



## Views You Can Use

### Vol. VI No. 4

Leadership development at all levels is critical for schools and districts as they pursue higher performance for all students. Our Education Leadership Institute offers Leadership for Learning Networks for experienced leaders, beginning leaders, and future leaders. Applications continue to be accepted, and cohorts will be established throughout the school year on an as-needed basis.

In addition, the Education Leadership Institute has a new service, 21<sup>st</sup> Century Leadership Academies. A two-day academy provides current and future leaders in a state, region, district, or school with the tools and resources to give technical assistance and instructional leadership aimed at meeting the needs of all students.

For more information on the Institute, please go to [www.leadered.com/eli](http://www.leadered.com/eli).

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#### **Information Technology Trends**

**Pass the Sugar, Please, R2D2.** Human skills have to be developed, typically through observation, cooperation, training, and by refining behaviors as we mature. Robots, however, are programmed “from birth” with whatever skills they are expected to need to maximize their utility.

Artificial intelligence researchers at the Institute of Cognitive Sciences and Technology in Italy are aiming to design robotic devices that can learn skills and rules by observation, adaptation, cooperation, and invention. Ultimately, different kinds of robotic devices could function as cooperative teams, learning in complex and dynamic environments with little need for human direction or management.

Source: Institute for Cognitive Sciences and Technologies <http://www.istc.cnr.it>

#### **Are You Sleeping Well, Aunt Bertha?**

A team of engineering and medical scientists at Carleton University in Ottawa, Ontario, is designing a “smart house” environment through which elderly patients may be able to continue to live in their own residences while still being closely monitored for changes in their health. The design includes sensors on the doors of kitchen appliances to check on seniors’ eating habits. There also are pressure-sensitive bed pads to monitor sleeping patterns and to determine if the sleeper is having trouble getting into or out of bed.

Source: *ITWorldCanada* <http://www.itworldcanada.com/a/Integrating-IT/ecad3bd5-46e9-4dd7-bd93-1ce9ba2237e4.html>

**Listening for Landslides.** The earliest known earthquake detection instrument was invented in 132 A.D. by Zhang Heng, a Chinese philosopher. It consisted of a bronze jar with a pendulum inside. The device could detect seismic activity too low to be felt, although, even today, there is no known method to predict earthquakes accurately. But, a new technology could change that. The Acoustic Real-Time Monitoring System, developed at Loughborough University in England, detects soil movement below the surface of slopes to provide early warnings of landslides. The same technology could eventually apply to earthquake prediction.

Source: Loughborough University <http://www.lboro.ac.uk/service/publicity/news-releases/>

**Surfing for Cents.** Internet search engines generate billions of dollars a year in revenues from sponsored links and other advertising. Those who run the electronic engines are finding creative ways to attract Web surfers to their sites. The GoodSearch engine, powered by Yahoo!Search, offers a contribution to a charity every time a surfer does a search. Users select a preferred charity's name in the "Who do you GoodSearch for?" window, then enter key words in the search window. GoodSearch aims to donate 50 percent of its total revenues, or about a penny per search, to the charities selected by its users.

Source: <http://www.goodsearch.com/>

**E-Mail Por Favor.** iTradúceloAhora! (Translate Now!) is IBM's grant program designed to allow Spanish speakers to access the Internet more easily using automatic English to Spanish translation software. This year, iTradúceloAhora! focused on improving communication between English-speaking teachers and Spanish-speaking parents by translating school-to-home e-mails. Interested teachers must be affiliated with one of the organizations participating in the iTradúceloAhora! grant program. Visit <http://www.traduceloahora.org/en/home.html>.

Source: *PC Magazine* at <http://www.pcmag.com/article2/0,1895,2035882,00.asp>

## **Biotechnology Trends**

**Controlling the Molecular Gatekeepers.** Researchers at the University of Milan are investigating ways to prevent damage from strokes by blocking the actions of G-protein-coupled receptors (GPCRs), obscure “gatekeepers” in cell walls. Learning how to block the initial impact, as well as the after-effects, of the GPCRs could lead to the development of drugs that prevent post-stroke brain damage.

When a stroke occurs, GPCRs tell the body to release a chemical transmitter, which in turn attracts repair-focused glial cells to the site of the stroke. Glial cells clean up the stroke-affected areas of the brain. Unfortunately, these repair cells also kill other glial cells and neurons, which causes most post-stroke damage.

Source: <http://www.sciam.com/article.cfm?chanID=sa003&articleID=0008F3CA-29B8-153D-A5D683414B7FFEB5>

## Nanotechnology Trends

**Clean Water from Sunshine.** Nanotechnology often involves the pairing of high-tech and low-tech solutions. For example, more than a billion people on our planet don't enjoy safe drinking water, in part because providing conventional water-treatment technologies is prohibitively expensive. Solar disinfection (SODIS), a low-tech, safe, and affordable way to improve water quality, may provide an answer.

SODIS involves placing contaminated water into transparent bottles, which are then placed in direct sunshine for six hours. SODIS reduces the incidence of diseases such as cholera, dysentery, and polio and proved effective in assisting the survivors of the 2004 tsunami disaster in Southeast Asia. This low-tech method of water treatment could be advanced by leveraging cost-effective nanotechnologies, such as those that enhance the photocatalytic (how water and sunlight interact) properties of water.

Source: <http://news.ulster.ac.uk/releases/2006/2747.html>

### Now You See It...

Science fiction fans already are familiar with the concept of “cloaking devices” and ways of making objects invisible. Duke University engineering researchers have devised what, theoretically, may become a “cloaking” technology using metamaterial, a composite structure consisting of metal rings and wires embedded in fiberglass. The metamaterial cloak affects the speed of the radiation and reduces reflectivity, shadowing, and absorption — the properties that cause detectability. The technology may make it possible to “hide” an object from detection by a single wavelength of light, such as microwaves, and could have defense applications and uses in wireless communications. The researchers acknowledge that cloaking shorter wavelengths of light, such as the visible spectrum, are likely to be more challenging. So keep your deflector shields up for now, Scotty.

Source: Duke University at <http://dukenews.duke.edu/2006/05/cloaking.html> and Scientific American at <http://www.sciam.com/article.cfm?chanID=sa003&articleID=000D3E81-8DF8-1537-8DF883414B7F0000>

**Playing with Nanotech.** PlayGen, founded in 2001, is a London-based game development studio that specializes in developing games for training and learning. PlayGen is creating an interactive 3-D learning game for the 12-18 age group based on understanding nanotechnology and the nanosciences. Players will be challenged in imaginative environments to learn about molecular building, nano-imaging, creation of nanodevices, nanomedicine, quantum behavior, manipulating electrons, and nanomaterials.

Source: <http://www.playgen.com/home/content/view/30/26/>

## Economic Trends

**Unhealthy Links in the Food Chain.** The Centers for Disease Control and Prevention estimate that the U.S. food supply sickens 76 million Americans every year, putting 300,000 into hospital, and killing 5,000. In September, some 200 people in 26 states became ill from eating E. coli-contaminated spinach. The strain of E. coli responsible for the outbreak is believed to have mutated from related, but nonlethal, strains of the bacteria that grow in the stomachs of cattle contained in enclosed feedlots, often hoof-deep in their own manure. Finding a way to return to the historical practice of separating meat production from manure production cost effectively, thereby increasing both food sanitation and farm fertility rates, is a challenge that our food production experts need to solve.

Source: *The New York Times Magazine*, Oct. 15, 2006

## Education Trends

**Brainstorming Strategies to Combat Global Warming.** Global SchoolNet and Google have joined forces to host students from around the world "to collectively brainstorm strategies for fighting global warming." The best ideas will be reported on Google and in *The Washington Post*. For details, visit [globalwarming@globalschoolnet.org](mailto:globalwarming@globalschoolnet.org) or <http://www.google.com/educators/globalwarming.html>

Source: *Futurist Update: News & Previews from the World Future Society* November 2006 (Vol. 7, No. 11).

**Engineering Graduates: U.S. Versus India and China.** The "By the Numbers" section in the October issue of *Views You Can Use* stirred some healthy debate about the accuracy of certain recent media reports regarding the number of annual engineering graduates in the U.S. versus China and India. In that section, we shared with readers a statistic cited from the July 20, 2006, issue of *Newsweek*, which stated that China and India combined graduate 950,000 engineers every year, compared to 70,000 in the U.S.<sup>1</sup>

Our intent was to draw attention to the emergence of China and India as post-industrial giants with large and increasingly skilled workforces. The figures were cited not to undermine confidence in the American education system but to energize it.

We thank those readers who pointed out that the same figures had been called into question shortly after they were first released in 2005 in the National Academy of Sciences report, "Rising Above the Gathering Storm." (View the document at <http://www.nap.edu/catalog/11463.html>.)

The principal rebuttal came in the study, "Framing the Engineering Outsourcing Debate: Placing the United States on a Level Playing Field with China and India," published by Duke University in December 2005. The study cautioned that the comparisons were inexact, in part because the

engineering graduation rates for China included four-year grads as well as three-year training and diploma program graduates while the U.S. numbers included four-year graduates only. Read the Duke report at [http://memp.pratt.duke.edu/downloads/duke\\_outsourcing\\_2005.pdf](http://memp.pratt.duke.edu/downloads/duke_outsourcing_2005.pdf)

We encourage you to continue to read the studies and judge the numbers for yourselves. We also encourage you to keep in mind the bigger picture, which is that our students will live and work in an increasingly competitive, high-skill, global economy. What this means is that a rigorous and relevant education never has been more important than it is today.

Consider the following quote from author Thomas L. Friedman in the updated 2006 edition of his bestseller, *The World Is Flat*. Speaking of the Duke study, Friedman writes:

“First, I would bet that many of the engineering degrees being granted by American universities are not going to American citizens but to foreign students who will return to their home countries. Second, yes, the average engineering degree in India or China today may not be the same quality as at the average accredited American university. But let me put this in very simple language: There are many more Indians and Chinese than there are Americans and a much, much higher percentage of them are studying science, computer science, and engineering – in their home countries and in American universities.”<sup>2</sup>

1. Source: Fareed Zakaria, “How Long Will America Lead the World?” *Newsweek International*, July 20, 2006. Link: <http://www.msnbc.msn.com/id/13123358/site/newsweek/>

2. Sources: as cited and Friedman, Thomas L., *The World Is Flat A Brief History of the Twenty-first Century Updated and Expanded*. Farrar, Strauss and Giroux. New York, 2005, 2006, p. 334.

## By the Numbers

- Total public school enrollment in the United States was 46.1 million in 1971. It dropped to 39.2 million by fall 1984, then increased 23% to 48.2 million by fall 2002.
- For most of the 20th century, the number of schools dropped as the population shifted to metropolitan areas and then through consolidation and closings after 1971.
- The number of public schools declined to a low of 81,147 elementary and secondary schools in 1984.
- The number of schools increased 16% between 1984 and 2002, reaching 93,869 in the fall of 2002.
- Hispanics accounted for 64% of the increase in public school enrollment between the 1993-94 and 2002-03 school years.
- Blacks accounted for 23% of the increase and Asians 11%. White enrollment declined by 1%.
- Between the 1993-94 and 2002-03 school years, 15,368 schools, with an enrollment of 6.1 million in 2002-03, were opened.
- Nearly half, or 2.5 million, of the students attending those 15,368 new schools were white, while white enrollment in older schools dropped by 2.6 million.
- About two-thirds of the increase in Latino enrollment between the 1993-94 and 2002-03 school years was accommodated in older schools.

## International Center for Leadership in Education

Sources: Pew Hispanic Center <http://pewhispanic.org/reports/report.php?ReportID=72> and U.S. Department of Education “Common Core of Data.”