

# STEM SKILLS

*Winning the Race 2012* is a series of ten policy briefs that lay out broad principles and actionable ideas for the next administration to embrace to help the United States win the race for global innovation advantage.

## Context and Policy Divide

Skills, particularly science, technology, engineering, and math (STEM), are key enablers of innovation and productivity. But the United States lags in the ability to field a globally competitive technical workforce.

In 2008, three times more students took the Art History AP test than the Computer Science AB AP test. Half of U.S. STEM doctoral degrees are awarded to non-U.S. residents. Over the last two decades STEM jobs have grown approximately 75 percent faster than STEM degrees, with the gap being filled by immigrants. And there is also a shortage of skilled technicians.

Companies can play some role in meeting these needs, but with increased pressures for short-term profits and reduced job tenure, corporate funding for workforce training has fallen by half as a share of GDP in the last decade. K-12 schools and colleges do not graduate enough qualified STEM workers and technicians. And our high-skill immigration system is not meeting the needs of employers. As such, we need new approaches to winning the skills race.

Unfortunately, our politics impedes progress. Elements in both parties see high-skill immigration as a threat. Moreover, many Republicans want to limit the federal investment in STEM education and technical training, while many Democrats resist disruptive, but needed educational innovations like school vouchers and shifting workforce training dollars to employers.

## Innovation Race Principles

- **We need an “All STEM for Some” approach.** The current “Some STEM for All” approach focused on ensuring that from kindergarten to college students get a high quality STEM education has not worked and is unlikely to work in the future, if for no other reason than limited public resources. We need an “All STEM for Some” approach that works to actively recruit students who are most interested in and capable of doing well in advanced STEM and provide them with the kind of educational experience they need to be able to contribute to the U.S. innovation economy.

- **Don't forget computer science and engineering.** All too often computer science and engineering are ignored in middle and high schools. Yet, together they account for approximately three-quarters of all STEM jobs.
- **More money is not enough, we need institutional innovation.** The prevailing view is that existing educational institutions can do the job, they just need more money, better teachers, and more information about what works. In fact, fixing the problem will require new institutions; including science high schools, new kinds of colleges, and new funding arrangements like school vouchers.
- **Education reform is needed at all levels of education, not just K-12.** It is myth that the only educational problems are at the K-12 level. There is increasing evidence that a not insignificant share of university graduates are unprepared to fully contribute to the U.S. economy.
- **Differentiate between high-skill and low-skill immigration.** Not all immigration has the same impact. High skill immigration, particularly in STEM fields, brings needed talent to power U.S. innovation, boosting jobs and living standards. Low skill immigration reduces productivity by making employers less likely to substitute capital for labor.

## Policy Recommendations

- ✓ **Create 400 new STEM-focused high schools:** To expand STEM graduates, high school is a key place to start and the best way to improve STEM high school education is to foster the creation of more STEM-focused high schools. The next administration should urge Congress to allocate \$200 million a year for ten years to the Department of Education, to be supplemented by states and school districts and industry, with the goal of quintupling the number of STEM high schools to 500.
- ✓ **Provide prizes to colleges and universities that do best at retaining STEM students:** STEM BS degrees could be increased significantly if more freshmen who intended to major in STEM graduated with a STEM degree. To give universities an incentive to worry about whether students switch from engineering to English, the next administration should urge Congress to appropriate \$100 million a year to the National Science Foundation, to be awarded as prizes for colleges and universities that dramatically increase the rate at which freshmen STEM students graduate with STEM degrees.
- ✓ **Fully fund a nationwide skills standards initiative:** The National Skill Standards Act of 1994 created a National Skill Standards Board responsible for partnerships to establish industry-defined national standards leading to industry-recognized, nationally portable certifications. Without full federal funding, this initiative will not reach its promise.



- ✓ **Expand high skill immigration by supporting passage of the Startup America Act 2.0:** The legislation would create a “STEM Visa” with permanent resident status for up to 50,000 foreign students who graduate from an American university with an advanced STEM degree, provided they remain active in one of those fields.

## Related ITIF Resources

*Innovation Economics: The Race for Global Advantage* (Yale University Press, 2012)

*Why the Current STEM Education Reform Strategy Won't Work* (Issues in Science and Technology, Spring 2012)

*Refueling the U.S. Innovation Economy: Fresh Approaches to STEM Education*

*Global Flows of Talent: Benchmarking the United States*



The United States is losing the race for global innovation advantage and the jobs and income that come with that. Many other nations are putting in place better tax, talent, technology and trade policies and reaping the rewards of higher growth, more robust job creation, and faster income growth. It's not too late for the United States to regain its lead but the federal government will need to act boldly and with resolve to design and implement strategies that include cutting business taxes and boosting public investment. *Winning the Race 2012* is a series of ten policy briefs that lay out broad principles and actionable ideas for the next administration to embrace to help the United States win the race for global innovation advantage. For more actionable policy ideas, visit ITIF's *Policymakers Toolbox* at [www.itif.org/policymakers-toolbox](http://www.itif.org/policymakers-toolbox).

### **ABOUT ITIF**

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