Twenty-third David Dodds Henry Lecture: Supporting the Talented Tenth: The Role of Research Universities in Promoting High Achievement Among Minorities in Science and Engineering by Dr. Freeman A. Hrabowski, III

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November 5, 2003

DAVID DODDS HENRY

President, University of Illinois
1955–71

The David Dodds Henry Lectures in Higher Education are endowed by gifts to the University of Illinois Foundation in recognition of Dr. Henry's contributions to the administration of higher education, including his career as president of the University of Illinois from 1955 until 1971. The lectures are intended to focus upon the study of the organization, structure, or administration of higher education, as well as its practice. The selection of lecturers is the responsibility of the chancellors of the three campuses of the University. Presentation of the lectures is alternated among the Chicago, Springfield, and Urbana-Champaign campuses.

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EDITOR'S NOTE: *This text has been updated from the original lecture in 2003.*

Welcome

I would like to welcome each and every one of you to the 23rd David Dodds Henry Lecture. It's an honor that really branches three ways. First, the lecture series honors our own David Henry, one of the most remarkable and enduring figures in the history of this University and mid-century American higher education; second, the lecture series honors those who are selected to present the most contemporary and insightful thinking within the broad topic of higher education; and third, the lecture series honors all who fill this room today or who will read about the lecture next year or 25 years from now. So, your participation signals your intellectual commitment to seeking meaning in higher education well beyond some issue of the day or some crisis that happens to be brewing tomorrow.

David Henry, who had a fine mind, powerful political skills, and a very large vision, was president of the University of Illinois from 1955 to 1971. He welcomed the Baby Boom to our campuses; he held firm against what is now called the "Red Scare;" he managed a partnership with His Honor Richard Daley to create a new campus on Chicago's near west side; he led the national effort to create and then broaden public television; he led a national effort to redefine graduate education; and he was also a national leader in American higher education. He believed that the administration of higher education was a specialty and, I quote, "whose study is as exacting in knowledge as medicine, as essential to effective operation as law, and as sensitive to human relations as government."

The Henry Lecture is a fitting tribute to Dave Henry, who left indelible marks on this University and on American higher education and culture and, again, I am very honored to welcome each of you in his memory.

Now I'm very happy to introduce Nancy Cantor, chancellor of the Urbana-Champaign campus. Dr. Cantor is a noted psychologist and has been chancellor at this campus since summer of 2001. Under her leadership, the campus has identified ten cross-disciplinary areas of emphases in research, teaching, and public engagement for strategic investment. In this very difficult fiscal environment, Nancy has applied her persuasive powers to maintain momentum on this campus with very limited resources. Nancy Cantor came to the campus from the University of Michigan, where she was provost, and previous to that had been a chair of the Psychology Department at Princeton. Dr. Cantor received her bachelor's degree from Sarah Lawrence University and her doctorate from Stanford. Chancellor Cantor will introduce today's speaker for the 23rd David Dodds Henry Lecture. Please welcome Chancellor Nancy Cantor.

James J. Stukel
President
University of Illinois

Preface

Thank you, Jim. Well, it is such a delight to be here and to introduce a remarkable, personal friend as well as a deep friend of this University who is, in his own right, as inspiring as David Dodds Henry was.

Freeman Hrabowski is the president of the University of Maryland, Baltimore County (UMBC). We are thrilled to say he holds two graduate degrees from this campus. I can't tell you how many people in the last two days have just been coming up to me, telling me how inspired they are to see what an Illinois grad can do to make a difference in the world, in the economy, and really, in pulling the academy and the world together.

It is a particular honor for us to be able to welcome Freeman back to campus this year, as we have a year-long commemoration of the 50th anniversary of the Supreme Court's *Brown vs. Board of Education* decision. As some of you know, Freeman grew up in Birmingham, Alabama, where he was a witness to the cruelty and violence of racial segregation, discrimination, and stereotyping. He has dedicated his extraordinary intelligence, his life, and his career to finding ways to open the doors to opportunity that were, literally and metaphorically, nailed shut for most African-Americans during his youth.

Freeman Hrabowski was only 19 years old when he graduated from Hampton Institute with highest honors in mathematics and came to Urbana-Champaign, where he received his M.S. in mathematics a year later. He then studied higher education administration here and received his doctorate from the College of Education at the age of 24. He brought with him his experiences in Birmingham; some did violence to the body, some to the soul. When he was in second grade, I'm told, he tore the cover off a textbook and discovered on the original cloth cover the name of a white

school across town. The book was a cast-off and he was upset. His teacher told him not to worry about that book, just "Get the knowledge and you'll be fine." And that's the message I most think that Freeman is bringing to youth today. That is, get the knowledge and you'll be fine and then we'll be fine because we will indeed be using all the talent in this country that we could be using. We will be opening those doors to opportunity.

After receiving his doctorate here at Illinois in 1974, Freeman never once looked back, nor did he ever forget the experiences of children of color across this country for whom the books were cast-offs and the doors were nailed shut. Two of his own books with Oxford University Press focus on parenting and high-achieving African-American children. *Beating the Odds*, published in 1998, looks at success among boys, and *Overcoming the Odds*, published in 2002, examines special challenges for parents of African-American girls.

At UMBC, he has been extraordinary in building the Meyerhoff Scholars Program, which is the national model for identifying, recruiting, and training future African-American scientists, engineers, and mathematicians. He is an extraordinary change-maker. The *Baltimore Sun*, in 1999, commented on how at the outset of the Meyerhoff program, it came up against the stereotypes portraying African Americans as being unable to do science, math, and engineering. The *Baltimore Sun* pointed out that Freeman had started a new stereotype at UMBC, one that said, and I quote, "that all African American men on campus were high achievers." And, indeed that's true. Stereotypes have kernels of truth, right?

There isn't a day that goes by that doesn't find him consulting to some major professional organization such as the National Science Foundation, The National Institutes of Health, or the U.S. Department of Education. He has been richly acknowledged for his extraordinary accomplishments,

holding membership in the American Academy of Arts and Sciences and the American Philosophical Society. He's received many awards, including the U.S. Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.

What I think is most remarkable about Freeman Hrabowski is that he absolutely lives and breathes (you hear it within five minutes of talking with him) ... the intertwining of diversity and excellence. To him, this is about creativity. It's about bringing as many different perspectives, views and experiences to the table as possible because nobody can do it alone, and together we are so much better off. That's exactly what we try to do on this campus every day. So it's such an inspiration to have Freeman come and to show us how we can create an intellectual climate that values different perspectives, one that welcomes different senses of what questions should be asked, engages in debate over just what the problems are to be solved, and collaboratively determines what good solutions would be. Because that's really the environment that intellectual and social diversity on a college campus build, like nothing else does. What Freeman's work is doing every day is opening those doors of opportunity that had been nailed shut and, indeed, as the data show, still are often nailed shut across this country, even 50 years after *Brown v. Board*.

Since he has been so energetically prying open those doors, taking out those nails, we can learn from that. And it is, therefore, with such real excitement, that we anticipate hearing what Dr. Hrabowski will tell us about the role research universities can play in promoting diversity and excellence and their intertwining.

Nancy Cantor
Chancellor
University of Illinois, Urbana-Champaign

Supporting the Talented Tenth: The Role of Research Universities in Promoting High Achievement Among Minorities in Science and Engineering

Dr. Freeman A. Hrabowski, III
President
University of Maryland, Baltimore County

Thank you very much, Nancy. That was quite an introduction. I'm not sure where you learned about that second grade experience, but we can see why she is chancellor. She does her homework. That's very clear.

Let me start by thanking President Stukel, Chancellor Cantor, and Provost Herman. Jim, Nancy, Richard, and I had a great conversation last night talking about some of these issues.

As I speak today, I want you to think about the meaning of the word "support." Think about the ways in which we support our students and our colleagues. When I walked in, I saw people who are part of my extended family—people who supported my wife and me when we were newlyweds here in 1970. We were very lost in this community and were able to go out into the city, to go and get meals and to be supported by these people. In very special ways they would say, "We're proud of you." And here today, I see people who were graduate students with me then who are parents of graduate students now. So I see amazing continuity here in special ways.

I want to thank you, Nancy and Jim, for your vision for making this a year of celebration, commemoration, and of continuing discussion revolving around the *Brown vs. Board of Education* decision. It is a special statement about this University. I am also honored to be among such an impressive group of people who have given the David Dodds Henry lecture in the past.

And I suspect that I am one of a small number (if not the only one) to have been both a student of Professor Henry and an alumnus of the University.

Several things stand out in my mind about Mr. Henry. First, he was very careful not to use "Doctor." I remember that. He was very much of the old school in a very special way. I clearly recall that he was dissatisfied with the writing of most of the students in our seminar, including my own. He continually emphasized the connection between thinking and writing—that clear writing reflected clear thinking. This isn't too surprising, as his field was English. I still remember his careful use of language as he drew upon his breadth of experience in the academy and challenged us to think critically about a number of issues in American higher education.

A number of my private conversations with him reinforced the importance of being deliberate in attacking complex problems and the need to consider different perspectives before drawing conclusions. I would sometimes listen to him and he was very careful (those of you who knew him will remember this) in talking about these matters, and what was very clear was that you were getting wisdom. It was very much the same way that today's students must feel studying under Stan Ikenberry. They have the sense that, "Here is somebody who knows what he is talking about." In Mr. Henry's seminars and in our conversations, he offered criticism in such a way that students knew he had their best interests at heart.

My experiences in the early 1970s as a graduate student here have proven helpful to me throughout my career. In fact, much of my thinking about the topic today was shaped by those experiences—not only through coursework and research, but also as a result of living with undergraduates as a residence hall director, later directing the Upward Bound program for high school students, and working with the University's Educational Opportunity Program.

Jo Ann Fley, a special professor of mine who is here today, has been a mentor for more than three decades. She, too, encouraged me to develop my communication skills (there are some themes here, if you keep listening) and to think broadly about my future. I remember well her course on the history and development of American higher education, and I want to thank her for her guidance. Nancy, I am going to send you a letter that she sent me 12 years ago when I became president at UMBC. One of the points of that letter, which many of you will appreciate, was, "Don't ever begin to take yourself too seriously. Don't begin to believe all the press they try to give you." In terms of my formal work in the higher education program, my administrative internship under Bob Waller, who was associate dean of the College of Liberal Arts and Sciences, provided me with very practical experience in academic administration that continues to serve me well.

As a student here, I spent many hours talking about issues involving minority student achievement with both Clarence Shelley, who was my boss at the time, and Gretta Hogan, who is also here today, my colleague in the Upward Bound program. What was significant was that we were grappling with questions about the academic performance and psychological adjustment of black students. One of the experiences that was so important to me that I have come to appreciate more and more with time is that Gretta and I—as we worked with students from high school and with undergraduates here—were often talking about the language skills, reading skills, and math skills of students at the high school and the college level. We were often talking about the attitudes and values of these students. Our question was, "How do we give these students the kind of support that will help them to strengthen their academic skills, to strengthen their sense of self and, in fact, to believe that they could make it?" To have that special sense that, "I can do this"—that's very important. In the process, as we evaluated

the program, as we wrote grants, I found myself learning, quite frankly, at the feet of Gretta Hogan. Because she was also constantly attacking my writing—not criticizing it, but saying, "Think clearly"—she was forcing me to learn to think critically and clearly and to use simple English and simple language that would convey the message and give the kind of assessment that would lead a potential donor to say, "This is a good idea. They're doing the right thing. They've thought about what they want to accomplish." Those skills, developed at that time in the Upward Bound program, with EOP, and in the residence halls, are exactly the skills that have proven most helpful to me over this past 30 years.

Since leaving here 30 years ago, I have continued to connect to the University through people who have been extraordinarily helpful in my career—from former President Stan Ikenberry, who invited me to serve on the board of the American Council on Education, to Donald Langenberg, who became chancellor of the University of Maryland System after serving as the chancellor of the University of Illinois-Chicago.

For the past three decades, then, as I have been focused on ways to strengthen minority student achievement, my thinking has been rooted in the idea of the "The Talented Tenth," which was expressed a century ago this year, in 1903, by the scholar W.E.B. DuBois. In his treatise, *The Souls of Black Folks*, DuBois wrote this:

> Can the masses of the Negro people be in any possible way more quickly raised than by the effort and example of this aristocracy of talent and character? .... [I]t is, ever was, and ever will be from the top downward that culture filters. The Talented Tenth rises and pulls all that are worth the saving up .... This is the history of human progress .... How then shall the leaders of a struggling people be trained and the hands of the risen few strengthened?

> There can be but one answer: The best and most capable of their youth must be schooled in the colleges and universities of the land .... A university is a human invention for the transmission of knowledge and culture from generation to generation, through the training of quick minds and pure hearts, and for this work no other human invention will suffice ....[1]

Writing more than 70 years later, in 1975, and having served for 16 years as president of the University of Illinois, David Dodds Henry expressed much the same vision for higher education. He wrote:

> An influential force for constructive action in its entire history has been the widespread belief that higher education or advanced learning, including research, is the 'engine of social progress.' Sometimes the belief has been a matter of faith and conviction; sometimes, it has been based upon the evidence of cause and effect. In either case, acceptance of the thesis has been the motivation for public policy in encouraging both institutions of higher education and the individual's pursuit of learning .... [T]here can be little doubt that higher education has survived periods of stress and crisis and gone on to new levels of achievement because the public has been aware of the interaction between higher education and social progress. [*Let's hope they remember this during these times, right?*].] In national emergencies of depression and war, the people have turned to organized higher education, its faculty and its graduates, for assistance. Even egalitarians, critical of the uneven distribution of benefits to individuals arising from advanced education, have accepted the essential elitism inherent in the search for talented students when it is accompanied by equality of opportunity and social justice for the individual.[2]

MINORITY ACHIEVEMENT AT THE UNIVERSITY OF ILLINOIS—PROJECT 500

Recently, the *Chicago Tribune* published a series of articles[3] on the University of Illinois Project 500 as an experiment in affirmative action, a program (that) began towards the end of Professor Henry's presidency. The articles reported on the history and success of that program and focused especially on the challenges that both the University administration and students faced during that period. Clearly, it took courage on the part of the University, under some pressure of course, to recruit and educate students who were in many cases not prepared academically or emotionally for this academic setting. It also took courage on the part of those students to accept the University's invitation to study here.

On a personal level, I recall working with a number of these students in the program, both those who thrived because of strong backgrounds and those who were not prepared to handle college-level academic work and, therefore, struggled simply to pass or who left discouraged. In retrospect, it is remarkable that so many of them succeeded. My experience with these students led me to understand what sometimes happens to minorities and to others whose academic preparation is significantly below that of the majority of students. We find that the environment or their experience in it shakes their confidence and leaves them feeling less able—and sometimes even less motivated—to overcome obstacles. This is especially true for students in science, math, and engineering—disciplines in which academic background is by far the most critical factor in success. It is virtually impossible, for example, to move from a weak pre-calculus background to successful performance in engineering.

Since the late 1960s, the University has been working to develop programs and practices to increase minority enrollment and success in science and

engineering. These efforts have ranged from the undergraduate Chemistry Merit Program to the graduate SURGE (Support for Under-Represented Groups in Engineering) Program. It was helpful to read reports about these and other programs and to see that you have been conducting analyses with the level of specificity necessary to understand which groups, in particular, are having difficulty or success at both the undergraduate and graduate levels. One of the characteristics of successful programs is that they take the time to evaluate both their effectiveness and their failures. It is essential to understand the impact of special initiatives and to revise strategies as necessary.

I had great meetings yesterday with people in the College of Engineering, both with chairs, with Dean David Daniels, and with students. One of the points I made was that we're finding that it's very important to look at who succeeds in each group. What are the characteristics—academic characteristics and other characteristics—of those students who have succeeded in Engineering at U of I? Let's look at all students—black, white, Asian, Latino, male, female, undergrad, and grad—and see what can we learn from their academic records. What can we learn from actually talking to them that might be helpful in developing, revising and strengthening what we do?

As Clarence Shelley has suggested, in that article in the *Chicago Tribune*, few people in the early 1970s appreciated the impact of Project 500 on public policy and on the University's definition of itself. Yet, like Illinois, American colleges and universities are still grappling with the challenge of bringing students of color into the mainstream of higher education and helping them to excel. And, like this institution, many others have come to understand that academic background should be a critical factor in making admissions decisions for all students. Sound decisions help to ensure that

admitted students have a solid chance of succeeding and ... that limited academic resources are invested wisely.

The challenge we face as we look at traditional measures—measures that are important—is to make sure we are looking at K through 16 initiatives to the extent we're not simply getting people who are the most advantaged in our society. We must ensure that we find ways to increase the number of young people from low-income backgrounds, black, white, and Latino, who are able to do well enough to succeed at the institutions. It's a balancing act. We must make sure the people we admit are people who can succeed. On the other hand, we must make sure that those admitted are not simply people from the most advantaged economic classes. This is an issue that public institutions face around the country.

As I read the *Chicago Tribune* articles, I could not help but think about my own experience here. I came here from Hampton University, where my excitement about mathematics was largely the result of a U of I graduate, Professor Geraldine Darden, who suggested to me that I continue my studies here. When I arrived, I found that I was prepared for the academic work, but I was not prepared to feel so isolated in classes—usually as the only African American student. In fact, my efforts to work with other students failed because no one was comfortable working with me. And I would tell you I was a southern kid ready to speak to everybody. It was very different from this culture, as many of you know. And that wasn't just because I was black. It was just a very different culture. It was clear that people were not mean-spirited so much, but they just weren't comfortable. But, even though there were study groups, it still meant nobody worked with me.

So I worked on my own and did well, but I had no one to talk with about the work. This is important in any discipline, but particularly so in mathe-

matics and in engineering. I did not ask questions in class because I learned very quickly that students rarely asked questions. In my second year, after seeing the problems that minority students were facing here in math and science, I established an informal mathematics tutoring center ... in Babcock Hall in Pennsylvania Avenue Residence Halls. This center supported students in a variety of math courses as well as students in the social sciences and statistics. It was amazing to me the type of synergy that developed among those students and the ways in which they were encouraging each other. I was learning lessons during all of this time. While I continued to enjoy math through the master's program, my sense of isolation made it difficult for me to imagine spending another four or five years by myself in the department.

I recalled an experience from my youth, during a National Science Foundation summer program at Tuskegee University, where I had met an African-American mathematician who was also a dean. I was so impressed by him that I decided, "That's what I'm going to do. I'm going to teach math and be a dean." This was when I was 13, by the way. I met this man who had a Ph.D. and I was so impressed that I said, "I'm going to be like him." So, every day, every morning, at age 13, this fat, little kid (and I was a fat, little kid) would look in the mirror and say, "Good morning, Dr. Hrabowski." Every day, I did that. I never told anybody because they would have thought I was crazy, and my wife will verify that. When she first met me, she did think I was crazy. She said, "What are you talking about, you're just starting grad school?" But, I'd get up and I'd say "Good morning, Dr. Hrabowski." It was amazing. But I saw it. I really did see it.

This was about the time, when talking with colleagues, that I learned that the president of the U of I at the time, Dr. John Corbally, had a Ph.D. in

Education Administration. I went to that department in the College of Education to learn about possible opportunities. I was told that I was too young to study administration. I was told to go out and get some experience first. But, I was determined to try it, so I started talking with lots of people. I talked about my interest in math and science and issues related to these fields in colleges and universities. My big question, quite frankly, was, "Why is it that there are no other people who look like me in any of the classes?" This was the question I wanted to study, and it was obvious that the people I spoke with about it were impressed. It probably also helped that I said I would be willing to focus on the statistics courses in Educational Psychology and that I would take all the courses available in that area. So, I always say I have a background in statistics in the social sciences. What was really exciting was that I ended up teaching Maurice Tatsuoka's graduate statistics course, and it was one of the high honors of my life that he trusted me with that responsibility.

I decided during that time to focus my research on minority student performance in math, science, and engineering. I focused heavily on the issue of performance of minorities coming from historically black colleges and universities versus those coming from predominantly white universities. It was an interesting study, looking at the students on this campus, at graduate students and their sense of self, their academic preparation, and their ability to adjust to this environment.

For the past 30 years, I have spent much of my professional career, in terms of research, addressing that issue and helping minority students excel in these areas. The Meyerhoff Scholars Program for high-achieving minority students on our campus, and now for others also interested in those issues, represents a dream being fulfilled. What I will talk about today will be my experiences and what I've learned from that program.

Let me begin by saying that people in the academy in general simply don't understand how difficult it is to talk about substantially increasing the number of African Americans and Latinos in mathematics and sciences programs. We have been spending literally hundreds of millions of dollars in recent decades and we have not substantially changed the figures. I am suggesting, as I talk today, that here is one approach that seems to be working and that is getting quite a bit of national attention.

NATIONAL CONTEXT

Recently, Clemson University convened a conference to celebrate the 40th anniversary of higher education's desegregation in South Carolina. The conference's theme, "Best Practices in Black Student Achievement," focused on academic achievement and on strategies designed to increase black students' retention and graduation rates. Like Illinois, many colleges and universities began major desegregation efforts in the '60s by admitting black students. Today, what we find is that more than 80 percent of all black college students are enrolled in predominantly white institutions, and about three-quarters of all bachelor's degrees earned by blacks are awarded by these schools.[4] The issue of minority student achievement has become increasingly important because underrepresented minority enrollments now include not only African Americans but also many more Latino and Native American students, and all of these groups trail significantly behind their white and Asian American counterparts in terms of high school completion, college participation, and college graduation rates.[5] All we need think about to appreciate the significance of this work is the fact that very soon one in every four Americans will be Latino.

Colleges and universities are regularly sending representatives to visit my campus because of our success in preparing high-achieving minorities in a predominantly white setting, particularly in the disciplines of science and

engineering. Our experience is especially noteworthy given the nation's growing diversity and the recent attention on affirmative action. In *The Shape of the River,* which many of you have read, former Princeton and Harvard Presidents Bok and Bowen convey the essence of these compelling issues.

> The reasons why diversity has become so important at the highest levels of business, the professions, government, and society at large are readily apparent. By the year 2030, approximately 40 percent of all Americans are projected to be members of minority groups. It will surely be more difficult for government officials to produce enlightened policies and harder still to enjoy the confidence of the minority community if an overwhelmingly white cabinet and Congress are making the decisions affecting the lives of such an increasingly diverse, multiracial society. Similar considerations apply to business .... In this environment, a diverse corporate leadership can be valuable both to understand the markets in which companies sell and to recruit, manage, and motivate the workforce on which corporate performance ultimately depends .... In addition, business executives often stress another reason for seeking diversity at all levels. Ultimately, they say, corporations will not be healthy unless the society is healthy, and a healthy society in the twenty-first century will be one in which the most challenging, rewarding career possibilities are perceived to be, and truly are, open to all races and ethnic groups.[6]

In this case, what is good for corporations is also good for universities. In fact, the Supreme Court's recent ruling on affirmative action at the University of Michigan, one in which Chancellor Cantor has been very involved, reaffirmed the importance of diversity by allowing the "narrowly tailored

use of race in admissions decisions to further a compelling interest in obtaining the educational benefits that flow from a diverse student body."[7] The ruling is especially relevant to high-achieving minority students who want to attend the most selective institutions, which produce many of the nation's leaders. Justice Sandra Day O'Connor issued a powerful statement on this point: "In order to cultivate a set of leaders with legitimacy in the eyes of citizenry, it is necessary that the path to leadership be visibly open to talented and qualified individuals of every race and ethnicity."[8] But she also expressed the expectation—and this is really important—that "... 25 years from now, the use of racial preferences will no longer be necessary."[9] And she meant well, based on her experiences. But here's the challenge. Going right back to the Upward Bound days for me 30 years ago—anyone looking at the reading and math skills of minority children or poor children in our country and at the requirements of the nation's No Child Left Behind Act with all of its challenges, realizes that this goal will challenge us all. Nearly 50 years after *Brown vs. Board of Education*, patterns of segregation continue for too many black and Latino children, most of whom attend schools that are underfunded, are underachieving, and unequal. The question has to be, quite frankly, what is it that's going to change to make the situation different 25 years from now than it is today or than it was 30 years ago?

To place Justice O'Connor's expectation in perspective, we should ask ourselves several questions: First, how do we strengthen K through 12 education for America's minority students and what role should universities play in that process? Second, how can we help the highest achievers among underrepresented minorities become more competitive even on traditional measures (e.g., grades, test scores, representation in gifted and talented classes)? Finally, how do we develop and implement strategies to

increase the presence of minorities at the highest levels of society in terms of achievement, whether we're talking about university professors or the best doctors and lawyers? I would suggest only by creating and supporting a larger pool of high-achieving minority students can we ultimately increase the number of faculty of color in our colleges and universities and the number who become leading professionals in their career fields.

I recently spoke at the 50th anniversary of the Howard Hughes Medical Institute (HHMI). The event featured a number of really impressive people including Elias Zerhouni, the head of the National Institutes of Health, and Tom Cech, a Nobel Prize winner and the head of HHMI. The audience consisted of some of the leading scientists in the country. But, interestingly enough, I looked into the audience and it was composed of maybe 10 percent women, perhaps 15 percent at the most, all of whom were Howard Hughes Investigators who were also members of the National Academy of Sciences. But we know we still have a way to go with women, first of all. There was absolutely nobody there, nobody, who was black. In fact, as I said to Tom Cech, in math terms if you take the set of Academy of Science members who were black and the set of Howard Hughes Investigators who were black and you put them together, the intersection would be the null set. There is nobody. That's how far we have to go.

Reaching the Top,[10] the College Board report that came out a couple of years ago on high academic achievement among minorities, pointed out that the greatest disparity in academic achievement between underrepresented minorities and their white and Asian counterparts is in mathematics and the sciences and related areas. This persistent gap, coupled with steady and dramatic demographic trends, poses serious challenges not only to our colleges and universities but also to our entire society.

So, what have we learned about colleges and universities, about what they can do to increase the number of underrepresented minorities who excel in science and engineering and to encourage them to remain in the field? We're talking about graduating more, but the real question is: "How have they done?" I have godsons and goddaughters who have gone to the best engineering schools in the country, and when they finish they say, "Whoo, I don't want to see engineering ever again. I'm going now for an MBA." So, while their universities have ensured that they have a strong technical background, they've done nothing to increase the number of engineers, faculty members, or researchers in the world. So, for selective universities such as Illinois or my own campus, I contend that we must focus not simply on improving retention and graduation rates (which is, of course, the first step), but we must also ensure that these students excel in the course work, that they gain substantive research experience, and that they go on to graduate school and ultimately into research careers.

National agencies have been working to strengthen minority science and engineering achievement for decades with moderate success at the undergraduate level and relatively little success at the grad level. Look at the numbers. Since 1990, the percentage of underrepresented minorities earning bachelor's degrees has gone from 10 to 12 percent; that's where we are. *All* underrepresented minorities—blacks, Latinos, and others—in 14 years have gone only from 10 to 12 percent. That's as much progress as we've made. They still account for only about 3 percent of the engineering doctorates and 4 percent of all science doctorates.[11] This is after we've worked really hard to increase those numbers. So what works? What can we say?

IMPLEMENTING A VISION OF MINORITY STUDENT ACHIEVEMENT

At UMBC in the late 1980s, we found that most African Americans were not performing well academically in science and engineering and, as a result,

many had become bitter. Keep in mind, on my campus, 60 percent of the undergraduates and 80 percent of the doctoral students are in science and engineering areas, and almost *everyone* comes with the intention of majoring in those areas. In response to this situation, and to the national paucity of minorities in these disciplines, and with a major donation from Baltimore philanthropists Robert and Jane Meyerhoff, we created the Meyerhoff Scholars Program in 1988.

Let me give you an idea of how difficult this challenge of increasing the number of those excelling seemed. When we started, even I, as an African American, was not sure that we could have a major impact on the number of students who would actually excel in these disciplines. Why? Because I hadn't seen it. In fact, my research showed that there was not a predominantly white institution in the country that has seen this type of success for African American undergraduates at this level in science and engineering. We have not done it for them nor, for the most part, for Latino students either. Most academics, in fact, have not experienced a climate in which large numbers of students of color, other than Asians, earn As or high Bs in most science and engineering courses. Clearly, our expectations are heavily influenced by what we've seen, and my colleagues, most of whom are white, have been working for decades with minority students, the best of whom might get a C in an organic chemistry or a genetics course. Usually, the only high-achieving black students that they've seen have been Africans from a British or French educational system.

If they're from other countries, it's very different. If they're Jamaican or if they're Nigerian, they've had a superior educational system. But, if they've come from Chicago, or from Baltimore, or from Urbana-Champaign, rarely is it the same case. Also, we in higher education, unfortunately, have tend-

ed to focus more on minority students' deficiencies rather than on their strengths. And while much of the discussion in education revolves around addressing achievement gaps, we also need to ensure that high achieving minority students—the "Talented Tenth" as DuBois suggests—will continue to achieve at high levels.

Such efforts have produced profound changes in the culture of our campus. We have focused on creating a climate that attracts the best minority students, that sets high expectations of them, and then helps them to succeed. I should mention that we've worked with two Upward Bound programs to make sure that we are not just recruiting students from advantaged backgrounds. In fact, at least 40 percent are first-generation college students.

At UMBC, our senior faculty (and this is the most important point I can make) in the sciences and engineering constantly think and talk about minority achievement issues, and they actively involve these students in their laboratories. Working in the labs from the first year gives students the chance to connect theory to practice, to reflect on their experiences, and genuinely to understand both the frustration and the great excitement of research. These efforts have required steady leadership in wide-ranging areas. It has been our faculty members who have worked collaboratively to embody this vision of UMBC as a place where students of all types—men and women, white or minority—can come and do well in science.

With approximately 12,000 students and increasingly selective admissions, UMBC enjoys this diverse student population where the largest minority group is Asian, but where we are talking about large numbers of students of all backgrounds succeeding in these disciplines. What did we do? In order to create a supportive environment for minority students, the campus leadership—and that was faculty and administrators—concluded that we

first needed to think about providing effective support for *all* students. Toward that end, we raised several basic, very important questions about the general student body in science and engineering. What were the academic backgrounds of our students? How were they doing academically? What were students' perceptions about coursework and the available support? Did they feel isolated? Did students know how to succeed? Did they understand what was required in terms of study habits? Were they involved in tutorial sessions? Were they communicating effectively with faculty?

We found, unfortunately, that large numbers of our students of all races were not doing well in science and engineering, so it was not simply a minority problem. Rather, this is an issue that American colleges and universities all face in general: the majority—well over half of all the students who come to Illinois or to my campus—have tended not to do well in chemistry or in engineering. As I spoke to the students yesterday, what was very clear was that there was a need for people to talk about those experiences and about what could be done to improve them.

At UMBC, we found answers to many of these questions through a series of focus groups with students and faculty and staff. Based on what we learned, we developed strategies for giving more support to these students. We went through a long series of activities. But, I want to share one in particular that will give you a sense of how differently we had to think. We wanted to encourage group study and to help our students to learn the importance of going to tutorial sessions. On most campuses, *tutorial centers are seen as places you go when you're having trouble.* We worked to change the culture in such a way that the chemistry tutorial center *has become a place where people go when they want to excel.* So now, on our campus, everyone works to get into one or more of those tutorial sessions.

Our vision was to create a cadre of well-prepared minority students who could become leading researchers. While we were working to strengthen their academic performance, we also needed to work on building institutional research and training capacity. This meant working as partners with agencies and organizations, with NIH, NSF, corporations, and others. As a result, we have been able to attract hundreds of millions of dollars which have helped us to expand our facilities and dramatically build new capacity.

THE MEYERHOFF SCHOLARS PROGRAM—OUTCOMES, LESSONS LEARNED, AND BEST PRACTICES

The gift from the Meyerhoffs was, at first, $500,000, and they have since given us over $8 million. Additionally, we raise about $2 million a year for that program. Currently, we have about 250 Meyerhoff Scholars enrolled. We have graduated between 300–350 students from this program. Here's the best part: we generally see over 90 percent of these students go on to graduate school. We are the leading producer among predominantly white universities of African American students going on to Ph.D.s, M.D.s, and M.D./Ph.D.s.

Let me briefly describe the components we developed that create this environment that continually challenges and supports these students. The components have been so successful that now we're using them with other students. You'll certainly recognize pieces of Upward Bound programs along with other things that I've thought about over the years, much of which I learned right here at U of I. The key components of our success at UMBC are these:

- Recruiting top students in science and math, culminating in an on-campus selection weekend involving faculty, staff, and students who take ownership of deciding who will be in the program. We get about 2,000 nominations; 1,000 will apply; we accept between 50 and 60.

- Providing a summer bridge program that includes math, science, and humanities course work and training in analytical problem-solving and group study and social and culture events.
- Offering comprehensive scholarships.
- Actively involving faculty in the recruitment, teaching, and research experience.
- Emphasizing strong programmatic values, including outstanding academic achievement, study groups, collegiality, and preparation for graduate or professional school.
- Involving students in substantive summer research experiences and, frequently, year-round research.
- Encouraging students to take advantage of departmental and University resources.
- Providing strong academic advising and personal counseling.
- Ensuring the University administration's active involvement and support in a variety of ways.
- Linking students with mentors—both black and white mentors—in science.
- Encouraging a strong sense of community among these students by regular meetings to talk about academic performance. If I were to say one thing I see across this country that's so unfortunate, it is that we've not taught students how to talk about how they're doing in classes. If you ask most people how they're doing, they will say, "I'm doing okay." People don't feel comfortable talking about where they are weak or where they're not doing well and how they can support each other.
- Evaluating the work with grants from The Sloan Foundation and NSF.[12]

These are the measures that have resulted in the kind of success that I have discussed. The significance of all of this is that we have found that success with undergraduates has led to our focusing much more attention at the graduate level. We're doing the same kinds of things—getting grants from NIH, from NSF, and others that will focus on building a community of learning. We're building interdisciplinary training programs that involve faculty and students sitting to discuss their research and much more. What we're doing is building a sense of community that keeps people from failing and that supports them along the way. That has led not only to grants, but also to others coming to look at what we're doing at the graduate level. One of the practices I would like to recommend to you is taking ownership of the issue and building trust. It is important for the administrative leaders and faculty to talk about these issues and to begin to understand, through an analysis of the data, who is succeeding, what is working, and what are the perceptions of people who have been through the program, both those who made it and those who did not.

Equally important is finding ways to create a climate in which there are partnerships for funding, because all of these things take money. The good news is that because of the gap in academic achievement among minorities and others, because of the gap in health care status, because of the challenges with the digital divide, there is quite a bit of money available. I should also tell you that because of our success with minorities, we are having even more success with women in science and engineering. We received a grant of almost $4 million to work on the improving the performance and support of women faculty in the sciences. We're working to change the climate and to change our thinking and to open our minds about the challenges that women faculty and researchers face in the institution.

The last practice that I think is very important involves making sure that we recruit outstanding faculty and students of color who can compete successfully in the environment. What we have found is that the more success we've had with able students, the more able students want to come to us. The more success we have with able faculty, the more inviting the campus becomes. We just recruited our first senior professor in physics who is black, which is a major coup for us. He will head a Center for Advanced Studies in Photonics Research. He's head of the American Optical Society. He came, he told us, because his vision is to do for us in the physical sciences what we've done in the biomedical sciences—that is, to produce this kind of excellence among all students in all disciplines. So providing strong institutional leadership and fully understanding that leadership means involving the faculty and the administration are simply crucial.

Let me go back to something that Nancy mentioned from my second grade experience. It was clear to me, throughout my career and throughout my studying here and other places, that the message from that second grade teacher was so very important. We have to teach students to appreciate the fact that they don't have time to be victims. They don't have the time to worry about whether somebody is discriminating against them. The point is: get the knowledge. We want to make sure that we're providing an environment where we support students and give them the kinds of habits and skills that will allow them to get the knowledge and to focus on that as power and on that as a way of transforming their lives. This is not easy. It requires sensitive and honest discussions about race and gender and the questions that people have about them, and that requires leadership.

Finally, I was honored this past year to receive Yale University's Edward Bouchet Leadership Award in Minority Graduate Education. Most of us

don't know Bouchet. We know DuBois. We think of DuBois as the first black Ph.D. in the country. Actually, DuBois was the first black to get a Ph.D. from Harvard, right before the turn of the century. But, Bouchet, my hero, was born in 1852, and he was the first African American to earn a bachelor's degree from Yale in 1874, Phi Beta Kappa. He was the son of a slave from Charleston, South Carolina. He was also the first African American to earn a Ph.D. in this country—in 1876. He was only the sixth person of any race to earn a doctorate in physics in the Western Hemisphere. His accomplishments, which came at a time when the nation was witnessing the end of Reconstruction and the emergence of Jim Crow, should serve as an inspiration to us all. We stand on the shoulders of giants like Bouchet, and on my campus, we are working hard to produce more "Bouchets."

Both David Dodds Henry and W.E.B. DuBois were convinced that universities are vital catalysts for change and social progress. Our challenge is clear: to keep changing and to continue making progress. And I am confident that you here at the University of Illinois, my alma mater, will meet that challenge.

In closing, we are all proud—very proud—to have learned about the professors here winning the Nobel Prizes in physics and medicine. This University has produced a number of leaders in our society. I see them all over the country. I now invite you to join my colleagues and me in producing many more leading research scientists and engineers who are minorities, and to share with us the vision that one day we will produce a minority Nobel laureate.

Thank you all very much.

Response, Nancy Cantor

That was so wonderful, and we have three fabulous respondents to Freeman's lecture, and then we'll have some time for questions. Our three respondents will be Dean David Daniel from the College of Engineering, Dr. Deborah Leckband, the head of the Chemical and Biomolecular Engineering Department, and Dr. Bill Trent, professor of Educational Policy Studies.

Response, David Daniel

Thank you, Freeman, for coming to our campus and for taking time to speak with us yesterday. I know that you hope that the time you spent here would have been constructive for us, and I can tell you that it already has been. From my perspective, I am someone who spends a fair amount of time talking to students who we hope will become future engineers. I tell them why it is so important that they stick with their studies and become engineers, and I also tell them why the profession of engineering is such a good one. But, I confess that I have difficulty expressing to people why it's such a wonderful profession if it's not one that is attractive and accessible to people of all kinds.

I think it's the word *leadership* that I take away from your remarks. When I talk to people I usually say we want more underrepresented minorities in the engineering profession. I think what I need to be saying is that we want more leaders from underrepresented minorities in the profession. That's one change that your visit here has helped me think about from my perspective. The question is: How do we, in this College of Engineering at this University, try to contribute to such a change? I think the problem breaks down in our view in classic ways to K–12 issues. We must get more people into the University of Illinois. I would say if there's a better place in the country to show improvement than this one, I don't know where it might be. We're the fifth most populous state in the United States; we have one of the world's premier Colleges of Engineering; we have a large, diverse, very well-qualified group of students in Illinois—SAT scores in Illinois rank third in the country. If anybody can do this, we ought to be able to do it well and we haven't done so. I think we really have an opportunity to take stock of why we've not attracted more minority students here and why

we've not done a better job in producing leaders from our program. So, I look forward to the challenge.

I also take away from your remarks some things to be nervous about. I actually feel better about a couple of things, and I'll tell you about those first. A couple of years ago, we created a new scholarship program in the College of Engineering called the SPECTRUM Scholarship. We did this because one of the obstacles to attracting more people of color to our college is availability of financial aid. That really is a practical burden for all kinds of people who have difficulty affording higher education. So we took about $500,000 of discretionary money in the College of Engineering and said we're going to provide the first full four-year tuition-free scholarship we've ever had in the College of Engineering, and it will be for people who will add diversity to our college. It was intended principally for women and underrepresented minorities, but we took a pretty open perspective on how we would define that. Dean Parker helped me put together a program and an announcement and, much to our surprise, almost without advertising this scholarship program, we had 100 applications. The really shocking thing to us was not the interest, but rather who applied. Of those hundred applications, we had 62 applicants in the top 1 percent of their class and three perfect 1600 SAT scores. The same thing happened the next year. We were kind of wondering what to make of all of this. After talking with and listening to you, I'm going to view this as a tremendous opportunity. You've challenged us to produce leaders—to produce people who will excel—and, in fact, the SPECTRUM Scholarship might be one mechanism for us to use as a leverage point to do just that—to focus on *the* most outstanding group of people who will excel at the most outstanding level. I don't think we, or at least I, have been thinking of it in quite that way.

Let me tell you about physics, here at the College of Engineering—and as I tell you this I know you're going to say, "Yep, I could have told you all that." We know that part of the issue is just loss of good people in the first two years, probably in all math, science, and engineering programs. In our programs, the first four semesters of physics are one of the areas where we tend to lose people. About six years ago, our physics faculty completely revamped the undergraduate sequence of physics courses. They created a much more team-oriented approach to teaching physics. They created discussion sessions. They engaged undergraduate students as learning assistants in those programs and they forced students to break their learning out in a team manner. Things, they thought, were going pretty well until they took a look at some of the statistics after they had redone the program in a much more positive way. They discovered that the failure rate for students in the first engineering physics course, Physics 111, averaged 15 percent. Eighty-five percent of the students passed, 15 percent failed. The rate for minority students was 65 percent failure and 35 percent pass rate. They wondered what to do about it, so they created a new course. I suppose you might call it a remedial course or a help course. You're going to say, "Yep, that's not the right way to think about it." In fact, though, it has been very successful. For all students who take this Physics 100 course, which is a preparatory course, we find that the fail rate is precisely the same rate as the overall fail rate. In other words, we level the playing field. Our problem is we have difficulty getting people into the Physics 100 course. All the students think they don't really need to take this course. So, we've created a Web-based course, or tests, so to speak, so students are all required to take the test. Then, they're advised on whether they ought to be taking Physics 100 or not. We actually start the Physics 100 a couple of days after they get their first exam back in the first physics course, so they can automatically

matriculate into the course. But you'll find the most interesting thing about this is that we've discovered that for the same performance on the qualifying test, those who take Physics 100 have an average of one grade higher in the first physics course when they get into the main sequence. While we've focused more on the failure rate and improving the failure rate, maybe we really ought to be selling this more on the success rate and focusing our discussion and our attention on the fact that people who get prepared properly perform better at all levels. So, I thought your comments, to me, were very powerful in helping me think about how we might do better in that physics sequence.

I am also struck by the challenge of including math in this. The fact of the matter is, in Engineering in the first couple of years, our main loss occurs with students taking courses in math and science. And really, this is a fairly limited number of courses, but outside the bounds of the College of Engineering. We're going to have to lock arms as a community within the campus to attack this problem in a comprehensive way and to think about it in the right way.

I now have a number of new thoughts on how we can do better, including the framework in which you suggested and challenged us to think in terms of excelling rather than just passing. I hope that's a fair characterization, and I think that's a wonderful way to frame the challenge and a wonderful way for us to think about doing better.

Thank you so much for taking time to share your experience with us.

Response, Deborah Leckband

I really wanted to applaud you for your efforts and for your success. This is really an enormous challenge. There were a number of things that really impressed me about the program (that) I thought were unique and that I hadn't really seen before in the programs here or at other universities. It seems to me that you have recognized that in order to really ensure the success of minorities and women in science, that we have to actually consider the whole person, what their history has been, and the social context that we're placing them into. I think that's special.

In particular, one of the issues that hinders universities, and I see this even within my department in Chemical Engineering, is that we tend to focus on the numbers and on the perceived gaps in education, particularly high school education. We go into this thinking that, "Well, all we have to do is basically get more students in, and give them a few more skills so that we sort of bring them up to the same level, and cut them loose and they'll be just fine." That's just not right. In fact, if you look at the numbers, they bear that out. The problem is that this is really a limited approach that ignores the isolating, and often discouraging, impact of the social and community experiences that these minority and women students experience. What struck me was the fact that your project has identified and addressed several major factors that contribute to the building of awareness and self-confidence in students of engineering and that you've actually integrated these into an entire program. You're not dealing with this piecemeal; rather, you're looking at the whole. Many institutions do only consider a few of these, and they tend to deal with them individually and the efficacy, I think, is pretty low.

I was also very interested in how you address the social context of learning for these students. I identified with a lot of these things. One of the issues that you point out really very early is the issue of isolation—feeling isolated from your peers. You're the only woman in the class, or the only black, or the only Hispanic. The Meyerhoff Program is creating a community of scholars who have similar backgrounds, similar experiences, and basically gives people a community of opportunity to discuss these issues.

Throughout my career, I have been involved in actually two Women in Science and Engineering Programs, which were self-organized and self-perpetuating by the women in Physics, when I was a graduate student, and then the women in Physics and Engineering when I was a post-doc at MIT. It was a great network because I run into these people all over the country now. They actually provide an important social outlet as well as professional outlet because they actually relieved a lot of the tension and sense of isolation that we all experienced, being women in a white, male-dominated field.

One thing which you didn't discuss in-depth, but which you mentioned briefly, is that there is also a potential disconnection from family for students. When we are transitioning out of our socio-economic background, that can be alienating from our families, particularly if our parents are not college educated. What I understood from your talk was that actually you are working to involve the parents, to educate and inform them in terms of what their children are actually experiencing so that they can continue to be supportive in appropriate ways.

The other component which I think is important is the involvement of role models, not just minority or people of color, but of all backgrounds. This is a key issue because it can provide vital access to career information. The problem for many students (and this is something that I have identified

with as a woman in engineering) is that you are often left without a ready access to formal or informal mentoring. This isn't necessarily intentional; it's just, as you noted, that people are not comfortable. So, what that means is that you're denied access to information that's critical for charting your successful career path. As an anecdote, in my graduate experience, I was actually excluded from competitive sports with my lab mates—I don't play basketball very well. This is where they did a lot of informal discussion of basic things, like how you apply for post-docs and where you go looking for jobs. It wasn't that they intended to block me from this information, but it was just that the consequences of my not being able to participate in this social activity essentially had the same effect as if it had been intentional. A fairly significant event in my career was when I was a post-doc at Santa Barbara. A woman faculty member introduced me to this program of mentoring workshops that were actually run by women in the Department of Computer Science. Now, I'm a chemist, turned chemical engineer, so I sort of snuck in and crashed their party. But these women, as they had made their way up through the echelons of academia, industry, and government, decided to get together to define what was important for a successful career in these different areas. I always call this sort of guerilla tactics for academics because this is how you do it. And that's it, exactly. It was very focused. For me, this was the first time the tenure academic path was actually demystified. It is not a mysterious, arbitrary process, but no one ever sat down and articulated it to me in a way that made sense. That's what a mentor would do. I think that those kinds of programs which provide access to this career information need to be more widely available to women and minorities who have more difficulty in finding appropriate mentors in science and engineering. I really think (and I have a very strong opinion about this) it shouldn't be a matter of luck.

The other thing which we, as administrators, really need to be vigilant about, is basically, we must guard against subtle social and cultural biases that we are sometimes not even aware of as individuals, and we need to be clear to articulate and define what standards we hold at the University. We need continually to repeat this because the make-up of the faculty is constantly changing, and we have a number of people who come from other cultures that may not be sensitive to these issues or be aware of these issues. Those are the main issues that really stood out for me, and I think you've recognized that it's really a multifaceted challenge, and I think you've done a great job in bringing it all together.

Response, Bill Trent

Freeman, let me start by saying thank you very much. I think you do Du-Bois, Bouchet, and David Henry a great service and do them proudly.

When I began reading the paper, my first thought was that I had to resist the urge simply to sit here and be a cheerleader for the work you're doing and will continue to do. Then, as I completed the paper, I realized just how difficult that would be, to not be a cheerleader. In this environment, we use the phrase "this is important work" with such regularity that we risk becoming numb to it. Despite my concern for exhausting the utility of that phrase, I must say that I think most here will agree that this really is very important work. If anything, saying that it is important work may even be an understatement of its significance. Far too often, when we focus on the idea of working with initiatives or interventions targeting minority students or issues, we are confronted with a notion that it is human relations as an orientation or the idea that we can focus on this as a matter of good will or as the right thing to do. What I think you have challenged us to do is to understand this differently, to appreciate and recognize that it's not just doing God's work, but it is rather the necessary and essential work that must be done and done well if we are to strengthen our academies, our economy, and our democracy. That takes institutional commitment, and I think the way you discuss building this conversation among your faculty remains a challenge for many of our campuses.

The second challenge and example that you present here is that this requires rigorous scholarship, analysis, planning, and investment if we are going to be successful. So I want to thank you for reminding us of the seriousness with which we have to engage this issue if we're going to be successful. Your presentation underscores the dimensions of the challenge

facing us in closing the achievement and the attainment gaps, while making clear the reasons for doing so. Those reasons are further amplified if we note the source of the Amicus Briefs submitted in the Michigan case that you cited in your presentation. Those briefs came from the military, the corporate sector, the labor unions, along with major educational associations. They all supported the importance of affirmative efforts and practices. I also think you correctly cite the challenge in Justice O'Connor's expectations that we would not need such measures at the end of 25 years. I think your third question and response to that is instructive. How *do* we develop and implement strategies to increase the presence of minorities at the highest levels of achievement in society: research scientists and university professors? Your answer was, "Only by creating and supporting a larger pool of high-achieving minority students can we ultimately increase the number of faculty of color in our colleges and universities and the number who become leading professionals, in general." Now, that's a substantial challenge, but I'd like to cite a couple of things that I think, one of which may even be a spin-off of your work.

The one I'll cite is one that we are currently doing research on here, and that's the CIC—Committee on Institutional Cooperation's Summer Research Opportunities Program. The program has operated since 1986. It involves the efforts and commitments of 15 campuses—the Big Ten campuses, plus four affiliated universities. That program has served over 9,000 students, nearly half of whom have gone into science and technical fields. The purpose of the program is to introduce students to the world of research, to give them a mentored experience, and to try to create an appetite that would encourage them to pursue faculty positions. In looking at some of the results from a survey of the 2002 cohort, it underscores the importance of exactly what you say—the mentoring. The students report that this

is a critical feature of that experience; and, when we conducted interviews on the different campuses as a part of an evaluation, we discovered that the graduate deans report that the biggest challenge is developing mentors—getting faculty to buy in, as you are describing it on your campus. So, we realize that that's a challenge to us; but, nonetheless, it represents such a clear answer to one way in which we can do this. It also suggests that the "Talented Tenth" may be a larger pool than we think of, normally, when we think of minority students.

One example of that is a second project that I have had an opportunity to work with, and this is the one that I think may very well have been influenced by your work. Bill and Melinda Gates gave $1 billion to support scholarships for students of color—it is $50 million a year for 20 years. To date, 7,050 students have been served; 4,053 students have received the scholarship. But those are not the most important or necessarily the best features of it, just by looking at the numbers. What I think is instructive, is the eligibility criteria. These are very high-performing and, at the same time, very high-need students. We've awarded those scholarships to students who have a 3.3 or better and they are all students who have to be eligible for the PELL Grant. The thing that we find is that the average high school GPA for those entering freshmen is 3.8. The overall average college GPA is a 3.4 in a 4.0 system. They had to turn down and turn away students in selecting the students from this pool; and, interestingly enough, they did not use SAT scores as a part of the selection process. But it underscores the point that if we begin to look for talented students, that those students are, indeed, there. They are students who are not just from affluent contexts; but also students who are high-need but who have the right intellectual preparation. Our analyses of some of the cohort for the 2001 cohort demonstrate that those students come from pretty good high schools. They come

from high schools that have four or more AP courses. They come from high schools that are stable, and I think that's good news. So, I'm encouraged by *your* findings and by the parallel findings of this work.

So, consistent with the idea that I would not simply be a cheerleader, I will return to just one other example; and I think, perhaps, the most fitting way to conclude my remarks is to underscore the significance of preparing a climate where students of color, who are achievers, feel welcome and valued. And to do that, I'm going to tell the story about a personal friend of mine.

Ron Henderson is a colleague of mine who works with the National Education Association. Ron has a son who is now, I think, a graduate of the Meyerhoff Scholars Program. Ron was taking his son on tours of Morehouse, Stanford, and several of the more elite campuses in the country, and one evening, in the middle of the week, Ron and his son went to the University of Maryland, Baltimore County, and Ron stayed with him. Ron tells me that his son went in, met with you and with the fellow students, and he came out and he said, "Dad, this is the first time I've been in a place and seen so many talented, high-performing, African American males who were neither embarrassed nor completely nerdy." And then he says, "We can end our tours here. I'm going to the University of Maryland, Baltimore County." I think you've constructed an incredible effort there, and I want to commend you for it, for the success of your work, and I look forward to continuing to benefit from your leadership and from your guidance in this critical endeavor.

Response, Freeman Hrabowski

I know that Nancy is going to take comments from the audience, but I'd like to just respond. I really appreciate the comments.

The question is: How many students of color here are excelling in science and engineering? Yesterday, I met some of them who are very bright. The real challenge is that you've been so successful in attracting the very best of students, in general, in terms of traditional measures, that even when you find very high-achieving minorities, they will rarely be as competitive, initially. Think about it. On my campus, the very best students will have nearly perfect math SATs. They will have often come from other countries and would have started calculus in eighth or ninth grade. They really have done a lot. So, even when you find minority students who are well prepared, who have high test scores, they still may not have had as rigorous a background and be as competitive.

In addition to the other issues, you have to address the role of family in encouraging and supporting, or knowing what to expect. They have to understand that a student may not be able to come home on a weekend because he really needs to study. Sometimes she may not be able to spend two hours in church on Sundays because she needs to be working.

The real question is how are those students doing (and I raise it rhetorically) and how can you look at practices that work? For example, it may be a mistake for students who have passed AP courses to start with advanced courses in college. Even when students have earned a 5.0 on AP courses in calculus or in chemistry, the question is: Are they truly prepared for the next level of course work? Often, they get into advanced science courses as freshmen and tend not to do well. When students don't do well, after having done extraordinarily well in high school, they don't feel as good about

themselves or the experience. It tears down their confidence. One of our ways of making sure students succeed is to say, "Even with your 5.0, start with the beginning freshman courses. We promise you will be fine. Even though you've seen the material, believe me, college testing is different from high school testing. And, if you take these basic courses in calculus and physics, and earn As, strengthen your background, learn how to work in groups, and adjust to being in the college setting, you will be much better off in the long run." It's amazing how that one practice makes a big difference.

The other important point is about the environment. The question is: Have we taken the time to think about how to encourage group work? Are there faculty members taking ownership of these kinds of questions? The chair of our Biology Department, who is well-funded by NIH, heads one of the major minority science grants on campus. Our Howard Hughes Investigator heads another one of these grants, producing large numbers of minority scientists. This means that we have very prestigious researchers taking ownership of the issues. At most institutions, minority programs are handled primarily by minority staff members who contribute a great deal. However, to produce scientists, the efforts must involve tenured faculty researchers. That's the challenge—to find faculty who are willing to say, "I'll be a part of this initiative," and to get them to see it as an intellectual endeavor. Because that's what it is. The question we continually ask is this: How do we pull minority students into science disciplines and get them excited about the research, and keep them doing well enough in the first two years of course work that they'll want to go on to grad school and to become researchers?

Audience Member: As you mentioned, a lot of underrepresented groups actually go to high schools or middle schools that are under funded, and they might not be as prepared as some other students. And, because of that, going into something like engineering, they have a lot of prerequisites and a lot of courses to get through, and it takes them more than four or five years to get through, in addition to their not having the financial support they need. How do you propose that universities help those types of students while they're still in the middle school?

Dr. Hrabowski: It's a great question. It really is, and I didn't set that question up. He happens to be one of my former students from my University, who's here in grad school now. He comes from an under-funded, predominantly black school. Yet he was just motivated to make it.

Let me suggest this, going back to what I said about the Upward Bound programs. We have learned so many lessons from working with middle school or high school kids on math, and word problems, reading, study habits, and student aspirations. We need to provide more opportunities for poor children of all races to have supplemental education. For example, after-school activities designed to give them a chance to do as well as others—through tutoring, additional homework, and through opportunities to talk about their experiences. Universities can develop programs to work with students with the appropriate interests and ability, and to help their families understand their responsibility. My colleagues and I wrote two books on parenting to shed light on what families of successful students do—for example, turning the TV off, getting them involved in university programs, reading to them at a young age, encouraging word problems,

solving word problems. Interestingly, some of the parents of Meyerhoff Scholars never went to college, and yet they learned about strategies for helping their children.

Audience Member: This is really more of a comment than a question. I am what is considered a towney. I was born and raised here in Champaign-Urbana. I have been educated here at the University of Illinois and I am an Upward Bound student. So, the things that you are saying I can take to heart. I majored in Animal Sciences undergrad here. There were maybe two or three of us of color. We got there; there were a lot of people from small towns; they weren't used to us; so, we had to form a network because they did not want to work with us.

Coming from here, I was used to the campus setting. I did a research apprentice program, which helped high school students, introducing them to the University of Illinois, and we were able, as a group, those of us two or three minorities here, to bond together. From there, under the guidance of great women such as Gretta Hogan and others, I was able to consider going on to graduate school when I finished. I went and earned my master's at the College of Veterinary Medicine at the University of Florida, where I was able to bond with the other people there. And, through friends, I was able to come back here, and now I'm at the College of Veterinary Medicine, working on my Ph.D. here in Veterinary Bioscience. And now, we are competing against international students and trying to keep up with them. This year, there are three African American females in the College of Veterinary Medicine's graduate program. (Before we got there, two years ago, there were none.) I'm kind of emotional because this is really hard. People don't understand the things that we go through every day—with the courses—but, we're trying.

I am from here in Champaign-Urbana, and I see children suffering. They've been tested and they are not passing. Something needs to be done with the children here in town. Because these kids will not get a chance to even go to high school if they're not passing elementary school, and people are ignoring these children.

Dr. Hrabowski: You inspire us all. Would you give her a hand? First of all, most of you may not know that participants in the Upward Bound program are typically first-generation college students and from low-income families. Unfortunately, today it is almost impossible, without intervention, for children of any race coming out of poverty to go to college. To hear someone from Upward Bound who is succeeding in science and is now in a Ph.D. program is extraordinary. It's an unbelievable story. It really is.

I understand your question. I have several points. Number one, it's important for faculty to understand this relationship between poverty and lack of advantage and what happens—not just in science—but in academic achievement in general. Yours is a very unusual situation, to make it in science. I was really pleased to meet a professor in the College of Education today who was very proud to tell me she had come through Upward Bound, herself. That is, again, a very unusual story. Here's the challenge. While my state has the highest percentage of bachelor's degrees per capita in the country, two-thirds of black and Latino children and large numbers of poor, white children—over half—are not reading or computing at grade level.

(Changing tape)

We need to know what universities can do to address this challenge. If I had not seen 30 years ago how transforming the U of I Upward Bound experience was for poor, high school kids from Urbana-Champaign, I never would have gone to other institutions throughout my career saying that

we could do much more in our communities. It's because of what I learned here at U of I that we have two Upward Bound programs on my campus.

I would say two things to you: I know that Chancellor Cantor is committed to these issues. Second, I suggest to my colleagues here, most of whom are not minority, that you spend some time in a setting where you can be a minority, if just for a few hours. I especially recommend this to white males. It is a strange feeling for most people to be the only one like themselves in the group. The reason Jo Ann Fley could be so helpful was that I believe she was the only woman in the Department of Higher Education, and she knew what I was going through. She had a way of looking at me and saying, "You can do this." Somebody else who did this, who was an unusual guy, was Stan Levy. He was somebody who always gave me that feeling—"You can do it. You can do it." It was amazing. My campus has made such progress with minorities largely because my white colleagues—male and female—have taken ownership of these issues. These are not minority issues. These are not women's issues. They are American issues.

You also mention the competition with students from other countries. We do know that these students often are better prepared. They often are the best in the world, and we want the best in the world in America. Our goal has to be to find a way to make sure that even poor children born in Urbana-Champaign can compete with the best in the world. This will, of course, mean special intervention—not because standards are lower—the goal is to help these students become competitive. But this will take more support, not only for black children, but for Americans in general. For example, in engineering on my campus, American students bond together sometimes as a support group like students do in the Meyerhoff Program just because the international students are so good. This is an interesting challenge for another day.

Audience Member 3: I'm a grad student pursuing a Ph.D. in engineering, and there are something like 40 of us in my class. I find that in the first year-and-a-half of grad school, we have three qualifying exams. And, you know, a certain percentage of us will be weeded out, and we're basically competing with each other. So, I was wondering how you create a supportive atmosphere among students when there's this competition among them?

Dr. Hrabowski: The approach we've used in thinking about the culture of a campus has continued to focus on opportunities for people to talk about their experiences, their perceptions, their values, their goals. For example, our minority training programs have recruited a variety of students who have sometimes been in a "cutthroat" environment. These students want the best. They want to be the best, so they do things that are really unfortunate sometimes. We see this and we're talking about these issues. That includes faculty members having discussions and also thinking about ways of having group projects that can cut down on some of the unhealthy competitive aspects. It's amazing what group projects can do to build teamwork and a sense of community among students. It is unfortunate that in many undergraduate settings students are accustomed to thinking, "I don't want to help somebody else because the other student may get a higher grade. And if the grading is on a curve, I may be at the disadvantage." It's a major problem in our country, not only in terms of the academic work, but in terms of our professional values. When you look at some of the problems we've had as a society, the fact is that we have not done the best job in the academy of focusing, beyond the academic work, on those values we consider most significant. I argue that one of those values should be learning how to support other people and learning how to work on a team to build community, as opposed to fighting over money or for a higher grade. It's unfortunate when that happens, but it will take honest discussions among

students, faculty, and staff to create a climate in which people can feel secure enough to have frank conversations. Raising these question here today is positive, and I know that your leaders here, starting with Chancellor Cantor and President Stukel, would agree with me that we want to create a climate in which people can work more collaboratively on these issues.

Audience Member 4: Good afternoon, Dr. Hrabowski. Thank you, very much, for coming and speaking for us and being a good role mode, not only for African American males, but also for everybody, in general.

While I'd like to think that we're in that group that's being pushed toward becoming leaders in the future, what are some things that we can do while we're in that process to reach back to other students who may be at the undergraduate level to get the ball rolling so that when they get to our level they're a little bit further down the road?

Dr. Hrabowski: That's a great question. One of our models of interaction, in the sciences particularly, involves post-docs and doctoral students working with undergraduates in the labs with faculty. And it has been great, the way they can work together and help each other in different ways. In general, I have two suggestions: Number one is that your first responsibility is to be the very best in your research. That means to work harder than you've ever worked in your lives.

My wife, Jackie, is also a graduate of Illinois. We were very fortunate to have graduated from college, and one week before coming here to graduate school, we were married (and we've been married 33 years). At the time, what it meant was that we could focus on our work. It was great, because we didn't have to date, which can be especially challenging for graduate students. We have to realize that at both the undergraduate level and the graduate level, students are human beings, and they need companionship.

We sometimes forget about personal issues when we talk about academic performance.

I want you to be the very best that you can be, but I also want you to be healthy. Why do I tell you that? Because, sometimes, people coming into graduate programs don't understand just how much effort it takes to make it in grad school. They don't know how focused and prepared their peers will be, nor do they realize the time and effort success will require. My advice is make sure you know how much it takes to be excellent.

Once you understand that, after the first semester or two, then the question can be, for example, how you might mentor an undergraduate in your spare time. Younger people look to people who are slightly older for advice about the possibilities. And, nothing takes the place of just a word of encouragement.

On so many occasions here, during challenging times and when I would least expect it, someone—either a fellow graduate student, or an undergraduate with whom I was working, or a friend—would say, "You can do this. You'll be okay." It is amazing what a little encouragement can do. My point is that you do just that. But you need to be careful not to give too much of your time.

That can be a real problem because minorities and women tend really to want to give. It's like, "Build it, and they will come." The more of your time you give, the more of your time people will expect. I remind our female and minority faculty of this all the time.

For undergraduates here, I strongly encourage you to become involved with children. On my campus, we have large numbers of undergraduates working with programs focused on math and reading. The goal is to

help the children succeed in school and pass standardized tests. But, more important, we want to give them a sense of the possibilities for their lives. I remember what happened when Upward Bound kids would come over to the U of I. It gave them a chance to see other minorities and to think, "I could do that."

I'll end with these two points. These young kids, who are often on my campus, will be walking with one of my college students who will point to me and say, "There's our president." Often, one of the children will respond, "President of what?" Because the campus is a predominantly white setting, these black children don't believe I am the president, and my student will tell them, "He's the President of the University, of UMBC"—to which the children respond, "Right!" So, my student will say to me, "Doc, give him one of your business cards." I'll give the child a card that says President of the University of Maryland, Baltimore County. He looks at the name, Hrabowski, on the card and responds sarcastically, "Right!" Sometimes the only way I can convince the kids is to show them the name on my driver's license. The point of this story is that the children need to see people looking like them in a variety of leadership positions. Our challenge is to produce more leaders from all racial and ethnic backgrounds, including from poor neighborhoods in Urbana-Champaign. I never imagined when I was a graduate student here that one day I would return as the president of a research university talking about these issues. Never in my wildest imagination did it occur to me that this kind of future, this present situation, could be here. What has made the difference, more than any other thing, is a community of people, black and white, stretching from Birmingham, through Virginia, to the University of Illinois who have told me, "You can do it." All I ask is that you do for others what you have done for me.

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