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Revisiting the STEM Workforce

A new NSB report says it's time to focus on a STEM-capable U.S. workforce

Does the United States have a “glut” or “shortage” of STEM workers? It’s a question that has long permeated policy conversations about the U.S. science, technology, engineering and mathematics (STEM) workforce. But is this the right question to be asking? *Revisiting the STEM Workforce*, a new report by the National Science Foundation’s (NSF) National Science Board (NSB), offers insights about long-standing workforce debates and seeks to catalyze constructive policy discussions about this critical and dynamic component of the nation’s economy.

Drawing on its biennial [*Science and Engineering Indicators \(Indicators\) report*](#), the NSB’s latest report highlights the growing need for STEM knowledge and skills in a 21st Century economy. In 2010, 16.5 million individuals—including many in non-STEM jobs, such as sales, marketing, and management—reported that their job required at least a bachelor’s degree level of science and engineering (S&E) expertise. This represents about three times the number of individuals working in occupations classified as S&E (5.4 million).

“The character of the STEM workforce is much more expansive than when NSF was founded 65 years ago,” said NSB Chairman Dan Arvizu. “New industries and the growing importance of STEM skills in jobs not traditionally thought of as STEM, means that we must revisit what we mean by a ‘STEM worker’.”

The report underscores that a consensus definition of the STEM workforce does not exist. Depending on the definition used, today’s STEM workforce includes employees across a wide swath of disciplines and job arenas, possessing everything from non-degree certifications to PhDs in STEM fields. It can even include individuals without a STEM degree who work in STEM jobs. Each adds value to the U.S. economy in some way—whether through traditional R&D activity, applying STEM knowledge and skills in a variety of settings to devise or adopt innovations, or using those knowledge and skills to complete occupational tasks.

What is typically called the STEM workforce is actually a complex aggregate of “sub-workforces.” Each comes with its own “story” based on occupation, education level, geography, sector, and a host of other factors. Broad generalizations fail to capture this complexity, according to the report, which notes that even an occupation like “computer and information scientist” comprises ten different occupations.

As the NSB dug deeper into these various sub-workforces, it found that career pathways are far from linear for individuals with STEM knowledge and skills.

“It’s time to stop thinking in terms of a pipeline from STEM degrees to STEM jobs,” said NSB Vice Chairman Kelvin Droegemeier, who also chairs the Board’s Science and Engineering Indicators Committee. “When you look closely at the data, you see that a degree in S&E is a passport to many jobs in STEM and non-STEM fields alike. Many of us on the Board were surprised to learn that about half of S&E degree holders work in non-STEM jobs, yet most individuals in these jobs see them as related to their field of degree.”

The report calls for building a strong, *STEM-capable U.S. workforce*.

“Perhaps we ought to shift from asking ‘how many STEM workers do we need’ to ‘what knowledge and skills do all of our workers need to be successful now and in the future’,” said Droegemeier. “The Board started this project focused on the debates about how many STEM workers our Nation needs to be competitive, but millions of workers who aren’t typically understood to be ‘STEM workers’ need these capabilities to be successful, and businesses need individuals with these skills to be globally competitive.”

“The report’s take-home message is that STEM knowledge and skills enable both individual opportunity and national competitiveness,” said Arvizu. “Ensuring access to high quality education and training experiences for all students at all levels and for all workers at all career stages, is absolutely essential. This is an ambitious goal, but we believe it’s the right goal, and we hope others in government, education and industry will join the Board in exploring how best to achieve it.”

Revisiting the STEM Workforce is the latest in a suite of NSB resources that provide high quality data and analyses of the STEM workforce and education arenas, including the 2014 *Science and Engineering Indicators* [report](#), [Digest](#), [state data tool](#), STEM education [interactive online resource](#) and mobile applications for [tablets](#) and [iPad](#).

About the National Science Board

The [NSB](#) is the policymaking body for the National Science Foundation. NSB also advises the President and Congress on science and engineering policy issues. The Board’s 24 members are drawn primarily from universities and industry and represent a variety of science and engineering disciplines. Selected for their eminence in research, education or public service and records of distinguished service, Board members serve six-year terms. NSF’s Director is an ex officio 25th member of the Board.