



# Views You Can Use

## Vol. VI No. 1

In this monthly briefing memo, which you have requested, my colleagues at the International Center for Leadership in Education and I share with you our research on trends and technologies that will have an impact on education, learning, and life.

Now is the time to sign up for our [School Reinvention Symposium for Grades 6-12](#)— Building Up in the Middle Grades to Achieve Breakthrough Performance in High School — to be held on Friday, Oct. 27 – Sunday, Oct. 29 in Washington, DC. The Symposium will provide an in-depth analysis of the unifying components found in all types of successful schools and a process to make your school highly effective for *all* students. Come as a team, preferably a combined middle grades/high school team. Registration is limited, and the Symposium is nearly half filled, so please don't delay.

Sincerely,  
*Bill Daggett*

## Education Trends

### U.S. and China Learn from Each Other

In 2005, the Asia Society and representatives from the Ministry of Education of the People's Republic of China met with U.S. education leaders in Denver to share a deeper understanding of the two nations' education systems in how they approach math and science education. China serves 20 percent of the world's students with a mere 2 percent of the world's education resources. Although one of China's greatest challenges is providing education to its remote areas, the math and science taught in cities is high quality and provides many lessons for the U.S.

- China has national standards and aligned instruction in both math and science for what is to be taught. Textbooks, instructional materials, teacher preparation, and professional development are all clearly aligned to these standards.
- The design of the Chinese curriculum focuses on building a strong knowledge foundation and mastery of core concepts. Biology, chemistry, physics, algebra, and geometry are mandatory high school graduation requirements.
- China's math and science teachers have a far higher proportion of degrees in their discipline compared to their U.S. counterparts. Fewer than 60 percent of U.S. eighth-grade science teachers and only 48 percent of eighth-grade math teachers majored in their discipline. In China, specialist science teachers are employed as early as third grade.
- The Chinese school year is a full month longer at the secondary level than in the U.S. and, overall, Chinese students spend twice as much time studying – inside and outside of school – as their peers in the U.S. do.

Engaging in such international benchmarking of best practices is an important process for the U.S. in its effort to remain a world leader.

Source: Senta Raizen and Vivien Stewart, *Math and Science Education in a Global Age: What the U.S. Can Learn from China*, Asia Society, May 2006.

[www.askasia.org/teachers/resources/item.php?no=67&era=&grade=&geo](http://www.askasia.org/teachers/resources/item.php?no=67&era=&grade=&geo)

## **Information Technology Trends**

### **Language Translation Technology**

If any technology is indicative of our global economy, it is one that makes it possible to speak in one language and be understood in another. Until recently, such technologies have produced mediocre results. Researchers at Carnegie Mellon University (CMU) in Pittsburgh, however, are making momentous breakthroughs in advanced communication technologies that will, in the next decade, finally bridge the language divide between countries and cultures.

During a demonstration at CMU in October, a researcher stood before an audience with 11 tiny electrode sensors attached to the muscles of his cheeks, neck, and throat. He mouthed the following phrase in Mandarin Chinese: "Let me introduce our new prototype." The sensor captured electrical signals from facial muscles, which traveled to a computer that recognized the words and translated them into English and Spanish. The phrase was then displayed on a screen and spoken by the computer in both languages. CMU researchers believe that, even further into the future, electrodes could be implanted into a person's mouth and throat, allowing the person's mouth to become bilingual.

Source: Jennifer Bails, "No Longer Lost in Translation," *Pittsburgh Tribune-Review*, October 28, 2005.

[www.pittsburghlive.com/x/pittsburghtrib/s\\_388625.html](http://www.pittsburghlive.com/x/pittsburghtrib/s_388625.html)

## **Biotechnology Trends**

### **Favorite Hobby: Biotechnology**

In the 1970s, before personal computers became mainstream, computer hobbyists met in groups to dabble with integrated circuits and swap tips on assembling rudimentary computers. Among the hobbyists were Apple founders Steve Wozniak and Steve Jobs and Microsoft founder Bill Gates. Today, as the tools of biotechnology become accessible (and affordable) to a wider public, hobbyist clubs are applying a collaborative spirit to experiment with life at the molecular level.

The Biotech Hobbyist collective, formed in 1997, has published a series of do-it-yourself articles that walk readers through such projects as performing basic computations using a DNA computer – which includes a \$100 high school science education kit and some used lab equipment – and how to cultivate skin cells or make uniform copies of plant tissue. The Biotech Hobbyist collective calls the spirit of the articles "playful," but adds that it's entirely possible that hobbyists, like the computer programming pioneers, could be part of the future of important biotechnology.

Source: Allen Riddell, "Tweaking Genes in the Basement," *Wired News*, July 6, 2006.

<http://www.wired.com/news/technology/medtech/0,71276-0.html?tw=rss.culture>

## Nanotechnology Trends

### Nanowires Make Brain Implants Safer and Cheaper

The current treatment for severe cases of Parkinson's disease involves implanting electrodes deep in the brain, where they deliver high-frequency electrical pulses that shut down the neural systems responsible for the disease's characteristic tremors. This method of treatment, called deep brain stimulation, is expensive and risky, however, because the patient's skull must be opened, and electrodes can damage blood vessels in the brain.

Rodolfo Llinas, professor of neuroscience at New York University, along with Ian Hunter, professor of mechanical and biological engineering at MIT, have worked to develop a nano-wire electrode so thin that it could be inserted through an artery in the arm or groin, threaded up to the brain, and snaked through the smallest blood vessels, getting close enough to neurons to detect and deliver electrical signals. This newer technology could make brain implants far safer and less costly.

Source: Kevin Bullis, "Nanowires in the Brain: Making brain implants safer, cheaper," *Technology Review*, July 11, 2006.

[www.technologyreview.com/read\\_article.aspx?id=17071&ch=nanotech](http://www.technologyreview.com/read_article.aspx?id=17071&ch=nanotech)

## Economic Trends

### Erosion of Science and Technology in the U.S.

As China, India, and the former Soviet Union continue to increase their clout in the global marketplace, enthusiastically embracing capitalistic ideals, the U.S. seems to be in denial about losing its grip as the top superpower. Much of the concern centers on the erosion of science and technology in the U.S., particularly in education. In 2006, the national academies of the sciences, engineering, and medicine published a joint report that concluded that the "scientific and technical building blocks of our economic leadership are eroding at a time when many nations are gathering strength." The report points out that China and India combined graduate 950,000 engineers every year, compared with 70,000 in the United States; that for the cost of one chemist or engineer in the U.S. a company could hire five chemists in China or 11 engineers in India; and that of the 120 billion dollar chemical plants being built around the world, one is in the United States and 50 are in China. General Electric CEO Jeffery Immelt says "More people will graduate in the United States in 2006 with sports-exercise degrees than electrical engineering degrees."

There are some encouraging signs for the U.S., however. The GDP continues to grow at more than 3 percent annually, productivity growth has been over 2.5 percent for a decade, the U.S. has 18 of the world's top 20 universities according to a new report from the London-based Center for European Reform, and the U.S. is currently ranked the second most competitive economy in the world (by the World Economic Forum) and is first in technology and innovation, first in technological readiness, first in company spending for research and technology, and first in the quality of its research institutions.

Source: Fareed Zakaria, "How Long Will America Lead the World?" *Newsweek*, June 26, 2006.

[www.msnbc.msn.com/id/13393359/site/newsweek/](http://www.msnbc.msn.com/id/13393359/site/newsweek/)

***By the Numbers***  
**Improving Dropouts' Chances of Staying in School**

Vital changes that high school dropouts agree would help keep students in school.

- Opportunities for real-world learning to make classroom more relevant (81% agree)
- Better teachers who keep classes interesting (81% agree)
- Smaller classes with more individual instruction (75% agree)
- Better communication between parents and school, get parents more involved (71% agree)
- Parents make sure their kids go to school every day (71% agree)
- Increase supervision at school; ensure students attend classes (70%).

Source: Catherine Gewertz, "H.S. Dropouts Say Lack of Motivation Top Reason to Quit," *Education Week*, Vol. 25, No. 26. March 8, 2006. p. 14. Statistical Source: Civic Enterprises.