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## MIT program helps minority high schoolers

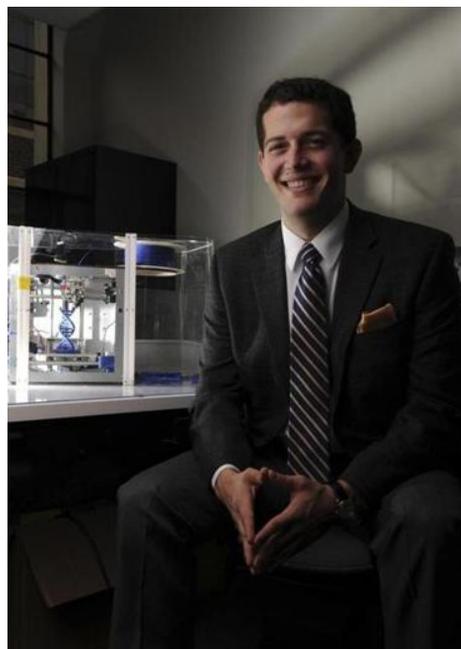
The school's long-running MITES program helps minority high schoolers navigate the rigors — and reap the rewards — of an education in the so-called STEM fields.

By Sarah Shemkus | DECEMBER 08, 2013

Growing up in southern Florida, AJ Perez was an accomplished student with dreams of attending an elite college. The schools he heard most about, however, were the local options: University of Miami, Florida State.

Then, in 2008, as a high school junior, Perez applied for and was accepted to MIT's Minority Introduction to Engineering and Science — or MITES — program. He spent a month and a half that summer immersed in university-level classes, learning about math, physics, and robotics and, it turned out, reshaping his plans for the future.

“I didn't know I wanted to go to MIT until MITES,” Perez says. “It wasn't too often MIT came up in daily conversation.”



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**MITES grad AJ Perez is a cofounder of startup New Valence Robotics.**

Perez, now 21, went on to earn a bachelor's degree in mechanical engineering from MIT. He also worked as a MITES teaching assistant the summer between his sophomore and junior years. Today, he is enrolled in a master's program at the school and is a cofounder of New Valence Robotics, a startup focused on creating 3-D printers that can be used by science and math students in elementary, middle, and high schools. "Realizing the impact we're having on people and realizing how excited the kids get — that's what keeps me going every day," Perez says.

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The importance of education in science, technology, engineering, and math — the so-called STEM subjects — has been widely discussed in recent years. MITES, however, has been working to expand interest and participation in these fields for almost 40 years. The Massachusetts Institute of Technology launched the program in 1975 in an effort to encourage more minority and disadvantaged students to study math and science, says Shawna L. Young, executive director of the school's Office of Engineering Outreach Programs, which oversees MITES.

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That first year, students came to Cambridge for just a week. Since then, the program has evolved into a six-week experience, including classes in physics, biology, chemistry, and humanities, and science and technology electives. The classes are rigorous and aim to teach both STEM content and lessons about what it takes to study science at the highest level, Young says. Students used to scoring A's with minimal effort quickly realize they have to work much harder to succeed at MITES.

"For a lot of them, it's the first time they've ever encountered academic failure," Young says. "We don't just have them experience that, we put them around people who will support them and help them figure out what to do when they don't know the answer."

For Perez, this learning-how-to-learn ethos smoothed his transition to college the year after his MITES experience. “I became so good at managing my time that there wasn’t that culture shock when I came to MIT,” he says. Instructors are largely MIT graduate students and alumni drawn by their enthusiasm for their subjects and their young pupils, Young says.

“It’s rewarding for the students and the instructors,” says Marc Graham, who holds undergraduate, master’s, and doctoral degrees from MIT, and has taught engineering design at MITES for more than 10 years. “The students — they grow a lot in one summer,” he says. “It is a very eye-opening experience.”

The MITES program is highly selective. More than 2,000 students applied for the 2013 session; just 78 were chosen, an acceptance rate of below 4 percent.

“When I read through the applications, I am stunned and humbled by how accomplished, smart, energetic, and excited about the world and about discovery these students are,” says Bruce Birren, a member of the program’s advisory board and director of Genomic Sequencing Center for Infectious Diseases at the Broad Institute.

Any high school student entering senior year is eligible to apply. The first criteria for admission is the ability to do the high-level work expected of participants, Young says, but students are also selected for socioeconomic, racial, and gender diversity.

Too often, Birren says, a student’s ZIP code rather than her ability determines whether she pursues a career in a STEM occupation. The MITES program tries to make sure talented students get opportunities regardless of background, he says. “There’s often a tendency to confuse achievement with ability rather than reflect on the opportunities that allowed students to make those achievements,” Birren says. “One of the questions we ask when reviewing applications is, ‘Who needs this opportunity the most?’ ”

MITES Students live in MIT dorms free of charge; they are responsible only for the cost of transportation to and from Cambridge. The program is funded by alumni groups, private industry, foundations, and government grants.

The work done by MITES fits into a growing national conversation about the importance of science and technology education. Job opportunities in related fields are expected to increase close to twice as fast as non-STEM occupations through 2018, but many American companies report having trouble finding qualified applicants for such positions, according to the STEM Education Coalition. Birren's experience with MITES students, however, leaves him optimistic. "Our country's future depends on research and our research depends on the next generation of scientists," Birren says. "And these MITES students speak to an incredibly bright future for American science."

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