Prepare and Inspire

A FEW WEEKS AGO, WE AND OUR COLLEAGUES ON THE PRESIDENT’S COUNCIL OF ADVISORS ON Science and Technology (PCAST) presented President Obama with the report Prepare and Inspire: K-12 Education in Science, Technology, Engineering and Math (STEM) Education for America’s Future.* It advocates a two-pronged strategy: To prepare all students to use STEM in their personal and professional lives, and to inspire them to learn STEM subjects and pursue STEM careers. It also provides a roadmap of programs that the federal government must seriously consider if the United States is to remain a vibrant and innovative society.

More than 25 years ago, the report A Nation at Risk: The Imperative For Educational Reform sounded an alarm about America’s K-12 (early education through precollege) educational system. Subsequent studies have highlighted the poor performance of the United States in STEM education, as assessed by comparative student achievement. This is of special concern because it is science and technology that propelled most of the increase in U.S. per capita income in the past century.

The good news is that the United States has begun to respond. A bipartisan consensus has emerged about the importance of educational accountability, and last year, approximately $4.4 billion dollars was committed in the Department of Education’s Race to the Top program to support educational reform. The National Academy of Sciences has distilled research about how students learn math and science, providing a base of knowledge for moving forward. This year, 36 states and the District of Columbia have adopted common mathematics education standards, and shared science standards are under discussion.

Our PCAST report includes five steps that the federal government should take to enhance the nation’s future well-being. First, existing high-quality programs should be scaled up to prepare 100,000 STEM teachers over the next decade. Second, to recognize excellence in STEM teaching, a STEM Master Teacher Corps should be created to award salary supplements and resources to support professional activities and networking. Third, a new federal entity, ARPA-Ed (Advanced Research Projects Agency—Education), should develop shared technology platforms and digital instructional materials to help teachers and students harness the potential of technology. Fourth, the government should help states increase the number of STEM-focused schools from 100 to at least 1000 over the next decade, in diverse communities and at multiple grade levels. Finally, a coordinated initiative (called INSPIRE) would give students opportunities to form connections with STEM through after-school programs.

The federal government has historically lacked a coordinated strategy and strong leadership on STEM education. Therefore, the PCAST report calls for a new partnership between the National Science Foundation and the Department of Education, with greater staff capacity at each agency. It also recommends increasing leadership, capacity, and coordination among the many federal agencies with disconnected programs for K-12 STEM education.

Some of these recommendations may require new authorities and/or appropriations.† But many federal actions can begin immediately, including scaling up STEM teacher preparation programs, directing existing funds to establish STEM-focused schools, and laying the groundwork for ARPA-Ed and a STEM Master Teacher Corps. STEM professionals must also act immediately. They should show unwavering support for the shared science education standards and encourage senators and representatives to enact programs in the PCAST report through appropriate legislation. STEM professionals must volunteer to help schools form robust connections to the STEM communities in academia, the private sector, and nonprofit organizations. It is important that the United States hold its leaders accountable for rising to the challenge of preparing its citizens for a competitive future, but everyone in the STEM community must rise to meet this challenge as well.


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*Science* 330 (6001), 151.
DOI: 10.1126/science.1198062

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