

Low-Income Students Nowhere to Be Found in STEM

Lauren Camera • May 25, 2017

Andrew Moore, the dean of Carnegie Mellon University's School of Computer Science, was blown away upon reading a college application essay from a student in rural Texas who described how he spent evenings writing computer code in pencil because he didn't have a computer at home. He'd head to school the next morning to try the codes out on the school's computers.

"That is awesome," Moore said. "That is so much a Carnegie Mellon person."

The Pittsburgh-based school has one of the best and most rigorous tracts in the country for computer science majors, and as such, requires students who plan to pursue that field of study to have a strong foundation in math.

"Rightly or wrongly," Moore said, "we have not done a good job serving students who come in without enough of a mathematics background. And this particular applicant did not have that background."

While much of the focus on underrepresented students in science, technology, engineering and math, or STEM, is placed on women and students of color, the dearth of low-income students has Moore and his colleagues at Carnegie Mellon "terrified," he says.

That was the theme on display Wednesday during the opening keynote of the 2017 U.S. News STEM Solutions conference in San Diego, where Moore and a handful of college presidents addressed how STEM plays into the future workforce in the U.S.

"If you look at where we admit students who are going to have the most amazing careers you can imagine, you can pretty much map that against a map of the suburbs of regions of the United States which are rich enough to have strong math and computer science programs," Moore said.

He continued: "This is very, very serious. We are genuinely worried that we are responsible for being part of an ongoing hegemony of the rich, wealthy – those being able to afford to live in the places where they can teach their kids to do that."

Moore says Carnegie has not homed in on the answer, but is considering ways to provide a more "gentle" introduction to students who lack a robust STEM background because their schools don't offer rigorous math and science courses.

The University of Washington's engineering program is in the infancy of a program it hopes will do just that. The school's academic red shirt program, which currently consists of a cohort of about 35 underrepresented minorities who live together on the same floor, assumes from the very beginning that it will take students five years to graduate, not four.

"The red shirt program has been working for us," said Ana Mari Cauce, president of the university, who says plans are in place to grow the program to 125 students over the next few years. "I go in and teach them about stress and coping because that's an important skill."

A recent effort out of Georgia Institute of Technology could give a similar boost to students from low-income backgrounds: The launch of an exclusively online computer science master's degree program with a price tag of about \$7,000.

"An employer can't differentiate between the online master's and the resident Master of Computer Science," said G.P. "Bud" Peterson, president of the college. "The reagents were quite honestly concerned, asking, 'Why are you spending so much money on these courses that are essentially free.' Well, we will provide this calendar year 8 percent of master's degrees of computer science in the country."

Meanwhile, Philip Hanlon, president at Dartmouth College in New Hampshire, said the school doesn't have as glaring of a problem when it comes to socioeconomic diversity among its STEM majors. First generation students, he said, tend to be overrepresented in STEM tracks compared to the average student body.

Dartmouth also recently made headlines upon announcing last year that 54 percent of graduates from the engineering school were women.

Everyone on the panel agreed that to maintain STEM participation among women, students of color and low-income students, parents and educators have to feed and nurture the interest from a very young age.

"If you're thinking about STEM education, whether it's women or underrepresented minorities, you really have to be thinking about it from cradle to college," Cauce said. "By the time they hit kindergarten, many of them are already behind. There is leakage in every step of the pipeline, so you have to have programs at every step of the pipeline."