Our goal is to address issues related to “Science, Technology, Engineering, and Mathematics” (STEM) education access and target students who will increase diversity in those fields.

Our program aims to provide Greater Boston area high school students, the majority of which are women and underrepresented minorities, with the opportunity to gain an experience in STEM.

As students who have overcome numerous social, financial, and academic obstacles, we have first-hand knowledge of the power of self-efficacy.

As we have learned to change the paradigm of success from external (“I can’t accomplish this because I was born in this situation”) to internal (“I can’t accomplish this because I’m not working hard enough”), we hope to instill these same life-changing values in our students.

Joshua C. Woodard (right), Class of 2018, studies Mechanical Engineering and Mandarin Chinese at the Massachusetts Institute of Technology.

Javier C. Weddington (left) is a neuroscience researcher at MIT currently studying brain circuits underlying social hierarchy in mice.

“The BoSTEM Scholars Academy was a very different but joyful and constructive program. I am very thankful for this program and I can proudly say the program has changed me for the better.” - Daniel Otokiti

“Seeing how you guys persevered through your experiences inspired me to work harder and do better.” - David Dixon

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Motivation

Though college acceptance of minority students has increased over the past decade, statistics show that many of these students do not graduate within a 5-year period.

6 year graduation rates of the Boston Public Schools Class of 2009. Source: Boston Globe

By providing first-hand STEM experiences and growth opportunities, the BoSTEM Scholars Academy will improve the Boston/Cambridge low-income community’s chances of graduating from esteemed institutions in STEM majors.

Jobs in STEM fields yield high paying salaries, thus improving the socioeconomic status of students and their families and contributing to breaking the cycle of poverty. It is clear that the BoSTEM Scholars Academy can be a pivotal instrument for redefining the long term career trajectories of under represented minorities.

Implementation

The MIT BoSTEM Scholars program was piloted in Summer 2017 as four-week program and will be expanded to be an 6-week program during Summer 2018.

We implemented a “flipped classroom” approach to facilitate hands-on experiences. The model engaged the students with an active learning experience, facilitated peer to peer mentoring, and primed them for the information they learned the night before. Research also shows that the flipped-classroom approach covers a wider range of learners and has a demonstrative impact on standardized testing outcomes (Hamdan and McKnight, 2013).

Of the program’s four weeks, each week was dedicated to a particular subject—either Chemistry, Biology, Physics, or Computer Science. Wednesdays were allocated as time for students' personal and professional development, including tutorials on college admission, diversity and inclusion, financial planning, interviewing, and job shadowing.

Impact

We successfully reached our target population of students. Most of our students were underrepresented minorities in the sciences and are raised in low-income families. There were seven public high schools represented in our student body across the greater Boston community.

Improvement of the students’ test scores were statistically significant.

All of our students:
• Wrote and received coaching from at least four mentors on their college personal statement
• Learned how to seek admission to a prestigious college
• Shadowed at least one science professional or graduate student
• Read and presented peer reviewed articles in the sciences
• Learned how to write a competitive resume