Education for the 21st Century
Author(s): Dave Posner
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Education for the 21st Century

What skills will students need to succeed in the 21st century? Mr. Posner tries to look ahead and suggests that our current education policies may be leading us in the wrong direction.
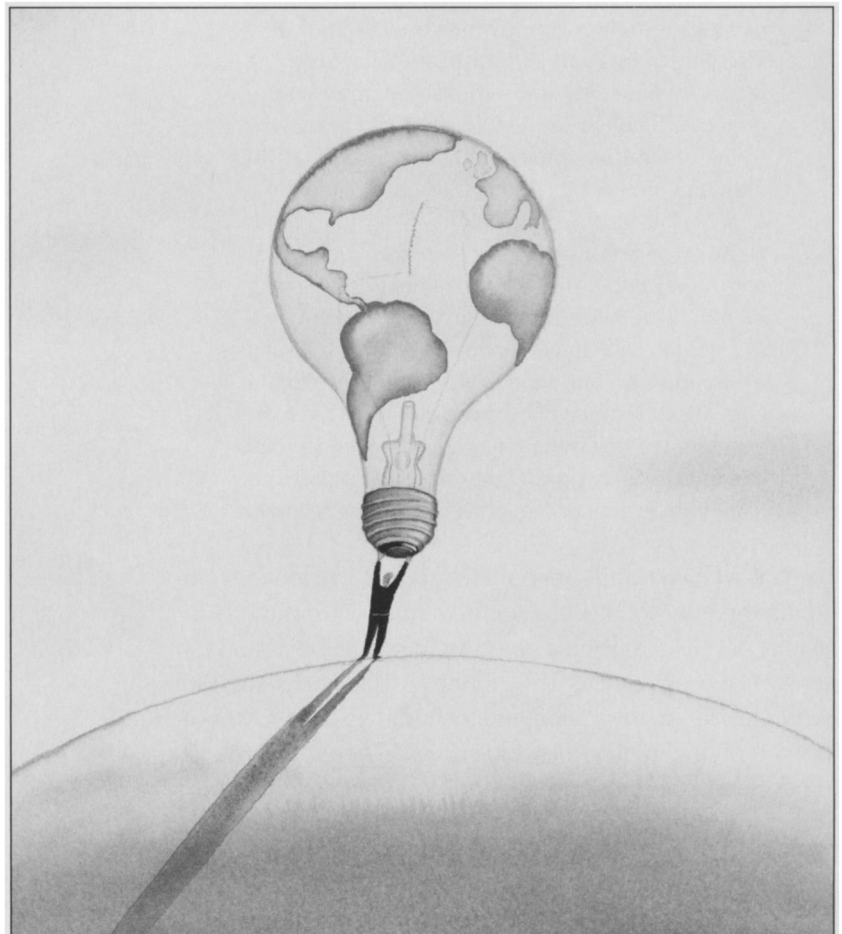
BY DAVE POSNER

A CARTOON from Gary Larson's weirdly insightful feature, "The Far Side," shows doting parents watching their son play Nintendo while visions of his lucrative future as a Nintendo master dance in their heads. Would this be less funny if instead of Nintendo their son were doing long division and his parents had visions of his lucrative future as a long divider? Before you answer, let me tell you that I know several talented engineers who can trace their careers back to their interest in video games. For them, there was a natural progression from enthusiasm for the games to wondering how such games are designed and implemented to wanting to make games of their own.

I've never met anyone who was similarly motivated by long division. I asked one of our engineers, a graduate of MIT, when was the last time he had used long division. He said that, in fact, he had used it only a couple of years earlier, when he and a fellow alum decided to determine whether they still knew how. (They did!)

It is a tricky business trying to guess what experiences will motivate an individual to intellectual achievement or what skills or

bits of knowledge will wind up being important in a person's life. There are at least two major factors that complicate such predictions. One is the absurd diversity of human beings. I am intimately acquainted with four children who share a common ethnic, cultural, and socioeconomic background. In fact, they were born of the same parents

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DAVE POSNER is a former professor of mathematics and computer science and co-founder and chief technical officer of Encirq Corporation, San Francisco.

Illustration: Eyewire Images

and raised in the same house. And yet with respect to talents, interests, rates of development, and personalities, these children are completely different. By the "norms" of our society, each of these children is weird. I'd feel sorry for their parents, except that all the parents I've ever known, including my own, have equally strange children. (Remember Stephen Jay Gould's message: norms are not real.[1]) It seems likely that the propensity for diversity is a consequence of natural selection. It has been fundamental to the ability of our species to adapt to radically changing environments, particularly those of our own making.

The second major factor that complicates the prediction of what skills will be important — and the one on which most attention seems to focus — is technology. How many of the skills we spent so much time learning are now done better by machine? Suppose Gary Larson's kid were shown solving differential equations. The cartoon would still be funny. Symbolic math software available for your personal computer is orders of magnitude better than you and I are at solving equations. Automatic spell checkers have eliminated the need to memorize the spelling rules we spent so much time learning. How important is handwriting these days? How long do you think it will be before speech recognition reaches the point where manual entry of text in any form is unnecessary? And search engines have revolutionized and simplified research.

None of this technology has required breakthroughs in "artificial intelligence." It's all just "ordinary" information processing in a world where people can carry billions of bytes of memory and gigaflops of processing power in their briefcases. Soon the same computing power will be available with just a cell phone. And I assure you, this process is not going to stop. Do you think composition is beyond automation? I've seen the future in a website that automatically generates Dave Barry columns.[2] You seed it with some humorous tidbits, and it does the rest. How long will it be before editorial style is automated? Information will come to you as semantically tagged data (look up "XML" on the Web), and software on your hand-held device will present it to you in any form or style you like. You want the *New York Times*, you'll get it. You want "McPaper," you'll get that. The fact is that any activity involving regular manipulation of form is — or soon will be — ripe for automation.

There is considerable confusion about how to react to these changes. For some, I think there is a misconception that advances in information technology will increase the importance of computational skills. Of course, exactly the reverse is true. For some, there may be a sense of loss because old skills, hard won, have become obsolete. But re-

ality and the free market are not tolerant of sentimentality. (As the billboard I just passed while writing this on my laptop on the train said, "Automate or Die.") For many, the rapidly increasing rate of technological change and the resulting unpredictability are frightening. And, indeed, though I'm closely involved with the development of current technologies, the fact is that I haven't a clue what bits of knowledge or skills will have value when my 7-year-old graduates from high school — let alone when she's in her twenties and thirties.

Perhaps such uncertainty causes some people to want to legislate certainty. But the problem is that policies that regiment teaching and restrict the ability of the teacher to adapt to the diversity of her students move us in exactly the wrong direction. In a world of rapid change, what we need are more flexibility and more diversity.

Now I'm not suggesting that our schools should stop teaching the three R's or even long division. After all, there are important reasons for learning beyond the acquisition of employment skills. But I do suggest that our children will not be well served by an education that is obsessed with some particular set of facts and manipulation skills. As John Henry learned, the consequences of competing with machines at their own game can be dire. What our 21st-century citizens need are trained minds and a passion for creative endeavor. And by a "trained mind" I mean not only the ability to think, to gather data, to formulate models, to test hypotheses, to reason to conclusions, and so on. I mean, most importantly, the desire for and habit of thinking.

Advocates for "standards-based teaching" and "getting back to basics" and "uniformizing the education experience" seem more interested in equipping children with the trappings of intellect than with offering any real intellectual substance. Here's how Marshall McLuhan described the process circa 1950: "Our educational process is necessarily geared to eliminate all bone. The supple, well-adjusted man is the one who has learned to hop into the meat grinder while humming a hit-parade tune. Individual resistance to that process is labeled as destructive and uncooperative."[3] Having come of age in the 1960s, I am confident that change and diversity will ultimately win the day. But I also know the individual and social costs of such a struggle.

1. Stephen Jay Gould, *Full House: The Spread of Excellence from Plato to Darwin* (New York: Harmony Books, 1996). See especially the discussion and footnote on "Reification," p. 38.

2. You can generate your own Dave Barry column at www.peacefire.org/staff/bennett/autodave/.

3. Marshall McLuhan, "Education," in idem, *The Mechanical Bride: Folklore of Industrial Man* (New York: Vanguard Press, 1951), p. 128. ⫶