

An innovation nation once more

To compete globally, the US workforce needs presidential leadership to bolster math, science, and engineering education.

By Todd L. Pittinsky

from the September 15, 2008 edition

Cambridge, Mass. - America is having one of those slow-motion nightmares where you're back in high school and suddenly you remember you're enrolled in chemistry, economics, and French. The exams are tomorrow but you haven't been to any of the classes, read any of the books, or done any of the homework.

In our national dream, we're high-tech champions, but we forgot that the other countries are also competing, doing just what we once did to be the most innovative, productive, and competitive. Suddenly, the signs are all over, from Indian tech support to Finnish cellphones to Japanese hybrid cars.

If technology will be one of the drivers of the economic prosperity we want, does the America of subprime mortgages and unaffordable healthcare, high gas prices, and low stock prices, still have what it takes? It feels as if we're slipping ... if only we could wake up.

We were on top for so long that we forgot what kept us there. Our spectacular run of world-beating innovation and productivity was not a result of some peculiarly American superiority. It was based, in part, on out-educating the rest of the world. Widespread, high-quality math, science, and engineering education gave America a workforce that could produce marvels from the Internet to the frozen French fry.

But is our public education still world-class? Cross-national studies suggest it isn't. In a worldwide 2003 study of fourth and eighth graders (the Trends in Mathematics and Science Study), the US fared only slightly above average. In a 2006 multinational study (the OECD Programme for International Student Assessment), the US scored lower than average on math and combined science. Meanwhile, it appears that fewer foreign graduate students trained in these fields on US campuses are applying for US citizenship.

Countries from Ireland to India to China have spent decades doing their homework – investing wholeheartedly in technically educated workforces – while America, still dreaming, seems to have forgotten it signed up for the course.

National somnambulism makes this a national leadership issue. Unfortunately, our presidential candidates seem only vaguely aware of the problem and unaware of the most effective role they

could play in solving it. J. Richard Hackman, a leading scholar on organizational behavior, has emphasized that the best leadership consists of creating the conditions for greatness, in part by (a) pointing people in a compelling direction and (b) providing the resources they will need to move in that direction.

By those criteria, neither John McCain nor Barack Obama are demonstrating serious leadership on this issue. They make vague statements and say little about specific problems, specific causes, and specific solutions. They address some problems of the moment (federal research spending, the politicization of federal science agencies), but seem unaware that the sources of the US scientific workforce are starting to dry up. Quickly.

What should presidential leadership on these issues look like?

Both candidates should be articulating a clear direction – excellence in math, science, and engineering education at all levels – and specifying the resources they will dedicate to that goal. They do not need to design specific programs; they do need to show strong support for others who come up with such programs. Unfortunately, with vast military spending, entitlements, infrastructure investments, and corporate bailouts looming, neither Senator Obama nor Senator McCain is sticking up for serious money to repair our intangible but critical infrastructure of math, science, and engineering education.

Great achievements are usually founded on great examples. For instance, in the State University of New York, Stony Brook University has pioneered a model in which the university serves as a hub for local science education. Through its Center for Science and Mathematics Education, thousands of middle and high-school students participate in science and technology programs – summer biotechnology sleepover camps, forensic camps, science competitions, independent research projects, and more – at a critical moment in their schooling years. Community programs reach out to adults, too, to increase scientific literacy.

Efforts such as this aren't just about boosting US test scores. They're an investment in sound science and sound policies. The stakes are high. These days, making sure we have an electorate that can understand the science – or lack of it – behind various positions on, say, global warming is a matter of life and death.

To help others achieve greatness, our candidates should be shining spotlights on programs that are already getting good results. Both candidates should seek out programs such as Stony Brook's (there are many and they will be happy to be found), talk them up while the whole country is watching, and make specific pledges of support for a range of promising programs. As president, the winner must make good on his pledges and support the successes that follow.

Our bad dream can end, but only if our leaders – and we – wake up and face reality.

• *Todd L. Pittinsky is a professor at the Harvard Kennedy School and research director of its Center for Public Leadership.*