

# E-Learning:

*Going the Distance*



Jones International University®

# E-Learning: Going the Distance

A Review of E-Learning Effectiveness

September 2002

Jones International University®, Ltd.

## OVERVIEW

The concept of lifelong, individualized learning engineered through online education is emerging as a major force in elementary, secondary, and higher education, as well as in professional training and development. Market researcher Gartner, Inc. projects the global market for Web-based learning to grow to \$33.6 billion in 2005.<sup>1</sup>

As Gary Becker, the University of Chicago professor and winner of the 1992 Nobel Prize in Economics for his work in human capital theory, explains, “We’ve had, up until the growth of the Internet, teachers standing up in front of a bunch of students and lecturing to them with some give and take. The Internet has the potential to be the first major change in this process since Socrates.

“What it means is that somebody can be in their office or at their home tuning into an instruction, having a give and take with the instructor. This provides the possibility, which is becoming an actuality of enormous increase, in the flexibility of the access to not only higher education, but to retraining and additional investment in one’s human capital. People can do that without having to go on-site to some learning center, which may be far removed or difficult for them to get to from either their home or workplace.”<sup>2</sup>

The implications, according to James J. Duderstadt, the president emeritus of the University of Michigan, are staggering.

“Rather than ‘an age of knowledge,’ perhaps we should aspire instead to building a ‘culture of learning’ in which people are continually surrounded by, immersed in, and absorbed in learning experiences,” he has written. “Information technology has now provided us with a means to create learning environments throughout one’s life. These environments are able not only to transcend the constraints of space and time, but they, like us, are capable, as well, of learning and evolving to serve our changing educational needs.”<sup>3</sup>

How to develop such a culture, continually renewing a population’s skills to promote success in a global economy? Observes Randy E. Bennett, distinguished presidential appointee at Educational Testing Service:

“Several blue ribbon panels have recently studied this question and come to similar conclusions. Interestingly, their conclusions aren’t restricted to workforce training but extend to education generally.

“The Commission on Technology and Adult Learning (2001), sponsored by the American Society for Training and Development and the National Governors Association, stated the following: ‘The Commission...encourages governors, CEOs and other leaders to make e-learning the cornerstone of a national effort to develop a skilled workforce for America’s digital economy....By embracing e-learning in our states, our communities and our organizations, we can improve our competitiveness and point the way to a new era of unprecedented growth and opportunity for all Americans.’

“Similarly, the National Association of State Boards of Education (2001) concluded: ‘E-learning will improve American education in valuable ways and should be universally implemented as soon as possible.’

“The President’s Information Technology Advisory Committee Panel on Transforming Learning (2001) recommended that ‘...the federal government set as a national priority the effective integration of information technology with education and training.’

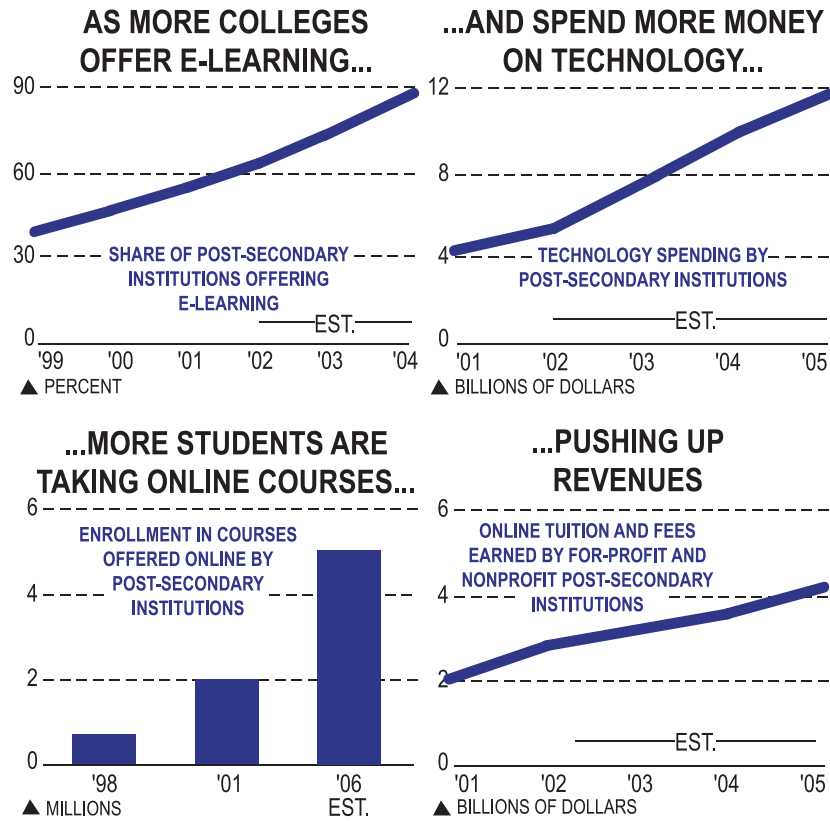
“Finally, the bipartisan Web-based Education Commission’s Report to the President and Congress concluded, ‘The question is no longer *if* the Internet can be used to transform learning in new and powerful ways. The Commission has found that it can. Nor is the question *should* we invest the time, the energy, and the money necessary to fulfill its promise in defining and shaping new learning opportunity. The Commission believes that we should.’”<sup>4</sup>

#### Post-secondary Adoption on the Rise

Today, just as the forces of technology and globalization have transformed the way business is conducted, so, too, are they altering the ways we educate ourselves and our children to stay apace of that change to the point that “what seemed ridiculous in 1996 seems commonplace today,” as John Seely Brown and Paul Duguid put it in their seminal 2000 book, *The Social Life of Information*.<sup>5</sup>

In the effort to serve a more diverse student population with increasingly specialized educational and professional needs, colleges and universities have doubled their spending on information-technology services in the last decade.<sup>6</sup> International Data Corp., an Internet market-research firm, estimates that U.S. post-secondary institutions’ technology spending will top \$9 billion by 2004<sup>7</sup> (Figure 1).

**Figure 1**  
**The E-Learning Explosion (U.S.)**



*Data: International Data Corp., Eduventures.com, IDC, U.S. Distance Learning Assn.*

By the end of 2004, more than 90% of the nation's bricks-and-mortar universities and colleges will offer online courses, according to International Data Corp. And that doesn't take into account independent, wholly online universities, such as Jones International University®.

Yet, as Shelia Tucker of East Carolina University wrote of online learning in 2001, "As distance education increasingly becomes a vital part of higher education, one must ask if distance education is, in fact, better, worse, or as good as traditional education."<sup>8</sup>

In his widely noted bibliography titled *The No Significant Difference Phenomenon*, North Carolina State University scholar Thomas Russell addresses that question by listing more than 300 papers, articles, and studies bolstering the stance that online education is as good as, if not better than, in most cases, traditional higher education motifs.<sup>9</sup>

Still, Tucker's thoughts are central to the ongoing debate about online education's efficacy: "Some argue that distance education is viewed as being different from other forms of education. Many advocates of distance education are ardent about their venue, and very critical of traditional education. Proponents contend that distance education is as good as traditional education. In other words, learning occurs as much in distance education as it does in traditional education. However, is this really so? Does distance education work better for some students as opposed to others?"

At the conclusion of a study that tracked the learning styles, progress, and outcomes of classroom and online students in an undergraduate business communications class, Tucker said she concurred with "the general body of knowledge that distance education can be just as good as traditional face-to-face education. No significant differences were found between pre-test scores, homework grades, research paper grades, and final course grades. However, there were significant differences between the two groups with regard to age, post-test scores, and final exam scores. Distance education students scored higher in all three categories."

#### K-12 Overcoming Traditional Obstacles

In the K-12 sector, online education is undermining the so-called "factory" or one-size-fits-all models of teaching and learning that have prevailed for decades.

In elementary and secondary schools, e-learning is fast becoming the domain of the home schooled, the creative, the curious, the hard worker, the academically gifted, the geographically isolated, and the precocious. And, considering that K-12 enrollment figures have risen 18% to 53.2 million since 1985,<sup>10</sup> online education is addressing such pressing issues as teacher shortages, overcrowded schools, and budget crunches.

Technology is certainly not an alien concept to today's school children and teenagers: According to the Pew Internet & American Life Project, 94% of 12- to 17-year-olds with Internet access have used it for school research (Figure 2), while 87% of the parents of online teens said the Internet helps students with their schoolwork, and 93% believe it helps children learn new things.<sup>11</sup>

Figure 2

**School-related Use of the Internet (U.S.)**

*The percent of online teens who have ever...*

Used the Internet for school research	94%
Used the Internet as the major source for their most recent school project	71%
Used a Web site set up by school or a class	58%
Downloaded a study aid	34%
Created a Web page for a school project	17%

*Source: Pew Internet & American Life Project Teens and Parents Survey, Nov.-Dec. 2000. Margin of error is 14%*

The existing research about online learning's efficacy in the K-12 educational sphere is sketchy, skewing along the same no-significant-difference lines as it does in higher education. But it's beginning to be shown to be as impactful as traditional, classroom-based schooling and, in some cases, better when measured by grade point averages and other student outcomes.

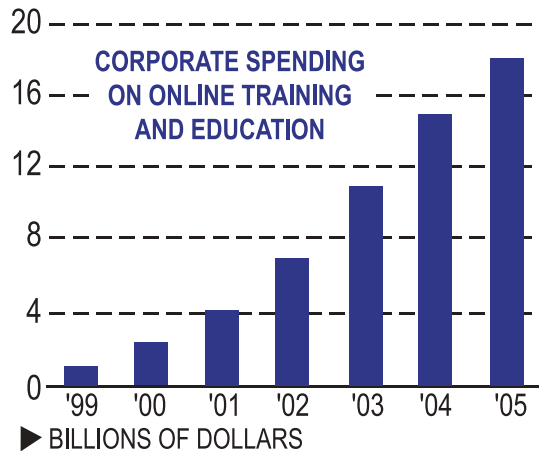
Nonetheless, considering the lack of in-depth research into such a young, burgeoning field, as well as teacher and student concerns about online education's role in learning, the issues posed by Tucker will be the focus of debate for some time to come.

#### e-training Cost Effective Solution

That's not necessarily the case when online education applications are deployed as corporate training tools. Venture capitalists have dramatically increased their investments in the e-learning sectors of education companies, from \$981 million in 1999 to \$2.5 billion in 2000<sup>12</sup> and, with U.S. corporate spending on e-learning expected to reach \$18 billion by 2005<sup>13</sup> (Figure 3), return-on-investment information is already beginning to roll in.

Figure 3

### Corporations are Charging into E-Learning (U.S.)



Data: International Data Corp.

Rockwell Collins, for example, has trained 800 of its 2,500 engineers in a critical regimen using e-learning courses over two months—four times more than the company initially believed it could train over the course of a year using traditional courses. PricewaterhouseCoopers has reduced per-learner training costs of \$760 to \$106 in a technology-based regimen.<sup>14</sup>

In converting its traditional training delivery methods to an e-learning platform, IBM saved \$200 million in 1999, providing five times the learning at one-third the cost of previous methods.

And, using an 80%-20% mix of Web-based and classroom instruction, Ernst & Young reduced training costs by 35% while improving consistency and scalability.<sup>15</sup>

This helps explain why enterprises ranging from American Express Corp. and Stanford University to the Roman Catholic Church and the U.S. Army use some form of online learning (EArmyU is now operational, allowing soldiers to get degrees online and enrolling 12,000 students in its first year)<sup>16</sup> As disparate as these entities may be, they share a need for and appreciation of Web-based learning's scheduling flexibility, cost effectiveness, and broad reach.

Dr. Oscar Arias Sanchez, the former president of Costa Rica and Nobel Prize winner, has said, "There is truly no end to the uses for education and technology in today's world." In line with that, tomorrow's more powerful, faster, and less-expensive computers, applications such as universal wireless access, and standards-based software and hardware will further promote anytime-anywhere

online learning. And, as man's understanding of human-technology interaction and its implications for learning continues to grow, educators and training experts will be in better positions to break down e-learning experiences into their most productive and impactful elements.

That, in turn, will begin to provide more answers to such thorny questions as: How can student-teacher and student-student interaction be maximized online? How should students be technologically prepared for online education and training? How can different learning styles and age ranges be accommodated? How does the choice of technology affect learning? What training do students/instructors need to implement online education effectively?

Michael Dertouzos, the late director of MIT's Laboratory for Computer Science, wrote in his 2001 book, *The Unfinished Revolution*, "education is vital because it defines future society." The answers we find to the questions facing online education will be central to maintaining that vitality going forward.

## K-12

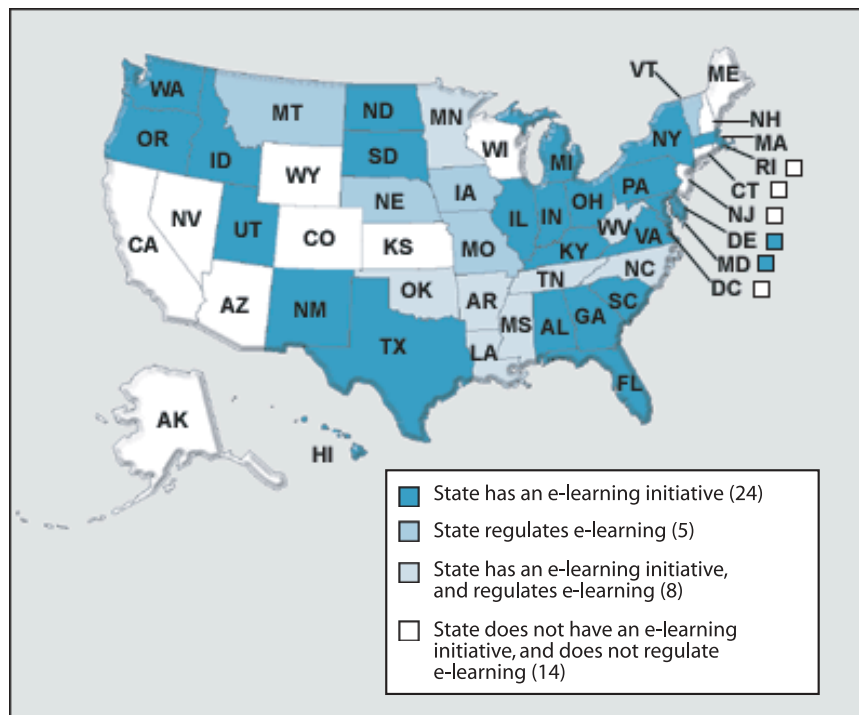
Michael Dertouzos, the late director of MIT's Laboratory for Computer Science, wrote in his 2001 book, *The Unfinished Revolution*, "the biggest hope of all for distance education is that it be used to interconnect young students with their teachers and peers, forming a new breed of educational communities that straddle time and space."<sup>1</sup>

Today, technology and its online-learning offspring are doing just that through K-12 schooling, affording students unprecedented access to academic material and new ways to learn, while flattening many of the chronological, intellectual, economic and geographic barriers that have constrained elementary and secondary education since their inception (Figure 4).

Online education is slowly demolishing the so-called "factory model" of learning that has prevailed for at least the last 100 years in the U.S., freeing K-12 education from the "the wish to preserve the past rather than the hope of creating the future [that] dominates the minds of those who control the teaching of the young," as philosopher Bertrand Russell fumed.

Figure 4

### E-Learning Initiatives, K-12 (U.S.)



Source: Education Week survey of state departments of education, 2002

In doing that, e-learning is fast becoming the domain of the home schooled, the creative, the curious, the hard worker, the academically gifted, the geographically isolated, and the precocious.

As K-12 enrollment in the U.S. has risen 18% to 53.2 million since 1985, e-learning also is addressing such pressing issues as teacher shortages, overcrowded schools, and budget crunches.<sup>2</sup>

As we move into the 21<sup>st</sup> century, teachers are acutely aware of their students' technological savvy, considering that today's children are born into a world of plug-and-play televisions, personal computers, Game Boys, VCRs, cell phones, DVD players, and the like. Hand in glove is the fact that the number of K-12 schools connected to the Internet climbed from 35% in 1994 to 96% in 1999; and that the ratio of students to computers fell from 16-to-1 in 1992 to 6-to-1 in 1999.<sup>3</sup>

Through the end of the 1990s, K-12 schools tripled their spending on instructional technology from 1991-1992's figure of \$2.1 billion to 1999-2000's \$6.2 billion.<sup>4</sup> And, according to the Pew Internet & American Life Project, 94% of 12- to 17-year-olds with Internet access have used it for school research; 78% say they believe the Internet helps them with schoolwork. Eighty-seven percent of the parents of online teens said the Internet helps students with their schoolwork, and 93% believe it helps children learn new things.<sup>5</sup>

#### K-12 e-learning: The Impact on Students

Little wonder, then, that the chief questions in K-12 online-education circles center on e-learning's direct and indirect impact on students. "At one level, we (and the general public) know that using technology to enrich learning is a good thing, but demonstrating its impact on test scores is tricky," researchers Lorraine Sherry and Daniel Jesse wrote in 2000.<sup>6</sup>

Among the more provocative questions: Which topics best lend themselves to online education? How can student-teacher and student-student interaction be maximized online? How can different learning styles and age ranges be accommodated? How does the choice of technology affect learning? What kinds of training do students and instructors need to effectively implement online education? How can online learning's effectiveness be assessed?

Consider one study focusing on four online and classroom courses—advanced statistics, literary analysis, photography, and pre-engineering—offered during the 1999-2000 academic year by The Virtual High School (VHS), an online learning project that delivers high school courses to almost 4,000 students in 350 schools in 30 states.<sup>7</sup> Traditional students and VHS students received similar grades, and administrators, teachers, and students expressed high levels of satisfaction with the online learning experience, according to the report's authors.

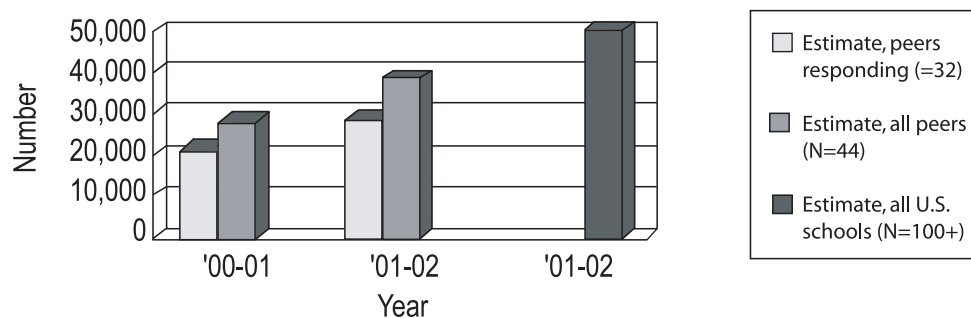
That's not to say the VHS program was bug-free. Even though teachers expressed satisfaction with the amount of interaction they had with students, those levels were significantly lower for the VHS courses than for face-to-face courses. And while the student-dropout rate was low for both sets of courses, it was lower for the face-to-face programs. Technological glitches sometimes interfered with online classes, impairing student-student and student-teacher communication.

Yet, the report's authors concluded, "In general, technology enables VHS students to take high-quality courses, offered by high-quality teachers, that would not be available to them otherwise." They added, "As teachers become more effective in the use of technology to support collaborative learning, as technological environments become more powerful, and as schools develop their technological infrastructure, students will begin to experience the same quality of interaction that they do in face-to-face classes."

In another study conducted by Washington State University's Michael K. Swan of students who took e-classes and classroom courses at several secondary schools in the Midwest, the online students' grade point averages were the same as the classroom-bound students'. Online ninth-grade students' grade point averages were higher than classroom-based 11th- and 12th-graders', while 12th-grade classroom-based students had significantly lower grade point averages than their online counterparts.<sup>8</sup>

Since 1997, when the first licensed secondary schools went online in Florida and Massachusetts, 32 states have launched e-learning initiatives.<sup>9</sup> An estimated 40,000 to 50,000 students were enrolled in a virtual school course during the 2001-2002 academic year<sup>10</sup> (Figure 5). And, Michigan, Arizona, New Jersey, Utah, Ohio, Kentucky, Illinois, and Vermont have built or are building e-learning networks to deliver university- and secondary school-level courses statewide to K-12 students.<sup>11</sup>

**Figure 5**  
**Students Enrolled in K-12 Virtual Schools (U.S.)**



Source: Distance Learning Resource Network, "Virtual Schools: Trends and Issues," Oct. 2001

The first licensed, online secondary school in Florida was also the first in the United States: Florida Virtual School (FLVS). Launched by a grant from the Florida Department of Education, it began with a staff of 18 and 11 online courses, serving 150 students in the 1997-1998 school year.

Today, the school's enrollments are projected to reach over 10,000 for the 2002-2003 school year. It has an instructional staff of 120, offers 65 courses, including honors and ten Advanced Placement courses, and is affiliated with all 67 school districts in Florida, as well as numerous charter and non-public schools. FLVS has an 80 percent completion rate and its students have exceeded both the grade point average and Advanced Placement scores of the average Florida student.

Noting the emerging momentum in the K-12 e-learning sector, Seymour Papert, the co-founder of MIT's Artificial Intelligence initiative and a professor of media technology at MIT, has said, "The generation of kids where a large proportion had computers in their homes from birth is just hitting the schools now. I think that that wave is going to have a dramatic effect on the schools. It just takes a sprinkling of kids in every class who know there is a better way of learning, and have experienced it, so they can make a bigger demand in the classroom."<sup>12</sup>

The upshot, according to Papert: "The kids are becoming a political force. They are also becoming an educational force: Because they are in quite a lot of projects around the country, kids are explicitly being mobilized. Those kids who really know about computers and love them are being mobilized by the system to teach teachers and parents and implement changes in the school."

## HIGHER EDUCATION

Technology is slowly, but dramatically, transforming higher education from a narrow, teacher-centered enterprise into a global, learner-focused juggernaut in which online learning is a key component. In trying to meet the demands of a shifting and growing student population, as well as a changing job market and globalized marketplaces, higher education is increasingly turning to online learning to offer anytime-anywhere learning options.

Indeed, today's higher-education student doesn't fit the profile of yesterday's. Adults over the age of 25 now account for over half of all post-secondary learners (Figure 6). Many tend to be working professionals less interested in traditional graduate and undergraduate degrees than in advancing careers and shoeorning continuing education into busy schedules.

Figure 6

### Total Enrollment in All Degree-Granting Institutions - Projections to 2011 (U.S.)

	(In thousands)				
	1991	1996	1999	2006	2011
<b>Men and women, total</b>	<b>14,359</b>	<b>14,368</b>	<b>14,791</b>	<b>17,029</b>	<b>18,219</b>
14 to 17 years old	125	231	143	218	231
18 to 19 years old	2,864	3,038	3,414	3,913	4,235
20 to 21 years old	2,920	2,659	2,989	3,443	3,828
22 to 24 years old	2,306	2,324	2,435	2,814	3,016
25 to 29 years old	2,072	2,128	1,870	2,208	2,425
30 to 34 years old	1,415	1,196	1,145	1,282	1,447
35 years old and over	2,656	2,791	2,796	3,150	3,036

Source: National Center for Education Statistics, May 2001

Other higher education e-learners may be academically ambitious teenagers; bright, go-at-their-own-pace learners; far-flung part-timers; and restless knowledge seekers of all stripes. Here, the role of instructor has become one of preparing the learning environment, anticipating student needs, and offering contingencies, as learners develop their own meanings for the material at hand, rather than wait for it to be interpreted for them.

"Within a couple decades, 'distance education' may be an obsolete concept," writes George Mason University's Chris Dede. "Instead, all instruction within college and university settings may be some balance between classroom-based and distance-based learning interactions, determined by the subject matter,

student population, and educational objectives. Such distributed learning demonstrates to students that education is integral to all aspects of life—not just schooling.”<sup>1</sup>

#### e-learning: Growth and Impact

Today, colleges and universities are among the Web’s most wired communities, where more than 90% of its inhabitants access the Internet thanks, in part, to a doubling in information-technology spending in the last decade.<sup>3</sup> Colleges spent an estimated \$3.3 billion on technology during the 2000-2001 school year vs. \$2.7 billion the year before, according to Market Data Retrieval, an education information company.<sup>3</sup>

Internet market-research firm International Data Corp. estimates that college and university spending on distance-learning technology alone will top \$744 million by 2004, up from under \$400 million in 1999.<sup>4</sup> Along those lines, New Jersey, California, and Missouri have built high-speed networks to link community colleges, four-year colleges and universities, and graduate schools.<sup>5</sup> By the end of 2004, more than 90% of the nation’s bricks-and-mortar universities and colleges will offer online courses, according to International Data Corp. And that doesn’t take into account independent and totally online institutions of higher learning, such as Jones International University.<sup>6</sup>

As Lucinda Lea and associates wrote in a 2001 study of Middle Tennessee State University students’ use of technology in learning, “[Students] now perceive instructional technology as an expected part of today’s learning environment.”

But as higher education’s online-learning applications proliferate, so do questions about their efficacy and impact.

The existing body of online-learning literature—research studies, academic papers, and anecdotal evidence—runs across the board: A small part of it focuses on traditional lecture courses, while a small portion favors technology-mediated approaches. But most suggest that students who use technology generate the same learning outcomes as students who participate in conventional classroom instruction. And the faculty and student attitudes about the latter are generally positive.

In his widely noted bibliography titled, *The No Significant Difference Phenomenon*, North Carolina State University scholar Thomas Russell lists more than 300 papers, articles, and studies bolstering the stance that distance education is as good as, if not better than, traditional higher education motifs.<sup>7</sup>

“There is so much research on this matter that I find it incomprehensible that any reasonable, knowledgeable, unbiased, and professional person could deny the fact that technology can deliver instruction as well as traditional modes—at least when we look at student populations as large groups,” Russell has said.

Among the key studies focusing on the role of online learning in higher education:

- In a 1999 study of graduate students enrolled in online and classroom curriculum design and evaluation courses at Southwest Missouri State University, Drs. Scott B. Wegner and Ken C. Holloway wrote that “there was no significant difference in test scores between the two groups, despite the experimental groups not attending even a single on-campus lecture.... Internet-based delivery of coursework appears to have no negative effect on student achievement or on students’ perception of their learning. This is good, since the proliferation of Internet-based courses shows no sign of abatement in the near future....”<sup>8</sup>
- Profs. William S. and Ruth H. Maki at Texas Tech University reported in early 2002, “we have consistently found better examination performance in Web-based versions of introductory psychology. In addition, students in the online sections learned more than students in lecture sections, as indicated by a greater increase in scores on practice questions from the Psychology Graduate Record Examination from the beginning to the end of the semester....”<sup>9</sup>
- In a 2001 study comparing classroom and online versions of a leadership management MBA course at the Harvard Business School, Prof. Quinn Mills reported that the online class of 20 students generated more interaction, as well as more intimate conversation, than the amphitheater classroom of 102 students. Of the students polled at the end of the online session, 74% said future courses should include online meetings; 83% enjoyed the online format; and 79% found it easy to participate online.<sup>10</sup>
- A University of Illinois faculty study during the 1998-1999 academic year concluded that “online courses may be appropriate for both traditional and non-traditional students; they can be used in undergraduate education, continuing education, and in advanced degree programs....”<sup>11</sup>
- In a survey published in June 2000 by the National Education Association, 40% of the 402 online-learning faculty members interviewed held a “very positive view” of teaching a Web-based course. Most respondents said they doubted whether the quality of higher education would decline in an online environment. The e-teaching faculty also gave their online-learning courses higher marks in offering students access to information and course material; helping them master the subject matter; and addressing a variety of student-learning styles.<sup>12</sup>

“It is important to recognize that ensuring student success in Internet-based courses requires the same careful attention to instructional design, the same level of diligence on the part of the instructor, and the same opportunity for meaningful communication that traditional in-class models require,” Drs. Wegner and Holloway said in their 1999 Southwest Missouri State University study. “The use of technology in any capacity does not guarantee academic success, but indications suggest that it does not necessarily have any significant negative effects.”<sup>13</sup>

#### The Future: e-learning's Role and Acceptance

Considering the nascent state of the research in such a relatively new field, major questions remain about online education's role in higher education.

A skeptical 1999 study—“What's the Difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education”—conducted by the Institute for Higher Education Policy for the American Federation of Teachers and the National Education Association asked some of the harder questions that continue to persist today.<sup>14</sup> Among them: Does distance education work better for some academic subjects than others? Does it work better for some students than others? Is there more of a dropout problem with distance education? What elements are necessary for student success? Do administrative issues affect distance-education quality? Are there shortcomings in the existing research?

Indeed, some of the barriers to adopting technology in higher education include inadequate technology training among faculty members; software and hardware reliability issues; difficulties in using various technologies; and class-preparation time-crunches.<sup>15</sup> Some students also complain about a lack of technical support and instructor feedback.<sup>16</sup>

But more recent studies are finding that faculty and student concerns about online education and technology's role in learning are being addressed by, for example, advances in interactive software, and by the development of more ways online learning successes and failures can be shared among teachers and other experts.<sup>17</sup> Orientation classes for students and faculty new to online learning can also go a long way toward reducing dropout rates, fine-tuning students' technical skills, and raising e-learners' independent education efforts.<sup>18</sup>

Tomorrow's super-powerful, hand-held computers, as well as universal wireless access, will promote mobility and anytime-anywhere access. Less expensive stationary computers will respond to voice commands, access the Internet hundreds of times faster than today's models, store much more information, and automate mundane tasks. Progress toward developing universal standards and

new ways to share e-learning tools and platforms will erase concerns about overpriced, overhyped, and poorly documented software.

As James J. Duderstadt, president emeritus of the University of Michigan, has written: “We have entered an age of knowledge in which educated people and their ideas—facilitated and augmented by rapidly evolving information technology—have become not only key to our social well-being, but a driving force for change in all social institutions. Although the primary missions of the university—the creation, preservation, integration, transmission, and application of knowledge—are not changing, the particular realization of each of these roles is changing dramatically.”<sup>19</sup>

## CORPORATE TRAINING

At the intersection of corporate training and online education, a new avenue has been built for business to improve its workforce's skills, tools, and professional development in today's fast-paced marketplace.

Companies faced with training some 50 million U.S. workers a year are increasingly turning to online learning to help employees brush up on job-related skills and learn new ones—applications that are saving these enterprises millions of dollars a year,<sup>1</sup> promoting collaborative learning, slicing through logistics issues,<sup>2</sup> tailoring the pace of learning to each employee, obliterating geographic constraints, and driving anytime-anywhere learning.<sup>3</sup>

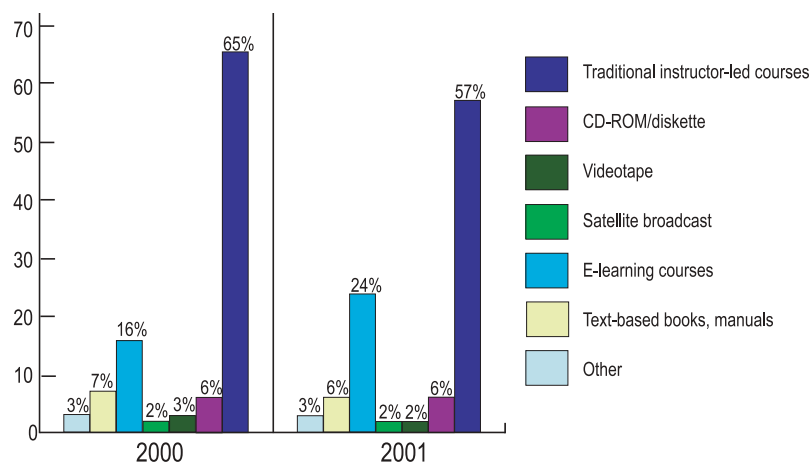
Also critical to the corporate training picture are current estimations that the knowledge required to maintain a job in many occupations is changing so quickly that 50% of all employees' skills will become outdated within 3-5 years.<sup>4</sup>

According to Merrill Lynch & Co., the one-two punch of education/professional development is any company's No. 1 source of competitive advantage.<sup>5</sup> Along those same lines, the American Society of Training and Development declares in its 2002 state-of-the-industry report that "year after year, we find a strong relationship between an organization's investments in training and its performance."<sup>6</sup>

Despite the fact that online education is a relative newcomer to the corporate training sector, its future appears bright: Overall corporate training delivered via the Internet rose from 16% in 2000 to 24% in 2001 (Figure 7), while corporations worldwide are expected to spend more than \$23 billion on e-learning efforts by 2004—up dramatically from the \$2 billion they spent in 1999, according to International Data Corp., an Internet market-research firm.<sup>7</sup>

**Figure 7**

### How Overall Training is Delivered (U.S.)



Source: *Online Learning Magazine*, October 2001

Improving on-the-job performance is the primary goal of most corporate training programs, but measuring that change is a more complex task than merely registering trainees' feelings or using test scores to ostensibly gauge how much they've learned. The quantitative and qualitative research in this growing sector is thin compared to the body of knowledge accumulating in related fields, such as e-learning's impact on higher education. But if some of the more credible reports beginning to surface are an indication, e-training is generating impressive return-on-investment figures.

#### Case Studies: Demonstrating ROI

In April 2002, IOMA, Inc., which tracks corporate human resource issues and trends, concluded a survey of the e-training industry by stating that “whether you look at e-learning from the perspective of cutting costs, retaining employees, or gaining employee buy-ins, it is a learning format that makes a great deal of sense.”<sup>8</sup> The report noted that corporations recouped from 50% to 70% of their initial costs when they moved from instructor-based training to e-learning. A good deal of those savings were tied to reductions in travel and housing costs, as well as the time employees saved on the job.

In the IOMA survey, Brandon-hall.com found, for example, that e-learning could reduce a traditional three-year training budget from \$1.9 million to \$1.2 million over three years. In addition, the amount of time devoted to training could be pared 40% to 60% by switching to e-learning regimens.<sup>9</sup>

According to IOMA, Rockwell Collins trained 800 of its 2,500 engineers in a critical regimen using e-learning courses over two months—four times more than the company initially believed it could train in a year using traditional, instructor-based courses. And PricewaterhouseCoopers found that per-learner costs of \$760 in traditional, instructor-led training could be cut to \$106 in an e-setting.<sup>10</sup>

In converting its traditional training delivery methods to an e-platform, IBM saved \$200 million in 1999, providing five times the learning at one-third the cost of previously used methods. And, deploying an 80%-20% mix of Web-based and classroom instruction, Ernst & Young reduced training costs by 35% while improving consistency and scalability.

Centra Software also has published several case studies that look at e-training's efficacy:<sup>11</sup>

- **Liberty Group**, a South African financial services enterprise with 1,500 employees and 3,500 independent agents in more than 50 offices, says e-trained new agents generate a 200% increase in revenue over agents trained in a classroom setting. The company also saves \$2,000 in travel costs for each online course an employee takes and spends 50% less time on an e-training course compared to classroom instruction.

- Hotel/resort operator **Wyndham International**, which trains 7,500 employees at 200 locations across North and South America and Europe, estimated first-year travel, facilities-usage, and support cost savings at 329% after moving to online training. The company, which said e-training paid for itself in five months, estimated that 2001 training savings would exceed \$2 million. Employees also would spend 40% less time in training by going online.

On another front, **Dow Chemical Co.'s** learn@dow.now Web-based training program, which cost \$1.3 million to install, saved the company \$2.7 million in training costs from October 2000 to February 2001. The program, which enrolled more than 40,000 employees, saved \$162,000 on manual record-keeping; \$300,000 on classroom facilities and trainers; \$1 million on course handouts; and \$1.2 million in salaries thanks to shorter training times.

In the first full year of operation, the company pegged learn@dow.now savings at \$30 million—\$844,279 on manual record-keeping; \$3.1 million on training delivery; \$5.2 million in reduced class materials; and \$20.8 million in salaries due to the fact that e-training requires 40% to 60% less time than classroom equivalents.<sup>12</sup>

When the North American operations of Lever Brothers, Helene Curtis, and Chesebrough-Ponds merged into **Unilever Home and Personal Care** in 1998, the new enterprise counted 12,500 employees across the U.S. who were generating \$11 billion in annual sales. But everything from job descriptions to the way products were sold and shipped was different with each business. The new company needed an umbrella approach that would communicate the broader corporate message and train employees in the specifics of making a sale. Corporate trainers, using CD-ROM and Web technologies, did such a good job getting everyone on the same page that Unilever estimates its salespeople have generated at least \$20 million in incremental sales thanks to e-training.<sup>13</sup>

**Cisco Systems, Inc.** must train thousands of sales and technical support staff each time a new product is launched. Since its workforce is deployed worldwide, the travel costs alone are daunting. In its 2001 annual report, Cisco stated that e-training saved the company 40% to 60% over instructor-led courses.<sup>14</sup>

#### Blended Learning: The Best of Both Worlds

Nonetheless, a major discussion continues in corporate America about the best ways to approach employee training. For example, what kinds of behaviors, habits, and characteristics work best in an online environment? What about mixing online and offline components, that is, technology-based and traditional learning formats?

Enter “blended-learning” initiatives, a mixture of e-training with classroom-based instruction that take into account individuals’ different learning styles and experiences. In this sector, several studies are worth reviewing.

In a 2001 white paper written for Centra Software,<sup>15</sup> Harvi Singh and Chris Reed reported that corporate training objectives could be achieved in 50% less class time using blended-learning methods, and that travel costs and time could be reduced by as much as 85%.

Singh and Reed also pointed to another study focusing on the University of Tennessee’s Physician’s Executive MBA program for mid-career doctors. The report showed that blended-learning programs could be completed in half the time and at less than half the cost of classroom-based instruction. The U. of Tennessee study also reported that students in the program demonstrated a 10% better learning outcome than those rooted in a classroom setting.<sup>16</sup>

“Taken together, these studies show us that, regardless of whether your starting point is the traditional classroom or self-paced e-learning, the diversity of a blended learning experience appears to have a significant impact on the overall effectiveness of a learning program relative to any individual learning delivery method alone,” Singh and Reed concluded.

According to another two-year study conducted by Thomson Learning, blended learning can create more productive workforces than online learning alone can.<sup>17</sup> Launched in 1999 and co-sponsored by Lockheed Martin, National Cash Register, Utah State University, and others, the Thomson study compared the results of several sets of learners from the aerospace, manufacturing, and retail industries, as well as from higher education. The first group learned to use Microsoft Excel® with a mix of online content and simulations, text materials, mentor assistance, and classroom-based training. A second group took an online course. The third, or control, group received no training.

When the regimens were completed, each group performed three tasks as if it was doing them on the job. Researchers found that the e-learning group performed the tasks with 99% more accuracy than the control group. The group using a blended curriculum performed the tasks with 30% more accuracy than the group that received instruction online, and with 159% more accuracy than the group that had no training. The group that took the blended course also performed real-world tasks 41% faster than the e-learning group.

## e-training: Here to Stay

To reiterate: Corporate training in an online milieu is a young field where questions abound. For example, ASTD's 2002 state-of-corporate-training study notes that the least effective e-training courses focus on quality issues, competition, and business practices; managerial/supervisory skills; and interpersonal communication.<sup>18</sup>

As management expert Larry Moyer has written: "While we cannot yet establish all reasons for complaints [about e-training], there are obvious contributing consequences of a rush to go digital: poor quality content, regardless of format; poor instructional design; technology and infrastructure problems; inappropriate software decisions; and inappropriate content for the business and learning objectives."<sup>19</sup>

Indeed, e-training will probably long be a work in progress due to the nature of the content and technology's evolution. Ironically, many of the corporations in the software, hardware, broadband, telecom, and satellite sectors that champion the concept today will solve many of the issues attached to it tomorrow.

And, as our understanding of human-technology interaction and its implications for learning grows, educators and training experts will be better able to break down the experience into its most productive elements. For example, experts will be better equipped to gauge which online and classroom learning components work best together; how big training "bites" should be to nurture better student comprehension; the tools workers need to better perform their jobs; how to accommodate different learning styles; and the kinds of training instructors need to get their messages across.

The potential payoff is outlined in a 2001 study titled, "Human Capital Investments and Firm Performance," in which Laurie J. Bassi, et al, wrote, "Firms that engage in unusually high levels of training subsequently experience far higher gains in stock-market valuation compared with those firms spending the least on employee training. Whether these differences reflect the causal effects of training on firm productivity, or whether the high-training firms are simply more productive in other unmeasured ways, cannot yet be determined with absolute certainty...."<sup>20</sup>

The authors conclude, "Overall, our analysis found that a firm's current training investments are the single most important statistical predictor of its total stockholder return for the following year—more telling than other key investments that are publicly reported, such as R&D."

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