Can a successful STEM program for minority students succeed outside of one school in Baltimore?

Strength in Numbers

By Sarah Goforth
Can a successful STEM program for minority students succeed outside of one school in Baltimore?
As she fields MD-PhD program offers, Blossom Tewelde knows that she will always be a guide to younger Meyerhoff Scholars.

IF YOU HAPPENED upon Centennial Park in Ellicott City, MD, one breezy Saturday last September, you probably saw what looked like a large and lively family reunion: Teams battled across a hand-made obstacle course. An animated crowd cheered on competitors in a pie-eating contest. People hugged.

But this was a gathering of scientists, not relatives. Meet the Meyerhoffs. They are united by a University of Maryland Baltimore County (UMBC) scholarship program that is steadily boosting the number of African Americans and other underrepresented groups in the upper ranks of math and science. Started 25 years ago with funding from Robert and Jane Meyerhoff, the Meyerhoff Scholars Program has graduated more than 880 students—the majority of them African American—with science and math degrees. More than three-quarters of them have gone on to graduate school.

Other universities around the country are clamoring to do the same. Meyerhoff administrators get two to three calls per week from faculty at other institutions who want to know more. What is it about this model that works so well? Can those elements be duplicated elsewhere in a nationwide push to make science more inclusive?

Attracting Talent

“People sometimes ask, ‘Why is it important to have diversity in science?’” says 20-year-old Meyerhoff scholar Blossom Tewelde, an African American biochemistry major who will graduate this spring. “It’s not because I think I’ll learn better from a black professor. It’s not about quotas. It’s about diversity of mindsets.” It’s also, she adds, about offering young people role models who look like them. “I can count on one hand all of the black female physician-scientists I’ve met in my life,” she says. “It can be hard to imagine yourself somewhere without that picture in your mind.”

Good science requires constant fresh ideas and a self-replenishing talent pool, and diversity is a foundation for both, echoes David Asai, senior program director for science education at HHMI. A recent study published by the National Bureau of Economic Research, for example, showed that scientific papers authored by ethnically and geographically diverse teams are cited far more often (and therefore generally have greater impact) than those from homogeneous teams.

“Many of the easy problems in science have been solved,” Asai adds. “If we want to tackle the really difficult ones, we have to bring as many creative approaches as possible, and that requires every kind of diversity—ethnic, geographic, gender.”

Yet diverse teams are not the norm. College-bound African American, Hispanic, and Native American students express similar levels of interest in science, technology, engineering, and math (STEM) majors as white and Asian students. Yet many fewer of the minorities complete STEM degrees. A 2000 study found underrepresented minority students switch out of STEM disciplines at more than twice the rate of white and Asian American students, and a 2005 study found much lower completion rates of STEM degrees among minorities. Although African Americans represent nearly 13 percent of the U.S. population, they earn only 2 to 3 percent of science and engineering doctorate degrees.

“If we want to maintain a strong scientific workforce in the United States, we have to attract the best and brightest from all groups and all parts of the country,” says Asai.

A Model for Many

The statistics reveal a challenge for those who wish to take the Meyerhoff model nationwide: What makes this community so successful? Is it its leader, UMBC President Freeman Hrabowski? The close-knit UMBC campus, which focuses on the natural sciences and engineering? The early access to research experiences its participants are granted? The social cohesion of the group? All of the above?

To answer those questions, leaders at UMBC and two other universities—Pennsylvania State University and the University of North Carolina at Chapel Hill—have partnered with HHMI to study these questions at UMBC and at the other two campuses, both of which have started pilot programs with similar goals. With $8 million in support from HHMI over five years, they are expanding and studying the Meyerhoff model to learn how to apply it to new, often dramatically different, environments. Social scientists at all three universities will gather data about how the students live and study, whether the students face similar challenges and pressures, and the positive “halo effect” these programs can have on faculty and students who are not direct participants. At the end of the
trial period, dubbed the Meyerhoff Adaptation Project, the participants hope to know enough to offer a set of guidelines for others.

It won’t be easy. The Meyerhoff program has advantages that aren’t shared by the other institutions: UMBC is located in an urban area with a diverse population; the program was built by UMBC President Freeman Hrabowski, a charismatic and passionate leader with a peerless ability to rally students; the program’s components have been honed over 25 years of trial and error in a single setting.

Some priorities are obvious, even before the studies begin. Having a group of faculty and staff who are committed to the program, and the students’ success, is key, says Meyerhoff Scholars Director Keith Harmon. Originally from a small town in southern Georgia, Harmon knew well the value of an attentive community when he was recruited in 2005 to help lead the Meyerhoff Scholars Program (originally as assistant director).

“I was born in a small Southern town at the tail end of the civil rights era,” Harmon says. “There was just a way that the community had oversight of you as a youngster. My friends and I could ride our bikes all day long on a Saturday, and as long as we checked in with someone’s mom at some time during the day, it was a normal thing. You would be walking down the street and someone would literally stop you and say, ‘I expect great things from you, Keith Harmon.’ It wasn’t until many years later that I realized how rare this is for young people today.” But it’s the norm for Meyerhoff scholars.

From day one of the six-week “summer bridge” that welcomes Meyerhoff scholars to the program before their freshman year, the expectations placed upon them are high and unyielding. Students are expected to make A’s consistently and to coach each other if they see another scholar falling behind. They are told, again and again, that they are ambassadors of a name synonymous with integrity and achievement, a name they are responsible for upholding. If they make a mistake, it never goes unnoticed. Each new scholar is paired with an older mentor, who is accountable for the younger student’s success. When one scholar breaks a rule—and there are many rules—the entire cohort is held accountable.

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UMBC President Freeman Hrabowski launched the Meyerhoff Program 25 years ago.

are connectors in a network that now spans generations, disciplines, ethnicities, and socioeconomic backgrounds.

Connecting it all is Hrabowski, who was recruited to UMBC in 1987 after a series of protests over racial discrimination on campus. He started the Meyerhoff Scholars Program less than two years later and is responsible for its signature togetherness. Hrabowski can often be seen leading his apprentices in a recitation of the Langston Hughes poem “Dreams,” which they all know by heart:

Hold fast to dreams
For if dreams die
Life is a broken-winged bird
That cannot fly.
Hold fast to dreams
For when dreams go
Life is a barren field
Frozen with snow.

The program’s impact is impossible to deny. Meyerhoff scholars are more than five times more likely to have graduated from or been currently enrolled in a STEM PhD or MD program than students who were invited to join the program but declined and attended another university, according to UMBC psychology professor Ken Maton in a 2012 study published in the Mount Sinai Journal of Medicine.

Keys to Success
“The past 25 years have taught us a lot,” says Mike Summers, an HHMI investigator and biochemist at UMBC who has played a crucial role in sustaining the Meyerhoff program and building alliances for it with faculty and administrators across the campus. “Freeman has shown what’s possible at a medium-sized institution in an urban area with a brilliant leader. The question is: Could something like Meyerhoff be done elsewhere?”

Summers has hosted dozens of Meyerhoff scholars in his lab over the years, including Tewelde. “I had spent my whole life with people telling me, ‘Why are you asking so many questions?’” says Tewelde. “I was used to getting in trouble for it. But I went to Dr. Summers’ lab, and at the end of a presentation you had two choices: you could ask questions or do pushups. Something I had been chastised for my whole life was suddenly worthy of praise. I thought, if research is where you get to ask questions, then that’s where I’m supposed to be.”

Building on what he learned as a mentor and program advocate, Summers visited the UNC campus in 2011 to meet with administrators who were thinking of adopting the Meyerhoff model. Together they created a roadmap for what is now the UNC Chancellor’s Science Scholars Program, which welcomed its first cohort of 24 students last fall.

“The problem was staring us in the face,” says Lauren Thomas, coordinator of the UNC program. In a good year, she says, two African American students who earn a bachelor’s degree at UNC go on to get a PhD. This from a campus with 18,400 undergraduates, about 3,700 of whom are underrepresented minorities. Faculty who teach upper-level science classes say they don’t ever see underrepresented students. Adds Thomas: “They can’t recall when they had an African American student in their lab. Mike Summers’ visit was the impetus to make a change. The university was reminded that the potential existed in the student body. It just needed to be tapped.”

UNC faculty who attended Summers’ 2011 talk were inspired to do something about it. They raised money from internal sources and HHMI, and looked to the Meyerhoff model for the essential program elements: summer bridge, early research experience, shared housing, and rules designed to get scholars to stick together.

“That visible cohort is so important,” agrees Summers, adding that it influences not only the students but the faculty as well. “Think about it: You’re a typical white male lecturer in a huge class with 300 students. If this program supports 15 minority students in a typical class, and those 15 students are scattered about, they won’t have the same impact on the faculty as they will sitting as a group right in front of the class. When they see eight or 10 minority students in their face, asking questions, it changes perceptions. It’s subtle, but it works.”

Changing Minds
Summers recalls a faculty colleague at UMBC who was convinced, in the early years of the Meyerhoff program, that it wasn’t productive to qualify students for programs based on their race or gender. “He pounded his fist on the table when he argued and told me he didn’t have a racist bone in his body,” Summers remembers. Five years later, this same faculty member was describing the Meyerhoff program to a visitor, and he said something Summers will never forget.

“He said that at one time, if he had a black student who sat in the back of the class and made a C, he would write a strong letter of recommendation for that student,” Summers recalls. “Now, there are large numbers of black students in his class, and they sit in front. If one of them makes a C, he calls that person into his office because he wants to know what the problem is.”

When Penn State leadership invited Summers to present the Meyerhoff model to the school’s faculty and administrators, he brought stories like this with him.
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—STARLETTE SHARP

Starlette Sharp, program director of Penn State’s Millennium Scholars Program, says the program would not have been possible at Penn State without a small group of committed advocates who were inspired by what they heard. Their enthusiasm “spread like a rash,” she says. “It started with the deans, who knew what this could do for Penn State. They walked around and rallied people. They used all their political capital to start this program.” With tight budgets and competing demands, administrators are hard pressed to start new programs without a clearly defined map to their return on investment. And while no one doubts the credibility of the Meyerhoff model, plenty of people doubted it could be applied to a mega-university with 40,000 students in predominantly white State College, PA.

“Parents were worried that their kids wouldn’t be able to find anywhere to get their hair cut,” says Summers, noting the cultural challenges. “You couldn’t blame them for asking why they should entrust this somewhat foreign community with their children.”

Last fall, when the first Millennium Scholars arrived on campus, Sharp admits she was nervous. After all, if a key element of the Meyerhoff program is mentoring from older students and alumni, Penn State scholars would not have the peer-mentor network established. “Our program is modeled after Meyerhoff. I read their papers, and whatever I can find about Freeman. Our parents’ association is like theirs. We have a summer bridge. Until we try something that doesn’t work here, why change something that has such a high success rate?” She knew her students would face the same pressures and demands of the Meyerhoff Scholars Program without the full support network. That job would fall to her, in one sense, and the students would have to support each other.

Taylor Soucy, a 19-year-old freshman Millennium Scholar from a small town in Delaware, says the intensity was surprising but worthwhile. “I didn’t understand the cohort mentality at first,” she says. “We couldn’t have cell phones during the day, and I couldn’t get away and just be by myself because the whole process was meant to bring us together. It felt like prison, in a way, but we formed a bond. I can’t imagine going through college without my cohort.”

“Last fall was hard, but the kids came out better for it,” says Sharp. “Now they’re out there telling parents of potential scholars that they should be a part of this. It’s transformational.” The first cohort had just 19 students.

“It was important to do it right and well before we do it big,” Sharp says. Next year the program will scale up to 25, and some of the rules will be different. For example, Meyerhoff Scholars are required to sit in the front row of their classes, but at Penn State, where introductory science classes can include more than 400 people, the front row fills up quickly. “I was getting text messages on the first day of school from our scholars, saying, ‘Star, all the front-row seats are full; what do we do? Do we sit on the floor?’”

Sharp responded that they could sit anywhere as long as they sat together. “Students call me all night long. I answer every phone call. I don’t have mentors yet, but they will become mentors.”

Mentors like Meyerhoff senior Blossom Tewelde, who is fielding offers from four prestigious MD-PhD programs and knows that her involvement in the program does not end when she tosses her cap in the air this spring.

“My mentor is in a PhD program at the University of Miami, and I know she’s just a text or a call away if I need anything. She still checks on me if she hasn’t heard from me in a while,” she says. “Now, I’m a peer advisor, too. I will support younger scholars the same way I’ve been supported. It’s just something about Meyerhoff—there’s a sense of ownership. Any Meyerhoff anywhere will take you in with open arms.”

“It is life changing to see someone as a high school senior and, years later, see them as a postdoc or college professor or leader in their field,” says Harmon. “You stop and say, ‘What a blessing it is to be a part of their story!’”

Mike Summer is helping other schools adopt the Meyerhoff mantle.