

Advancing American Research and Innovation

April 2022

Policy Brief



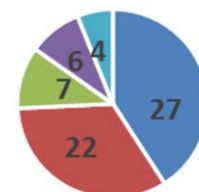
A National Imperative: Robust Federal Investment in Research and Innovation

For the United States to remain at the forefront of scientific research, cutting-edge technology, and advancement in innovation, the nation must continue to make robust investments at all federal research agencies and provide grant opportunities to support graduate education and research. Providing research opportunities for graduate students is essential for the U.S. to remain ahead of competitor nations and continue to make progress in the advancement of the nation's STEM workforce. The application of resulting discoveries drives advancements across multiple industries and improves the daily lives of Americans. Federal investments in agencies that support basic science research, as well as timely breakthroughs that are responsive to national need, ought to be strengthened.

Research and Development Performance

Reporting from the [National Science Board](#) shows that global research and development performance is concentrated in a few countries, with the proportion of total U.S. R&D funded by the U.S. government decreasing from 31 percent in 2010 to an estimated 21 percent in 2019. Due to the global concentration of R&D performance continuing to shift from the United States and Europe to countries in Asia, the Senate and House passed competitiveness and innovation legislation to increase authorization levels for federal research agencies.

Global Research and Development Performance



■ United States ■ China ■ Japan ■ Germany ■ South Korea

Graduate Education and Research Programs are Essential to the Nation's Innovation Enterprise

Providing research opportunities to scientists, engineers, and STEM workers through postdoctoral fellowships, traineeships, and career development opportunities is essential for the U.S. to remain ahead of competitor nations and continue to make progress in the advancement of the nation's STEM workforce.

Department of Energy's Office of Science

- **Graduate Student Research Program (SCGSR):** The goal of the Office of Science Graduate Student Research (SCGSR) program is to prepare graduate students for science, technology, engineering, or mathematics (STEM) careers critically important to the DOE Office of Science mission, by providing graduate thesis research opportunities at DOE laboratories.

National Institute of Standards and Technology (NIST)

- **Graduate Student Measurement Science and Engineering Fellowship (GMSE):** The NIST GMSE fellowship program provides doctorate-level graduate students with opportunities and financial assistance to obtain laboratory experience within the NIST laboratories in the STEM disciplines related to NIST measurement science and engineering research.

National Oceanic and Atmospheric Administration (NOAA)

- **John A. Knauss Marine Fellowship Program:** The Sea Grant Knauss Fellowship provides a unique educational and professional experience to graduate students who have an interest in ocean, coastal and Great Lakes resources and in the national policy decisions affecting those resources.

National Science Foundation (NSF)

NSF's two major agency-wide programs in graduate education are the NSF Research Traineeship (NRT) program and the Graduate Research Fellowship Program (GRFP). Both programs support actions to prepare graduates for a broad range of careers. Both NRT and GRFP programs provide professional development opportunities for graduate students, including internships and international research experiences.

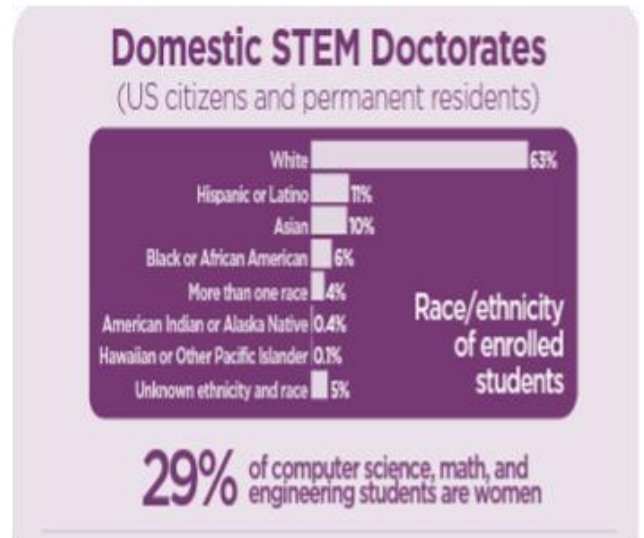
- **NSF Research Traineeships (NRT):** This program is dedicated to effective training of STEM graduate students in high priority interdisciplinary or convergent research areas through a comprehensive traineeship model that is innovative, evidence-based, and aligned with changing workforce and research needs.
- **Graduate Research Fellowships Program (GRFP):** As the oldest fellowship program supporting graduate education, the GRFP recognizes and supports outstanding graduate students pursuing full-time research-based master's and doctoral STEM degrees and STEM education research.

Building a Diverse Research and Development Workforce

The National Science Board recently released a document detailing the need to break down barriers to build a diverse research and development workforce. In the document, NSB writes that doctoral students are the future of scientific and technological innovation. To maintain our global competitiveness in science and engineering, we need to reduce barriers for domestic students that discourage many from pursuing STEM graduate degrees.

Students from the Missing Millions — Blacks, Hispanics, American Indians, Alaska Natives, Native Hawaiians, and women — as well as those from low socio-economic backgrounds, often have higher educational debt, greater family obligations, little to no intergenerational wealth, and have been disproportionately impacted by the COVID-19 pandemic.

The report mentions that policymakers should work to make advanced STEM education a financially sustainable choice for individuals from all backgrounds. This includes continued Congressional support for research and development, as well as strengthening investments in the research pipeline and robust investments in all federal research agencies.



Conclusion

Research and scientific inquiry are cornerstones of graduate education. The application of resulting discoveries drives advancement across industries and improves the lives of the American people. Federal investment in agencies that support basic science research, as well as timely breakthroughs that are responsive to national need, ought to be increased.

Moreover, federal policies should bolster the ability of the research pipeline to investigate, evaluate, and translate findings, as well as promote the safety, efficacy, and transparency of research and data sharing. In addition, policies should support programmatic activities that provide U.S. domestic graduate students opportunities to participate and contribute to international research.