BRINGING MORE DIVERSITY TO STEM FIELDS

Mind the Gap

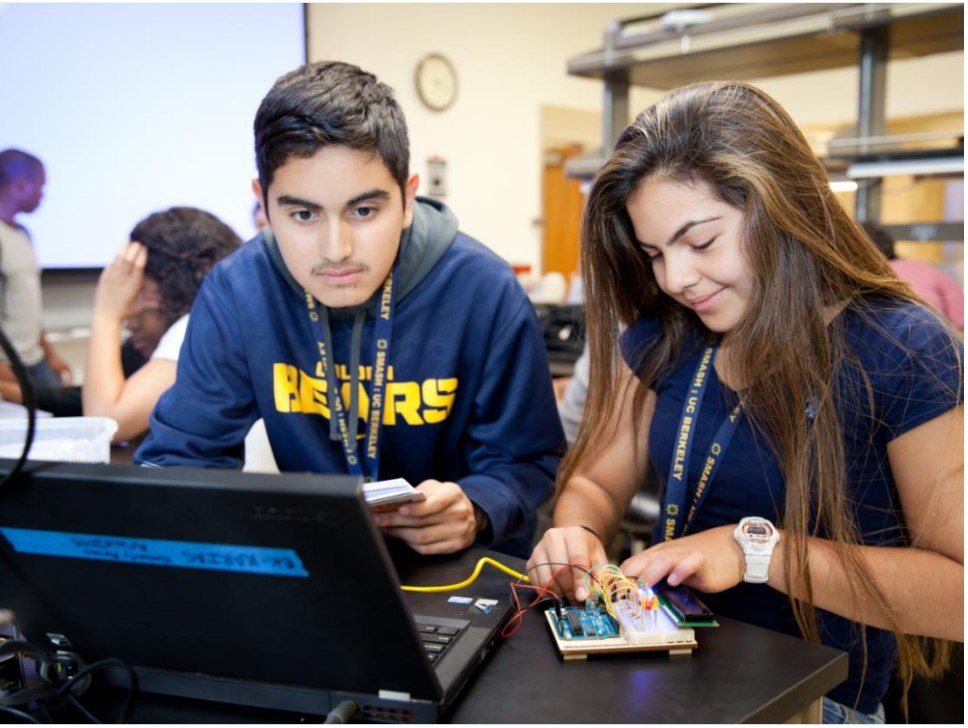

Image courtesy of LPFI

Educators have long known that careers in the STEM fields—science, technology, engineering, mathematics—are key to economic empowerment as they offer higher-than-average salaries and opportunities for advancement. That trend will continue—by 2024 the number of STEM jobs is expected to grow by 17 percent, compared with 12 percent for non-STEM jobs, according to a report by Change the Equation, a coalition of Fortune 500 companies focused on increasing STEM education.

Unfortunately, as the report notes, a growing number of African Americans and Latinos are missing this opportunity; currently, they are less likely to pursue STEM careers than they were in 2001. Here's how several organizations are helping young people from underserved communities reap the benefits that technical innovation is making possible.

Inspire the Very Young

Image courtesy of EiE

A University of Virginia study found that elementary school children who decide to pursue a science career are more likely to obtain a bachelor's degree in the physical sciences or engineering than their cohorts—even those who had higher mathematics scores. The Engineering is Elementary program aims to provide elementary school students from underserved school districts with that critical exposure to science. Children read storybooks featuring kids of differing ethnicities who solve engineering problems with the help of an adult. Afterward, they're invited to develop their own innovative solutions. For example, in one experiment, children create plant pollinators with low-cost materials like pipe cleaners and pom-poms.

"If we can get kids self-identifying as engineers now—seeing themselves with that 'hat' on—before they get the cultural message that 'engineers are white men,' we think that will be a powerful influence down the road," says Christine Cunningham, PhD, EiE's founder and vice president of the Museum of Science, Boston, which runs the program.

Connect Students with Their Potential

Image courtesy of LPFI

Data from the U.S. Department of Education shows that schools with primarily African American and Latino populations offer significantly fewer STEM courses than other public schools. In California, for example, nearly 75 percent of the public high schools with the highest percentage of underrepresented students of color offer no computer science courses, says Danielle Rose, director of programs for the Level Playing Field Institute. "The gap in access and opportunity for underrepresented students of color is both wide and deep," says Rose.

A mandate that computer science and other STEM courses be requirements for high school graduation could compel school districts to invest in resources (laptops, labs, and reliable Internet access), STEM courses, instructors, and out-of-school programs such as SMASH (Summer Math and Science Honors) Academy. The five-week, three-year summer STEM-enrichment program is offered to underrepresented high-school students of color free of charge, providing access to rigorous coursework, mentors, and support networks.

Increase Access to AP Courses

Image courtesy of **NPSI**

Students who successfully complete Advanced Placement (AP) courses are significantly more likely to graduate from college than those who do not, says a report from the National Center for Educational Accountability**.** In addition to increasing the number of AP classes available to students of color, Gregg Fleisher, chief academic officer for the National Math and Science Initiative (NMSI), says such courses should be open to all students who want to enroll, rather than just those expected to do well.

This is the policy of NMSI's College Readiness Program. Working in underserved areas, the program offers expert teacher training and study sessions, as well as lab equipment and funds to subsidize the costs of AP exam fees. Administrators found that African American and Latino students who participated in the program for three years had AP scores nearly four times the national average for that group. "Too often, opportunities are limited because of perceptions of students' ability to do well in math and science. Our results show that with proper resources and support, all students can achieve at high levels," says Fleisher.

Offer Structure and Support

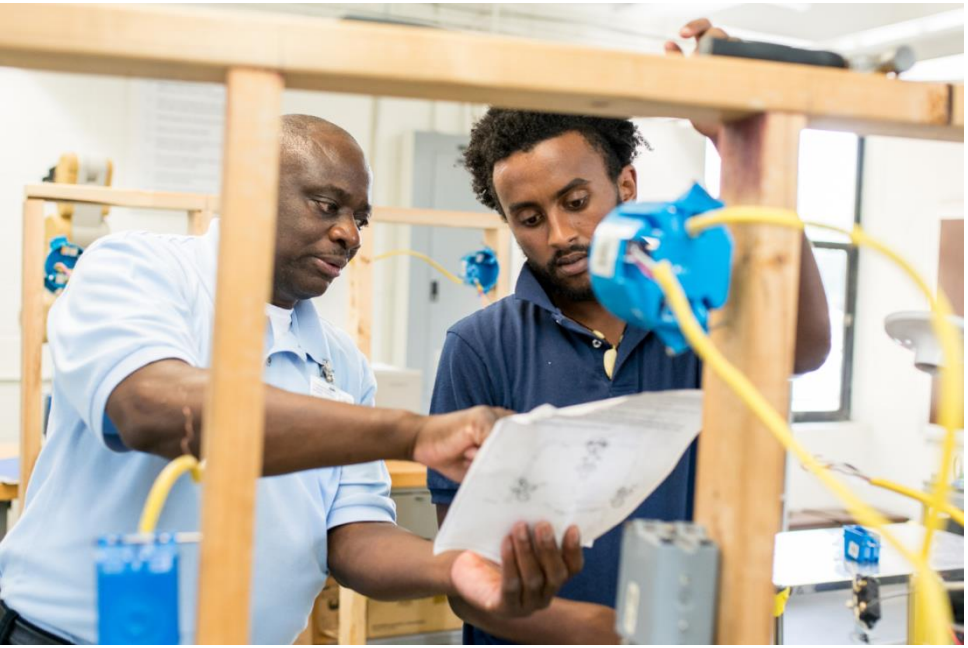

Image provided by TCAT

Traditionally, many STEM programs have tried to "weed out" underperforming students, and unfortunately it's worked. A U.S. Department of Education report found that 48 percent of bachelor's degree students and 69 percent of associate's degree students starting STEM majors between 2003 and 2009 left those fields.

However, post-secondary institutions that have adopted a "cultivate" approach are seeing impressive results. The Tennessee College of Applied Technology at Memphis, which has a primarily African American and Latino student body, achieved an 80 percent completion rate in 2014. As with other schools in the state system, administrators credit the low attrition rate to a structured curriculum that ensures that students learn the skills they need to graduate. Classes are also scheduled in chunks and at uniform times, enabling students to more easily juggle work and family obligations, while the financial aid system ensures that tuition is free for all students. "We eliminate a lot of choices and we teach what's relevant. It's a structured environment, but if you follow the model, then you will graduate on time," says James King, vice chancellor for the Tennessee College of Applied Technology.

Fuel Passions and Create Communities

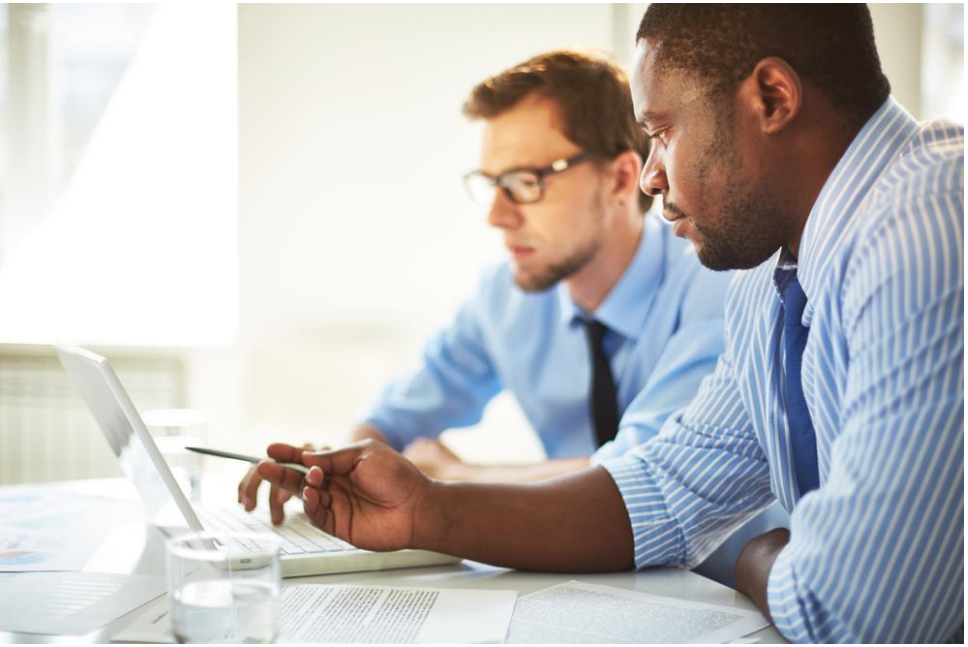

Photo credit: Shutterstock

Although the U.S. college graduation rate has grown about 50 percent since 1990, the number of engineering graduates has remained constant at about 120,000 per year, says a report from the President's Council on Jobs and Competitiveness. Providing engineering students with mentors and a community can help undergraduates pursuing degrees in engineering and other STEM fields stay on track—and inspire them to explore the full range of possibilities these degrees offer.

STAY WITH IT™ is an online community created by Intel that enables first- and second-year engineering students to connect with mentors and peers, as well as find engaging academic and career resources. "By creating relationships, sharing experiences, and providing support together, we can encourage the next wave of engineers," says former Intel CEO Paul Otellini, who served on the President's Council on Jobs and Competitiveness.