TREND/Beam us. Period.

Anytime, Anywhere

Are you ready for m-learning?

Simulations?

Online universities?

Despite the general acceptance of e-learning (even the staunchest training traditionalists recognize the benefits of a blended approach) and the constant deluge of new products, there's still little within e-learning that sparks the imagination, fries the synapses, and makes you say *Wow!* Disagree? Try this: Sit down with a 15-year-old (son, daughter, or borrowed) and try to explain what's so great about LCMSs. They are pretty great, actually, but if you can get that 15-year-old arbiter of cool to sit through "A learning content management system is really neat because...." know that that kid is probably asleep with his eyes open.

But show them the latest in m-learning applications on your new Compaq iPaq, describe the latest in learning simulations from the military and FBI, explain how to earn an M.B.A without ever setting foot in a classroom, and you're bound to get a "Wow!" Those are just a few of the e-learning advancements predicted to keep the training industry exciting today, tomorrow, five years from now.

Of course, a swami's hat can quickly turn into a dunce cap when trying to divine trends in technology. It could be years before third-generation wireless lives up to its potential. Simulations that incorporate human emotion and bring us closer to real-world experience are still used predominately by the military, and it's safe to say that Harvard isn't going to start granting online degrees

By William Powell

anytime soon. Still, b-school enrollment overall is down. Back to the point: Astonishing technologies are real, within reach, and they're going to change the way we think about learning.

Pocket **Essentials**

Even clothing manufacturers are responding to the wireless trend. UFunction ◁)) **www.ufuntion.com** has created a line of women's wear whose design principles revolve around a mobile, wireless lifestyle. Clothing and handbags all incorporate special pockets for cell phones, PDAs, and MP3 players.

For the ultimate in wired clothing, Philips Electronics and Levi Strauss & Co. have created a range of jackets that feature what the companies call a "body-area network." Branded under the name Industrial Clothing Design or ICD+ ◁)) **www.levis-icd.com** the network is a series of cables stitched into the fabric allowing for hookup of a mobile phone, an MP3 player, a remote-control unit, and headphones.

Nautica and Calvin Klein have updated their lines to include special pockets and resized others to fit wireless devices. Even Brooks Brothers is including a cell phone pocket on the interior of its sport coats.

Mobile learning

If you're looking for a wireless frontier, you don't have to go to Tokyo or Helsinki. One also wends through southeast Virginia, in the neighborhood of Westbury, where 63 brand-new, federally subsidized homes stand to be the first wireless community in the United States. Problem is, this frontier lacks pioneers. No one seems to be using the new homes' wireless Internet capability, which offers 3 megabits per second connection speed delivered through a PC card with rabbit-ear antennas. Why? The users don't have the hardware or the knowhow. "There's an educational process they'll have to go through," says Eric Sheffield in a *Wired.com* interview. Sheffield is owner of Combined Computer Services, the company responsible for the community's wireless infrastructure. "I don't think people quite get it yet."

There's no doubt that the future of m-learning lies somewhere in the ethereal void that is wireless technology. But for now, we must trust that wireless technology's Wow-ness does exist. Its critics, and there are many, aren't buying it. Others, on the other hand, think the critics just don't get it yet.

AT&T's July launch of GPRS cell phones and service is a major first in high-speed mobile Internet access in the United States and may be the harbinger of future wireless advances. General packet radio service technology lets users talk on the phone and surf the Internet at speeds up to 10 times the average rate of current cellular systems. Though the service is currently limited to Seattle, and works only with one model of Motorola phone, it's a tremendous coup and puts pressure on competitors Verizon Wireless and Sprint PCS (which use the competing CDMA technology) to offer third-generation (3G) broadband Internet service—and quick. AT&T plans to go U.S.-wide with its GPRS coverage by the end of 2002, and it foresees 3G service by 2003. Third generation, which offers picture-quality graphics and Web access at more than 100 Kbps—or equivalent to an ISDN connection—is considered to be the ultimate in wireless technology. The real success of wireless e-learning delivery hinges on its eventual rollout, but that hasn't stopped analysts from predicting staggering numbers for wireless adoption.

Cahners In-Stat Group estimates that global use of Internet-enabled cell phones, PDAs, and two-way pagers (such as Blackberry's email tool) will increase by 2004 to 1.3 billion, a huge increase from the current user rate of 170 million. Admittedly that number seems a bit enthusiastic, but even if the market hits 75 percent of the Cahners estimate, it's still hovering around 1 billion users within three years. And don't think those numbers have gone unnoticed. Despite the naysayers that claim that wireless technology is still the bully in the playpen, several e-learning companies want to make sure that their applications grow up right along side it.

Global Knowledge recently launched a new e-learning subscription series for Palm devices. Called eSentials, the series has chunks of information, job aids, and quick tips regarding Nortel Networks's technical and product information—all available via wireless access to PDB files (iSoloPlayer) from your PDA.

Within days of that launch, Cisco Systems announced the launch of its CTE 1400, a content transformation engine that converts XML and HTML content from a Webpage into usable content by wireless handheld devices, such as PDAs and WAP and IP phones. The product takes into consideration a device's screen size and memory requirements in its translation, while converting huge chunks of content on the fly. In fact, Cisco claims that CTE 1400 can convert the entire Amazon.com catalog in less than 10 minutes. Stanford Law School is already using Cisco's CTE to provide an extremely high level of connectivity to online data such as class lists, programs, and tests—anytime, anywhere.

"The key [to m-learning] is interconnectivity," says Sun Microsystems's Michael Wenger in a July article for *Learning Circuits,* "Goin' Mobile."

GO TO **WWW.LEARNING CIRCUITS.ORG**

So while portable information is handy, m-learning's ultimate success hinges upon being able to connect to larger systems of information, anytime, anywhere. And that means wireless. Sun Microsystems's ISOPIA has launched wireless access to its Web-based LMS and its hosted ASP service, giving users the capability to access course information, training status, and learning activities via cell phones and handheld wireless devices. Also look for more Websites such as Avantgo to tout solutions for wireless users and content providers. The Hayward, California-based company offers software and services to aid enterprises in the delivery of data and applications to mobile users, who include consumers, clients, and employees. The logic follows: As the number of users of wireless devices increases, so will the demand for wireless content. A recent study from Goldman Sachs estimates that U.S. mobile Internet expenditures for deploying mobile Internet to workforces will reach

Wireless **Facts**

● By year-end 2001, world cellular subscriptions will top 1 billion. ◁») **Source/ECM**

● More than 1 billion wireless handsets will be sold worldwide in 2003.
◁») **Source/Cahners In-Stat Group**

● Data-enabled handsets that utilize wireless Internet technologies accounted for 30 percent of shipments in 2000. That number is expected to rise to 80 percent by 2006.
◁») **Source/Allied Business Intelligence**

● China currently has more 130 million mobile phone subscribers compared to 164 million fixed line users.
◁») **Source/China's Ministry of Information Industry**

● Worldwide shipment of handheld devices for 2000: 13.6 million.
◁») **Source/International Data Corporation**

● The Pocket PC platform will surpass the Palm platform for handheld devices by 2005.
◁») **Source/Allied Business Intelligence**

● Bluetooth shipments are expected to rise to 1.6 billion in 2006. ◁») **Source/Aberdeen Group**

Hot-**Wired** Terms

GSM: Global System for Mobile Communications. The de facto digital cellular system in Europe and Asia. Allows eight simultaneous calls on the same frequency.

3G: The third generation of mobile communication technology. Analog was the first; digital PCS was the second. Promises increased bandwidth and high-speed wireless Web access.

Bluetooth: A short-range radio technology that allows equipped devices to communicate with each other and the Internet.

WAP: Wireless application protocol. A secure specification that allows Internet content to be read by wireless devices.

◁ᵈ) Sources/Webopedia.com,
www.learningcircuits.org/glossary.html

The **Big** Eight

The following schools are playing hardball in the game of online degrees. They know their market, they have financial backing, and they eschew Ivy League aspirations. Though the University of Phoenix Online is the clear leader at this point, look for more online universities to counter with a more robust online presence and with strong branding initiatives that include partnerships with traditional universities.

● University of Phoenix Online ◁ᵈ) **http://online.uophx.edu**
● UNext/Cardean ◁ᵈ) **www.cardean.edu**
● Capella ◁ᵈ) **www.capella.edu**
● Jones International University ◁ᵈ) **jonesinternational.edu**
● Strayer ◁ᵈ) **www.strayer.edu**
● Keller Graduate School of Management ◁ᵈ) **www.keller.edu**
● Walden University ◁ᵈ) **www.waldenu.edu**
● Sylvan ◁ᵈ) **www.sylvan.net**

US$13 billion by 2005. Recurring service fees and add-on software is likely to contribute $9 billion of that total. And if early feedback is any indicator, that estimate may not be far off.

In "Case Study: Combining Web and WAP to Deliver E-Learning," users responded positively to WAP-delivered content provided through a recent pilot course. **www3.astd.org/lc_search.htm** Created by an Asia-Pacific consortium made up of Nokia, INSEAD, and ICUS, the course offered 80 percent of its content through WAP-delivered material. Though only 36 percent of participants expected to enjoy using the WAP-enabled phone for learning, 93 percent found that having WAP access to material made the course more convenient. Users accessed course materials while riding in taxis or waiting for the bus, and more than one cited an increased sense of freedom. And who doesn't enjoy an increased sense of freedom?

OK, it may be foolhardy to proclaim that one day all training will be delivered via cell phones or wireless handheld devices. But mobile technology will play a major role in training. It's a sure bet. Yes, the displays are small, the battery life is short, and processor power is a bit feeble compared to current PCs. And, yes, the telecomm industry has taken a beating of late. But it's not all about wireless.

Utilizing Macromedia's Flash, the latest handheld m-learning applications aren't just spinach-colored text on a lettuce-colored background. They're full-color graphics, sound, and animation—just what you've grown to expect from e-learning, only smaller. Content? Don't throw out your PC just yet. Applications such as KnowledgNet's KnowledgeNet Mobile for Compaq's iPaq offer big potential in those little packages. **IN GEAR for info on KnowledgeNet Mobile** However, though a recent demo of KnowledgeNet Mobile impressed with its sound and graphics, its limits were clearly evident. The animation was crude and often confused the examples provided through the audio track. At this point, the graphics seemed to be more for form than function. What was more impressive was the Compaq iPaq itself. A few minutes with this new PDA and it's easy to understand why the Pocket PC platform, which it supports, has gained considerable ground on the Palm OS. Though offerings from companies such as KnowledgeNet, SmartForce, and Docent do get the wheels turning, the potential of increased bandwidth, processing speed, and battery life really gets the engine racing. With the success of two-way pager devices such as the BlackBerry and the latest WAP-enabled cellular phones, expect growing competition to result in increased innovation on the hardware side and increasingly robust applications. Before long, initial wireless offerings will be nothing more than a glinting signpost in your rearview mirror.

Out With the Old, Online With the New

After 791 years, the Cambridge University rule requiring all students to reside in the town of Cambridge, England, has been stricken from the books. The university's global M.B.A. program (created in partnership with Cambridge's Judge Institute of Management Studies and FT Knowledge) rendered the long-standing rule impractical. The change is a considerable step forward into the online age (or backward as some people will see it), considering that Cambridge refused to offer an M.B.A. until 1991.

But the university isn't getting carried away with its new online venture: Sixty-five percent of the program still requires face-to-face residency at the Cambridge campus. Participants must pay for the privilege of learning online, and the cost is considerably higher than the traditional residential program. Early estimates are approximately £10,000 to 20,000.

Be true to your online U.

If you want to see tremendous potential in online universities, you have to look no further than Apollo Group's University of Phoenix Online. A recent spin-off of the nine-year-old, bricks-and-mortar University of Phoenix, the online university has quickly become the darling of Wall Street analysts. Sales growth for University of Phoenix Online increased 91 percent through third quarter 2001 to $54.1 million; enrollment through the same period is up a whopping 85 percent to nearly 25,000 students.

Trace Urdan, senior analyst with WR Hambrecht + Co, sees the success of University of Phoenix Online as the result of an equation begun years prior by bricks-and-mortar universities that cater to professionals. "The ability to offer degrees online is kind of the ultimate promise in the equation of being able to work full-time and get your degree in your spare hours. Now, it's even more convenient than having to go to an actual physical classroom," says Urdan.

University of Phoenix Online has left competitors playing a game of catch up. As long as it continues to draw professionals into its online classrooms, expect other universities, online and traditional, to target that market.

"Consider the fact that more than 60 million working Americans don't have an undergraduate degree," says Urdan. "There's a huge market opportunity for [online universities] to address. Lots of people who fall through the cracks, who aren't motivated to go to [traditional universities], or who find it too inconvenient are inclined to [take courses] online."

"The Internet is changing everything in terms of learning," says Paul LeBlanc in his recent *Learning Circuits* article "Universities Discover E-Learning."

The president of Marlboro College

and a former executive publisher with Houghton Mifflin predicts dramatic growth in continuing, adult, and graduate education. He also foresees online universities pursuing international and senior audiences. But before we see a proliferation of virtual universities, there are some real-world hurdles to cross.

"Accreditation is certainly a real hurdle," says Urdan. "But the biggest hurdle is establishing a brand, because there is no business that is more brand sensitive than degree education. The bricks-and-mortar players, like the University of Phoenix, have an inherent advantage."

In an effort to counter the difficulty of establishing a brand, expect to see increased partnerships between online and bricks-and-mortar universities such as UNext and its subsidiary Cardean University. The Deerfield, Illinois-based UNext has invested more than US$120 million in establishing its sophisticated software development and partnerships with prestigious universities such as Carnegie Mellon, Columbia, and Stanford University, as well as the University of Chicago and the London School of Economics and Political Science. "The bet they're making is that they can short-circuit the brand building process for Cardean," says Urdan. Though that bet is a risky

Facts U.

● By 2004, 80 percent of top U.S. and European universities will offer global courses.

🔊 **Source/Gartner**

● Seventy percent of traditional two- and four-year universities offered online courses in 2000.

🔊 **Source/Market Data Retrieval**

● Online learning revenue is expected to increase from $6.3 billion in 2001 to $23 billion in 2004. 🔊 **Source/IDC**

Simulations from SimuLearn (above) and Boston Dynamics (right) immerse users in emotionally charged situations. Whether that's a heated business meeting or a traffic accident, users must focus on visual clues to decide when and how to react.

one for an online university that has yet to graduate students and achieve full accreditation, UNext's efforts have helped it close considerable ground in the race for credibility. And until that model proves a success or a failure, you can expect such partnerships to continue.

Learning gets emotional

We're not talking about milquetoast e-learning apps that give users a case of the warm fuzzies. Don't get out your hanky just yet. If artificial intelligence expert Roger Schank has his way, the future of e-learning simulation will be realistic enough to scare the stuffing out of you. And sufficiently frightening or not, current simulation technology definitely gets a *Wow!* Using the latest in artificial intelligence, animation, and audio, current computer simulations create a realistic visual image backed by a complex framework of simulated logic and emotion.

"Emotion is critical in education," says Schank, who's also chairman and chief technology officer of Chicago-based simulation designer Cognitive Arts. ◁)) www.cognitivearts.com "But I also think that it really doesn't matter unless there are visuals. It's hard to be emotional about a piece of text. It's not hard if you have somebody yelling at you."

Schank says simulations should put users in emotionally charged situations that not only require them to make split-second decisions, but also to master their own emotions. Whether that's dealing with an irate employee in a management simulation, making the wrong decision and having your simulated boss chew you out, or interrogating an uncooperative suspect regarding a potential homicide, the idea is to create a situation that's memorable and lasting.

"The key issue is failure—not failure in not knowing the answer but failure in not being able to effectuate what you intend," says Schank. And how are you going to get people to remember? "You make it emotional, and you get as close visually to reality as possible."

Though there's certainly nothing new about that approach, the idea of harnessing failure and consequence in order to create a more effective learning scenario seems almost revolutionary at a time when much of what's offered tries to deliver the answer as quickly as possible.

SimuLearn founder Clark Aldrich is a staunch supporter of learning through simulated environments. His company, which focuses on softskills simulation, is currently preparing for the release of its first offering, a sim on leadership, due out by year end.

"When people think about softskills simulations specifically," says Aldrich, "their assumption is same content but better. So, if I wanted to learn leadership, [a simulation] would be basically the same kind of material that I'd get from a lecture or an e-learning course. The exciting thing is how different the simulation is. You go from learning what to learning when." When? Aldrich gives the example of learning to drive a car. Physically, it's a rather easy task—a steering wheel and two pedals. The key, however, is not how to drive, but when. Going through a red light, for instance, can have disastrous consequences.

Another important distinction that Aldrich points out is a simulation's ability to not just deepen people's skills in a small group, but also touch everyone in an enterprise. "The real goal is to have essentially the same course be as relevant to an administrative assistant as to a CEO," he says. "When it is, you can really bring together a corporation."

Schank has witnessed firsthand the ability of simulations to affect a company beyond one or two individuals. For example, Cognitive Arts created a character who, as intended, proved to be extremely annoying to deal with, someone whom every employee loved to hate. "Eventually the employees started to talk about that character as if he were real," Schank says. "And [typical] corporate culture is that people have had similar experiences and have come to agree on how to deal with [situations]. So, yes, you can very much alter a company's culture through the use of a simulation."

A traffic accident between a U.S. Army humvee and a civilian vehicle is just one incident a young lieutenant must face in "Mission Rehearsal Exercise," an advanced simulation developed jointly by artificial intelligence developers. Institute for Creative Technologies and Boston Dynamics.

Still, changing corporate culture probably isn't the first thing you think of when someone says computer simulation. Typically, that technology has been applied to military training or video games. But expect to see more within the corporate world. For example, Cognitive Arts has created simulations for several well-known companies willing to shoulder the steep price tag, such as Wal-Mart, Walgreens, and IBM. "There are a bunch of companies that are willing to spend the money and use those simulations," he says.

Aldrich and Schank predict that more companies will become increasingly dissatisfied with a traditional e-learning approach to soft-skills training. "Whenever you see a video, you know that's well-trod ground. The nice thing about dynamic computer animation is that you can truly be somewhere someone has never been before. You actually feel as if you've created a real environment," says Aldrich. "Ultimately, simulations are the technology and content that enable something, not valuable in itself. What simulations are enabling is experiential learning."

Just-in-time

M-learning, online universities, advanced training simulations—what they all come down to is anytime, anywhere, anyhow. And that's the real *Wow!* Taken as a whole, those new advancements in technology and learning are providing us with the incredible power of choice and the ability to personalize the way we learn and train. And though those advancements clearly speak for the individual, they also mean a greater degree of interconnectedness, and that speaks for the good of the learning community and companies.

Take, for example, San Francisco-based Cisco Systems. When a Cisco engineer discovers a piece of information that needs to be passed along to the rest of the company, it can be delivered simultaneously through its Internet-based learning network to nearly 4,000 systems engineers and salespeople spread over 70 countries, as well as 200,000 engineers in 115 countries that make up its reseller salesforce. And Cisco isn't alone. Almost weekly, I receive report of some enterprise-wide learning solution that brings a company ever closer to true just-in-time delivery of information. And though my focus has been in large part on emerging technologies (where there seems to be the most debate regarding effectiveness and feasibility), it's not the technology that will ultimately hinder m-learning, online universities, and training simulations. It's people.

"The technology-oriented hurdles aren't that difficult to overcome," says Michael Metz, director of marketing for Cisco's Internet Learning Solutions Group. "It's the social and cultural transformation that a company has to go through."

Time and again, Metz has witnessed companies make it to the edge of the just-in-time waters only to have their thirst go unquenched due to a lack of executive leadership, cross-functional strategizing, or appropriate funding models. "It's easy to see a quick ROI on implementation of something like e-learning. It's easy to document the travel and entertainment saved in the first year, cost savings of shipping manuals and books via FedEx around the world. That's easy enough to document," says Metz. "What's harder to grasp is the competitive differentiation that comes from a company that implements [a just-in-time solution]."

Jeff Botkin puts it succinctly in his book *Smart Business: How Knowledge Communities Can Revolutionize Your Company:* "In the knowledge economy (1995-2020), the best strategy is to overinvest in connecting power. Competitive advantage accrues to those who invest more than their competitors to connect to more people and share knowledge faster and farther."

Connecting to more people, connecting faster and farther, that's the future of learning. The companies that get it will deliver in amazing ways. **TD**

William Powell *is an associate editor of* T+D; *wpowell@astd.org.*