

Will Science and Engineering Now Be a Good Career?

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Article begins on next page

Will Science and Engineering Now Be a Good Career?

“ Before rushing to panicked conclusions about a math and science crisis in every classroom and college, let us take an evidence-based approach to addressing the nation's future.”



Bob Damm

By Lindsay Lowell & Hal Salzman

The classroom or the boardroom? Where does America's problem in finding the best and the brightest for its science and engineering jobs begin? Dissatisfied policymakers and corporate managers constantly point to schools as the culprit, in not producing enough globally competitive science and engineering students. Yet a careful look at the data suggests that the finger-wagging may be aimed in the wrong direction.

Our in-depth analysis of international testing data, the graduate pool, and over 30 years of data on top-performing high school students finds no decline in the K-12 performance of U.S. students, nor any significant disadvantages in comparison with students around the world.

Of course, America can and *should* do better. We mustn't let the stellar performance of our top students lead us to overlook the dismal record of our lowest-performing students and schools. But that is a far different problem from the purported inadequacy of the nation's high schools in developing globally competitive talent.

High schools today graduate as many students with the math skills necessary to pursue a career in science and engineering as they ever have, according to our recently released examination of the past few decades.

(See *edweek.org*, Oct. 28, 2009; *Education Week, Report Roundup*, Nov. 4, 2009.) Colleges and universities, in turn, are graduating as many scientists and engineers as they ever have, or more. Yet, starting in the 1990s, many of the highest-performing students, those with the best SAT scores and grade point averages, chose careers in fields other than science and engineering after graduation.

Though American industry was amply supplied by students over these years, its leaders complained unceasingly about the difficulty of finding the workers they wanted and the need to import scientists and engineers from abroad. From this, one might surmise one of their problems: The best-performing students, those with all that math background, were flocking to higher-paying jobs in business and finance.

Will industry's thirst for bright, highly trained young people finally be satiated, now that it no longer needs to compete with the bloated Wall Street salaries once offered to recent science and engineering gradu-

ates? After a decade of complaints that the United States doesn't supply enough scientists and engineers, it seems the equation may be changing, and top-performing graduates from our universities should be in ample supply. Over the past decade, American colleges and universities graduated roughly three times the number of scientists and engineers than were employed in the growing science and engineering workforce. In fact, there are about three times as many individuals with science and engineering education today as there are in the science and engineering workforce proper.

Yet, at the same time, our research indicates that the best students in the science and engineering pipeline, those in the top SAT or GPA quintiles, did not stay in science and engineering studies or jobs. Clearly, these top performers were drawn to occupations outside these fields.

Perhaps it was the struggle of employers in these fields to attract the best and brightest that led to their

PAGE 26 >

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Will Science and Engineering Now Be a Good Career?

CONTINUED FROM PAGE 32

inability to find workers despite an ample supply of graduates. To be fair, we now see that the powerful lure of Wall Street in recent years was fueled largely by unsustainably high salaries in an unstable financial system.

Employer complaints have a familiar ring to them. Beginning with the information-technology industry's dot-com super-bubble in the late 1990s, industry associations began a drumbeat of criticism about low-performing U.S. schools and decried the federal government's H-1B guest-worker program as too restrictive to attract the foreign talent needed. Science and engineering firms soon joined in the chorus of complaint. A more reasoned analysis now suggests that these companies simply were not meeting the salaries that top graduates got elsewhere. Our schools steadily produced top-tier science and engineering students, who reasonably pursued the demand reflected in higher wages for jobs outside of science and engineering.

As we now struggle to restore the American economy, we have the opportunity to take a sober look at our science and engineering students and workforce supply. Before rushing to panicked conclusions about a math and science crisis in every classroom and college, let us take an evidence-based approach to addressing the nation's future.

Our research suggests three starting points for policymakers. First, recognize and build upon the nation's educational strengths. Consider how our leading states and school systems have been successfully educating the world's scientific and engineering elite. Like many others before it, our analysis of international test scores finds that "best practices" for America are to be found within our own borders, rather than abroad.

Second, education policymakers need to target reforms where they are most needed, addressing the weaknesses of the U.S. education system while building on its strengths. America's greatest challenge is to encourage, and to provide the wherewithal for, the growing number of able minority students struggling in low-quality schools and trying to afford the cost of college.

Third, we must look at the demand side to understand the career choices our best and brightest students make. Without the unsustainable bubble economy of the financial industry to distort the market, science and engineering employers must now examine all aspects of their labor markets to attract workers from the ample supply of high-qualified graduates from our universities. The Obama administration's budget for research and development is one step toward strengthening the demand side, but more steps are needed.

Without undermining an education system that produces the lion's share of the world's best students, reforms must be made to fix the part of the school and social system that also produces the lion's share of the industrial world's worst-performing students. Recent postsecondary enrollment increases of African-Americans graduating from high school and moving on to science and engineering studies demonstrate the positive results from many efforts to increase the number of underrepresented groups in the science and engineering workforce. Further progress, however, will require that they find good jobs at the end of their studies.

It is now time to focus on the demand side of the equation. Students can intuitively calculate, without higher-order math, the costs of education and the benefits of opportunities after graduation. These elements of the equation matter, if we wish to truly build America's science and engineering capacity.

A balanced, evidence-based policy approach must guide our efforts to strengthen the workforce in these vital areas at a time when dollars are precious, time for effective solutions is short, and the competitive costs of pursuing the wrong fixes are great. ■