

THE SKILLED TECHNICAL WORKFORCE: CRAFTING AMERICA'S SCIENCE & ENGINEERING ENTERPRISE

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3.4M

Why do the National Academies expect 3.4 million unfilled skilled technical jobs by 2022?

139

What did 139 stakeholders from across the country say the U.S. should do to improve opportunities for skilled technical workers?

4

What 4 recommendations do we offer for building the Skilled Technical Workforce of the future?



To grow our nation's science, technology, engineering, and mathematics (STEM) capacity and ensure that Americans can participate in tomorrow's economy, the United States must do more to foster its Skilled Technical Workforce (STW). These are workers who use science and engineering (S&E) skills in their jobs but do not have a bachelor's degree. Our competitiveness, security, and research enterprise require this critical, but often overlooked segment of our STEM-capable workforce. To highlight this part of the workforce, the National Science Board (NSB) has released a report, which you can read [here](#). A key message of the report is that STW pathways *complement* rather than *compete* with pathways requiring bachelor's degrees or higher.



Four Recommendations to Boost America's Skilled Technical Workforce

1. Change The Message:

The NSB, the National Science Foundation (NSF), and other S&E leaders should communicate to parents, educators, and students about the importance of the STW and the opportunities it offers.

2. Focus On The Data:

NSF's National Center for Science and Engineering Statistics and other statistical agencies should collect nationally representative data on the makeup of the STW. NSF should promote partnerships between governmental and non-governmental stakeholders to share data and develop tools for the public and decision makers.

3. Leverage Federal Investments:

Federal agencies that support STW programs can maximize the impact of their activities by working together. NSF can lead by example by analyzing its STW investments across all directorates to show NSF's contributions to the STW and build awareness of funding opportunities.

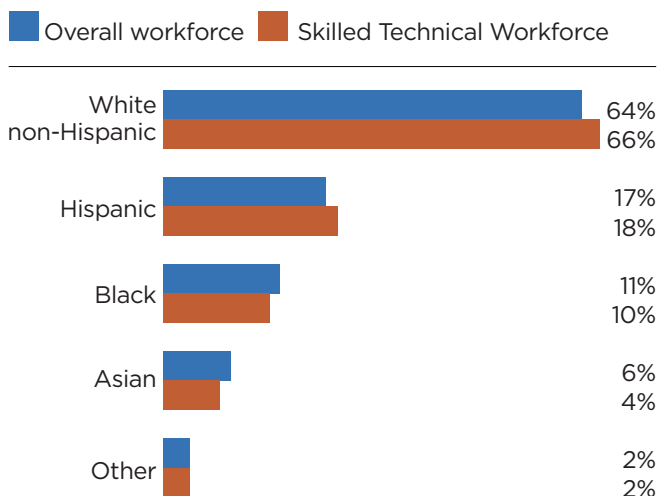
4. Build Partnerships:

Educational institutions — including K-12 schools, 2-year colleges, 4-year colleges, universities, and workforce development programs — should work with industry and governments to grow the STEM-capable workforce. Policymakers can design programs that require various stakeholders to work together.

Building a Diverse STEM-capable U.S. Workforce

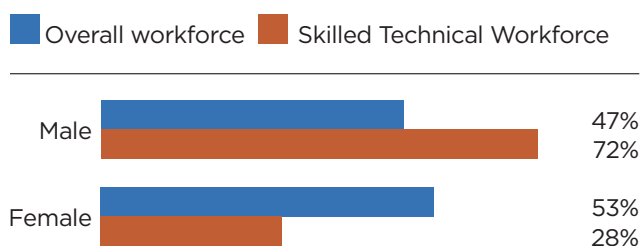
Cultivating a diverse STW is crucial to building a diverse STEM-capable U.S. workforce, because the STW is both a destination in itself and an on-ramp to further S&E education.

The Skilled Technical Workforce By Race and Ethnicity: 2017



The STW is the most diverse segment of the STEM-capable workforce. Its racial and ethnic composition is similar to the overall U.S. workforce age 25 and older.

The Skilled Technical Workforce By Sex: 2017



National Science Board, "Science and Engineering Labor Force," Science and Engineering Indicators 2020 (forthcoming).

Data source: Census Bureau, American Community Survey 2017, public use microdata

As is the case across the STEM-capable workforce, there is work to be done to increase women's participation in the STW. Only about 28% of STW workers are female.

Developing the Skilled Technical Workforce Our Nation Needs

We identify four systemic issues that will require new partnerships to strengthen the STW:

- **Designing STW education and preparation** to meet the needs of individuals.
- **Building partnerships** among industry, government, non-profit, and educational institutions to leverage resources and knowledge, and meet the needs and circumstances of local communities.
- **Conveying accurate information** about the STW, including employment and career opportunities.
- **Addressing data gaps and data silos** to maximize effectiveness of programs and initiatives.



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[nsf.gov/nsb/publications/2019/nsb201923.pdf](https://www.nsf.gov/nsb/publications/2019/nsb201923.pdf)