Education in a Digital Democracy

Leading the Charge for Learning about, with, and beyond Technology

> *If a nation expects to be ignorant and free in a state of civilization, it expects what never was and never will be.*
>
> —Thomas Jefferson to Charles Yancey, 1816

BY MARK DAVID MILLIRON AND CINDY L. MILES

What a heady time for education and democracy!

The world is shrinking, traditional boundaries between organizations and countries are fading, and developments in technologies—information technology, biotechnology, and even nanotechnology—are evolving in Internet time. Businesses and governments are scrambling to develop coherent strategies to address these new technologies in their daily operations and future planning. Even the U.S. electoral process is going high-tech, with Arizona leading the way as the first state to hold an Internet-enabled primary. The Republican, Democratic, Reform, Green, and Libertarian parties are all leveraging Internet technologies in their campaigns, conventions, and fund-raising. During the 2000 Republican primary, Senator John McCain referred to his Web site in almost every interview and speech, noting with pride that his Web-based fund-raising enabled Americans to enter the political process like never before. The "pol" sites abound, from more traditional destinations like vote.com to more youth-oriented, hip sites like rockthevote.com. The United States has entered the twenty-first century as an emerging "digital democracy."

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In this digital democracy, the role of education is central. Educational systems, public and private, face unparalleled calls to provide the infrastructure for a stable and successful society. The expanded role of education in the digital age is a sharp contrast to its status in previous economies. In the agrarian and industrial ages, employers often viewed education as an impediment to or luxury for their workers—farmers wanted their workers plowing or harvesting, and industrialists wanted their workers making or selling products. Today, in contrast, employers *want* their workforce to learn. Knowledgable workers with cutting-edge information and skills are a competitive advantage that few organizations can do without and survive. Employees are not only encouraged but often required to take additional coursework or training. Companies are relocating to states with better educational systems and workforce-training capacity. Participation in adult education in the United States has risen sharply over the last eight years—from 50 million to 75 million. Currently, more than 40 percent of the adult U.S. population is involved in some form of education, and these numbers are slated to go even higher.
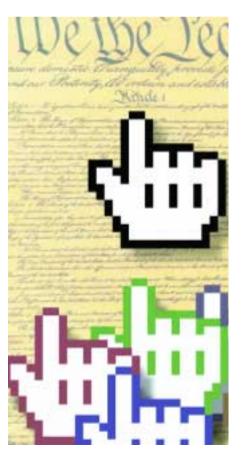
Not all educators respond enthusiastically to the call to meet the needs of the digital economy, however. Our visits to the conferences, campuses, and communities where educators congregate have revealed a discordant rhetoric, from angry cynics on one side to true believers on the other. To these rival camps, the digital age is either the on-ramp to the apocalypse or the highway to heaven. But a third group is emerging, one that we call the "reasoned center"—the thoughtful critics and the careful advocates. From this reasoned center, we hear some consistent themes. They are looking at the changes the digital age has brought—changes in how we work, play, and learn. They are also exploring the challenges that confront us, from the digital divide to massive workforce shortages. Finally, they are beginning to formulate a charge for education in our emergent digital democracy, a charge that speaks even more directly to Jefferson's emphasis on the relationship between education and freedom.

Changes

Because the use of technology in the political process is so new, we have yet to experience a fully digital-media-savvy candidate. Moreover, no candidate has yet addressed how the changes in technology will ultimately affect education. With the rate of change increasing almost palpably, we need a big-picture perspective of how technology-driven societal shifts are working their way through the educational enterprise. Taking a step back to examine the effects of technological change on how we work and play reveals interesting implications for how we learn and helps illuminate the changing role of higher education.

Changes in Work and Play

In 1995, Don Tapscott stated: "Today we are witnessing the early, turbulent days of a revolution as significant as any other in human history. A new medium of human communications is emerging, one that may prove to surpass all previous revolutions—the printing press, the telephone, the television, the computer—in its impact on our economic

and social life."[1] Tapscott is fond of noting that when he first spoke of the coming changes related to the explosion of digital technologies and the Internet, he was often assailed as a paragon of hyperbole. It is interesting to discover that many of Tapscott's predictions about new technology adoption rates were dead wrong—he massively underestimated. The Web as we know it—meaning the Netscape-driven or Internet Explorer–driven Web—fast became the most quickly adopted "disruptive" technology in history.

Disruptive technologies are those innovations that have a dramatic impact on how the whole of society works, plays, and learns. The discovery and exploration of electricity in 1873 is an example. Still, it was nearly forty-six years before electricity saw mass use in the United States (with "mass use" commonly defined as 25 percent of the population using an innovation). The gas automobile, equally as disruptive, took fifty-five years to reach mass use. Mobile phones burst on the technology scene more recently but have quickly become a staple of American life. Even with high costs and poor service as initial barriers to entry, mobile phones took only thirteen years to become a mass-use innovation.

The modern Web, however, wins the rate-of-adoption race by achieving mass use in only four years. Although it was helped along by previous innovations and infrastructure development—ARPANET, TCP/IP protocol, Tim Berners-Lee's HyperText Transfer Protocol—this rate of adoption still tells us something about the usefulness and accessibility of the Web, about how quickly we manage to adopt change in today's world, and about how ready we are for the convergence of our media experiences.

The Web holds the potential to finally integrate our disparate media experiences. We moved through our passive, one-way media stages with the printing press, radio, and television. Television, in its time, was the "killer" media application because it brought together a full spectrum of state-of-the-art media experiences. TV sucked people in, so much so that our modern lexi-

con had to add the term "couch potato" to describe our transfixed repose in front of this technological marvel.

Then came Pong. This video game, with its pixel ball sent back and forth by short white panels guarding a goal, was nothing more than a simplistic and stark video soccer. It flew off the Radio Shack shelves. Pong was the first high-profile, interactive visual media. It allowed kids, along with a fair share of adults, to interact with visual media and actively participate in their entertainment. Pong began our love affair with digital interactive media. The telephone was a stable, interactive audio technology; and e-mail was soon to emerge as the written interactive media experience. So when the Web came along, with its ability to unite passive and interactive media, it took on the new "killer" status. Media-savvy consumers, workers, learners, and players jumped online at explosive rates.

Depending on which survey you read, the Web now has approximately 300 million users worldwide and traffic doubles every 100 days. There are more than 1 billion cataloged Web pages, with estimates of more than 50 billion deeper in database applications connected to the Web. AOL wins the Net Neilsen contest for most viewed Web sites, averaging more than 35 million unique visitors per month. Its subscription service is now at close to 24 million and supports an average of 1.1 million concurrent users at any given time. And in further support of our capacity to adopt interactive media, AOL's Instant Messaging system—which allows Internet users to spot when friends are online and to hold an instant chat session—took only two years to garner more than 50 million users.

We are shopping online in record numbers, particularly if you count browsing as shopping. Almost all Web users admit to at least window-shopping online, even if they still buy in person or over the phone. The U.S. Commerce Department estimates that consumer e-commerce will reach $300 billion by 2002. Even more striking, however, are the business-to-business e-commerce numbers. A recent Forrester Research report estimated that this market will be in the range of $2.7 trillion by 2004, in large part due to the ability to tightly track and reward value added at each stage of the supply chain in business transactions.[2] Interestingly enough, estimates of consumer and business-to-business e-commerce markets continue to rise, sometimes by more than double with each new report.

The average connected American sends at least one e-mail a day and obtains at least one weekly news story from the Web. And our online habits are changing as the Internet matures. We are now spending an average of 8.8 hours per week online, visiting an average of 9 sites. Even more notable is that our number of hours online has increased in the last year but our average number of sites visited has actually decreased by 40 percent. Many point to this trend to note that the Web is no longer the "wild West" it was just some three or four years ago. Better search engines, widespread acceptance, use in work and school, and the explosion of major information portals have transformed the once harrowing Web experience into a more useful, if commercial, experience. In short, with the mass of information and choices, people are gravitating to trusted sources and valued relationships. CNN, the *New York Times*, AOL, Yahoo, and MSNBC are all winners in this process. People feel that the content and community of these sites is safe, reliable, and high-quality. Venture capitalists working in the Web sector put it best: "The eyes have it." Whichever site develops the best relationship with surfers holds the most value.

This new economic reality—that service and repeat business constitute the coin of the digital realm—is leading to an increasing focus on Customer Relationship Management (CRM) strategies and software. Almost all major business applications and database vendors are scrambling to roll out their solutions to help business, government, and education develop better, long-lasting relationships with their customers. The goal of CRM is to create relationships that move people from a hot prospect to a loyal customer. The ultimate intention is to make the pain of exit from a current relationship greater than the ecstasy of entry into another relationship with a competitor. Modern companies are looking at their functions (e.g., marketing, sales, and service) and infrastructures (e.g., Web, phone, and field) and making sure that they can meet or exceed expectations in each area. A simple matrix outlining this idea is presented below:

	marketing	sales	service
web			
phone		internet	
field			

Customer Relationship Management (CRM) Model

The concept is straightforward, with customers increasingly expecting across-the-board service in consumer relationships. If we are buying a new car, we expect to be able to browse available models online, call a dealership to get more information about a car we are interested in, or see that model glistening on a grassy hill in front of our local dealership. And today we expect to be able to buy the car online, get help with the sale over the phone, or walk into our local dealership to make the purchase. We also expect to be able to buy replacement parts from the manufacturer's Web site, its 1-800 number, or

the local dealership service center. This is the true "bricks-and-clicks" experience, with companies providing a variety of contact opportunities based on the wants and needs of the consumer.
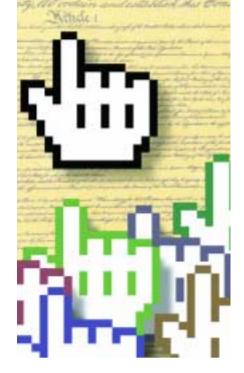
Soon intelligent search engines, net-to-phone discussions, one-touch video conferencing, digital personal service agents, and—a little farther down the road—holographic imaging will further enhance and become standard elements of CRM. Each new innovation will further enable businesses and industries to build positive, long-term relationships with their customers. And as the rate of change increases, so too will our predisposition to rely on those individuals and organizations with whom we have created relationships. The "eyes have it" indeed!

Changes in Higher Education
Before we dive into a business metaphor in education, let's take another step back and look at how these changes and trends are playing out in our field. Kenneth Green's 1999 *Campus Computing Survey* (<http://www.campuscomputing.net>) reveals that more than 50 percent of higher education classes use e-mail to connect students to faculty and other students. This simple innovation has enabled more asynchronous interaction in instruction and has provided communication venues that enable previously quiet students to be more open with their instructors and fellow students. And basic e-mail brings part-time instructors, who have a difficult time holding office hours, more directly into contact with their students outside of class.

The *Campus Computing Survey* also shows that more than 40 percent of courses nationwide utilize Internet resources. Increasingly, almost any instructor in higher education can roll out a "Web-enhanced" course, with its syllabus, additional readings, and other resources accessible via the college Web site. These enhancements are particularly useful given that most surveys show that the average faculty member and the average student access the Internet at least once a day.

Finally, since 1994, the use of Internet tools to enable online learning has

taken the field of distance learning by storm. Every day we read of another "cyber" college or consortium of colleges that are "going virtual" to provide on-demand, synchronous and asynchronous online instruction.

These technologies, combined with society's lust for learning, have enticed new players into the educational "marketplace." Corporate educators estimate that the total education market in the United States is worth more than $600 billion and that the market worldwide approaches $3 trillion. With this kind of valuation, it is not surprising that a host of corporate universities, along with other for-profits like Sylvan, Kaplan, University of Phoenix, and U.S. Open University, are aggressively courting our learners.[3] In addition, they are targeting learners underserved by community colleges or universities.

With this kind of competition and the rising expectations of students, it is also not surprising that there is a flurry of infrastructure work in the more traditional higher education sectors. Being Web-enabled is a must for any administrative software system, and vendors are required to have a data-integration or data-management strategy linked tightly into whatever software solution they present. Colleges are eager to use the tools of CRM—such as portals, customized profiles, and targeted Web services—to make sure that they can be competitive in the modern educational world.

Keeping up to speed with expectations is increasingly difficult when we realize that the "DotCommies" are coming. "DotCommies" is the tongue-in-cheek term we use to describe people who fully expect that the organizations and individuals with which they interact will be digitally enabled.[4] Tapscott's 1999 book, *Growing Up Digital: The Rise of the Net Generation*, targets the baby-boom echo generation, which fits in this group. They are 88 million strong—larger than the first baby boom—and are just beginning to pass through the doors of higher education. Many have grown up with technology as a large part of their everyday life and have little empathy for those who fear, resent, or resist information technologies. To this generation, resisting information technologies is like being afraid to use a toaster or a washing machine. These kids are not just tech-literate, they are tech-savvy.

The "baby-boom echo DotCommies" are joined in education by the more techno-friendly faculty replacing the wave of retiring academics, who are leaving at record rates. Moreover, presidents in higher education today—particularly in community colleges—are being charged by their boards to develop thoughtful plans for the integration of technology into their institutions. This infusion of technology is driven by alumni, community, and business groups who see the value of high-quality technology education and who are becoming more involved in curricular planning and delivery. DotCommies everywhere!

Challenges
Along with these exciting, interesting, and sometimes difficult changes come several challenges. The pages of this magazine abound with treatises on the troubling outcomes related to changes in how we work, play, and learn.

The most prominent and most politically hot issue is the "digital divide." Data from the U.S. Education Department, the *Federal Computer Weekly*, and the National Center for Educational Statistics all point to a troubling trend: the promise and power of information technology is not being realized equally in

our society, with the poor, rural, and minority groups falling quickly behind. White Americans are twice as likely as blacks or Hispanics to have an Internet connection. Households with incomes of more than $75,000 per year are twenty times more likely to have access to the Internet than those with incomes in the $50,000-or-lower bracket. And fewer than 39 percent of low-income schools have a *classroom* with an Internet connection.[5] Many federal agencies note that we have run fiber to most of our public schools, but all too often these connections go only as far as the principal's office. The reason these divisions give us pause is that knowledge, access to knowledge, and the ability to use knowledge mean power in the information age. The lack of technology access and skills puts disadvantaged members of our society increasingly at risk of becoming disenfranchised spectators of a digital world that is passing them by, bit by bit.

Next on our list of challenges is the workforce shortage. The Information Technology Association of America (ITAA), the Northwest Center for Emerging Technologies (NWCET), the U.S. Departments of Labor and Commerce, and the National Alliance for Business (NAB) all note that the shortage of qualified workers in almost every sector of information technology is seriously constraining productivity. While estimates of the number of jobs available in IT fields or IT-related fields range from 300,000 to 3 million depending on how one defines each category, there can be little doubt that training, hiring, and retaining IT workers has become a business imperative. Companies are experiencing escalating retraining costs and are turning to imported talent to fill major gaps. The salaries of IT workers continue to rise as companies become more aggressive in their recruiting efforts. Other organizations are changing their hiring practices, bringing in less-experienced workers and trying to "grow their own."

The challenge, however, is not solely with IT jobs. The U.S. Commerce Department estimates that by 2002, more than 60 percent of all jobs will require IT literacy. These are not just the tradi-

tional IT jobs: auto-body-repair technicians will need to send digital photos to claims adjusters; police officers will need to access Global Positioning System (GPS) software to locate stolen cars; and doctors will need to log into international disease control centers to check for updates.

The 21st Century Workforce Commission (<http://www.workforce21. org>), a joint commission formed by the Senate and the House and led by Commissioner Lawrence Perlman, the chairman of the board of Ceridian Corporation, has probably done the most comprehensive job of exploring these challenges. Its six regional hearings and extensive research led to a report titled "A Nation of Opportunity," which outlines key strategies for taking on the challenge of IT worker shortages. The core message of this report is that shortages of IT workers in the United States have reached such a volatile point that we must pool our corporate, government, educational, and community resources to find more integrative, effective, and lasting solutions.

The challenges of the digital divide and the workforce shortage—this ironic combination should not escape us— are joined by a host of other equally troubling trends. *Newsweek* recently reported that computer fraud is growing at more than 500 percent per year, 27 percent of all software in the United States is pirated, 90 percent of workers surf recreational sites during work hours, 80 percent of workers send personal e-mail at work and 50 percent shop online, and nearly 70 percent of all employers conduct surveillance on their employees' technology use.[6]

Finally, we are also challenged personally to live well in the information age. It seems that a new technology or a slick new product lurks around every corner. Technology tools abound to help us organize and schedule our lives, and high-tech communication tools, from e-mail to NetMeeting, beckon us to connect with friends and family. Still, as the Harvard psychiatrist Ed Hollowell has noted, the top-two reasons people are seeing psychologists and psychiatrists today are stress and lack of human connection.[7] Even more troubling, tech-

nology inserts work into our personal lives, with "home" computers becoming weekend workstations for modern professionals. For all those who would pass judgment on "technoworkaholics," let the first stone be cast by those who have never used their home computers to check work e-mail at midnight on the way back from the bathroom. Clearly, we are scrambling to find balance and peace, as well as ways to keep up with a rate of change that seems ridiculous. A title of a chapter in our recent book puts it this way: "Keeping Up To Speed When You're Moving Too Fast Already."[8]

Charge
Surrounded by changes and challenges at every turn, educators are looking to develop a compelling charge in this digital democracy. What can education do to step into this technological maelstrom and provide insight and instruction for learners of *all types*?

This question is particularly relevant as we ramp up to serve not only our traditional students but also the booming cohort of workforce-development students. As more adults return to the classroom—real or virtual—the "pipeline" metaphor of education becomes obsolete. We are better served by thinking of our systems as enabling *cycles* of learning and learners, with students moving through a primary cycle that ends at high school, a community college, or a college or university but returning regularly for credit and noncredit learning experiences as their wants and needs dictate. Indeed, in many community colleges, more than half of the students in technology or allied health programs already hold a four-year degree.

What we see emerging from the host of reports, commissions, and conferences exploring these changes and challenges is the following charge: *Higher education must become the key community resource for learning about, with, and beyond technology.*

Learning about Technology
Alan Cooper, the inventor of Visual Basic, has observed that there is not enough interchange between the everyday world and the world of the

technologists who are designing the software and hardware we work with every day. Clearly, he notes, the rush to add functions is outpacing the press for utility because technologists often work in isolation from the problems for which they are designing "solutions." Technological skills are essential, Cooper asserts, but they cannot be taught in isolation. Indeed, he predicts, the successful twenty-first-century professional will be either a "business-savvy technologist" or a "technology-savvy businessperson."[9]
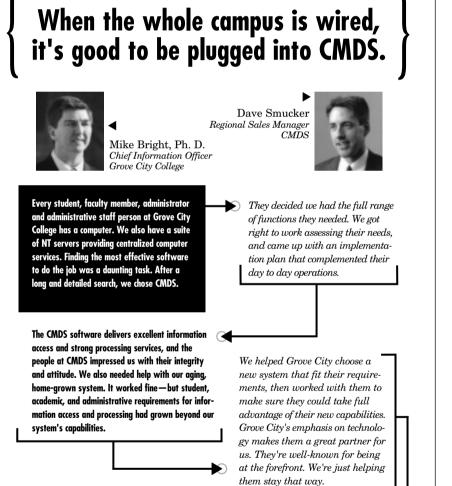
Our education systems are addressing the need for technological literacy in numerous ways. Progressive community colleges, for example, are catalyzing conversations about technological literacy on and off campus. They are working to become leaders in providing student and community access to learning about technology, often running extensive weekend programs for first-time users or opening community technology labs in rural or depressed urban areas. Those leading the pack are employing a simple success formula: access plus quality instruction.

Community colleges are also partnering with large and small businesses in new ways. Increasingly, companies like Cisco, Novell, Microsoft, Oracle, and IBM/Lotus are using community colleges to provide industry-specific certification programs, many of which transfer to credit-bearing curricular programs. Students graduating from these short-cycle training programs are in high demand and often make significantly more money after certification than do the faculty who are teaching the programs. Many of these programs are further strengthened by connections with career-placement opportunities in local and national businesses. In addition, many community colleges are running small business centers with technology training classes and are providing customized corporate technology training in the workplace. Helping students learn about technology is clearly a mission that higher education is taking seriously.

Learning with Technology
In our zeal to help students learn about technology as an *end* for learning, we cannot neglect the potential of technology as a *means* for learning. Studies abound touting the transformative power of educational technology, but IT is not always the panacean vehicle for learning. Terry O'Banion, League for Innovation president emeritus, is fond of noting that the Web holds the distressing potential to make bad instruction more widely available. After the "new toy" thrill wears off, most thoughtful educators find that best practices for the use of technology as a tool for learning correspond to best practices for education and learning in general.

What we know is that learning with technology, if done well, can help students and faculty connect with quality educational content, with rich context, and with each other while it also provides a means for offering better service and support for learning. K. Patricia Cross, senior fellow at the League for Innovation, has distilled the research on learning from multiple fields. Her conclusion is that quality education is about helping students make meaning-

ful connections with content and with others in the learning environment—neurological synaptic connections, cognitive schematic connections, socially constructed connections, and experiential connections.[10] In learning with technology, the connections to *content, context,* and *community* can be powerful.

Through information technologies, students can make rapid connections to *content* of dazzling scope and dimension. Faculty who teach astronomy can log onto NASA's Web site to obtain real-time pictures from the Hubble space telescope rather than sending students to a photo or drawing in a textbook that is likely outdated. Political science faculty can access international Web sites to gather current events in almost any country. The examples abound. The simple, irrefutable fact is that content is more readily available than ever before. With the Internet, the challenge is no longer accessing information but rather developing skills for sifting through the morass of data provided by this transformational content connector to find high-quality or relevant content—the challenge of becoming intelligent consumers of information.

Even more powerful learning connections can be made using these technologies to connect to the *context* of curricular information. Faculty wanting to demonstrate how calculus is applied in the "real world" can take students on a virtual tour of Intel or Boeing plants. Faculty can help students in international business classes create chat rooms and threaded discussions with students from other countries, enabling the students to see, for example, how individuals from other places conduct negotiations. Almost any discipline can use Internet-based technologies to place its curricular content in a richer context, thus enhancing the extent to which students see the content as relevant, applicable, and useful.

Most important, however, is the power of technology to create connections to *community*—to bring people together. By engaging the social and collaborative aspects of education using technologies such as e-mail, listservs, newsgroups, threaded discussions, and synchronous chat rooms, the Internet has provided new and interesting ways to engage in the learning process. Particularly as time-bound, place-bound, role-bound, and bureaucracy-bound models of education dissipate, these collaboration capabilities become essential to quality education for the knowledge age. And as Web-enabled video and voice technologies improve and technology itself becomes less obtrusive, we expect to see even greater use of technology to build community in higher education.

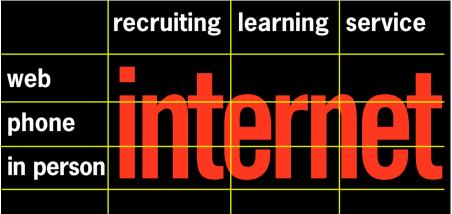Moreover, just as technology has enabled business and industry to strategically move the customer relationship to a higher level, an integrated technology-enabled educational infrastructure can enhance learning by developing better, more lasting relationships with students. Most colleges and universities would shun a strategic plan dubbed Customer Relationship Management, but savvy educators are recognizing the

value of what we call Learner Relationship Management (LRM). Notwithstanding the limitations of a business

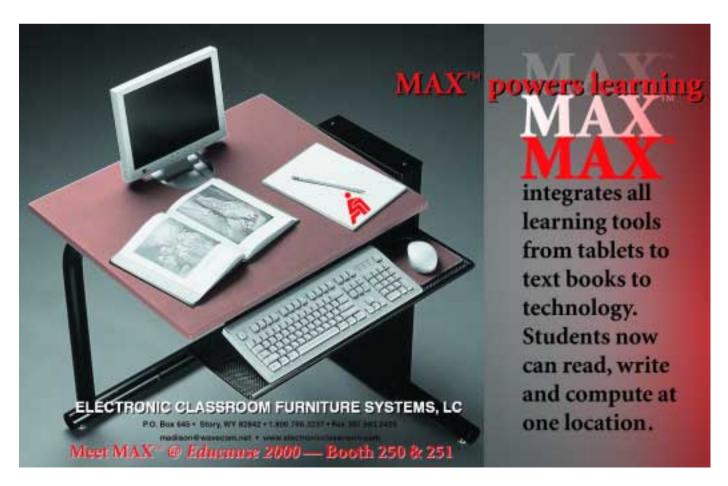Learner Relationship Management (LRM) Model

metaphor in education—the process of learning being far more complex than a simple business transaction—the LRM concept could move us toward more integrated educational infrastructures that support robust learning interactions with students across multiple modalities, as characterized in the LRM model.

Students, faculty, staff, and communities have come to expect the outcomes that an LRM approach promises. They expect to have a variety of options—Web, phone, or in person—to review programs and services; apply for admission; register for classes; take courses; access syllabi; check grades; communicate with faculty, staff, or peers; and access state-of-the-art research materials. Moreover, they expect all of these ser-

vices to be supported by an integrated data system that shares information seamlessly and securely.

Learning beyond Technology
Another of the ironies of the information age, one we take the most pleasure in noting, is that through the pressure to learn about and with technology, we have more opportunities than ever before to touch students with learning *beyond* technology. Evidence and experience suggest that we are well served by pursuing the third learning connection as aggressively as we do the first two.

The earlier mentioned report from the 21st Century Workforce Commission put it best: "The current and future health of America's 21st Century Economy depends directly on how broadly and deeply Americans reach a new level of literacy—'21st Century Literacy'—that includes strong academic skills, thinking, reasoning, teamwork skills, and proficiency in using technology."[11] The League for Innovation in the Commu-

nity College has been working for more than a year with the Pew Charitable Trusts on the "21st Century Learning Outcomes" project, which explores general education curriculum projects nationwide.[12] This project has identified eight clusters of critical life skills needed for students to survive and flourish in the digital age:

- *Technology skills* (acquiring computer literacy and Internet skills, retrieving and managing information via technology)
- *Communication skills* (reading, writing, speaking, listening)
- *Computation skills* (understanding and applying mathematical concepts and reasoning, analyzing and using numerical data)
- *Critical thinking and problem-solving skills* (evaluating, analyzing, synthesizing, decision making, creative thinking)
- *Information management skills* (collecting, analyzing, and organizing information from a variety of sources)

- *Interpersonal skills* (developing teamwork, relationship management, conflict resolution, and workplace skills)
- *Personal skills* (understanding self, managing change, learning to learn, taking personal responsibility, understanding aesthetic responsiveness and wellness)
- *Community skills* (building ethical, citizenship, diversity/pluralism, and local, community, global, and environmental awareness)

These skills—or *learning outcomes*, to use twenty-first-century language—were identified and validated by educators from more than 260 colleges across the United States and Canada and represent a thoughtful bridging of institutional differences as well as the traditional gap between academic and technical workforce terminology and goals. In the digital democracy, higher education no longer occurs in the traditional educational silos of departments or divisions and colleges or universities.

Learning is *about*, *with*, and *beyond* technology—and is a never-ending cycle of connecting learners to *content*, *context*, and *community*.

To realize our democratic ideals in the digital age characterized by change and challenge, we need learners who can think, relate, and act responsibly in a dynamic array of interrelated social, economic, and technological situations. In this era of ubiquitous connections and rampant relationship-building, the undereducated members of society are more susceptible to the negative underbelly of technology innovation—for example, online purveyors of hate groups, pornography, and stock schemes. Our charge should be to enable people to learn about, with, and beyond technology so that the doors of economic, educational, and personal empowerment will open wide as they take their steps through the passages of their lives.

This argument for entering the world of information technology is more persuasive to our faculty friends than is the common threat to "get on board the

train or be left behind." The truth is, we should all be scurrying back to the station and inviting everyone to get onboard. We need *every* educator's help, because to be successful in the twenty-first century, we must be either technologically-savvy educators or educationally-savvy technologists. In many ways, it's all about balance. In the digital democracy, people need to know not only how to turn technology on but also, and even more important, how to turn it off. *e*

No other sure foundation can be devised for the preservation of freedom and happiness.... Preach a crusade against ignorance; establish and improve the law for educating the common people. Let our country-men know that the people alone can protect us against the evils [of misgovernment].

—Thomas Jefferson to George Wythe, 1786

Notes

1. Don Tapscott, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (New York: McGraw-Hill, 1995).
2. U.S. Commerce Department, "Digital Economy 2000," ⟨http://www.ecommerce.gov⟩ (accessed August 3, 2000); Forrester Research report, "eMarketplaces Boost B2B Trade," ⟨http://www.forrester.com⟩ (accessed August 3, 2000).
3. See U.S. Department of Education, "Digest of Education Statistics, 1999," ⟨http://nces.ed.gov/pubs2000/digest99/d99t031.html⟩ (accessed August 8, 2000); on Sylvan's positioning in education, see *InvestorLinks*, July 2000, ⟨http://www.investorlinks.com/analysis/00-06/000628-webstreet-analysis.html⟩ (accessed August 8, 2000).
4. We first heard the term "DotCommies" in a presentation by the chair of the University of Southern California Entrepreneurship Program. However, our usage of the term is quite different. He used it to talk about the rush of people who wanted to set up dot-coms.
5. "U.S. Cities Race Gap in the Use of the Internet," *Washington Post*, July, 9, 1999; "Internet Access in U.S. Public Schools and Classrooms: Stats in Brief, 1994–1999," February 2000, ⟨http://nces.ed.gov/pubs2000/2000086.pdf⟩ (accessed August 8, 2000).
6. Keith Naughton, "CyberSlacking," *Newsweek*, November 29, 1999, 62–65.
7. Ed Hollowell talks and writes about the importance of maintaining the human touch in the information age; we heard him make this point at the 1997 Teaching, Learning, and Technology Roundtable Institute in Phoenix, an annual event sponsored by the TLTR Group focused on the role of technology in higher education.
8. Lynn Taber's chapter on technology staff development programs and user support appears in *Taking a Big-Picture Look at Technology, Learning, and the Community College* (Mission Viejo, Calif.: League for Innovation in the Community College, 2000).
9. Alan Cooper, *The Inmates Are Running the Asylum* (Indianapolis, Ind.: Sams, 1999).
10. K. Patricia Cross, *Learning Is about Making Connections* (Mission Viejo, Calif.: League for Innovation in the Community College, 1999).
11. 21st Century Workforce Commission, "A Nation of Opportunity," 2000, Executive Summary, ⟨http://www.workforce21.org/finalreport.htm⟩ (accessed August 3, 2000).
12. The results of the first stage of this work have been reported in a monograph entitled *Learning Outcomes for the 21st Century* (Mission Viejo, Calif.: League for Innovation in the Community College and the Pew Charitable Trusts, 2000).

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Recognizing the Winners

2000 EDUCAUSE Award Programs

e
EDUCAUSE
Transforming Education Through Information Technologies

Leadership Awards
program sponsored by SCT

EXCELLENCE IN LEADERSHIP

for extraordinary effectiveness, influence, statesmanship, and lifetime achievement, on both individual campuses and the wider higher education community

Ira H. Fuchs
Vice President for Research in Information Technology
The Andrew W. Mellon Foundation

LEADERSHIP IN THE PROFESSION

for exceptionally effective leadership in campus information technology use and management, and mentoring of other professionals

David L. Smallen
Director, Information Technology Services
Hamilton College

Jerry Niebaum
Assistant Vice Chancellor for Information Services
University of Kansas

LEADERSHIP IN INFORMATION TECHNOLOGY

for visionary achievements and effectiveness in identifying and advancing technology directions for the various needs of higher education

Jeffrey I. Shiller
Network Manager
MIT

Excellence in Campus Networking
program sponsored by Novell, Inc.

Winner

Wake Forest University

An exemplary blend of standardization, decentralized support, and allowance for customized computing needs that creates an environment of low-cost ownership and exceptional acceptance of technology

Honorable Mention

University of Northern Iowa

EDUCAUSE Quarterly Contribution of the Year
program sponsored by SCT

"The Catalyst Project: Supporting Faculty Uses of the Web . . . with the Web"

A fresh approach to support of instructional technology based on a very collaborative process

Mark C. Donovan
Strategic Marketing Manager
RealNetworks
and Senior Research Fellow, Center for American Politics and Public Policy
University of Washington

Scott Macklin
Director, Program for Educational Transformation through Technology (PETTT)
University of Washington

Systemic Progress in Teaching & Learning
program sponsored by Eduprise

Winner

University of Washington

Vibrant, cross-campus programs and collaborations that encompass experimentation, implementation, assessment, and distribution of mainstream, open-standards-based tools to improve teaching and learning through technology

Honorable Mention

Seton Hall University

Honorable Mention

University of Technology, Sydney

Exemplary Practices in Information Technology Solutions
program sponsored by PeopleSoft, Inc.

Winner

HoyasOnline
Georgetown University

The transformation of a standard alumni directory into a unique Web-based resource to broaden communications and foster community among the university's 125,000 alumni

Winner

PAWS—Personal Access Web Service
Louisiana State University

A one-stop shop to university services that delivers 55,000 unique intranet portals, each customized to dynamically reflect the individuals' current relationship to the university

For information about these achievements—and about award programs for 2001—www.educause.edu/awards/awards.html or e-mail us at awards@educause.edu

The EDUCAUSE program of awards brings peer endorsement and visibility to achievements in many arenas. Judged and ratified by professionals with expertise in the fields they are evaluating, each award is an affirmation of merit.