

Opinions

Why America's obsession with STEM education is dangerous

By **Fareed Zakaria** March 26

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If Americans are united in any conviction these days, it is that we urgently need to shift the country's education toward the teaching of specific, technical skills. Every month, it seems, we hear about our children's bad test scores in math and science — and about new initiatives from companies, universities or foundations to expand STEM courses (science, technology, engineering and math) and deemphasize the humanities. From [President Obama](#) on down, public officials have cautioned against pursuing degrees like art history, which are seen as expensive luxuries in today's world. Republicans want to go several steps further and [defund](#) these kinds of majors. "Is it a vital interest of the state to have more anthropologists?" [asked](#) Florida's Gov. Rick Scott. "I don't think so." America's last bipartisan cause is this: A liberal education is irrelevant, and technical training is the new path forward. It is the only way, we are told, to ensure that Americans survive in an age defined by technology and shaped by global competition. The stakes could not be higher.

This dismissal of broad-based learning, however, comes from a fundamental misreading of the facts — and puts America on a dangerously narrow path for the future. The United States has led the world in economic dynamism, innovation and entrepreneurship thanks to exactly the kind of teaching we are now told to defenestrate. A broad general education helps foster critical thinking and creativity. Exposure to a variety of fields produces synergy and cross fertilization. Yes, science and technology are crucial components of this education, but so are English and philosophy. When unveiling a new edition of the iPad, Steve Jobs [explained](#) that “it’s in Apple’s DNA that technology alone is not enough — that it’s technology married with liberal arts, married with the humanities, that yields us the result that makes our hearts sing.”

Innovation is not simply a technical matter but rather one of understanding how people and societies work, what they need and want. America will not dominate the 21st century by making cheaper computer chips but instead by constantly reimagining how computers and other new technologies interact with human beings.

For most of its history, the United States was unique in offering a well-rounded education. In their comprehensive study, [“The Race Between Education and Technology,”](#) Harvard’s Claudia Goldin and Lawrence Katz point out that in the 19th century, countries like Britain, France and Germany educated only a few and put them through narrow programs designed to impart only the skills crucial to their professions. America, by contrast, provided mass general education because people were not rooted in specific locations with long-established trades that offered the only paths forward for young men. And the American economy historically changed so quickly that the nature of work and the requirements for success tended to shift from one generation to the next. People didn’t want to lock themselves into one professional guild or learn one specific skill for life.

That was appropriate in another era, the technologists argue, but it is dangerous in today’s world. Look at where American

kids stand compared with their peers abroad. The most recent international test, conducted in 2012, found that among the 34 members of the Organization for Economic Cooperation and Development, the United States [ranked](#) 27th in math, 20th in science and 17th in reading. If rankings across the three subjects are averaged, the United States comes in 21st, trailing nations such as the Czech Republic, Poland, Slovenia and Estonia.

In truth, though, the United States has never done well on international tests, and they are not good predictors of our national success. Since 1964, when the first such exam was administered to 13-year-olds in 12 countries, America [has lagged](#) behind its peers, rarely rising above the middle of the pack and doing particularly poorly in science and math. And yet over these past five decades, that same laggard country has dominated the world of science, technology, research and innovation.

Consider the same pattern in two other highly innovative countries, Sweden and Israel. Israel ranks first in the world in [venture-capital investments](#) as a percentage of GDP; the United States ranks second, and Sweden is sixth, ahead of Great Britain and Germany. These nations do well by most measures of innovation, such as research and development spending and the number of high-tech companies as a share of all public companies. Yet all three countries fare surprisingly poorly in the OECD test rankings. Sweden and Israel performed even worse than the United States on [the 2012 assessment](#), landing overall at 28th and 29th, respectively, among the 34 most-developed economies.

But other than bad test-takers, their economies have a few important traits in common: They are flexible. Their work cultures are non-hierarchical and merit-based. All operate like young countries, with energy and dynamism. All three are open societies, happy to let in the world's ideas, goods and services. And people in all three nations are confident — a characteristic that can be measured. Despite ranking 27th and 30th in math, respectively, American and Israeli students

came out at the top in [their belief in their math abilities](#), if one tallies up their responses to survey questions about their skills. Sweden came in seventh, even though its math ranking was 28th.

Thirty years ago, William Bennett, the Reagan-era secretary of education, noticed this disparity between achievement and confidence and quipped, “This country is a lot better at teaching self-esteem than it is at teaching math.” It’s a funny line, but there is actually something powerful in the plucky confidence of American, Swedish and Israeli students. It allows them to challenge their elders, start companies, persist when others think they are wrong and pick themselves up when they fail. Too much confidence runs the risk of self-delusion, but the trait is an essential ingredient for entrepreneurship.

My point is not that it’s good that American students fare poorly on these tests. It isn’t. Asian countries like Japan and South Korea have benefitted enormously from having skilled workforces. But technical chops are just one ingredient needed for innovation and economic success. America overcomes its disadvantage — a less-technically-trained workforce — with other advantages such as creativity, critical thinking and an optimistic outlook. A country like Japan, by contrast, can’t do as much with its well-trained workers because it lacks many of the factors that produce continuous innovation.

Americans should be careful before they try to mimic Asian educational systems, which are oriented around [memorization and test-taking](#). I went through that kind of system. It has its strengths, but it’s not conducive to thinking, problem solving or creativity. That’s why most Asian countries, from Singapore to South Korea to India, are trying to add features of a liberal education to their systems. Jack Ma, the founder of China’s Internet behemoth Alibaba, recently hypothesized [in a speech](#) that the Chinese are not as innovative as Westerners because China’s educational system, which teaches the basics very well, does not nourish a student’s complete intelligence, allowing her to range freely, experiment and enjoy herself while learning: “Many painters learn by having fun, many works [of art and literature] are the products of having fun. So,

our entrepreneurs need to learn how to have fun, too.”

No matter how strong your math and science skills are, you still need to know how to learn, think and even write. Jeff Bezos, the founder of Amazon (and the owner of this newspaper), insists that his senior executives write memos, often as long as six printed pages, and begins senior-management meetings with a period of quiet time, sometimes as long as 30 minutes, while everyone reads the “narratives” to themselves and makes notes on them. In [an interview](#) with Fortune’s Adam Lashinsky, Bezos said: “Full sentences are harder to write. They have verbs. The paragraphs have topic sentences. There is no way to write a six-page, narratively structured memo and not have clear thinking.”

Companies often prefer strong basics to narrow expertise. Andrew Benett, a management consultant, [surveyed](#) 100 business leaders and found that 84 of them said they would rather hire smart, passionate people, even if they didn’t have the exact skills their companies needed.

Innovation in business has always involved insights beyond technology. Consider the case of Facebook. Mark Zuckerberg was a classic liberal arts student who also happened to be passionately interested in computers. He studied ancient Greek intensively in high school and majored in psychology while he attended college. And Facebook’s innovations have a lot to do with psychology. Zuckerberg has often pointed out that before Facebook was created, most people shielded their identities on the Internet. It was a land of anonymity. Facebook’s insight was that it could create a culture of real identities, where people would voluntarily expose themselves to their friends, and this would become a transformative platform. Of course, Zuckerberg understands computers deeply and uses great coders to put his ideas into practice, but as he has [put it](#), Facebook is “as much psychology and sociology as it is technology.”

Twenty years ago, tech companies might have survived simply as product manufacturers. Now they have to be on the cutting edge of design, marketing and social networking. You can make a sneaker equally well in many parts of the world, but you can't sell it for \$300 unless you've built a story around it. The same is true for cars, clothes and coffee. The value added is in the brand — how it is imagined, presented, sold and sustained. Or consider America's vast entertainment industry, built around stories, songs, design and creativity. All of this requires skills far beyond the offerings of a narrow STEM curriculum.

Critical thinking is, in the end, the only way to protect American jobs. David Autor, the MIT economist who has most carefully studied the impact of technology and globalization on labor, [writes](#) that “human tasks that have proved most amenable to computerization are those that follow explicit, codifiable procedures — such as multiplication — where computers now vastly exceed human labor in speed, quality, accuracy, and cost efficiency. Tasks that have proved most vexing to automate are those that demand flexibility, judgment, and common sense — skills that we understand only tacitly — for example, developing a hypothesis or organizing a closet.” In 2013, two Oxford scholars conducted [a comprehensive study](#) on employment and found that, for workers to avoid the computerization of their jobs, “they will have to acquire creative and social skills.”

This doesn't in any way detract from the need for training in technology, but it does suggest that as we work with computers (which is really the future of all work), the most valuable skills will be the ones that are uniquely human, that computers cannot quite figure out — yet. And for those jobs, and that life, you could not do better than to follow your passion, engage with a breadth of material in both science and the humanities, and perhaps above all, study the human condition.

One final reason to value a liberal education lies in its roots. For most of human history, all education was skills-based. Hunters, farmers and warriors taught their young to hunt, farm and fight. But about 2,500 years ago, that changed in Greece, which began to experiment with a new form of government: democracy. This innovation in government required an innovation in education. Basic skills for sustenance were no longer sufficient. Citizens also had to learn how to manage their own societies and practice self-government. They still do.

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