



Views You Can Use

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I hope you are enjoying your summer. Forgive me for looking ahead to the start of school, but you may want to consider attending our Leadership Academy on September 26-28 in Las Vegas. This will be a great opportunity for leadership teams to learn how to create a sustainable culture that embraces change and encourages innovation. The Academy will offer research-based leadership strategies and tools, case studies, discussions with leaders from model schools, and best practices that are realistic and practical.

Brain Research Trends

Connecting Both Hemispheres of the Brain

An international team of researchers has identified a single network core, the most central part of the brain, that straddles both hemispheres of the brain. This core, or hub, may be the key to the workings of both sides of the brain. The finding was the result of the first complete high-resolution map that shows how millions of neural fibers in the human cerebral cortex — the outer layer of the brain responsible for higher level thinking — connect and communicate. The mapping process is a noninvasive technique that will be used to continue mapping the trillions of neural connections in the brain at even greater resolution. Mapping the brain in this way is a new field of science called "connectomics."

Until now, scientists have mostly used functional magnetic resonance imaging (fMRI) technology to measure brain activity — locating which parts of the brain become active during perception or cognition — but there has been little understanding of how this activity is generated. In this new study, the team of neuroimaging researchers used state-of-the-art diffusion MRI technology, which is a scanning technique that estimates fiber connection trajectories based on gradient maps of the diffusion of water molecules through brain tissue.

Sources: <http://newsinfo.iu.edu/news/page/normal/8469.html>
www.sciencenews.org/view/generic/id/33747/title/Journey_to_the_center_of_the_brain

My new book, What Brain Research Teaches About Rigor, Relevance, and Relationships, written in collaboration with Dr. Paul D. Nussbaum, can help you understand the latest brain research and how it relates to education.

Technology Trends

Kindling the Digital Book Revolution

Amazon.com recently unveiled the latest electronic reader, Kindle, meant to spark the digital book revolution. As a product of Amazon, the device is interlinked with the world's largest online bookstore, where books can be downloaded for about \$10. Kindle is the weight of a paperback and slim enough to fit into most bags. Unlike other electronic readers, Kindle has wireless capability, allowing readers to

download 125,000 titles from Amazon, including books, newspapers, and magazines anytime and anywhere. The device has a keyboard, as well as buttons that allow the user to turn pages as one would turn the pages of regular book. Also, unlike the typical computer screen that is hard to read outdoors, a technology incorporated into Kindle makes the screen readable in direct sunlight.

Source: www.npr.org/templates/story/story.php?storyId=92079896

Education Trends

More IT Support

A lack of information technology (IT) staffing is keeping schools from realizing the full benefits of technology inside and outside the classroom, according to a recent survey conducted by eSchool News and SchoolDude. The survey included nearly 1,000 school and district leaders. Little funding and the lack of a clear vision were seen as key stumbling blocks to building staff and implementing a successful technology program within the curriculum. Of those surveyed, 64% said their IT budget isn't enough to support technology assets already purchased and nearly 70% said it is not enough to meet their district's IT expectations. One respondent, a technology manager from Irving, Texas, said he has two full-time technicians serving 2,900 students, 300 teachers and administrators, and more than 1,200 computers in a six-school district, with campuses spread across suburban Dallas. This is a far cry from a typical large corporation, which tends to employ one technology support person for every 50 computers at a cost of \$142 per computer per year. According to this model, a school district with a 1,000 computers would need a staff of 20 and an annual tech-support budget of \$1.4 million.

Part of the funding issue has to do with being able to provide a competitive wage to potential IT employees, who can make more in the private sector. Some schools have used creativity to solve their technology challenges. For example, when an IT coordinator asked teachers to help implement technology for learning, the teachers formed a team that guides, assists, and supports their colleagues. The team focuses on the curriculum as the starting point and then suggests appropriate technology to support it. (See "By the Numbers" for more statistics.)

Source: www.eschoolnews.com/news/top-news/?i=51522;_hbguid=2d059a60-7877-4119-949b-20e90d76e90e

Gas Prices Drive Students Toward Online Courses

High gas prices appear to be driving thousands of students toward online college courses to save on transportation expenses. Colleges from across the country, including those in Massachusetts, Florida, Texas, and Oregon, have reported significant online enrollment increases, reaching 50% or higher than last year. Online enrollments already are up 114% from last year at Bristol Community College in Massachusetts, for instance. Half the students queried cited the cost of gas or other transportation issues as a reason for studying online, said April Bellafiore, an assistant dean at the college. The greatest surge in online enrollment has been at two-year community colleges, where many students are commuters, have families to support, and cannot afford extra expenses.

Source:

www.nytimes.com/2008/07/11/education/11colleges.html?ex=1216440000&en=29f5b14fe3211c7f&ei=5070&emc=eta1

Biotechnology Trends

Don't Hold Your Tongue for This Technology

A new assistive technology developed by engineers at Georgia Institute of Technology could help individuals with severe disabilities lead more independent lives. The system, called Tongue Drive, allows people to operate a computer, control a powered wheelchair, and interact with their environments simply by moving their tongues. Attaching a small magnet tracer the size of a grain of rice to an individual's tongue by implantation, piercing, or tissue adhesive allows tongue motion to direct the movement of a cursor across a computer screen or a powered wheelchair around a room. Unlike hands and feet, which are controlled by the brain through the spinal cord, the tongue is directly connected to the brain by a cranial nerve that generally escapes damage in severe spinal cord injuries or neuromuscular diseases.

Movement of the magnetic tracer is detected by an array of magnetic field sensors mounted on a headset outside the mouth or on an orthodontic brace inside the mouth. The sensor output signals are transmitted wirelessly to a portable computer, which can be clipped on the user's clothing or wheelchair. The researchers have begun clinical trials and expect to develop software to connect the system to a wide variety of readily available communication tools, such as text generators, speech synthesizers, and readers.

Source: <http://gtresearchnews.gatech.edu/newsrelease/tongue-drive.htm>

Nanobiotechnology

What's Old Is Now New

Through nanotechnology applications, researcher Ofra Benny of Children's Hospital Boston has reformulated an anticancer drug, developed nearly two decades ago, into a new drug that may be more effective and have fewer side effects. The drug, called Lodamin, is the first angiogenesis inhibitor that can be taken orally and may be used as a preventive therapy for patients at high risk for cancer or as a chronic maintenance therapy for a variety of cancers. Angiogenesis inhibitors prevent tumors from forming or recurring by blocking the growth of blood vessels that feed them. Lodamin is a slow-release reformulation of TNP-470. In clinical trials, TNP-470 suppressed a wide range of cancers, but trials were suspended in the 1990s because of neurologic side effects. Lodamin appears to retain TNP-470's potency and broad spectrum of activity, but with no detectable neurotoxicity.

Source:

www.smalltimes.com/news/display_news_story.cfm?Section=WireNews&Category=HOME&NewsID=164068

DNA Transforms Gold

Researchers at Northwestern University have used DNA as the blueprint, contractor, and construction worker to build two different three-dimensional structures out of gold. Using gold nanoparticles 15 nanometers in diameter (one nanometer is a billionth of a meter or about 100,000 times smaller than the diameter of a human hair), the researchers built two different crystalline structures merely by changing the strands of synthesized DNA attached to the tiny gold spheres. A different DNA sequence in the strand resulted in the formation of a different crystal. The technique is a major step toward building functional "designer" materials using programmable self-assembly techniques. The method will allow scientists to take inorganic materials and build structures with specific properties for a variety of applications in such fields as therapeutics, biodiagnostics, optics, and electronics. Using the X-rays produced by the Advanced

Photon Source synchrotron at Argonne National Laboratory in combination with computational simulations, the research team imaged the crystals to determine the exact location of the particles throughout the structure. The final crystals have approximately one million nanoparticles.

Source: www.northwestern.edu/newscenter/stories/2008/01/dnamirkin.html

By the Numbers

Schools need more IT support to use technology effectively in the classroom. (See “Education Trends” section.)

- Nearly three out of four school leaders say they don’t have enough IT staff to support their needs.
- Of the participants, 65% said that integrating technology into the curriculum was a primary concern.
- 55% said they can’t maintain their network adequately and 63% said they can’t plan for new technologies.
- Implementing new technologies is a struggle for 76% of the respondents.

Still, despite technical difficulty, schools are managing to meet some technology demands:

- Only 13% of respondents said they don’t have wireless connectivity in any of their schools.
- 38% said they have it in all their schools.
- 84% said they conduct an inventory of IT assets and report these results yearly.

Source: www.eschoolnews.com/news/top-news/?i=51522;_hbguid=2d059a60-7877-4119-949b-20e90d76e90e