THE MEYERHOFF SCHOLARS PROGRAM

The Meyerhoff Scholars Program is built on the premise that, by assembling a strong concentration of high-achieving students in a tightly knit learning community, students continually inspire one another to excel in a strengths-based approach. Building on this underlying principle is the assumption that every affiliated student is capable of succeeding in STEM when given appropriate opportunities and resources. This concept and university commitment has ignited major institutional transformation and systemic change at UMBC.

Keith Harmon, director of the Meyerhoff Scholarship Program at UMBC, introduced the program and its role in transforming the university into what he called "an incubator for initiatives for student success." The program was founded to build community support for minorities in STEM fields, Harmon explained, and it seeks applicants from a pool of high achieving students who are interested in terminal degrees and also have an interest in issues around underrepresentation in STEM. The key factors in their success, he said, are advising and coaching, moral and social support, encouragement, and enrichment. In founding the program, the organizers tackled head-on some of the factors known to impede student success, including low expectations, academic and cultural isolation, unsupportive peer groups, and lack of practical research experience.

The Meyerhoff Scholars Program and Beyond

Updating the strengths-based program on which the Meyerhoff Scholars Program was based, Mariano R. Sto. Domingo, research scientist at UMBC, noted that:

- People have many strengths and the capacity to continue to learn, grow, and change.
- Intervention focuses on the strengths and aspirations of the members of the community.
- Communities and social environments are seen as being full of resources.
- Collaboration is a key to learning and achieving.
- Problems are seen as the result of interactions between individuals, organizations, or structures rather than deficits within individuals, organizations, or structures.

The Meyerhoff Scholars Program was founded in the late 1980s to develop a more positive climate for students of color in STEM who would become leaders and role models for the country. The current program composition of about 300 students is 53 percent African American, 22 percent white, 18 percent Asian and Pacific Islander, and 6 percent Hispanic. In the current first year class of 61 students, three quarters are underrepresented minorities.

The program seeks to enhance the academic and professional success of underrepresented students in STEM, to encourage collaboration and close working relationships among students and faculty members, and to provide students with financial, academic, and social support. The program model has a variety of components,

theory-based psychosocial influences, desired student outcomes, and contexts (Figure 3-1). To achieve the desired outcomes, it has 13 components:

1. Financial aid
2. Summer bridge program
3. Program values
4. Advising and counseling
5. On-campus and summer research internships
6. Faculty involvement and mentoring
7. Recruitment and selection weekend
8. Study groups
9. Program community
10. Tutoring
11. Administrative support and campus champions
12. Community service
13. Family involvement

Many of these components overlap. For example, the summer bridge program introduces students to the program and its values and also starts building community. The combination makes for an exceedingly rich experience for students, Sto. Domingo said.

The theory-based psychosocial influences in the program model include:

• High levels of expectations and challenges
• Academic and social integration
• Role models and a critical mass of like-minded students of color
• Mitigation of stereotype threats
• Comprehensive support and guidance
• Relationships and networks that facilitate career success

The intended outcomes are:

• Knowledge, skills, and STEM self-efficacy
• Motivation
• Identity as a scientist and as a Meyerhoff scholar
• Sense of community, professionalism, leadership, and persistence
• Commitment to PhD attainment
• Entry to STEM PhD program
• STEM PhD completion

These influences and outcomes are both shaped by the contexts in which the program operates. For students, these contexts include major and career options, their life influences, and their personal fit with STEM culture. For example, one of the strongest and most consistent predictors of entry into STEM PhD programs is the student's pre-college interest and excitement about scientific research. At the level of the campus, contextual factors include a stable and committed leadership; a focus on inclusive

excellence; the size, mission, location, and history of an institution; and program evaluation.

The academic outcomes for Meyerhoff Scholars in the years since the program was founded have been remarkable, said Sto. Domingo. African American Meyerhoff students in the years 1989 through 2008 were 5.2 times more likely to matriculate in graduate STEM programs than students who were offered the scholarship but declined the offer and went to a different institution (40 percent versus 8.4 percent). Meyerhoff students opted for medical school less often than students who declined the offer (15.4 percent versus 28.6 percent). And Meyerhoff students were more likely to enter STEM PhD programs than to enter either master's or allied health programs or no graduate STEM program.

The program also has had a profound impact on the institution as a whole. The number of African American undergraduates majoring in science and engineering has increased more that 11.5-fold since 1985. Overall and science enrollments among Latino students have grown 6.1- and 16.1-fold, respectively, since 1985. And the average grade point average of African American students majoring in science and engineering increased from 2.7 in 1989 to 3.2 in 2014. In addition, a number of institution-wide improvements have resulted in part from new program additions for underrepresented minorities and improvements in pedagogy, including:

1. The Evaluation, Integration, and Institutionalization of Initiatives to Enhance STEM Student Success (iCubed@UMBC project)
2. The Building Infrastructure Leading to Diversity (BUILD) initiative
3. The Sherman STEM Teacher Education Scholars Program
4. The Center for Women and Information Technology (CWIT)
5. Maximizing Access to Research Careers Undergraduate Student Training in Academic Research (MARC U*STAR)
6. The University System of Maryland's Louis Stokes Alliance for Minority Participation (LSAMP)

As Sto. Domingo said, "Many, many students who are outside of the program are benefiting from the practices that originally were tested, applied, and experienced by the Meyerhoff Scholars."

Because of the success of the program, universities elsewhere have been getting in touch with program administrators in an effort to implement components of the program on their campuses. One outcome of this outside interest has been the Meyerhoff Adaptation Project, which is an alliance among the Howard Hughes Medical Institute; the University of North Carolina, Chapel Hill; Pennsylvania State University; and UMBC. An integrated research design for this project has nine evaluation components:

- Multilevel implementation assessment
- Yearly student academic outcomes
- Program component implementation
- Value-added student academic outcomes
- Institutional impact on science culture and the success of underrepresented minorities

- Formative assessment and feedback
- Modeling analyses
- Partnership assessment consultation
- Integrative report of findings

To date, said Sto. Domingo, 175 interviews have been conducted with 60 key personnel from all of the campuses involved, focusing on program implementation, development, accomplishment, and challenges. At the time of the conference, analysis of the results was underway, with an initial finding of a general convergence across responses and a high level of candor.

Sto. Domingo closed by pointing to several challenges to programs like the Meyerhoff Scholars Program. These include transitions in campus leadership, changes in program personnel, limited lead time afforded to program directors, overlap with existing programs, and campus structure and culture. As one example, Sto. Domingo noted that institutions like the University of North Carolina emphasize student autonomy, while the Meyerhoff program has a focus on community. "It's not easy to adapt the Meyerhoff way, because its family-like cohesion and development has been forged through intense summer bridge bonding and modeling from all the cohorts. The other two universities do not have that history yet and those years of experience and relationships."

The Meyerhoff program is continuing to evolve. It is continuing its implementation of an integrated cross-campus research design that includes study of short-term and medium-term academic outcomes, the implementation fidelity of core program components, and the relation of theory-based mediating variables to program components and outcomes. It also is continuing its commitment to the Meyerhoff Adaptation Project, with an emphasis on refining and generalizing key program components, conducting implementation assessments, and assessing the strengths and weaknesses of the partnership. "We believe that, through incremental development, many of the programs initiating today using the strengths-based paradigm could reach the point that they will be similar to the Meyerhoff program today."

Change Resulting from the Meyerhoff Program

Mitsue Wiggs, assistant director of the Meyerhoff Program, talked about what UMBC looked like prior to implementing the program and the change that has taken place since the program began operating. The university realized 25 years ago there was a problem in looking at its graduation statistics, she explained: "When you're graduating fewer than 18 African-American students in STEM, it's time for a change."

The Meyerhoff program changed those numbers, she said, but it also rubbed off on other students at UMBC. "We now have a number of students that we don't claim as our own financially, but we absolutely claim as our own in terms of support and resources." As a result, the culture of the campus has benefitted from the program.

The program's retention strategies, Wiggs explained, revolved around three components: administrative, social, and academic. Recruitment and administrative support were important to the integrity of the program and are handled as part of the program, not externally. The program also considers each student as a whole person and

focuses not only on academic success but on social success and community building as well. "When you can make a program bigger than any individual, then there's strength to it," she said. However, the Meyerhoff program sets high expectations for students and strives to have them look at the whole picture: from freshman year to PhD and beyond. This type of vision cultivates ownership and accountability, Wiggs said.

Wiggs shared a few indicators of success from the Meyerhoff program. Retention for students who participate in their summer bridge program is at 95 percent, and cumulative GPA among the Meyerhoff scholars is 3.5. Today the program has 205 students that have completed their PhD, and 78 percent of those are from underrepresented student populations. An additional 186 students are in the process of PhD completion.

One of the lessons they've learned from the program, she said, is that strength of community cannot be overvalued. The program relies on and encourages student collaboration, friendly competition, and group work. Wiggs also emphasized the importance of having the program components be part of the larger workings of the institution. "You cannot work in a vacuum and expect to have great success," she said. Not only do the pieces of the Meyerhoff program align with the mission and purpose of UMBC, they are completely transparent to students so that every program participant knows the rationale behind the teaching methods.

One final lesson learned, Wiggs said, is the importance of working with families. Parents work closely with staff to ensure that students have support on campus and at home.

Applying the Lessons from the Meyerhoff Program

The lessons learned from the Meyerhoff program have been used to create honors experiences for a much broader range of students, explained Diane Lee, vice provost for undergraduate and professional education at UMBC. By looking at what made the Meyerhoff program successful and implementing those strategies within other programs, significant positive changes have occurred throughout the UMBC campus. For example, small group learning with real-world problems brought increased success in large chemistry classes. "Students work well in small groups; they get a sense of belonging." The university also created first year seminars, which have increased graduation rates among students. A request for more writing opportunities led to UMBC implementing an intensive writing requirement. Grants for innovation among students and faculty have been offered, which created new courses and new experiences. Some critical changes have come from listening to students and what they want.

Giving back is also one of the central points of the Meyerhoff system. This point also has been emphasized at the campus level, looking at where the skills students are learning could add value in the community.

UMBC now hosts an undergraduate research conference annually, where between 2,000 and 3,000 people view undergraduate reports on their independent research. Students can apply for Undergraduate Research Awards to conduct a year of independent research in collaboration with a faculty mentor. Work is published in a UMBC research

journal run by undergraduate students. And UMBC has a collegiate success institute modeled after the summer bridge program that is such an integral part of Meyerhoff.

"One thing we always remind ourselves is that we have to adapt and adjust," Harmon concluded. "We know that we can be better and do better. We are not at the point of thinking we know it all."