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The Cost of Doing Business: Should the United States Create Incentives for STEM Labor?

GILLIAN ANDRES

Academics, business leaders, and policymakers have all issued the warning: The United States is facing an imminent workforce shortage in science, technology, engineering, and mathematics (STEM) that threatens the country's economic competitiveness in the global marketplace. Some nonprofit research groups and members of the science community, however, are chary of adding their voices to the chorus because past predictions concerning the STEM workforce have proved erroneous.

According to the Bureau of Labor Statistics (BLS), STEM employment will grow three times faster than employment in other fields, with the total number of STEM jobs increasing by 47 percent between 2000 and 2010. If STEM employment does grow as expected, can US universities produce enough skilled graduates to meet the demand? Many fear the answer is no: From 1994 through 2003, reports the Government Accountability Office, the number of STEM degrees earned failed to keep pace—by 22 percent—with the national average increase in all degrees earned, a possible early indicator of future STEM labor shortages.

Other reports concur. The National Academies recently issued *Rising above the Gathering Storm*, a report detailing 20 priorities for protecting US competitiveness. Among the recommendations: a call to “develop, recruit, and retain the best and the brightest students, scientists, and engineers” by increasing the number and proportion of US citizens who earn STEM degrees and enter the STEM workforce. The Business Roundtable, the National Science Board, and others have made similar recommendations.

Legislators in both parties have been attentive to these proposals. High-profile Republicans, including Repre-

sentative Frank Wolf (VA) and former Speaker of the House Newt Gingrich, were among the first advocates for a renewed investment in innovation to protect the STEM workforce. Now they have been joined by leading House Democrats and a bipartisan group of senators.

In November 2005, House Minority Leader Nancy Pelosi (D-CA) unveiled the Democrats' Innovation Agenda, which calls for “100,000 new scientists, mathematicians, and engineers to [be added to] America's workforce in the next four years.” Representative Bart Gordon (TN)—the ranking Democrat on the House Science Committee—and Senators John Ensign (R-NV) and Joseph Lieberman (D-CT) have introduced initiatives that address the same workforce concerns. All of these bills are intended to protect US competitiveness by ensuring a steady supply of STEM graduates ready for skilled employment. Although their methods vary, the initiatives generally offer students scholarships, grants, and tax breaks for higher education to encourage them to pursue STEM degrees and enter the science workforce upon graduation.

Some beltway insiders are questioning the need for these initiatives, given the difficulty in predicting future workforce demands and graduation rates. According to Richard Monastersky, writing in the *Chronicle of Higher Education* in 2004, similar fears of a STEM workforce crisis in the 1980s were ultimately unfounded. Even the BLS admits that it has been unsuccessful in the past at predicting technical workforce needs. Current projections of STEM workforce shortages might also be flawed, considering that science and engineering unemployment reached a 20-year high in 2002, according to the

National Science Foundation's *Science and Engineering Indicators 2004*. A 2004 study by the Rand Corporation, a nonprofit research institution, analyzed STEM workforce and graduation rates and concluded, “Despite recurring concerns about potential shortages of STEM personnel in the U.S. workforce...we did not find evidence that such shortages have existed at least since 1990, nor that they are on the horizon.”

As Congress prepares for the November midterm election, STEM workforce concerns are likely to stay in the spotlight. Yet the current bipartisan support for new, expensive initiatives comes before contradictory projections about the STEM workforce have been fully reconciled. Why are so many business leaders and decisionmakers motivated to address a workforce innovation “crisis” that might not develop?

The answer could be economic. In 2004, *Science* editor Donald Kennedy and colleagues offered this explanation: “The present situation [of an excess STEM labor supply] provides real advantages for the science and technology sector and the academic and corporate institutions that depend on it.” The United States has “arranged to produce more knowledge workers than we can employ, creating a labor-excess economy that keeps labor costs down and productivity high.” Within this context, it remains to be seen whether the proposed innovation initiatives will successfully prevent a future STEM labor shortage without reducing the wages and employment rates of the current STEM workforce.

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