New Study Challenges Conventional Wisdom on Shortage of STEM Graduates

Large numbers of students who major in STEM subjects do not pursue related careers, a study found. Toxic work cultures prompt many who do work in related fields to leave.

Jack Grove for Times Higher Education

You have 4/5 articles left.
Sign up for a free account or log in.

As headlines screaming about acute shortages of scientists, technicians or engineers arise on a near-monthly basis, the finger of blame for the so-called STEM skills gap is often pointed at universities—which, in some eyes, are too keen to churn out unworldlyy arts graduates lacking technological proficiency.

In turn, government support for humanities is wound down; generous subsidies are plowed into science, technology, engineering and mathematics education; and students are
urged to earn a scientific degree offering a well-paid and secure career.

But a new book-length study of the actual destinations of U.S. STEM graduates has sought to challenge what has become a hardened political consensus in the U.S., the U.K. and more widely. Arguably the most startling statistic in *Wasted Education: How We Fail Our Graduates in Science, Technology, Engineering and Math* is that anywhere from 30 percent to 60 percent of STEM graduates, depending on the sector, do not work in a STEM job. The figure could be as high as 72 percent, according to a 2021 U.S. Census Bureau study.

“There is huge pressure on children to take STEM majors, which are portrayed as tickets to the middle class. If you take a degree in a ‘softer’ subject, teachers will ask what you’re doing,” author John Skrentny, professor of sociology at the University of California, San Diego, told *Times Higher Education*.

“So it blew my mind when I heard that a minority of Americans with STEM degrees—maybe as low as a third—were doing STEM jobs,” he said. “We’re told that there is a dire shortage of STEM workers and we need to overhaul education systems or open the immigration floodgates because employers need these people, but only a minority of STEM graduates are working in these sectors.”
The discourse about STEM labor shortages is often accompanied by talk about the “leaky pipeline” of STEM workers drifting out of the labor force after just a few years, Skrentny observed. While he examines this “exodus” in detail, a more surprising fact is that a large proportion of STEM graduates never enter STEM professions at all; studies have found that 45 percent of US STEM majors took a non-STEM job after graduation and another 20 percent were in graduate school studying a non-STEM subject.

“Some people will make it through and have rewarding careers, but there is also a perception that STEM jobs are not all they are cracked up to be,” said Skrentny, who believes many have seen through the “mythology of the relaxed software company where guys play foosball and bounce around on pogo sticks. In some workplaces, average working weeks are 70 hours, and management expectations are just too high.”

Other STEM sectors have their own difficulties that undermine the popular perception that they are happy and secure places to work, continued Skrentny. “Since publishing this book, I’ve had a lot of emails from STEM employees who have their own stories about life in different sectors. One guy working as an engineer in the oil industry compared it to being a prospector in the 1890s—when the price of oil is high, it’s boom time, but otherwise you see layoffs. The
dysfunction in bioscience is that you could be highly trained but your product might not get FDA [Food and Drug Administration] approval and then people are out of a job.”

The idea that STEM careers are, as a rule, more lucrative than non-STEM roles is also tackled. Despite reports of $500,000 salaries for some new superstar Ph.D. students at Google, Skrentny found that managers of STEM workers are paid about 50 percent more than STEM workers themselves, who often exit their industries for jobs in business, accounting, marketing and sales—all of which employ large number of STEM workers.

For Skrentny, the purpose of the book is not to deny the need for STEM skills but rather to “rebalance a debate” that is dominated by what he calls the “STEM education industrial complex”—namely, large corporations that lobby for more STEM workers but make little effort to retain staff by stamping out the toxic work cultures that push so many staff to leave.

“Employers are complaining about this shortage of STEM workers, but these companies have strong incentives to demand more technical workers rather than look after existing ones,” said Skrentny, who said such pressure might explain why the U.S. government provides about $3 billion annually to support some 207 elite STEM university programs, and many more nationally.
"There are hundreds of things that these companies could do to improve their dismal record on retaining STEM staff rather than simply asking universities to give them more oranges to squeeze," said Skrentny. "They are very quick to point the finger at universities for not producing enough STEM graduates, but while it might look self-serving, maybe universities should point the finger back."