students in the sciences.

The Meyerhoff Program has achieved dramatic success. Science GPAs have dramatically turned around: the African American Meyerhoff students now achieve science GPAs comparable to those of their Caucasian and Asian peers. As a result of their high achievement levels, and related factors (e.g., research experience), close to 50% of entering African American Meyerhoff students now attend Ph.D. Programs in the sciences, a level substantially higher than equally talented comparison samples (Maton, Hrabowski, & Schmitt, 2000). The university has become a major contributor of black undergraduates to science and engineering Ph.D. programs (Maton & Hrabowski, 2004), and the Meyerhoff Program is widely viewed as a national model (cf. BEST, 2004; Staples, 2006).

The success of the Meyerhoff Program and the larger diversity initiative within which it was embedded can be perceived in campus-wide data as well. Whereas there were only 11 African American graduates in natural science, technology, engineering, or mathematics (STEM) majors in 1990, 15 years later, in 2005, there were 73, an increase of 564% (32 of the graduates were Meyerhoff students). In contrast, during this same period, the number of European American STEM graduates only increased 18% (223-262). Whereas 11.1% of graduating African American students in 1990 were in STEM majors, 33.6% were so in 2005; during this same period, the increase among European American students was more modest, from 22.4% to 30.0%. In addition, there was a marked increase in GPAs from 2.7 to 3.2 among African American STEM graduates from 1990 to 2005; in contrast, the GPAs among European American STEM graduates increased only modestly, from 3.1 to 3.2, during this period. The dramatic improvement in the overall campus climate for diversity is reflected in the fact that in 2002 UMBC was named by Kaplan/Newsweek as a "hot campus" in the diversity arena.

The Meyerhoff Scholars Program

The Meyerhoff Scholars Program was developed in 1988 at UMBC, as a response to low levels of academic performance among well-qualified African American STEM majors. Baltimore philanthropists Robert and Jane Meyerhoff provided the program's initial funding. The program developers, led by UMBC's then vice-provost (and since 1992 UMBC's president), endeavored to create a

comprehensive, multicomponent program that addressed the factors research suggested were associated with minority student success in difficult science majors. These factors include knowledge and skill development, academic and social integration, support and motivation, and advising and monitoring (Maton et al., 2000).

In 1996, the program was opened to non-African American students (with an interest in the advancement of minorities in STEM fields). Currently, between 50 and 65 Meyerhoff students are selected each year (depending upon funding availability); the majority are African American. The program is situated on a campus with a diverse student population (34% minority), with more than half of the undergraduates and 60% of the doctoral students pursuing STEM degrees.

The program incorporates 16 components briefly described below (cf. Maton & Hrabowski, 2004; for a more detailed description, see Gordon & Bridgell, 2004, 2005).

Financial Aid

The Meyerhoff Program provides students with a comprehensive academic funding package that generally includes tuition, books, and room and board. This support is contingent upon maintaining a B average in a STEM major.

Recruitment

The top 100-150 candidates and their families attend one of the two recruitment weekends on the campus.

Summer Bridge Program

Meyerhoff students attend a mandatory prefreshman orientation program that includes taking math, science, and Africana Studies courses. They also participate in STEM-related cocurricular activities and attend social and cultural events.

Study Groups

The program staff strongly and consistently encourage group study, as study groups are viewed as an important aspect of success in STEM majors.

Program Values

Program values include support for academic achievement, acquiring help from a variety of sources, peer support, high academic goals (with an

emphasis on Ph.D. attainment and research careers), and giving back to the community.

Program Community

The Meyerhoff Program presents students with a family-like social and academic support system. All Meyerhoff freshmen live in the same residence hall and are required to live on campus during subsequent years.

Personal Advising and Counseling

Full-time advisors monitor and support Meyerhoff students on a regular basis. These staff members focus not only on academic performance and planning but also on any personal issues that students face.

Tutoring

The Meyerhoff Program staff strongly encourages students to tutor others and/or be tutored to maximize academic achievement (i.e., to get As in difficult courses).

Summer Research Internships

Each student participates in summer research internships at leading sites around the country as well as some international locations.

Research Experience During the Academic Year

A number of students also participate in a program that requires involvement in a faculty member's research lab during the student's junior and senior years.

Faculty Involvement

STEM department chairs and key faculty are involved in the recruitment and selection processes of the program. A number of faculty also provide research opportunities for students in their laboratories.

Administrative Involvement

The university supports the Meyerhoff Program at all levels, including ardent support from the president.

through symbols, and recognizing how meaning is constructed at multiple levels. Each of these dimensions is reflected in the inclusive excellence change process that occurred at UMBC, as highlighted here (cf. Hrabowski, 1999).

In the late 1980s, the UMBC President's Council decided to undertake a major initiative focused on inclusive excellence. Science, engineering, and math department chairs; several interested faculty from these departments; and other administrators were brought together to develop a greater understanding of why students were not succeeding in the STEM disciplines—with the ultimate goal of improving their academic performance. When data on student performance were examined, it was revealed that the GPAs of black students were far below those of whites and Asians. Focus groups with students, faculty, and staff were held to develop further understanding of the problem, and based on what was learned, meetings were held with department chairs and faculty to develop strategies for giving more support to students. Solutions devised included encouraging group study, strengthening the tutorial centers, encouraging faculty to provide feedback to students earlier in the semester, raising admission standards, helping students understand how much time and effort are needed to succeed, and enhancing the freshman experience (e.g., improving orientation and communicating to freshmen what it takes to succeed). Within this broader context, a vision was generated to develop a more positive climate for students of color by creating a cadre of science and engineering African American students who would become leaders and role models for the country. Once foundation funding was obtained, the latter vision resulted in the creation of the Meyerhoff Scholars Program.

These initial aspects of the inclusive excellence change process at UMBC included various elements of change in the structural/bureaucratic, collegial, and symbolic dimensions of the organization. Most prominent within the bureaucratic/structural dimension, inclusive excellence was instituted as a campus priority. This key development was the linchpin for all that followed. Most prominent at the collegial level was building successful coalitions with key science department chairs and faculty. Without such coalitions, it is unlikely that institutional change would have followed. In terms of the symbolic dimension, most noteworthy was the highly visible effort to address a campus history of inequality. This enabled both the campus and the larger institutional environment (e.g., the University of Maryland system) to make sense of and rally behind the change process.

Over the years, the diversity initiative has been sustained, with additional steps taken to address equity, access, and campus climate. Of special note was the decision to select the founder of the Meyerhoff Program, an African American mathematician, to become president of UMBC (in 1992). Over the years he has been a visible, positive presence on the campus, relating effectively to all segments of the university community, and in so doing, directly contributing to a positive campus climate. Targeted university efforts to hire

minority faculty in the sciences and engineering and to recruit increased numbers of minority graduate students represent further aspects of the institutional change effort. Building on the success of the Meyerhoff Program, additional programs, all funded by large federal grants, were initiated and continue to this day. For example, at the undergraduate level the MARC U*STAR program, directed by the Biology Department chair, was developed, focused on research involvement of a select group of minority undergraduates in faculty laboratories. At the graduate level, the graduate Meyerhoff Scholars Program, directed by a Howard Hughes Medical Investigator, was initiated, providing financial and programmatic support to graduate students of color in the sciences. Additional federally funded programs include Louis Stokes Alliance for Minority Participation (LS-AMP; undergraduate, cross-campus program to support minorities in the sciences), Alliances for Graduate Education in the Professoriate (AGEP; provides workshops and seminars to support graduate students of color) and ADVANCE (program focused on advancing careers of women faculty in STEM disciplines).

These continuing aspects of the inclusive excellence change process at UMBC again encompass multiple dimensions of organizational behavior. Most prominent at the bureaucratic/structural level is the routinization of efforts to enhance minority student success, reflected in both the institutionalization of the Meyerhoff Program and the periodical addition of new, related programs focused on minority student achievement. Most prominent at the collegial dimension is inclusion of numerous parties in change efforts, reflected, for example, in the Chair of the Biology Department and the HHMI senior chemistry professor becoming key members of the inclusive excellence leadership on campus. Finally, at the symbolic level, especially noteworthy is the articulation of new values through the selection and ongoing presence of an African American university president.

Transformation in Organizational Culture

Organizational culture includes multiple levels or layers and transformation in organizational culture (organizational learning) requires change in the deeply shared values, assumptions, norms, and beliefs of a campus (Williams et al., 2005). In the 1980s, the UMBC campus culture included a devaluing of minority students, especially in science disciplines, and low expectations for their performance. Inclusive excellence was not a priority. The institutional change process noted in the earlier section, along with the success of The Meyerhoff Program, contributed directly and importantly to changes in the university culture (Hrabowski, 1999; Maton et al., 2000). Faculty attitudes toward African American students among science faculty underwent a dramatic transformation as African American Meyerhoff students achieved at the highest levels in the most difficult science courses and in many cases

environment, in the mid-1990s there was a growing anti-affirmative action climate in the country and an appellate court decision supporting a landmark lawsuit challenging the University of Maryland, College Park's Banneker Scholarship program, a program targeted exclusively to minority students. This led to the strategic decision to open the Meyerhoff Program to students of all races, as long as the applicant could demonstrate an interest in the advancement of racial/ethnic minorities in STEM fields. Within the campus, from the start there was resistance to the program among some faculty and students, criticizing the channeling of resources to minority students in science, rather than to all students in science and/or to all disciplines. Strategically, the university has responded by engaging in dialogue about the issue and ensuring that various university resources are directed to the larger goal of inclusive excellence. For example, university monies have been earmarked since 1996 to support scholarships for nonminority students in the Meyerhoff Program, and general efforts have been made to effect curricular changes that would benefit all students (e.g., revamping the introductory biology and chemistry courses using "active pedagogy," "discovery learning," and "inquiry based" elements to make them more accessible and engaging to all students). Within the Meyerhoff Program, students experience high levels of monitoring and challenge by program staff (along with high levels of support), both in public and private contexts, and for a subset of students this is viewed as overly intrusive and negative. Finally, the students also have to contend with attitudes from students not in the program that they are "elitist" and receive preferential treatment; for the African Americans students, this can present special challenges in terms of their relationships with both African American and non-African American students on campus.

Discussion

The proposed social transformation theory simultaneously encompasses a focus on programmatic means to enhance minority student achievement—the development of empowering settings—and the larger institutional change process that is necessary to support such program development and bring about necessary change in the larger institutional environment. The proposed theory is based upon and illustrated through a successful diversity initiative at UMBC, ongoing since the late 1980s. The social transformation theory combines empowering settings theory (Maton, 2008; Maton & Salem, 1995) with extant knowledge about transforming campuses to support inclusive excellence (Williams et al., 2005).

The proposed theory is consistent with related literature on social transformation. Kezar and Eckel (2002), for example, based on a review of the

literature and six case studies (none related to diversity) of institutional transformation in higher education, suggest an Institutional Transformation Process Model. The model delineates core and secondary strategies and overarching principles of comprehensive, enduring change within higher education. Many of these components match those proposed in earlier sections (e.g., senior administrative support, collaborative leadership, robust design of vision and mission, and staff development); other components, though not explicit, are implicit in the proposed theory (e.g., sense making, balance, momentum, and communication). Maton (2000) proposed a Social Transformation of Environments model that included four key processes: capacity building, group empowerment, relational community building, and culture challenge (Maton, 2000). Each focuses primarily on a particular dimension of the social environment—respectively, the instrumental, structural, relational, and cultural. These processes and dimensions are also each reflected, either explicitly or implicitly, in the proposed theory.

The consistency with extant literature notwithstanding, the proposed social transformation theory of change represents only a beginning effort to understand the conditions necessary to enhance diversity on college campuses. One limitation of the theory is that it is not sufficiently developed to specify the necessary and sufficient conditions for change and accompanying mechanisms. Instead, the theory focuses on articulation of programmatic, organizational, and strategic components that are plausibly linked to transformative change. A program of research is necessary to test directly the proposed theory of change beyond the single case study presented. Such additional research will help to generate an understanding of what initial conditions, contextual factors, and combination of strategic elements must be present if a transformational institutional change process is to be initiated and effectively sustained. For example, what roles do the size of the campus, the campus culture, student academic and social backgrounds, educational mission, and geographical locale play in facilitating the initiation of effective diversity initiatives? How high up, how skilled, and how widespread must senior leadership support be to make a difference? When do local problems in campus racial climate contribute to, and when do they impede, such efforts?

A major challenge facing theory development and theory refinement related to inclusive excellence is the reality that the relative importance of the strategies and processes linked to transformational change can be expected to vary depending on the unique characteristics, culture, and history of the college or university in which a diversity change process is initiated. Thus, an important primary goal of theory testing is to encompass ecological specificity so that the theory of transformational change includes tailoring to the local context. Additional challenges for theory development are the need to specify "bottom-up" as well as top-down transformational processes, to

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Chapter 8

The School Climate for Lesbian, Gay, Bisexual, and Transgender (LGBT) Students

STEPHEN T. RUSSELL AND JENIFER K. MCGUIRE

The school environment is one of the most important development contexts for children and adolescents, not only for the development of academic and occupational skills but also for the development of the personal and social skills that shape the first 20 years of life. In recent years, there has been growing attention to understanding and supporting positive school climate, the "values, cultures, safety practices, and organizational structures" that characterize a school and its daily life; school climate refers to the influence that the school and its culture have on students (McBrien & Brandt, 1997, p. 89). Safety at school is an obvious foundation of the school climate. Following a series of school shootings, significant attention to school safety in the United States has resulted in new federal, state, and local education laws and policies during the past decade. These policies, most clearly typified in the No Child Left Behind (NCLB) Act of 2001 (2002), focus on aggregated individual student achievement rather than on the climate of schools. Our goal is to demonstrate that a focus on school climate in addition to individual student behavior is crucial for understanding policy innovation as well as student well-being. We focus on the school experiences of lesbian, gay, bisexual, and transgender (LGBT) students, who are arguably among those who are least safe in contemporary schools (Human Rights Watch, 2001).

Like most contemporary school policy, research on school safety has typically focused on understanding individual-level factors that are associated with student well-being; this approach is limited. With emphasis at the individual level rather than at the institutional level (the structural level, including school climate), efforts to improve student experiences must necessarily focus on changing perceptions, behaviors, or experiences of individual students.

THE FUTURE OF HIGHER EDUCATION
Perspectives from America's Academic Leaders

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Expanding Access for America's Future

Freeman A. Hrabowski, III

We in education are in the business of transforming lives and preparing students for the future. Today, more than ever, students need as much education as possible, not only to find employment in the near-term, but, even more importantly, to prepare for a future full of change. Twenty years ago, we had little idea where we would be today as a nation—and as a planet—because of unprecedented changes involving demographic shifts, new technologies, and economic globalization. To give just one example, I often ask audiences how many had cell phones when they were in college. If it's an "over-40" crowd, almost no one raises a hand; but if I ask how many have cell phones today, whether the audience is made up of professionals or children, virtually everyone raises a hand. Given how profoundly life has changed over these past 20 years—often in unforeseen ways—it is difficult to know with certainty where America and the world will be 20 years from now. We do know, however, that one critical challenge will be the need to increase access to college for Americans.

Many of America's college graduates and current college students represent the first generation in their families to go to college. This phenomenon has been a major part of the evolution of America's middle class, cutting across population groups from all backgrounds. Throughout the 20th century, particularly since World War II (and especially following the Higher Education Act of 1965), many more Americans have had the chance to attend college and pursue the American dream in ways that their parents and grandparents could not without a college degree. In fact, according to the U.S. Census Bureau over the past 60 years, growing numbers of Americans from all backgrounds have earned college degrees. Between 1947 and 2005, the percentage of whites 25 years old and over with college degrees increased from six to 28 percent, and the percentage of African Americans the same age with college degrees rose from only three percent to 18 percent. Over the past three decades, the percentage of Hispanic Americans with college degrees increased from six to 12 percent, and more than 50 percent of Asian Americans 25 years old and over hold college degrees. Unfortunately, the educational attainment data on Native Americans have not been reported by the Census Bureau because the samples have been too small. While this progress is encouraging, the fact remains that slightly under 30 percent

Other studies on access (such as those by McPherson and Schapiro and by Bowen et al.) have also focused on inequities in American higher education and income. At the nation's most selective schools, for example, only three percent of the students are both first-generation college students and from families in the bottom income quartile, in contrast to 20 percent of college and university enrollments nationwide (Bowen et al. 176-77). It is particularly troubling that even high-achieving low-income students are much less likely to attend college than more privileged students. Among students with high test scores, nearly 20 percent from low-income families do not go directly to college compared to fewer than five percent of students from families in the top income quartile. Only in recent years have more institutions fully recognized this alarming disparity and begun to address it seriously (McPherson and Schapiro 5-6; Bowen et al. 177). Indeed, growing numbers of public and private institutions across the country will be developing strategies to increase the numbers of low-income students on their campuses. It is difficult, however, to determine how successful they will be because these campuses face financial challenges as they work to balance their interest in recruiting these students against their need to admit paying students. Institutions will be working at the Federal and state levels to develop responsive financial aid policies, and these agencies will be giving more attention to strategies designed to fund students' education and to provide more attention to institutions to develop targeted programs for them.

Initiatives designed to increase access must also include institutional strategies to ensure that admitted students actually succeed. We know that in recent decades, while more low-income students have entered college, many have not graduated from four-year programs. Over the next decades, institutions will grapple with the question of how to ensure that the admissions door is not a revolving door, as it so often has been called. Colleges and universities will develop more rigorous approaches to evaluating academic preparation, learning more about how to predict success, using not only such traditional methods as grades and test scores, but also other, more subjective factors, such as students' level of motivation, their passion for learning ("fire in the belly"), willingness to take advice, and ability to follow through. Institutions also will spend much more time building models for success that go beyond simply adding isolated courses or offering traditional developmental and basic-skills courses at the margin of the academic program. In each case, the key question will be what resources are required to ensure that intervention programs are effective, given the academic needs and strengths of students? Institutions also will need to look into the mirror to determine how—and to what extent they are willing—to change as they accept a broader range of students. Much more attention will be placed on documenting success and encouraging honest dialogue about challenges and failures. Institutions will focus on more collaboration with each other as they develop best practices to address student needs. In addition, institutions will connect basic-skills coursework to other teaching and learning on the campus, emphasizing more meaningful ways of involving regular faculty in this challenging work.

In working with school systems throughout the country, I have found that each is grappling with an achievement gap, particularly between white and minority children. The data are distressing. While the National Assessment of Educational Progress (NAEP) report showed gains by African American school children, for example, in the 1970s and early 1980s and a narrowing of the achievement gap, by the late 1980s that gap had ceased to narrow. Most alarming today, the achievement gap in the nation's high schools is a major problem, with African American and Hispanic 12th graders performing at the same level as white students in eighth grade (Thernstrom and Thernstrom 12-13). Equally disturbing, for every 100 9th graders, we know that only 67 will graduate from high school in four years, only 26 are still in college after two years, and only 18 will graduate from either a two-year college within three years or a four-year institution within six years, and the numbers are most alarming for children of color (Kazis et al.) In the years to come, public policy officials—for example, at NSF and the U.S. Department of Education—will work with universities, community colleges, K-12 systems, and foundations to focus on this problem.

One example of collaboration that may become more common can be found in the City University of New York system, in which high school students take developmental coursework at community colleges (for which they receive concurrent secondary and college-level credit), exposing them to the college setting, increasing the likelihood that they will graduate from high school and consider college, and preparing them for college-level work by the time they graduate from high school. This model of dual enrollment and accelerated learning not only benefits students from all backgrounds, but also helps institutions work with state policymakers in clarifying expectations and developing incentives for students to attend college. In recent years, 10-30% of high school juniors and seniors in different states have been earning college credits, depending on the state. More institutions and states will look at this model as an effective strategy for increasing enrollments and improving academic performance. One of the major policy challenges will be to ensure that institutions are not at a disadvantage financially as a result of K-16 collaboration, but rather have incentives to strengthen collaboration. More and more foundations, following the example of the Gates Foundation and others, will be involved in supporting these initiatives in the future. Ultimately, dual enrollments will help to make higher education both more accessible and affordable, lead to enhanced communication between high school teachers and college professors, and help ease the transition of students from high school to college by giving them a preview of the college experience and showing them that they can be successful.

America's community colleges, which account for nearly 40 percent of all college enrollments today, will play an increasingly critical role in educating students from low-income families and students of color. In addition, we know that Historically Black Colleges and Universities (HBCUs) continue to produce approximately 20 percent of the nation's African American college graduates (see Cook and Córdova). Predominantly white institutions can learn much from

than ever to continue rethinking approaches to reshaping the economy to ensure jobs for Americans. To compete globally, the U.S. must strengthen its public education systems and support innovation to strengthen the nation's science- and-technology infrastructure (Meredith 205). While American higher education is still considered by most observers to be the best in the world, American children continue to lag substantially behind their peers in a number of countries with strong educational systems not only in math and science but also in language skills. In the coming years, colleges and universities will become even more proactive in reaching out to potential students, not only to encourage college attendance, but also to stimulate students' interest in math, science, and engineering. They also will be more proactive in working with national agencies and companies in such areas as health care, national defense, and national intelligence through multi-institutional grant-funded collaboration.

In the light of successful for-profit institutions and online degree programs, public and private colleges and universities will have no choice but to become more adept at identifying and understanding current and potential students. The primary goal will be to provide specialized support to these students during different stages of their careers and lives. Institutions will place increasing emphasis on (1) easing the transition of students between different types of institutions not only in this country but around the world (as many more working students will have careers requiring travel); (2) allowing students to complete programs using a hybrid approach involving in-person and online work and fully online programs, both on campus and at work; (3) making Federal and state policies more consumer friendly for different types of students (involving effective financial assistance programs, for example); and (4) offering more corporate-related training as an integral part of mainstream academic programs with an emphasis on meeting the needs of varying employers and employees. No doubt, given the increasing competition for scarce dollars and the expanding training options for students, universities will work to prevent market share loss by encouraging companies to partner with them. These changes will require strong collaboration not only between institutions and partners, but also among faculty, staff, administrators, and students as traditional institutions strive to become more responsive and flexible in a society with rapidly changing needs.

In addition to the hybrid and blended programs and courses, many more institutions will consider programs in evenings and on weekends, on- and off-campus, giving students options to consider certificate programs (credit and noncredit) along with degree programs. We will see more institutions expanding training options beyond traditional semesters, quarters, or summer sessions, especially when degree-completion time is critical. Focusing even more time and resources on the quality of student support and services will sometimes mean major changes in the culture and values of campuses and significant investments in professional development. As campuses expand distance education sites, more attention will be focused on substantive interaction with the traditional academic program because students will expect to receive the same quality of

instruction that students receive in the traditional programs. This increased support will be especially important in light of student recruitment and retention as well as accreditation standards. Finally, more students will expect institutions to take a long-term view of institution/student relationships; for example, institutions will be much more involved in lifelong learning for alumni, and as institutions become more dependent upon instructional technology, they will rely increasingly on on-line community-building. Institutions will strive to be more caring and student-focused, providing value added for their students, their own faculty and staff, alumni, and external partners.

New technologies will play a central role in extending higher education's reach, not only making postsecondary education more accessible, but also improving how we teach, learn, and do business. Many institutions have already "virtualized" such key services as registration, billing, and even academic advising, and they will continue offering many more courses requiring less "on ground" time by using online technologies. Online instruction has enormous appeal to growing numbers of students who not only are juggling work and family obligations, but also are deeply concerned about reducing their energy consumption and related costs. Some also argue that new technologies can make students' learning experiences richer, serving as a catalyst for more critical thinking and reflection. New technologies also will respond to the desire of many students to become a part of the digital information economy. Needless to say, chasing the latest technology "toys" or fads without evaluating them in relation to academic missions could lead to meaningless dabbling, but institutions have the opportunity to focus instead on technologies' enormous capacity for extending and strengthening teaching and learning to benefit students for generations to come.

Over the next two decades, colleges and universities will spend considerably more time and resources focused on refining their mission and vision in the light of changing demographics and other trends in society. We will see many institutions thinking critically about ways of attracting and educating more Americans of all backgrounds and new immigrants. Indeed, the general premise of my thinking has been that we should be heavily focused on increasing the number of people from these groups who ultimately complete four-year programs and postgraduate work. Of course, as we work to bring more into traditional academic programs, the nation will need to debate the extent to which we should be encouraging some students to consider pursuing postsecondary educational opportunities outside the traditional academic programs. Jobs For the Future has effectively presented this argument, recognizing that many young people simply are neither emotionally nor academically inclined to study in traditional programs at this point in their lives. In the coming years, we may find ourselves suggesting to some who lack strong academic preparation that they would be better served perhaps by selecting programs that will give them important job skills and allow them to begin making a living much sooner than students on the traditional college path. Of course, this would not preclude these students deciding one day to pursue a liberal education. At present, we seem

CHAPTER

Moral Leadership: Promoting High Achievement among Minority Students in Science

Freeman H. Hrabowski III

I am now in my thirteenth year as president, following the strong leadership of my predecessor and mentor, the late Michael Hooker, who helped establish minority student achievement as a high priority for the campus. During these years, our campus climate has shifted dramatically from one that routinely included black student protests to one that now celebrates high academic achievement among all of our students, including African Americans.

This essay focuses on my leadership experience working to increase the number of underrepresented minorities who excel in science and engineering.

Our challenge was great. Thirteen years ago, few African American students succeeded in science and engineering. Their grade point averages were slightly below 2.0, compared with 2.5 for whites and Asians. Admittedly, many of these students lacked the background needed to succeed—not simply in terms of high school grades, but also in study habits, attitudes about course work, and a willingness to accept advice about balancing school work, outside interests, and part-time employment.

With strong faculty leadership and generous support from Baltimore philanthropists Robert and Jane Meyerhoff, who were particularly interested in addressing the academic plight of young African American men, we launched the Meyerhoff Scholars Program in 1988. Collectively, the program's components created an environment that continually challenges and supports students, from their pre-freshman summer through graduation and beyond. Program components are the substance of the

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influential administrators who would take ownership of the changes. We involved them in ongoing informal discussions about possible strategies, practices, and approaches to changing attitudes and raising expectations of all constituents. For example, at the time, the new chair of our chemistry department, who had been a professor in the medical school at Johns Hopkins University, honestly believed in the potential of talented minority students to succeed in science, and she was very helpful in focusing on strategies to improve their performance and that of all undergraduates. In my interactions with her and other leading faculty, I learned the importance of striking a balance between showing my strong interest in academic issues and the need to have faculty at the forefront of discussions and resulting actions.

4. Aggressively and strategically pursue external partnerships and funding, appealing to both the public and private sectors in order to augment institutional resources. It is essential to cultivate effective public and private partnerships. There is no substitute for providing entrepreneurial leadership, and in order to do so, the institution must clearly understand its mission, its strategic strengths and programmatic niches, its capacity, the broader community's needs, and the interdependent environment in which it operates. Most important, perhaps, is the institutional attitude or mindset.

5. Recruit and support faculty and administrators of color, or who are women, to reflect the diversity of the student population. We have focused on these objectives and were among a small number of universities to receive both a multimillion dollar advance grant from the National Science Foundation, in recognition of our strengths in preparing women in science and engineering, and a major grant through NSF's Alliances for Graduate Education and the Professoriate Program (AGEP) to prepare more minority doctors of philosophy in science.

6. Take the lead in talking about the growing diversity on our campuses. Recognizing the need to discuss challenging issues is often the first step in providing leadership; facilitating substantive discussions with fellow administrators, faculty, and students is critical. It has been important for me to show an interest in minority science and engineering student performance by being present at activities, raising questions, and talking about the issue's significance. More recently, we have been focusing greater attention on supporting women faculty in science and engineering disciplines and increasing participation of women in these fields (as well as that of domestic Americans of all races). We have found that what we have done to increase minority participation has proven helpful in addressing issues involving women faculty and students. We have

been collecting and discussing data on representation of women students and faculty by department and conducting focus groups to learn more about their perspectives on instruction, academic support, and research opportunities.

7. Visit other campuses to learn from other effective models. I had the opportunity to speak at the tenth anniversary of Georgia Tech's Focus Program, designed to recruit outstanding minority science and engineering graduate students. On the basis of that model, my campus developed a similar initiative several years ago, the Horizons Program, which has been very effective in substantially increasing our minority graduate enrollment. Wayne Clough has provided both strong presidential leadership and a highly successful minority graduate recruitment model at Georgia Tech.

8. Emphasize the importance of helping minority students, particularly those in their first year (freshmen, transfers, and new graduate students), to feel welcome on the campus and to become engaged. This area, in particular, reflects the change in campus culture that has occurred over the past decade. In fact, our success in sensitizing the campus to the needs of first-year minority students has paid dividends for all first-year students, whose initial experiences both inside and outside the classroom are much more closely monitored by faculty and staff. First-year retention rates are strong for both white and minority students, with minority students actually enjoying slightly higher rates.

9. Encourage faculty and staff—minority and majority—to talk about issues involving minority students and to interact with the students beyond the classroom. I have found that in healthier campus cultures, people talk honestly about difficult issues, including race and academic performance, countering unhealthy resistance to change. Campuses with healthy cultures also find time to celebrate the successes of minority students and faculty. For example, we have celebrated the publication of faculty-student teams' research findings in refereed science journals by framing enlarged reproductions of the journal covers and displaying them and pictures of the teams throughout the campus. Some of our most highly regarded science faculty work closely in their labs with minority students, not only mentoring these students and helping them prepare for graduate school and research careers, but also serving as influential models for their faculty peers.

Regarding campus culture, I recently gave an address at another institution's fall opening session for faculty and staff. The president had arranged for a group of students, including minorities, to talk with faculty and staff about their experiences on that campus. Some students

the quality—the gift—that keeps the fortunate of whatever age focused on all the marvelous undiscovered things to come.”³ Though my colleagues and I are not quite geezers, we have been successful largely because of just this attitude.

NOTES

1. K. Maton, F. Hrabowski, and C. Schmitt, “African American College Students Excelling in the Sciences: College and Postcollege Outcomes in the Meyeroff Scholars Program,” *Journal of Research in Science Teaching* 37, no. 7 (2000): 629–654.
2. American Society of Biochemistry and Molecular Biology, “Graduation Survey,” *ASBMS News* (January–February 2000). In 1999, UMBC awarded twenty-one of the sixty-seven undergraduate biochemistry degrees earned by African Americans in the nation. It also awarded forty-five undergraduate biochemistry degrees to minority students, the second highest number nationally, and seventy-two undergraduate biochemistry degrees overall, the fourth highest number (tied with Yale).
3. John F. Kotter, *What Leaders Really Do* (Boston: Harvard Business School Press, 1999).
4. Warren G. Bennis and Robert J. Thomas, *Geeks and Geezers: How Era, Values, and Defining Moments Shape Leaders* (Boston: Harvard University School Press, 2002).
5. *Ibid.*, p. 20.

BEATING THE ODDS: SUCCESSFUL STRATEGIES TO INCREASE AFRICAN AMERICAN MALE PARTICIPATION IN SCIENCE

Freeman A. Hrabowski, III and Kenneth I. Maton

OVERVIEW

This chapter focuses on successful strategies for increasing the number of males who enter and succeed in science at the college level. These strategies reflect lessons we have learned over the years from the Meyerhoff Scholars Program, launched in 1989, for high-achieving African American students in science and engineering at the University of Maryland, Baltimore County (UMBC).

We draw on both program evaluation data and case studies that demonstrate our success in terms of the actual numbers of academically successful Black males, and on some of the approaches we have taken to overcome barriers to attracting, retaining, and graduating these high-achieving young men. We also examine the challenges we have faced involving young African American males, ranging from their emotional and social maturity to their high-school preparation and performance.

Our analysis of why and how the Meyerhoff Program has been successful also reflects focus-group discussions with faculty and staff members about

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Thus, an important focus in our work with Black male students is to help them feel positive about being high-achieving and being a future scientist or engineer, and to help them develop strategies to counter all of the external influences that could pull them away from their work, or lead them to not wanting to be seen as too academic, too enthusiastic, or as being passionate about science. All of these potentially negative influences based on Black male culture and popular culture had to be successfully addressed by the program to alter Black males' identity and help them to visualize themselves as capable of being future scientists or engineers.

THE MEYERHOFF PROGRAM

The Meyerhoff Program is a multifaceted program attempting to address the academic, social, and cultural needs of underrepresented minorities. The program integrates 15 different components, briefly described as follows (cf. Maton & Hrabowski, 2004; Maton, Sto Domingo, Stolle-McAllister, Zimmerman, & Hrabowski, in press; for a more detailed description, see Gordon & Bridgall, 2004):

Financial aid: All program trainees are provided with a comprehensive academic funding package that generally includes tuition, books, and room and board. Accordingly, students are expected to maintain a B average in a STEM major.

Recruitment: The top 100–150 candidates among all applicants and their families are invited to one of the two recruitment weekends on the campus. *Summer Bridge Program:* Meyerhoff students are required to attend a mandatory pre-freshman orientation program. During this program, they take courses including math, science, and African studies. STEM-related co-curricular activities and sociocultural events are organized during the program.

Study groups: All students are strongly and consistently encouraged to form and be involved in a study group.

Program values: Academic achievement, acquiring help from a variety of sources, peer support, high academic goals (with an emphasis on Ph.D. attainment and research careers), and giving back to the community are the major program values.

Program community: A family-like social and academic support system is presented to all Meyerhoff trainees. All Meyerhoff freshmen live in the same residence hall and are required to stay on campus until their graduation.

Personal advising and counseling: Full-time advisors are made available to monitor and support Meyerhoff students on a regular basis. The advisors focus on both academic performance and planning and personal issues that students face.

Tutoring: The Meyerhoff Program staff strongly encourages students to tutor others and/or be tutored to maximize academic achievement (i.e., to get As in difficult courses).

Summer research internships: Students participate in summer research internships at leading sites around the country, as well as some international locations.

Research experience during the academic year: A number of students also participate in the "MARC U*STAR" program, which provides research experience in a faculty member's laboratory during the student's junior and senior years.

Faculty involvement: Involvement of STEM department chairs and key faculty is an integral part of the recruitment and selection processes of the program. A number of faculty also open their laboratories to Meyerhoff students.

Administrative involvement: The university supports the Meyerhoff Program at all levels, including ardent support from the President.

Mentors: Each student is matched with a mentor who works in a science profession.

Community service: All students are encouraged to participate in community service activities, which frequently involve volunteer work with at-risk Baltimore youth.

Family involvement: Parents participate in social events and are kept advised of their child's progress.

The Meyerhoff Program has achieved dramatic success. We focus here on the success of African American males in the program. African American male Meyerhoffs in recent cohorts are three times as likely to attend, and to graduate from, STEM Ph.D. programs than equally talented African American males who were accepted to the program but who attended another university instead (declined comparison sample). Of note, in the last five cohorts studied, 44% of entering African American Meyerhoff students for whom post-college academic data are available attended STEM Ph.D. (or MD/Ph.D.) programs (another 15% attended medical school, 18% master's programs, and 23% did not attend graduate or professional school). Indeed, the university has become a major contributor of Black undergraduates to science and engineering Ph.D. programs nationwide

The weekend discussions focused on (1) the significance of being a young, gifted, African American male in science, (2) challenges that African Americans face in high school and college, in general, and in particular related to performance in science and engineering, (3) the young men's dreams and possibilities for careers in science, engineering, and medicine, and (4) the Meyerhoff Program's primary rationale of producing Black Ph.D. researchers. This last point was especially critical as we talked with families about the shortage of researchers and focused, for example, on biomedical challenges unique to populations of color. Our essential point was that if we do not have the best underrepresented minority students aspiring to become scientists, we would never solve those problems. As a result of the successful weekend, 19 of the 25 students invited ended up being in the first class of Meyerhoff Scholars.

As we developed language to talk about both the success of our Black males and the challenges that Black males face in education and society, parents of these students, along with their teachers and counselors, became increasingly aware of our growing expertise in this area. The Meyerhoff Scholars Program became a one-of-a-kind program in a predominantly White setting that attracts underrepresented minorities, mostly African American males and females, with an ambition to pursue a career in STEM fields. Following the first several years of the program, there has been a boom in the number of applicants and the total number of recruits (the latter is due in part to an increased amount of funding available).

The ultimate success of the program in attracting African American males is based on the foundation established the first year. Because we were able to help those students succeed, we could use their success when talking to subsequent groups of male and female candidates for the program. Our approach was to highlight strategies that had proven effective, and to revise the less effective approaches. Most important, because of the first-year efforts, the program quickly developed a reputation of being distinctive because of its emphasis on Black males.

Our decision in the second year to recruit women was the result of our interest in helping that group and also federal stipulations that initiatives like the Meyerhoff Program could not be for males exclusively. While we began to recruit women, we continued to emphasize the importance of recruiting Black males because of the shortage of high-achieving Black males in the K-12 systems in Maryland and the nation, and also due to the need to highlight the importance of giving this particular group support. To date, approximately 300 Black males and 300 Black females have entered the program; over the years, the percentage of entering males has ranged

from a low of 39.3% (1996 entering class) to a high of 100% (1989 entering class), with an average across all years of 50.9%.

IDENTITY AS A BLACK MALE: CAUGHT BETWEEN TWO CULTURES

Many of the African American male students are trying to think through their own identity because most have been influenced by the popular culture and have a certain view of Black males who act "cool." During interviews that are part of the initial recruitment weekend on campus, for example, staff explain to Black males the importance of not being "laid back" in their responses to interview questions, because scientists and engineers are more impressed with students who show enthusiasm, passion, and "fire in the belly" for the work. Unfortunately, effervescence is simply not a characteristic associated with "cool" Black males in the popular culture. Staff observe a certain ambivalence among the students. On the one hand, students are working to excel in science, while on the other hand they are trying not to be seen as "acting White" or being a "nerd" or "geek." Often, Black males feel that they are between two worlds – the academic world, science and engineering on the one hand, and the pop-culture world, their neighborhoods, and the campus community on the other. We find the same ambivalence among Black females, although the staff perception is that there is even more pressure on the young men, in some cases, to de-emphasize enthusiasm for science in off-campus settings because of the need to be accepted by peers, especially in their neighborhoods.

Fortunately, the campus community of African Americans at UMBC may be somewhat different than that of other campuses because of our concerted efforts to make it "cool" for all students, including African Americans, to be focused on academic work and high achievement. We do not see peers looking down on students who regularly talk about science. It is not just acceptable, but desirable for students to be able to talk comfortably in groups about biochemistry and AIDS research, for example, and the more facile a student is with that language, the more impressive the student is considered. In fact, we have seen successful students here able to strengthen their identity and sense of self and to move away from that ambivalent position. Those who are not successful continue to waffle back and forth about seeming not to be too excited about the work, not wanting

encourage the students themselves to speak comfortably about these issues. Consistent with the practices on campus and university policy on diversity, we teach students to respect the rights of other students, including diverse perspectives on sexual orientation, and staff are open in talking with students about tolerance and acceptance.

More generally, the role of staff has always been critical in identifying and solving the problems of our scholars. They are very effective in identifying students from the beginning who exhibit characteristics that may be problematic. One particular strategy is for staff to talk among themselves about approaches that may work with particular students, for example, working with parents, choosing upper level students who may be able to relate more easily to the student, and even having intervention sessions with students who are not doing well because of poor study habits, an uncooperative attitude, or problems with skills. One other strategy involves appropriate advising and making hard decisions about whether a student has the potential to succeed in science, or whether the student needs to go back first to strengthen his background in math or science.

Interestingly, staff tell us that they have had to spend considerably more time in difficult situations with the males than with the females to ensure their success. These difficult situations often involve students' attitudes or their reluctance sometimes to do what we want them to do, or to accept advice. Males are disproportionately involved in those cases (staff estimate at least 60% of the cases involve males). It has been important to take time to think through approaches to use in trying to influence those young men in order to get them to follow directions, adhere to guidelines, meet deadlines, and to persist and be successful. It takes much more effort with a number of the males than with the females. In other words, if we are having problems with students who are resistant to taking advice, it is more likely to happen with African American males.

CHARACTERISTICS OF MALE STUDENTS WHO SUCCEED

There is wide variation in terms of the students' backgrounds. Some are from small rural towns, while others are from urban areas or wealthy suburbs. Some have attended science-and-technology high schools, while others come from fairly weak, underfunded comprehensive schools. Some students have been the only Black person in their classes, while others have

attended predominantly Black schools. Many are from educated homes with college-educated parents, while others are the first to attend college in their families. Indeed, the students' backgrounds have a great deal to do with their comfort level in UMBC's highly integrated setting, their attitudes toward Whites, their level of sophistication, the strength of their math and science skills, their study habits, and their aspirations and visions of themselves in the future.

Perhaps one of the most important characteristics and determinants of students' future success is the willingness to take advice. For example, we advise students who have earned the highest score of 5 on Advanced Placement physics and calculus tests to begin their UMBC coursework with Calculus I and Physics I – the beginning freshman courses. Those students who did not take our advice in the earlier years tended to earn Bs and Cs in the second-level courses, and mediocre grades tend to foretell mediocre performance in later courses due to the sequentially based nature of math and science courses. In contrast, students who take our advice, even if they do not have as strong a background as the less cooperative students, tend to do much better in the long run.

Also, students who are willing to talk about their challenges – from feeling intimidated in the university setting or not being comfortable with students who are different from themselves to being shy or reluctant to talk to a professor or to take advantage of group study – are more likely to find the help they need to overcome those obstacles. Unfortunately, students who are less successful tend to be more inward in their approach, less willing to say what is wrong, and less forthcoming in discussing their problems. Students who succeed are often not only willing to talk about their problems, but also learn how to be resilient when they do not do well. One of the traits we frequently emphasize, because most students at one point or another will make mistakes and encounter difficulty with a course, is the importance of learning from those mistakes and bouncing back to continue on, rather than focusing on the failure. So, willingness to take advice, being willing to be forthcoming about challenges, and resilience are three characteristics common to most students who are successful.

Further, students in science who exhibit curiosity are assertive about taking advantage of opportunities to become involved in research (especially by getting to know a variety of scientists or engineers on the campus), and, most important, who show the discipline and hard work necessary to be the best are often the most successful. Successful students also tend to understand the importance of building community, of having a network of support, of working with others on coursework, and

racism appear to have developed, over time, increasing comfort with discussing minority issues in education.

An enduring perception, however, is that the Black males in the Meyerhoff Program receive more support than other students (which is true), and, as a result, people sometimes express concerns about fairness. A number of them have suggested that the extra support should be given to weaker students rather than to students, like the Meyerhoffs, who enter college well prepared; in fact, we have seen Black and White students who have been quite bothered by the special status that Black males in the Meyerhoff Program have. However, it needs to be emphasized that many faculty and students are very proud of the Meyerhoffs.

In the first year, African American students, in general, at the university complained to the staff that they did not think it was fair to have a special program for high achievers. Staff responded by inviting these students to think about why they were bothered by the special treatment and support given to students to promote high academic achievement, though, in contrast, they were comfortable with the special support being given to student-athletes, including Black student-athletes. Having that discussion proved to be a healthy approach to encouraging the students to think about their own values, practices, and personal goals. It also helped to stimulate discussion about opportunities for students, in general, to become involved in the program based on their performance and efforts in subsequent years.

The university administration's perspective on the program is, first of all, that the university has been able to produce a level of academic success among African American males that rarely, if ever, has been seen in predominantly White universities in the rest of the country. Moreover, because of the Meyerhoff Program's deliberate and proactive effort to recruit and graduate high-achieving young African American males in science, the campus's Black student population is now half male, which, in itself, is a major accomplishment. The success of Black males in the Meyerhoff Program – exemplifying excellence and diversity – has brought much national attention to the campus, resulting in millions of dollars of funding from national agencies, foundations, companies, and individuals for scholarships, faculty support, and program evaluation. Moreover, many Black males not in the Meyerhoff Program work with Black males who are, which has contributed to Black males, in general, achieving well academically. For example, among 2008 graduates, the average GPA of African American males was 2.94.

Among a number of faculty and staff, there is tremendous pride in the Meyerhoff students and recognition that the students' success is tied directly

to faculty and staff support. One key factor that makes the program so distinctive and successful is that large numbers of our STEM faculty, which is heavily White male (given the current makeup of the nation's science and engineering workforce; less than 2% of the UMBC STEM faculty are African American) have taken ownership of this effort – indeed, it takes researchers to produce researchers. Much of the success of African American Meyerhoff males can be attributed to the commitment of faculty, in general, to these students. Faculty regularly “pull” the students into their research, articulate high expectations in the classroom, and have substantive personal interactions with the students. Even among those who may be bothered by the uneven level of support for other students (they simply want to see other students achieving at the same level), there is respect for the achievements of the Meyerhoff students, and the university has been working to identify other sources of support for other groups of students not affiliated with special scholarship programs like the Meyerhoff Program. Meyerhoff Program staff also identify African American males, not in the program, who are majoring in STEM fields to encourage them to work with Meyerhoff students in group study. In a number of cases, these students have done so well that they have been invited to become officially affiliated with the program.

Lessons learned about the performance of Black males and females have been helpful in looking at STEM performance at UMBC in general. As a result, more and more people have been respectful of the “spillover,” or “value added,” by working with Black males on campus. More generally, the success of the program has engendered a lot of good will on the campus. In part, this reflects the successful collaboration between African American leaders and the campus community. Students, faculty, and staff thus observe and experience a successful collaboration among African American and others of all races, indicating the importance of inclusiveness and collaboration across races.

Our work with African American males and other minority students has led to our proposing a theory of change that is a basis for strengthening an institution (Maton, Hrabowski, Ozdemir, & Wimmis, 2008). More specifically, the proposed theory is designed to strengthen recruitment and retention initiatives involving minority students in higher education. The approach can be used by an institution in addressing the particular issues and challenges faced by any underrepresented group at the institution – from African American males to other men and women of color, and, in fact, to women in general in science and engineering since they often represent a minority in many STEM disciplines. It is significant that because

fund their education often serve to prevent African American males from devoting their full attention to their studies.

- *Study groups:* Faculty should encourage students to form study groups early in the learning process by providing assignments which require collaboration. Campus administration should seek forums in which students can form mid-sized study groups as well as provide guidelines for effective ways to study with others. Studying together offers all students (and particularly African American males) motivation and support, and helps students to become more engaged with the material.
- *Listening to the voices of African American males:* The Meyerhoff Program has succeeded in part because it has continually sought out opportunities to hear the voices of the African American males in the program. It has proved invaluable for the success of the program to understand and learn from them what their experiences have been, how they view themselves and the challenges they face, and what aspects of the program can be strengthened or changed.
- *Advice for parents:* Our advice to parents of Black males going to college includes – (1) find out if the institution evaluates the performance of Black males on the campus; (2) look at the perceptions of Black male students in terms of the support they receive and their performance (e.g., grades and retention and graduation rates); (3) look to see if there are examples of Black males in positions of authority with whom students can relate; and (4) look to see if Whites on the campus are comfortable talking about issues involving race, in general, and related to Black males, in particular. More generally, in-depth information about approaches to successful parent African American males who are successful in STEM careers can be found in our book, *Beating the Odds: Raising Academically Successful African American Males* (Hrabowski, Maton, & Greif, 1998).

In conclusion, the success of Black males at our university is largely the result of a deliberate effort on the part of a number of faculty and administrators to address proactively issues involving these young men. On many campuses, people are often uncomfortable talking about this group. Honest dialog among campus leaders – listening to the voices of the students, themselves, and both those who have succeeded and those who have not – can lead to considerable understanding on the part of all about the challenges that both the students and the institution face. The fundamental question that all of us must ask is, “*Are we confident that the environment of the campus encourages and supports Black males to achieve academically at the highest levels?*”

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BLACK AMERICAN MALES IN HIGHER EDUCATION: DIMINISHING PROPORTIONS

EDITED BY

HENRY T. FRIERSON
University of Florida, USA

WILLIE PEARSON, JR.
Georgia Institute of Technology, USA

JAMES H. WYCHE
*National Science Foundation, Arlington,
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THE ROLE OF
YOUTH IN THE
CIVIL RIGHTS
MOVEMENT:

Reflections On Birmingham

FREEMAN A. HRABOWSKI, III
President, University of Maryland Baltimore County

On a recent Sunday, more than 30 years after growing up in Birmingham, I had the pleasure of taking to church over 100 of my students—all Meyerhoff Scholars, talented African-American students in science and engineering—to hear Civil Rights leader, and former United Nations Ambassador and Atlanta Mayor, Andrew Young speak. As I introduced my young students to the church congregation, I could not help but remember—and remind Ambassador Young—that I was a child of 12 when he and Martin Luther King came to Birmingham, where they prepared children, like me, to march peacefully in protest for our civil rights. As I spoke to the congregation that Sunday, I wondered how much the students were able to appreciate my comments and perceptions, and those of Andrew Young—especially because all of them had been born after 1975, years after the Civil Rights Movement.

As I talked to my students, I vividly remembered that for many of the children involved in the Movement academic work took on an added dimension. From our exposure to local leaders, like Reverend Fred Shuttlesworth, and national leaders, like Dr. King and Reverend Young, we learned that very often these leaders were knowledgeable people, and that knowledge was power! They had the ability to think clearly, speak eloquently, and act confidently. In so doing, they reinforced what our families and teachers had been telling us all our lives—that education makes the difference between success and failure. In the process, many of us became more committed than ever to becoming the best, so that one day we would be successful competing against all kinds of children, proudly representing ourselves, our families, and our race.

The Movement, its leaders, and our parents also taught us a great deal about values—what's right and wrong. We learned about the importance of teamwork from the many, many hours we spent in meetings with adults and other young people, talking about the challenges we faced and trying to understand the strategies and legal issues involved. I remember that my childhood friends and I talked with our parents about whether we would be allowed to participate in marches and the likely implications of doing so. I also recall hearing the rumors that teachers and other workers

(like my mother and father) would lose their jobs if they marched. We witnessed the courage of fellow students and our families, and we took part in the Alabama Christian Movement's evening meetings where we learned how spiritual music—from I Ain't Gonna Let Nobody Turn Me Around to Woke Up This Morning with My Mind Set on Freedom—can fortify a people and give them a vehicle for expressing their aspirations and strong belief in lofty goals.

In spite of the inspirational meetings and speeches, those children who went to the jail often found themselves in a frightening situation. For me, incarceration was especially depressing and unnerving because we were intentionally placed with juvenile delinquents who had had very hardened lives. In some cases, these delinquents were proud of us, but in other cases, they could be cruel. Like others, I spent my five days of confinement thinking about the meaning of freedom while constantly worrying about my own personal safety. I must admit that I began to breathe with ease only after my parents secured my release. Even after getting out, I was devastated to realize that I could not return to school. In fact, the local Board of Education had suspended all children who had participated in demonstrations and used this approach to discourage others from doing so. In fact, I distinctly remember worrying that, even as an A student, I might not be able to finish school, or that I might miss so much school work that I would be unable to excel. I will never forget the jubilation we all felt that night in one of the Movement's church gatherings, when we learned that a federal judge in Atlanta had ruled that those of us who had marched could return to school and go on with our lives. I will always hear and see in my head the singing, speeches, and celebration of this moment because it symbolized the hope for a better day.

My memories of Birmingham in 1963 are vivid, indeed. As a ninth-grade student, I listened to adults seriously questioning the idea of asking children to march as a tactic in the struggle for civil rights. In fact, there were many middle-class Black families who, like prominent Black business leaders and the head of the Birmingham World, C.A. Scott, were suspicious of Dr. King and the Movement.³ What became increasingly

not protect us from the horrors of racism, which raged like a fire. We grew up witnessing the bombing not only of churches but of homes belonging to people like Reverend A.D. King, Dr. King's brother, and the most prominent Black attorney in town, Arthur Shores.

Despite the terror, it was encouraging to know that people throughout the country were deeply troubled by the events in Birmingham, and that the nation's President, John Kennedy, was on our side. We learned from the experience that faith in God and ourselves, coupled with individual acts of courage and service, meant far more than we could ever realize. We learned also the importance of hating in justice rather than people, and of being on our best behavior and exercising strong self-control, especially when we were confronted by the police during the marches and while we were in jail. We learned, too, the value of controlling our emotions and of conducting ourselves as responsible citizens. Finally, we learned that America, at its best, cares deeply about its children, and that children touch the conscience of adults. The nation's conscience was stirred, and people of all colors came to see this struggle not simply as a racial conflict, but, even more important, as a question of American justice.

Today, the critical question—besides asking what have we learned from our experiences in the Civil Rights Movement—is what are the similarities and differences between the 1960s and 1990s? Several thoughts come to mind. Most important, this nation has made enormous progress in expanding opportunities for all of its citizens. One clear outcome of the Movement is that large numbers of African Americans have been able to gain a college education, and more, at all types of colleges and universities throughout this nation. In addition, we have increased substantially the number of Black elected officials at all levels, and the numbers of Black professionals, in general, from doctors and lawyers to accountants and business people. Certainly, people with the financial means can now eat in any restaurant or attend any university (if they have the necessary academic credentials).

As I looked into the young faces of my students on our recent visit to church, I was struck by how hard it was for them to understand the meaning of not being able to drink from a public water fountain or use a public restroom, having to enter the side door of a restaurant, or being forbidden from attending a school, simply because of the color of one's skin. I am also struck by the fact that many young African American children today still face injustice and discrimination, but in more subtle ways. We continue to see totally segregated schools, particularly in urban areas, that are far more poorly funded than their suburban counterparts, but people do not readily see or understand the distinction. Moreover, integrated schools today often place larger numbers of Black children in lower-level classes, while Black children in gifted classes usually see themselves as exceptions. And although our children now see more African-American success stories in the newspapers and on television than in the 1950s and '60s, the success stories, more often than not, are about successful Black entertainers and sports figures. Sadly, few know that less than 2% of the research scientists and engineers produced each year in America, and fewer than 4% of the nation's new social scientists, are African American. In short, although it is true that we, as a race, have made substantial progress over the past 30 years, millions of our children are being poorly educated everyday. The major challenge facing young African Americans today, unlike in the 1950s and '60s, when we were denied our rightful access to schools we were qualified to attend, is to capitalize fully on the opportunities our nation offers. The leading question is what role can today's young people play in increasing the numbers the young African Americans who succeed in American society—particularly in the light of recent governmental decisions that significantly threaten affirmative action programs in this nation?

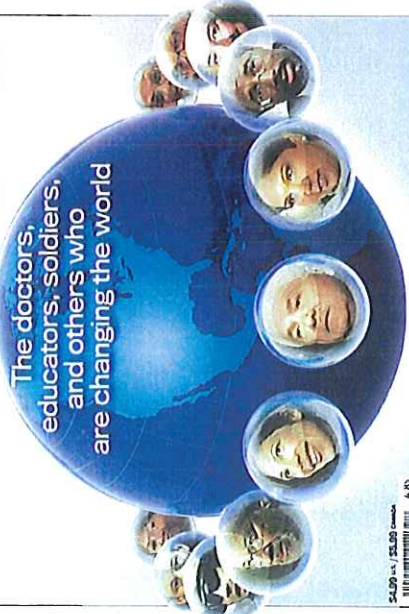
One answer is that, like African American children of the 1960s, those in the '90s and the 21st century must focus on being the best and believing that knowledge is power. My second response—one that most closely resembles the youth involvement during the Civil Rights Movement—is community service. In fact, in the words of Martin Luther King,

OTHER SUPPORTING MATERIALS

World's Top Universities • Obama's Next Moves

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AMERICA'S BEST LEADERS



The doctors, educators, soldiers, and others who are changing the world

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COVER STORY



America's Best Leaders 2008

If the election of Barack Obama showed anything, it's that America—at war and coping with a financial crisis—is hungry for leaders who inspire us. The nation's greatest leadership, however, does not come just from the most powerful office in the land but also from the worlds of science, education, art, and even in this troubled economy, business. ■ This year's crop of Best Leaders was chosen by a panel of judges convened by Harvard University's Center for Public Leadership. They are diverse, from the truly famous, such as filmmaker Steven Spielberg, to the less well-known, like small-town doctor Regina Eberjemin. Although she runs a tiny rural health clinic in Alabama, her work on primary-care medicine is international in scope. ■ There's also the growing field of junior officers in the U.S. military—the lieutenants and captains who learned the true meaning of leadership under fire on the battlefields of Iraq and Afghanistan. They all stand as models for a nation in troubled times.



PHOTOS: COURTESY OF THE LEADERS; GLOBE: GETTY IMAGES; COVER: JEFFREY M. HARRIS



FREEMAN HARBOWSKI | EDUCATOR

Inspiring the Pursuit of Math and Science

By Kim Clark

CATONSVILLE, MD.—Freeman Harbowski III was a fat, nerdy, African-American kid with a weird name growing up in segregated Birmingham, Ala. But he was smart. He had skipped ahead to the ninth grade by the time he was 12. And when he saw his friends reading for the Children's Crusade march for civil rights in 1963, "I just had to join in."

As he got swept up in a mass arrest, Birmingham's notorious Public Safety Commissioner Eugene "Bull" Connor spat on him. The jail guards locked the young freedom marcher in with hardened criminals. Harbowski remembers spending five terrified days and nights shivering, younger kids by reading his Bible about and singing songs.

At one point, the Rev. Martin Luther King Jr. led a march of parents to the jail. "We looked out and saw him and our parents," Harbowski recalls. "They were singing. And [King said], 'What you do this day will have an impact on generations as yet unborn.'"

King was right. Outrage at the brutality against Birmingham

children helped build national pressure for laws banning racial discrimination. That outcome gave Harbowski a life mission: "The experience taught me that the more we expect of children, the more they can do," he says.

Harbowski's civil rights background, his Ph.D. in education and statistics (which he earned when he was just 24), and his ebullient cheerleading for education have led him to the presidency of what had been a no-name commuter campus—the University of Maryland-Baltimore County. And they've empowered him to take bold actions, such as disbanding an African graduate studies program and refusing to field a college football team in favor of funding math undergraduates and a championship chess team. The result: a dramatic increase in the number of technologically advanced graduates of all races and genders.

"Freeman is one of the rare figures who has single-handedly turned around a major institution," says Anthony Marx, president of Amherst College. "Along the way, he has taught all of higher education that minority and low-income students can and should be held to the highest standards, and can meet those standards and excel."

UMBC was a relatively young school in Baltimore's suburbs when Harbowski arrived as vice provost in 1987 with big plans to turn it into a place where "it is cool to be smart."

Harbowski, who got his bachelor's in math, focused on math and science in part because he worried that the American economy would suffer if other countries continued to graduate more technology experts than the United States. But Harbowski knew that many people who looked like him—young black men—could need a little extra help to succeed in the sciences.

Providing support. Within his first two years at UMBC, he had raised enough money to set up the comprehensive tutoring and aid offerings of the Meyerhoff Scholars program. Initially designed to help smart black males become scientists and engineers, the program quickly expanded. Harbowski took over as UMBC's president in 1992, and four years later, the Meyerhoff program was open to students of all races and genders "who are interested in the advancement of minorities in the sciences and related fields." Now about 1,900 high school seniors a year are nominated by their teachers for one of the 60 or so Meyerhoff slots that provide scholarships, special summer classes to sharpen academic skills, tutors, and research opportunities. One thing Meyerhoff Scholars don't get: any breaks. If they get a C in a class, for example, they are "encouraged" to repeat the course.

Harbowski managed to steal A students away from far more famous schools because he recruits brainiacs the way some schools recruit quarterbacks. Malcolm Taylor, a graduating Meyerhoff computer engineer, turned down full scholarships elsewhere because he was invited to UMBC when he was a sophomore in high school and was "amazed" by Harbowski. "He comes into the room and you can feel it.

He has that leader charisma. He knows everyone by name." Harbowski turns even chance meetings into teachable moments. If he happens to be showing a guest around campus and runs into Taylor, "He'll say, 'Introduce yourself. Tell them what research you are doing.' If Taylor doesn't deliver a clear, succinct and audible response, Harbowski booms out in his megaphone-like voice: 'Speak up. You have to project! If people can't hear you, it doesn't matter what you say.'"

Seeing the campus with Meyerhoff Scholars as role models was one of Harbowski's first blows against what he sees as a self-destructive subculture prevalent in too many communities and ethnic groups, a subculture in which those who get good grades are held in contempt; for being weak or effeminate; or for "selling out" or "acting white."

Many of his moves have been unconventional and sometimes controversial. He won't fund a varsity football team, but, to attract world-class minds, he funds big scholarships for chess players (many from Eastern Europe). And he stages big celebrations when the chess team wins national championships. Harbowski pushes professors to replace boring lectures with more active lessons and to create opportunities for students to work and study in groups. He punts students to give back by tutoring or mentoring younger kids.

It's working. Harbowski has turned the 12,200-student school into one of the nation's biggest producers of technology graduates. The 20-year-old Meyerhoff program alone has graduated more than 600 students in the sciences. Over whom have gone on to earn M.D. or doctoral degrees. Overall, 43 percent of the nearly 1,900 diplomas UMBC hand-

ed out in June were for math, engineering, or science. And UMBC's student technology pipeline is growing. The number of white science majors at UMBC has almost doubled, to nearly 1,500, since 1985. The number of African-American UMBC undergraduates majoring in science or engineering has increased sevenfold, to more than 400.

Perhaps most important, Harbowski's influence is spreading beyond Catoonsville, Md. Shidmore College in New York, for example, has launched a similar program to recruit and support low-income and underrepresented youths.

Timble down. And it is spreading down to youngsters in their most formative years, such as 13-year-old Brandon Giles. A year ago, Giles was just one of thousands of fatherless, failing youngsters in Baltimore. Then, his mother signed him up for a new, boys-only charter middle school focused on science that was cofounded by a friend of Harbowski's. At first, Giles didn't like spending six days a week, year-round, at a no-gifts school. Last fall, Giles continued to get into trouble and was bristling at teachers' attempts to rein in his behavior. He asked for advice from one of the Meyerhoff scholars who volunteered Saturdays at the Blufford Drew Johnson STEM Academy in East Baltimore. "He said, 'Don't let people bring you down. You have to run with whatever punishment and assignments teachers mete out. So now,' Giles says, "If they say, 'Go to detention,' I go to detention. If they tell me to write 15 pages, I write 15 pages."

Last spring, Giles made the honor roll. His new ambition is to get a degree from UMBC and become a police officer. "I want to create a mentoring program for kids who grow up without their fathers," as he did, Giles says.

Harbowski has never met Giles. But the mathematician in him would appreciate this proof of the transformative power of leadership. He has helped create another generation of good students, eager to inspire the generation after them. ●



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Freeman Hrabowski

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Freeman Hrabowski
DOUGLAS SONDRERS FOR TIME

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Freeman Hrabowski has a problem. The president of the University of Maryland, Baltimore County (UMBC), has been so successful at cultivating his school's reputation for steering African-American students toward science and engineering — fields in which they have been traditionally under-represented — that he fears the university will be forever typed as a hard-discipline powerhouse at the expense of everything else. "I often say to people that yes, over half of our students are in science fields, but the other half are in arts," says Hrabowski. "We're working to build a university that has first-rate research across all disciplines." It's easy to understand why UMBC has been pigeonholed, though. Hrabowski — a charismatic leader who was jailed for almost a week as a 12-year-old in the fight for civil rights in early-'60s Alabama — has spent much of his 17 years at the school's helm

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striving to channel minorities toward grad school. It's worked. UMBC is one of the nation's leading sources of African-American Ph.D.s in science and engineering, and almost half of its seniors go immediately to grad school. All things considered, it's not a bad problem to have. —*Gilbert Cruz*

See TIME's special report on paying for college.

View the full list for "The 10 Best College Presidents"

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Keep an Eye on These Schools

These colleges and universities may not be at the top of the rankings (yet), but they're leading the pack in improvements and innovative changes

College rankings tend not to vary much from one year to the next. In many ways, there's virtue in such consistency. But how to identify colleges and universities that have recently made striking improvements or innovations—schools everyone should be watching?

This spring, for the second year in a row, *U.S. News* asked the experts who respond to its annual peer assessment survey to identify schools that fit this profile. The 77 colleges and universities that received the most nominations range from household names such as Arizona State University to Wagner College, a 2,000-student private college on Staten Island, and Claflin University, a historically black school in Orangeburg, S.C.

For prospective applicants, we believe the schools on this list offer the reassurance that whatever their his-



torical reputation (or lack of it), they're firmly focused on improving the job they're doing today—at least in the judgment of their peers.

As happened last year, two midsize schools, Elon University in North Carolina and Belmont University in Tennessee, were cited most often by their peers. Both appear regularly in one of our most useful resources for college applicants, our list of A-plus schools for B students. In all, 39 of the 77 up-and-coming schools are on this year's A-plus list. In addition, many of the colleges and universities in this list appear on the opposite page in our new list of schools with a strong commitment to undergraduate teaching. ●

Top Up-and-Coming Schools

These 77 colleges and universities were singled out as schools that have recently made the most promising and innovative changes in academics, faculty, students, campus, or facilities. They are ranked against other schools within their categories in our rankings.

National Universities

1. Univ. of Md.—Baltimore County*
2. George Mason University (VA)*
2. Northeastern University (MA)
4. Drexel University (PA)
5. Arizona State University*
5. University of Central Florida*
7. Ind. U.—Purdue—Indianapolis*

8. University of Denver (CO)
8. Univ. of Southern California
8. University of Vermont*
11. Clemson University (SC)*
11. Emory University (GA)
11. Rice University (TX)
11. University of S.C.—Columbia*

15. N.C. State University—Raleigh*
15. Ohio State U.—Columbus*
15. Univ. of California—San Diego*
15. University of Cincinnati (OH)*
15. University of North Texas*

*Public

A Strong Commitment to Teaching

We asked schools to tell us which of their peers do the best job of teaching undergraduates. Some of the names they mentioned might surprise you

It's a *Simpsons* classic. Searching for an insult to hurl at a rival college at a Springfield tailgating party, Carl Carlson yells: "Your superstar professors treat undergrads like an afterthought!" In fact, some schools do a much better job than others of teaching their undergraduate students. If you're applying to college, you'll want to know which they are.

To see how colleges and universities measure up, in spring 2009 *U.S. News* asked the experts who respond to its annual peer assessment survey to identify schools where the faculty has an unusually strong commitment to undergraduate teaching—schools that emphasize this aspect of academic life.

Apples to apples. Schools are ranked against their peers within the categories we use for our regular rankings. That means, for example, that we compare liberal arts colleges with other liberal arts colleges. That is only fair, since by definition those schools emphasize undergraduate education as opposed to postgraduate research. Schools that fall outside our national universities and liberal arts categories were surveyed regionally.

When we asked administrators at schools on our list to explain what made their approach successful, the common theme was a productive, caring faculty. "People here would say teaching's in the water, it's so much part of peer expectation," says Andrea Lee, president of St. Catherine University in St. Paul, Minn. When it comes to tenure decisions, she says, "if you're not highly rated as a teacher, you're not even in the running."

Marvin Krislov, president of Oberlin College in north-east Ohio, says Oberlin's commitment to teaching undergraduates runs through the entire faculty. "Were you to come here, what you'd find is a comfort among students and faculty that I find quite remarkable," he says. "These are relationships that often continue for years afterward. There's a sense that the students are treated as peers."

And Freeman Hrabowski, president of the University of Maryland-Baltimore County, says his school leverages its connections with employers such as NASA to steer students into research (the university sponsors two creative journals, one of which focuses on cutting-edge undergraduate research). "UMBC is a place where the research comes to life," says Hrabowski, who stresses its importance in his first address to each incoming class. "Freshmen are learning from older students that it is the UMBC way to be seriously engaged in research early." ●

For more information, including methodology, at www.usnews.com/college

A Focus on Undergrads

These 80 colleges and universities were singled out most often when experts were asked to identify schools where the faculty has an unusual commitment to undergraduate teaching. Schools are ranked against others within their categories as listed in this guidebook.

National Universities

1. Dartmouth College (NH)
2. Princeton University (NJ)
3. Yale University (CT)
4. Stanford University (CA)
4. Univ. of Md.-Baltimore County*
6. Brown University (RI)
6. Coll. of William and Mary (VA)*
8. Duke University (NC)
8. Miami University-Oxford (OH)*
8. University of Notre Dame (IN)
11. Bowling Green State U. (OH)*
11. Howard University (DC)
11. Rice University (TX)
11. U. of California-Berkeley*
11. University of Chicago
11. U. of Michigan-Ann Arbor*
11. University of N.C.-Chapel Hill*
11. University of St. Thomas (MN)
11. Wake Forest University (NC)

*Public

Programs to Look For

For the eighth consecutive year, *U.S. News* is publishing a list of schools with outstanding examples of academic programs that are commonly linked to student success. With the help of education experts, including staff members of the Association of American Colleges and Universities, we identified eight such program types. We then invited college presidents, chief academic officers, and deans of admissions to nominate up to 10 institutions with stellar examples of each kind of program. Colleges and universities that were mentioned most often are listed here, in alphabetical order.

UNDERGRADUATE RESEARCH/ CREATIVE PROJECTS

Independently or in small teams, and mentored by a faculty member, students do intensive and self-directed research or creative work that results in an original scholarly paper or product that can be formally presented on or off campus.

- California Institute of Technology
- Carnegie Mellon University (PA)
- College of Wooster (OH)
- Dartmouth College (NH)
- Duke University (NC)
- Elon University (NC)
- Furman University (SC)

- Georgia Institute of Technology*
- Hamilton College (NY)
- Harvey Mudd College (CA)
- Hope College (MI)
- Johns Hopkins University (MD)
- Massachusetts Inst. of Technology
- Princeton University (NJ)
- Stanford University (CA)
- Swarthmore College (PA)
- Truman State University (MO)*
- University of California-Berkeley*
- University of California-Irvine*
- Univ. of California-Los Angeles*
- U. of Maryland-Baltimore County*
- University of Michigan-Ann Arbor*
- U. of North Carolina-Asheville*
- U. of North Carolina-Chapel Hill*
- Univ. of Wisconsin-Madison*
- Washington University in St. Louis
- Williams College (MA)

*Public

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U.S. HIGHER EDUCATION

Minority Retention Rates in Science Are Sore Spot for Most Universities

A few universities have demonstrated what it takes to help more minority students earn science degrees. But their efforts are only beginning to be widely replicated

CATONSVILLE, MARYLAND—Yohance Allette didn't panic when he hit a "rough stretch" of science courses last year as a sophomore at the University of Maryland, Baltimore County (UMBC) here. He knew that, as a Meyerhoff Scholar, he could lean on what he calls his "friends and family"—older students, faculty members, and university staff—to help him make it through organic chemistry, physics, and genetics.

Having such a support group is a big reason why Allette, a biology major, and other Meyerhoff scholarship students are twice as likely to earn a bachelor's degree in a science field, and five times as likely to enroll in graduate study, as their peers who were accepted but chose not to enter the program. "It's like being able to talk with your older brother or sister," says Allette, whose parents are from the Caribbean.

Begun in 1989, the Meyerhoff program has tried to address a glaring failure of U.S. higher education: the high attrition rates among minority students (predominantly African-Americans and Hispanics) who declare an interest in science, technology, engineering, and mathematics (*Science*, 31 March 2006, p. 1870). Although minority students entering U.S. colleges are just as interested as their

white peers in these STEM fields, they are only two-thirds as likely as whites to earn bachelor's degrees in those fields within 6 years. (Asian Americans, who are not considered a minority in STEM fields, are more likely than whites to earn such degrees.)

"Most institutions have the *intent* to improve retention rates; they simply don't



A team approach. John Matsui and students in the Biology Scholars Program at UC Berkeley.

know how to do it," says mathematician Freeman Hrabowski, UMBC's president. He's also a standard-bearer for the program, backed by Baltimore philanthropists Robert and Jane

Meyerhoff. Their family foundation supplies two-thirds of the program's \$3.5 million budget for 2008–09.

On the West Coast, the 16-year-old Biology Scholars Program (BSP) at the University of California (UC), Berkeley, has also succeeded in helping underrepresented minorities make it through college. Since 2000, 69% of its 650 students have graduated within 4 years, topping the 61% rate for the rest of the student body. Among African-American students—some of whom take more than 4 years to complete their studies—scholars have a 93% graduation rate versus 73% for their nonprogram peers. Only 0.15% of biology scholars are dismissed for poor academic performance, notes evolu-

tionary biologist John Matsui, who directs the program, compared with 3.5% for all UC Berkeley undergraduates. The program's annual budget of \$1.5 million comes from the Howard Hughes Medical Institute (HHMI) and, since 2004, the Gordon and Betty Moore Foundation.

Although the two programs differ in many respects, their ability to lend minority students a helping hand at the right time seems to be critically important. For his first 2 years at UC Berkeley, Eric Octavio Campos, a graduating senior, says, "I was very much alone on this huge campus, and there were so few Latinos or African Americans in my science

Following the Leaders

Several institutions have begun to imitate aspects of the Meyerhoff program at the University of Maryland, Baltimore County, and the Biology Scholars Program at the University of California (UC), Berkeley (see main text). However, none has published comprehensive data on what has been accomplished.

Five years ago, Louisiana State University, Baton Rouge, began a program to serve disadvantaged science students. LA-STEM tries to replicate Meyerhoff's tiered mentoring and summer programs but without the same level of financial aid. With this month's graduation, 46 students have completed the program, with a retention rate of 90%. Even so, its driving force, vice chancellor and analytical chemist Isaiah Warner, admits that "we are far behind Meyerhoff in terms of getting and measuring results."

This past summer, about 50 incoming engineering students at the University of Michigan (UM) joined a new academy that includes a summer program, mentoring, research internships, and modest student grants. "Our challenge was, How could we put a Meyerhoff-like model to work in a large research institution?" says Derek Scott, who directs UM's multicultural engineering program.

The UC Berkeley program has been an inspiration for two other UC campuses, and in 2007, Cornell University embraced its name and concepts to tackle its attrition rate among minorities in biology, says virologist Laurel Southard, who directs the department's undergraduate research and outreach. The Cornell program takes in 20 to 25 first-year students each year, offering them mentoring, special events, and research opportunities. Southard is seeking outside support to supplement a small budget provided by the department and the vice provost's office.

The biology department at Harvard University offers a Howard Hughes Medical Institute–sponsored program that each year enrolls about 40 freshmen students from disadvantaged backgrounds. "We stick with them for all 4 years," says biologist Robert Lue. "They are assigned to a faculty lab and mentored by faculty and others." In 2006, Harvard started a wider effort—the Program for Research in Science and Engineering—that offers summer research opportunities to undergraduates from all of the sciences. Lue says that the number of women and underrepresented minorities majoring in the life sciences has risen by 16% over the past 4 years. He's now analyzing the program's impact on attrition rates.

—R.K.

classes.” But joining the Scholars program “gave me a sense of community and helped advise me on how to get where I wanted to go in science.” This fall, Campos will enter a Ph.D. program in biology at the University of Washington, Seattle.

Good intentions, scant data

UMBC and UC Berkeley often figure prominently in discussions of how to bolster the numbers of minorities entering STEM fields. It's a perennial topic among those who worry about whether the United States is producing enough scientists and engineers. Michael Summers, a biochemist at UMBC who has been active in the Meyerhoff program, wondered why more universities haven't been able to match its success.

Summers took his concerns to HHMI, which supports Summers' lab as an HHMI investigator. With help from the institute and contributions from the National Institutes of Health, Summers and colleagues invited diversity specialists from 75 research universities and leading 4-year colleges to discuss undergraduate STEM diversity and retention.

Summers recalls that many administrators who attended the group's first meeting in 2004 at Harvard University “were shocked at how low STEM retention was among disadvantaged students” and by how few institutions actually tracked dropout rates from STEM fields. They vowed to do better. Educators met again in 2007 and 2008 to report on their progress, including the status of new programs.

But Summers says few have developed good empirical data. “Most institutions don't track their students and thus don't know their own performance when it comes to retaining and educating underrepresented minorities,” he says. And it will take years to collect and analyze the data at institutions that have begun to do so.

One problem, says John Slaughter, president of the National Action Council for Minorities in Engineering in White Plains, New York, is that most universities that care about diversity have concentrated on entry points rather than completion rates. “We need to focus more of our attention on outcomes like retention and graduation rather than simply enrolling more minority students,” he argues.

Another issue is the paucity of good studies of what Matsui calls “the sociology of science diversity.” Conventional wisdom values summer bridge programs for incoming freshmen and the chance to do undergraduate research, for example, but Matsui says “we need more rigorous study to understand what works, for which students, and under what conditions.” Such comparisons are hard to make when most programs preselect students, notes social psychologist Martin Chemers of UC Santa Cruz, who adds that the lack of control groups hinders empirical studies.

A third problem is the absence of data on what happens after students graduate. “We have no idea whether most of these programs are working or not,” says Willie Pearson Jr., a sociologist at the Georgia Institute of Technology in Atlanta who studies science education. “There's a great need for follow-up data.” The National Science Foundation hopes to address that need, says Kellina Craig-Henderson, a manager within NSF's cognitive sciences program, with an initiative, labeled “The Science of Broadening Participation,” that would fund research on effective programs and how they can be scaled up.

Different approaches

The UMBC and UC Berkeley programs take different paths to help their target populations. UMBC recruits high-achieving



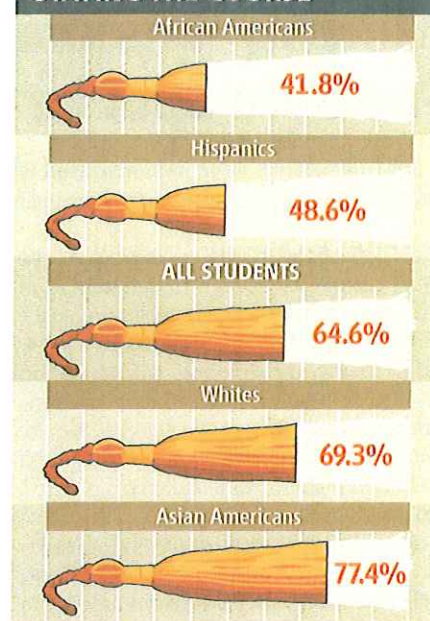
Success in situ. Yohance Allette says the Meyerhoff program has helped him stay in biology.

high-school seniors, two-thirds of them underrepresented minorities, gives them generous financial aid, uses a summer bridge program to create group cohesion, plunges them quickly into research, and surrounds them with mentors. Rather than focus mainly on what he calls “high flyers,” Matsui looks

for “those on the margins, who will succeed if given the right environment and opportunities.” The UC Berkeley program offers mentoring and group cohesion but does not include a summer program, offer a separate stipend, or require freshmen to do research.

Meyerhoff's results are impressive. Seven of eight graduates (more than 650) have earned degrees in STEM fields, and they have gone on to receive 53 Ph.D. degrees, 74 medical degrees, and 21 combined degrees. Hrabowski says that makes UMBC, with an enrollment that is 14% African-American and 3% His-

STAYING THE COURSE



Elusive degree. A minority of African-American and Hispanic students who begin as science majors actually graduate with a STEM degree.

panic, “one of the few predominantly white universities producing significant numbers of African-Americans who go on to get Ph.D.s.”

UC Berkeley's program, which has helped 2000 students, can't match those retention numbers: So far, about 70% of BSP students have graduated with biology degrees. Matsui is proud of having created what he calls a sense of community among students, advisers, and “culturally sensitive” faculty members. “The network of close-knit students and mentors gives you a basis to succeed,” says UC Berkeley senior Dannielle McBride, an African American who joined Matsui's group after four part-time years at a community college.

Although they disagree on some of the necessary ingredients, Hrabowski and Matsui are both passionate about collecting and analyzing data to evaluate and improve their programs. They are also eager to share their knowledge with other universities. “We place a great deal of emphasis on evaluation, and other institutions should also,” says Hrabowski, who chairs a National Research Council panel for the National Academies that is assessing minority STEM education.

Allette, a rising senior who hopes to earn a combined M.D.-Ph.D. degree, says programs like Meyerhoff provide students with the support they need to persevere. “The challenge for science majors is not so much, ‘Do I want to do it?’ as ‘Can I do it?’ Once you are confident of success, you can go far.”

—ROBERT KOENIG