



Views You Can Use

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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.

The continuing pursuit of improved K-12 learning is reflected in the high interest in the 2006 Model Schools Conference. If you are considering attending the Conference on June 25-28 in Florida, I encourage you to act now to register and make your hotel reservation. In all likelihood, we will reach capacity much sooner than usual this year. You can find more information on the conference as well as register online at <http://www.leadered.com/msc06/main.html>.

Sincerely,
Bill Daggett

Biotechnology Trends

Printing Human Organs on Bio-paper

New techniques could eventually allow scientists to create skin grafts, livers for transplants, and other organs on special printers using bio-ink and bio-paper. Researchers at three U.S. universities have developed technology that will make human organ printing a reality in perhaps five to ten years. Tests are being funded by a \$5 million National Science Foundation grant. While DNA chips have been printed successfully in two dimensions, the research has progressed to the point that tubes similar to human blood vessels and sheets of heart muscle cells can be printed in three dimensions on a special printer.

The process involves printing a small sheet of bio-paper, which is a combination of modified gelatin and a sugar-rich matter, using a customized milling machine. Bio-ink blots, little clusters of cellular material, are then printed onto the paper. The process is repeated many times until the desired thickness is achieved. The stack is incubated, and the cells from the ink-blots fuse with one another in all directions, using the bio-paper as a scaffold until the desired tissue is formed. A blood vessel tube can take about a week to fuse.

Source: Rachel Metz, "Printing Organs on Demand," *Wired News*, December 5, 2005.

Nanotechnology Trends

Are Nanotechnology Regulations Adequate?

The presence of nanotechnology in our daily lives is becoming increasingly common. Dozens of common products, including stain-resistant pants and suntan lotions, incorporate nanoscale materials, and the

potential is there for nanotechnology to be used in drug development and pollution clean-up. The speed at which nanotechnology is blossoming, however, is causing some concern among those who believe that laws that safeguard the public are not keeping up with the research and development of small-scale materials.

Generally, nanotechnology is viewed as clean and safe, but as with most new technologies, the potential exists for risks to the public's health and safety to arise. Proponents of nanotech regulations aimed at protecting the public argue that, as was the case with nuclear power, unless adequate safeguards are in place, the public will resist the technology and will not realize its potential. There is, in fact, some basis for concern. Material developed at the nanoscale sometimes will exhibit unpredictable behavior. Even subtle changes in the size of the nanoparticles can dramatically alter the properties of the material, including their toxicity.

Source: Andrew Bridges, "Report Examines Safety of Nanotechnology," *Associated Press*, January 11, 2006.

Workforce Trends

IBM Freezes Its Pension Program

On January 5, U.S. corporate giant IBM announced that it will freeze its employee pension plan beginning in 2008. IBM is the latest in a series of major companies that will no longer offer a monthly benefit to workers when they retire. IBM reports that it will, however, enhance 410(k) contributions for its 125,000 U.S. employees.

Although IBM is financially "healthy" at the present time, its concern is the unpredictability of future cost of defined-benefit plans. Pension plans are "captive to the volatility of the capital markets," says IBM spokesperson John Bukovinsky. "This is one more corporate rollback happening around the country," says a former IBM employee now with the unionizing and advocacy group, AllianceAtIBM. "A lot of people, especially senior employees, are in a bit of a shock. They feel like the rug's been pulled out from under them."

Source: Stephanie Armour, "IBM to Freeze Pension Program," *USA TODAY*, January 6, 2006.
www.usatoday.com/money/industries/technology/2006-01-05-ibm-pensions_x.htm

Demographic Trends

Budget Watchdogs Warn of Fiscal Trouble

A group of the nation's foremost budget experts – Democrats and Republicans alike – is traveling around the country, discussing candidly the impending fiscal crisis that will hit the United States. David Walker, comptroller general of the United States, is the most outspoken of the group. "We face a demographic tsunami that will never recede," explains Walker, citing the fact that Medicare and Social Security benefits promised to the soon-to-be retiring baby boomers will cause the federal deficit to soar in the coming decades.

Barring major cuts in spending, tax increases, or both, the national debt is projected to grow to \$11.2 trillion in 2010, or about \$38,000 for every person in the U.S. The budget watchdogs are attempting to raise public awareness of the challenges facing the country, because inaction will cause consequences

such as higher interest rates, lower wages, shrinking or freezing of pensions, a lesser standard of living, exceedingly high taxes for future generation, plunging stock and bond prices and, ultimately, recession. Says Leon Panetta, former White House budget director and chief of staff to President Clinton, “The choices you have to make [to balance the budget] are almost exactly the opposite of what wins political elections.”

Source: Richard Wolf, “As Social Security Surges and Medicare Takes Off, the Deficit Will Soar. The Result: ‘Fiscal Hurricane,’” *USA TODAY*, November 25, 2005.

Education Trends

Are High School Start Times Cruel and Inhumane?

Efforts to improve student achievement pay little attention to the essential biological function of sleep, according to some brain researchers and human behavior specialists. Mary Carskadon, Brown University professor and director of sleep research at E.P. Bradley Hospital in Rhode Island, says that high schools would start later if educators knew just how “out of it” teenagers are at the early morning hour of 7 a.m.

It’s not their fault, according to researchers, it’s a biological fact that levels of the sleep-promoting hormone melatonin rise later at night in teenagers than in younger children and adults and remain at a higher level later in the morning. Carskadon claims that levels of melatonin start to rise between 10 and 11 p.m. and don’t stop until about 8 a.m. Some schools have accepted the research and have moved high school start times back more than an hour in some cases.

Source: Valerie Strauss, “Schools Waking Up to Teens’ Unique Sleep Needs,” *Washington Post*, January 10, 2006.

www.washingtonpost.com/wp-dyn/content/article/2006/01/09/AR2006010901561.html

By the Numbers

- Prescription drug coverage under Medicare took effect on January 1. In 2003, the projected cost of coverage was \$400 billion over 10 years. Current projections place the cost at more than \$720 billion over 10 years.
- The number of people covered by Social Security is expected to grow from 47 million in 2005 to 69 million by 2020. The Congressional Budget Office projects that by 2030, Social Security spending as a share of the U.S. economy will rise by 40%.
- Baby boomers will be eligible to go on Medicare starting in 2011. If the cost of Medicare coverage grows just 1% (a conservative number) faster than the economy, Medicare would cost \$2.6 trillion in 2050 (after adjusting for inflation) or about the size that the **entire** federal budget is today.

Source: Richard Wolf, “As Social Security Surges and Medicare Takes Off, the Deficit Will Soar. The Result: ‘Fiscal Hurricane,’” *USA TODAY*, November 25, 2005.