Toward a Federal STEM Policy

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Key New England industries including information technology, defense technology, biotechnology, environmental services, health care and university research rely upon people with skills in science, technology, engineering and math (STEM) fields. Yet, just 20 percent of New England high school students who took the SATs in 2005 indicated a desire to major in a STEM field. That's below the U.S. average of 26 percent and significantly below the rate of North Carolina, a major competitor where 33 percent of SAT-takers said they were interested in a STEM major. Moreover, if current trends continue, by 2010, more than 90 percent of all scientists and engineers in the world will be living in Asia, according to a presentation by Rice University chemist Richard Smalley to the President's Council of Advisors on Science and Technology.

To head off labor shortages in crucial STEM fields, New England needs to shore up the pipeline of talent with a long-term strategy that focuses on K-12 and higher education.

While there are roles for state governments and the private sector to play in improving STEM education, we urge New England's congressional delegation to propose a significant *federal* initiative to encourage and promote STEM education nationally. A model for this could be the National Defense Education Act of 1958, which was enacted in response to the former Soviet Union's launch of Sputnik. This law provided new funding for mathematics and science education and training at all education levels. It inspired generations of U.S. students to pursue study in fields vital to national security and aided the nation in establishing its dominance in science and technology for the next half century.

As part of a newer initiative, we urge New England's congressional delegation to support more specifically:

• **Increased investment in STEM teachers.** This could involve scholarships, loan forgiveness and tax incentives for STEM graduates who commit to teaching, as well as training for current teachers and mid-career professionals and retirees who might like to teach STEM in public schools. Many STEM graduates go into fields other than teaching in part because of better pay. The legislation should also include market- and performance-based compensation and incentive packages to attract and retain effective STEM teachers at all levels. It could also launch a "Finally, Science, Technology and Engineering" initiative as a logical next step to the U.S. Department of Education's focus on "Reading First" and "Math Next".

• **Increased investment in technology in schools.** We propose a National Technology Funding Program that would help schools purchase educational tools and require school leaders and teachers to focus on strategies to increase interest in STEM fields of study. This should include requiring school districts to develop STEM plans indicating goals and strategies and a guarantee of continued funding only if schools meet key milestones for each year.

• **Increased investment in STEM higher education**. The federal government can provide more incentives and support for programs aimed at getting a greater number of college students to major in STEM fields. These should build upon a range of existing scholarships and loan-forgiveness programs for students who pursue STEM fields. The National Science Foundation's STEP program providing grants to colleges for increasing the number of students majoring in STEM fields should be expanded. Centers for Undergraduate Education in STEM fields should be established at universities to improve the quality of undergraduate courses and increase the number of students taking these courses. Congress should also expand financial incentives for colleges and universities to partner with industry in creating science master's degree programs that respond to local and regional demand for workers with skills beyond a bachelor's degree, and for community colleges to increase the success of students in transferring to four-year STEM programs. And funding should be expanded to programs that succeed in graduating women and minorities in STEM fields

There are additional ways the federal government can bolster the infrastructure for STEM education. Steps should be taken to increase federal research and development funding, which has grown by only 1.5 percent since 2004, compared with 37 percent between 2000 and 2004, and to reform immigration laws to expedite permanent residence for foreign students who receive advanced degrees in STEM. Additional incentives should also be offered to business to develop more partnership roles with schools, donate technology, promote mentoring and provide training. Moreover, federal cabinet secretaries with a stake in STEM—Defense, Education, Homeland Security, Commerce, Labor and Energy—should develop a strategy to raise public awareness of STEM education.

New England must have an adequate supply of workers with skills to support an innovation economy. As other regions and countries focus investment toward innovation, it becomes even more pressing that New England and its representatives in Washington act now to prepare for the future.

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