CHAPTER 9

PERFORMANCE AND WEB-BASED LEARNING*

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I. Introduction

Corporate training through the utilization of technology-based learning systems has been gaining popularity in professional circles for their accessibility, efficiency and effectiveness. Companies that once only had a choice between in-house and off-site residential training now have new options: video, conferencing, CD-ROM, and Online. This chapter examines Online learning, which is an especially compelling option among all technology-based learning solutions[1].

The advancement in computer-based communication helps speed the evolution of Web-based learning. Along with the remarkable growth of the Internet, many companies are installing their own internal corporate webs or Intranets, networks that look like the Web but are accessible only to users within the corporation. When these Intranets were first installed, they were used largely to communicate administrative information within the company, and for posting of personnel policies and job vacancies. Computers and data communications have made possible the transmission of instruction to multiple distant locations, and through the growth of the Internet and Intranet, opportunities for content delivery as a means to address the learning needs of corporations have been greatly enhanced.

Online learning may be quite basic or highly sophisticated and interactive. At the lower end, it relies on text, graphics, exercises, testing, and record keeping. At the other end of spectrum, Online learning incorporates animations, simulations, audio, video, peer and expert discussion groups, online mentoring, links to materials on a corporate Intranet or the Web, and uses extensive archival materials.[2] Because of its unique advantages, Online learning has revolutionized the way training is provided. Table 1 highlights the main differences between residential training and Online training. The temporal, spatial and interpersonal dimensions have been completely restructured. Participants are no longer bound to a fixed location and schedule, and they have greatly expanded opportunities to interact with instructors and peers. Anytime, anyplace web access makes possible a shift in corporate training from reliance on the instructor-led, residential training model to the self-paced training model. At a click of a mouse, employees can enter an Online course that paces the instruction to their own capabilities. They can repeat or go back to the material as time and circumstance may dictate. For these employees who wish to develop greater skills and career opportunities but unable because of economic or geographic circumstances to avail themselves of traditional learning venues, the

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WWW and the recent development in Online education provide a high payoff learning opportunity. Web-based learning can also improve the overall quality of training. Updating and maintenance of content can be easily centralized. From a company's standpoint this is advantageous because employees get consistent, ongoing, up-to-date information, regardless of the geographic dispersion of the learners.

Table 1. Residential Training vs. Online Training

Residential Training	**Online Training**
Instructor-led	Self-paced or Instructor-led
One-time lectures	Reusable lecture notes
Physical classroom	Virtual classroom
Discussion	Chat room/conferencing
Study group	Virtual community
Office hours	E-mails/telephones
Campus	Anywhere
Fixed time	Anytime
Text books	E-books
Library	Virtual library

Because of its anyone, anytime, anywhere capabilities, Online training is a significant component of the training strategy for an increasing number of corporations. Since about 1995 there has been a virtual explosion in the use of Online training. U.S. companies are spending more to train their employees, and that has been matched by a dramatic growth of educational institutions and private companies that purport to be able to train employees quicker and cheaper through the adoption of Web-based technologies. Although Online learning as a corporate training model is still in its early stages, it has stimulated a diversity of responses among the business sector: amusement, eagerness to embrace, suspicion, resistance. Initially, companies are spending the bulk of their online training budgets to teach workers about new technologies; in the future, as employees become more tech-savvy, corporate executives are expected to refocus their budgets on training in soft skills such as management, communications, and professional development (Lake 2000). At the end of the day, Online learning may transform how corporate management training is designed, organized, and delivered.

The rest of the chapter is organized into three parts. Part II traces the evolution of corporate training, focusing on the emergence of Online training. In recent years, spending on this type of training has increased significantly, although it still accounts for only one-fifth of corporate training dollars. Many corporations are attracted to Online training because it is cost effective and improves the firms' competitiveness. Moreover, employees also see this as a way to enhance their careers. Part III reviews the role of California, both as an innovator and consumer of Online training. The picture in California is mixed. While the state has been a major source of innovation, most California companies are still hesitant about replacing more traditional training approaches with Online training. Part IV examines the crucial roles of partnerships in expanding the use of Online training and quality of Online courses which are key to a sustainable growth of Online learning. To ensure access to quality instruction materials, companies and reputed business schools are increasingly working together to design custom courses with company-specific content. A move toward knowledge management partnerships provides linkage to private and non-profit organizations, government and higher educational institutions. The chapter concludes with comments on the challenges of Online training and some recommendations.

II. The Evolving Corporate Training Landscape

All corporate training, irrespective of how it gets delivered, has as objectives one or more of the following: training to assist employees to perform their jobs at an acceptable level, training to prepare

employees to perform more varied and complex tasks, and training to prepare employees for promotion and leadership. At a more strategic level, a goal of corporate training is to tie training to company goals and performance, and to help the firm gain competitive advantage. To these ends, corporations attempt to design and deliver cost-effective training solutions that can capture the best metrics of their strategic objectives.

Employer paid programs to train their employees are big business in the United States. According to an estimate by Multimedia and Internet Training Newsletter, spending on corporate training and education has grown by 5 percent a year for the past decade. Education and training accounts for 9 percent of GNP, and of the estimated $772 billion of total education market in 2000, 62.5 billion is allocated for corporate training (Wolinsky 2000). The resources that go into corporate training divide into two broad categories. Of the estimated total expenditures for formal training programs in the United States in 1999 of $66 billion, approximately one-half of it went into soft skills training (leadership, communication, general management, human resources, executive education, team building), commonly referred to as management training. The other half went into IT training (application software, system infrastructure, etc.). Spending on training and education for managers rose to $16.5 billion, up 17 percent from 1998 (Reingold and Schneider 1999). An increasing share of corporate training is being provided by "corporate universities." Corporate University Xchange (www.corpu.com), a New York City-based corporate education research and consulting firm, estimates that currently there are more than 1,600 corporate universities nationwide, up from only 400 in 1988. According to its 1998 survey of the deans of 100 top corporate learning organizations, the average corporate university budget is roughly equal to 2.6 percent of company payroll (Meister 1998).

About 20 percent of the total amount for corporate training is spent on Web-based learning (Bucher 2000). According to an estimate by the International Data Corporation (Urdan & Weggen 1999), Web-based delivery represented approximately 15.6 percent of all soft skills (i.e., management) training in 1998. By 1999 that percentage had increased to 27.8 percent. Table 2 captures the broad division of the corporate training dollars in the U.S. in 1999. The figures indicate that a little over one billion dollars of the estimated $62.5 billion corporate training dollars resulted in training delivered through Web-based training technology. Although the numbers in table 2 are estimates and would need to be refined before drawing fixed conclusions, they are generally in line with expenditure estimates obtained from other sources[3].

Table 2. Corporate Training Market Size by Training Product and Delivery Method in 1999 ($ Billions)

	IT Training	**Soft Skills Training**
Total Corporate Training Market	$31.19	$31.31
Outsourced Training Market	$9.45	$5.55
Technology-based Training Market	$2.27	$0.72
Web-based Training Market	$0.87	$0.20

Source: Urdan, Trace A., and Cornelia Weggen. 2000. "Corporate E-learning: Exploring a New Frontier." WRH + Co Weekly 2, 10 (10 March). Data in table 2 based on Training Magazine, International Data Corporation, and WR Hambrecht + Co estimates.

Most companies are supportive of Online training and expect it to grow rapidly in the future. In 1999, 92 percent of America's largest corporations had begun testing technology-based training models (Meister 1998). Two-thirds of the Fortune 500 companies now employ some form of e-learning to deliver professional development and training to their employees, and all of the training managers at these companies would recommend Online learning as a training model (Baum 1999). Motorola University offers 700 to 800 courses online, which is about 10 percent of its formal learning (Westerbeck 2000).

According to estimates, approximately 5,000 vendors, including 300 Online learning providers are fighting for a share of the Online training market (Lake 2000). Most of these businesses perform one or more of the following three functions: development of training materials, technological solution in the delivery and management of online training courses; or offering of consulting, hosting, or other learning-related services.

Experts anticipate a significant wave of consolidation in the years ahead as training providers compete to become one-stop Online corporate training centers (Lake 2000).

Online training is attractive because it lowers the cost of training for many firms. Testimony to this can be seen in the following remarks obtained in surveys of companies and other authorities.

> Instructor-led training is very expensive. You have to pay for the printed material, the speakers, lodging, food, and travel. But with Web-based content we're able to reach people at their desks. We're saving hundreds of thousands of dollars on travel alone. (Software company)
>
> The value proposition for Online learning is very simple to understand: It's all about making training available all the time, anywhere, for everyone. (Electronics company)
>
> Web-based training offers flexibility, accessibility, and convenience. Such training has a cross-platform feature, meaning that it can be accessed by Web-browsing software on any platform and allow inexpensive worldwide distribution. No separate delivery system is needed, keeping delivery costs to a minimum. (Brandon Hall)

As the demand for training increases beyond the resources available, budget restrictions have forced many organizations to seek Online learning as a more cost-effective training model. One way that Web-based training can realize cost savings is because corporations can eliminate long program development cycles and buy Online courses in bundles or on a subscription basis from training suppliers, consulting firms, and institutions of higher education.

Motorola University, one of the largest and most successful corporate learning entities, obtains much of its content from individual faculty members and research laboratories around the world that are not connected to Motorola. This content then gets developed into curricular material. Motorola also contracts for content with commercial firms such as Digital Think, Blackboard.com, Caliber, and Sylvan Learning Systems, all of which are working to gain market dominance in Web-based learning.

Established consulting firms such as Anderson and PricewaterhouseCoopers have invested significant sums of money to transform the knowledge in company files and in the minds of their experts who work for these firms into marketable Online training products. PricewaterhouseCoopers' Client Training Group (CTG) is prepared to develop classroom or Web-based learning for clients in both the hard and soft-skills areas.

Traditional training programs are typically developed course by course, based on specific needs within the company at a specific time, resulting in a fragmented training process. Online training offers greater opportunity for consistent content development and the economies of network-based learning systems and long-term cost savings. This will help to accelerate the trend among firms to allocate more of their time and resources to a networked training model. From a company standpoint, once the training infrastructure has been implemented it can be used again and again.

Some companies, like MCI, have recognized the power that is embedded in new technologies (May 2000). More than 55 percent of its employees can learn directly through the Intranet, using either virtual courseware – computer-based training, or a virtual classroom, where instructors and students assemble to exchange ideas, information and knowledge in real time. This technology alone has cut $917 per person for each day of travel to the company's Dallas training facility. The total savings from travel, facility and labor costs have exceeded an estimated $2.8 million since October 1997. Other cases in point include Fatbrain.com who lent its Information Exchange solution to Agilent Technologies, and helped to cut costs back as much as 20 percent for Agilent. This technology can add value to the development and distribution of training content in an extremely cost-efficient way. Our findings confirm that the cost of Internet and Intranet-based courses decreases rapidly once the initial conversion costs are recovered.

Cost, however, is not the only consideration in adopting Online training. There is also a concern about remaining competitive in an ever-changing economy. One thing all companies seem to agree on is that a knowledge-based, change-oriented environment can only be sustained if the creativity of the employees is

nurtured and developed through education and training. According to PricewaterhouseCoopers, about 70 percent of the world's 1,000 high performing companies view the absence of trained employees as the major barrier to sustained growth (www.pwcglobal.com). Many companies have adopted the view that to flourish in a highly competitive business environment, they must become a learning organization even though they are often not clear about what it means to be a "learning organization."

It would be unusual to find a large or medium-sized knowledge-based organization that does not provide its senior executives with several management development options. Weekend seminars at elite universities, or payment for executives to enroll in a two-year Executive MBA program are expensive and for many medium and small firms where budgets are tight, there are clear limits to how much of this can be done. Many of these companies look for less costly yet effective training alternatives. In addition, the challenge for knowledge-based companies is not only to serve the development needs of senior executives, but to make sure that the entire workforce has a way to systematically keep abreast of new knowledge and new developments. Tension exists between the high cost of traditional management training programs and the pressure to remain on the cutting edge that first prompts many companies to explore the potential of a corporate Intranet for Web-based training.

It is not only companies themselves that want to remain on the cutting edge in business terms, but professionals and managers within these companies who increasingly have to assume greater responsibility over management of their own careers and are insisting on more learning options for themselves. So it is not surprising that there is rapid growth in self-initiated training and education activities by managers. The Web provides the potential of getting high quality training content for a current job without having it interfere with work obligations to the current employer. There are also longer term career advantages. Increasingly the estimated 2.5 million executives and senior managers (Mailick and Stump 1998) have learned the basic fact that few companies will guarantee a manager an entire career of employment and advancement. These managers recognize that the most important asset a manager has is knowledge; as technology and working methods continue to change, managers need to continually upgrade their skills and knowledge. This is particularly important today when many managers may work for five or more employers over a career. To be in demand in the highly competitive job market, life-long learning is vital. Success in finding a good position depends on organizational, interpersonal and leadership skills as well as technical ability.

III. California and Online Training

California has had a mixed record with respect to Online training. Where the state shines is in its contribution to the innovations that directly and indirectly makes this Online training possible. Ironically, Web-based training is not widely adopted. Most California companies are still hesitant about adopting Online solution, but the momentum is in that direction.

California leadership in innovation is built on its high-tech industries, including semiconductors, computers, networking, and interactive multimedia. Among California's accomplishments are the first Internet transmission, the invention of the hard disk drive, and the computer work station. Its companies and educational institutions are at the forefront nationally in the development of advanced hardware and software. California has been widely recognized for its dynamic entrepreneurial efforts in leading the global information economy. This state is home to many major web sites and portals. State government has also encouraged the diffusion of new technologies. In 1989, the Farr-Morgan-Quackenbush Technology Act (AB 1470) established the California Planning Commission for Educational Technology to develop a master plan for California educational technology and to recognize the specific role of technology in corporate training and education.

The state's extraordinary technological infrastructure has enabled California to become a national leader in the development and distribution of training software, courses and programs. The efforts by the Los Angeles-based Quisic, www.quisic.com, company is an example of the innovative approaches to meeting the needs of the projected corporate market for Online training. Quisic (formerly University Access) partners with business schools to obtain access to faculty for content and then combines the content with its capabilities in technology and service to create e-learning solutions for the corporate and academic markets. Quisic's

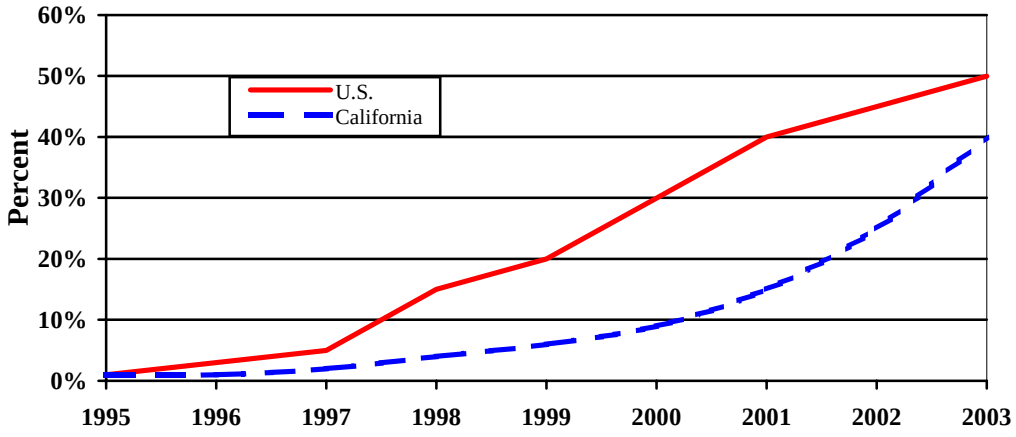
objective is to deliver a host of new products for the corporate management education market, including the recently announced Corporate MBA program with Kenan-Flagler's Business School at UNC-Chapel Hill. Recently, Internal & External Communications, a company that creates custom technology-based learning programs, was absorbed by Quisic to strengthen its capacity to provide custom training offerings.

Another distinctive and promising approach to the issue of acquiring quality content for Online training is represented by the startup company, Global Window Partners, Inc (GWP), www.globalwindowpartners.com/. GWP develops and markets learning products and services for educational institutions and corporate customers who deliver education online. GWP enters into agreements with individual (generally, University of California) professors for their teaching content, then does the work of transforming the content into market-ready interactive learning units. The principal product marketed by GWP is a catalog of curricula, courses, modules, lectures, and symposia, which can be delivered over the Web by educational institutions and corporate Intranets.

Meanwhile, some influential companies in California have undertaken fairly bold steps to implement the Online training option. The Charles Schwab Corp relies on in-house training but is transitioning to electronic training with a strong focus on Web-based delivery, and toward elimination of CD-ROM or other non-centralized mediums (UCLA Survey). CB Richard Ellis Services, a real estate leader in California, delivers its employee orientation training Online. It has recently partnered with the USC Marshall School of Business to develop instructional programs for sales professionals. At the same time the company intends to make rapid progress towards greater reliance on Online training by the year 2002. Agilent Educator's Resources Center gives more than 43,000 Agilent employees access to training documentation, book recommendations and related materials via Agilent's intranet education portal.

Despite the State's technological prowess and innovative entreprenurship, California companies as a whole have not embraced Online training. Traditional (mostly residential) training models still dominate some of California's more prominent corporations such as Walt Disney and Wells Fargo. Our research into the training practices of the largest 100 companies in California and companies of less than 500 employees in the manufacturing sector reveals that Web-based training in California companies lags behind the nation. The majority of California corporate training activities take place in an instructor-led classroom, and relatively few companies have initiated Web-based training or out-sourced their training. Figure 1 shows the relationship between California and the United States in integrating education technologies into corporate training.

Figure 1. Percent of all Corporate-training Delivered via Technology: California and U.S, by selected years



Sources: The projection of the U.S. and California trends is based on the Survey of Corporate University Future Directions, report from International Data Corporation about the U.S. Web-based corporate training activities, UCLA's survey on California Top Employee 100, and data provided by the California Training Cooperative.

The relative lack of Online training is not unique but instead appears to be symptomatic of a broader problem. As Erickson and Jacoby note in their chapter in this book, employer-based training is less prevalent in this state than for the rest of the nation. A study by the California Training Cooperative reveals that Baldridge Award winning companies in California reported 1.5 percent of payroll expenditures on training in comparison to the 2.6 percent reported by companies nationwide. According to a report form the California Training Cooperative, small and medium-sized companies of less than 500 employees that are primarily in manufacturing in California provide less than 10 hours of formal or informal training per year and typically do not assign a budget for training.

Universities have not been able to close the state's gap relative to the nation State as a whole in Online training. Selected executives from these firms as well as from larger corporations take advantage of the vast array of management training and development programs offered by the campuses of The California State University and The University of California. Although both institutions are starting to make Online instruction available to the business community, it remains a relatively small component of their total instructional offerings. The residential programs created by the University of Southern California (USC) and tailored for Hughes Electronics and Kaiser-Permanente executives, and the PricewaterhouseCoopers short-term executive training programs at UCLA's Anderson School of Management, are good examples of the residential program offerings of California universities. What is needed, however, is a greater effort to complement the residential programs with more Web-based programs.

While today's use of Online training appears suboptimal, the prospects for the next decade is better. Our California study shows that virtually all the companies surveyed anticipate rapid growth in the use of the corporate Intranet for management training. Corporate expenditures for employee training of all kinds will continue to grow statewide with Web-based training capturing an ever growing share of dollars.

IV. The Future of Web-Based Corporate Training

The predictions for Online training look bright. Motorola University, for example, intends to move about 30 percent of total learning online by 2001 and 50 percent by 2003 (Westerbeck 2000). Projected increased use of Online learning is not limited to one corporation. The majority of companies have Online initiatives in place, and if their plans are realized, then the use of Online training will accelerate. Moreover, those using Web-based training are willing to recommend it to others. A survey done by IDC among American training managers from companies that have used Web-based training reveals that nearly 100 percent of the respondents would recommend Internet-based training to companies that are not currently using it, with 60 percent strongly recommending it (Urdan and Weggen 2000). Both increased usage by firms already using Online training and its diffusion into other companies has a potentially large impact. IDC predicts that the U.S. corporate market for e-learning will exceed $11 billion by the year 2003, representing a compound annual growth rate of 83 percent from 1998 to 2003. A 1998 Survey by Corporate University Future Directions indicates that training delivered with assistance from technology will increase from 20 percent of all corporate training in 1998 to over 50 percent by 2000 (Meister1998).

Despite the optimism, how quickly the use of Online training will grow remains an unanswered question. The fact remains that, at most, between 10 and 20 percent of all corporate training in the U.S. is presently being delivered via Web-based technologies. Examination of how individual companies address training reveals substantial experimentation with new methods and approaches, but skepticism about abandoning traditional approaches until additional evidence on the effectiveness of technology-based training is accumulated.

In theory, Online training courses offer greater opportunity for consistent, up-to-date learning content. Almost any topic can be delivered over the Web. An Online curriculum can be easily customized for the unique needs of a particular company. In reality, there are serious issues and questions. How solid is the evidence that Online training programs can properly address important corporate training goals for improved performance? The Web-based model provides elements that conventional training cannot match: flexibility, convenience and cost-effectiveness. On the negative side of Online training are hidden costs, technical hassles in using the courseware, lack of mental discipline and aptitude on the part of learners and excessive reliance on static,

superficial and text-heavy learning content. These barriers to rapid acceptance of Web-based training are among the explanations for the gap between the promise and reality of improved organizational performance through Online training.

First, Online learning still tends to have many technical glitches that traditional learning formats do not have. The development of Web-based programs is intended to make training programs more accessible and to provide greater flexibility in the delivery of instruction; however, it can involve unexpected technical problems to companies resulting from limits of technologies, misuse of systems and equipment and from gaps in the qualification of the technical staff. For example, the bandwidth limitations of the telephone lines used to connect to the Internet or a company's Intranet may restrict the quality of video, and inhibit sound and motion synchronization resulting in a waste of time and money.

Having high quality training content available on the Web "all the time, anywhere, for everyone" is desirable; getting it accomplished is no easy matter. There are obvious issues of cost involved as more features and more complex technology delivery mechanisms are adopted. Meanwhile, the costs of acquiring and transforming content into compelling Online training materials are high. The hidden cost of an Online strategy is another inhibitor that prompts many companies to delay deployment. The additional costs, which include the initial development costs that involve expensive programming costs, especially for highly customized software, course administration, fees incurred in maintaining Online communities, and the costs of updating course content, intangible costs that may make the presumed economies of an Online solution disappear. In many California companies, no metrics have been effectively implemented; however, they reported a waste of significant capital in designing Online training programs.

Another prominent issue of Online learning concerns poor quality of content. In the early stages of development a great deal of Online instruction consisted of little more than placing textbook (generally outdated) and other readily available (which frequently translated into materials where the copyright had expired) text material on the web. From a technical standpoint it is relatively easy today to include interactive elements, simulations, video, email and other learning aids in Web-based instruction. Few companies, no matter how large, have a sufficiently large internal market to financially justify producing Online training material for their use alone, except for highly tailored courses to meet internal requirements. Accordingly, corporations establish connections with various content experts, production companies and vendors, to obtain the desired Online training materials.

To provide the Online instruction materials that corporations are willing to purchase, the burgeoning number of training companies seek to join with business schools and other knowledge experts to design quality custom courses with company-specific content. There are several problems that cast doubt on the viability of this approach. For one thing, professors in business schools are typically not eager to develop Online course content over which they may lose control. Another problem is that universities themselves are trying to define their own role as well as the revenue generating potential of the Online corporate training market. So there is a lot of foot dragging by the university community. Quite naturally, universities ask, if the growth of the Online training market will be as robust as many projections suggest, why don't the universities themselves create and market Online training materials? For most universities this could be done as part of the established Extension programs or as part of the residential management training programs already in operation.

In February 2000, the American Society for Training and Development organized a study on the acceptance of new learning technologies. The study asks, do learners, when offered technology-based training, still prefer classroom-based training, or abandon technology-based training after only a few sessions? Among the findings, factors that result in high dropout rates are poor incentives to learn due to lack of accountability for completing classes, and the inability of poorly designed courseware to hold a person's attention (David 2000).

While Online training eliminates the need for lengthy, inefficient off-site courses, it can be more expensive, time-consuming and perhaps not as stimulating as a classroom experience. The promise for Web-based learning lies in the fact that when education technology and classroom instruction work in concert, the entire learning process can be more efficient, targeted and strategic. A classroom setting offers time-tested

interpersonal, face-to-face contact, which Web-based training cannot match. On the other hand, Web-based learning can substitute for traditional training approaches in many ways and enable participants to acquire the knowledge and practice the skills more efficiently than in a classroom. A well-designed technology course charts progress, provides feedback, and ensures that completion of the program guarantees an appropriate level of competency. We believe that Internet and Intranet-based learning can never replace classroom teaching and face-to-face contact. Many executives voice concerns that Online training receives less personal attention from top management and reduces group interaction. Despite its limitations, intelligent use of web platforms for professional learning combined with traditional learning formats and structures can contribute effectively to corporate needs for improved performance.

Leadership will be needed to ensure the future. One example is the American Training Council, which helps its members to access government funding for training initiatives in California. The ATC claims to have helped more than 400 member companies access funding assistance. Another kind of leadership is provided by the California Training Cooperative (www.ctcoop.com), an example of a sophisticated training organization which helps member companies obtain faster access to quality training resources at competitive rates. Its mission is to help California employers build a sophisticated and competitive workforce through training and development of human potential. It emphasizes Online training and serves as a window for employers to access in concrete ways the potential of Web-based training.

The promises and limits of education technology raise important public policy questions. For the state of California to retain its cutting edge, political and business leaders will need to pay close attention to learning and skills development through effective and affordable training solutions. Supportive policies towards the nurturing of a sound Online learning environment will contribute to the preparation of managers in California to meet the challenges of a complex business environment.

References

Aune, Askjorn. 1998. "Quality and Quality Management at a Crossroads." *Total Quality Management* 9 (July).

Bachler, Christopher, J. 1997. "Corporate Universities Are Catching On." *Workforce* 76 (June).

Baum, David. 1999. "Education for an E-World." *Oracle Magazine* (September/October) http://www.oracle.com/oramag/oracle/99-Sep/59cov.html.

Bucher, John. 2000. "Revolutionizing Corporate Training and Strategy." *Fortune Special Sections* (May) http://www.fortune.com/fortune/sections/onlinelearn/onlinelearn.htm.

Dotlich, David L. and James L. Noel. 1998. *Learning: How the World's Top Companies Are Re-Creating Their Leaders and Themselves.* San Francisco: Jossey-Bass Publishers.

Eskildsen, Jacob K., Jens Dahlgaard, and Anders Norgaard. 1999. "The Impact of Creativity and Learning on Business Excellence." *Total Quality Management* (July).

Fitz-enz, Jac. 1988. "Proving the Value of Training." *Personnel* 65, 3 (March): 17-23.

Frazee, Valerie. 1999. "Send Your Expats Prepared for Success." *Workforce, Global Workforce Supplement* 4, 2(March): 6-8.

Garger, Eileen M. 1999. "Goodbye Training, Hello Learning." *Workforce* 78, 11(November): 35-42.

Jacobs, Paula. 1998. "Training for Managers." *Info World* 2 (7 September).

Jones, Marcia L. 2000. "Use Your Head When Identifying Skills Gaps." *Workforce* 79, 3 (March): 118-122.

Kleingartner, Archie. 1996/97. "The Five Rs of Managing Creative Employees." *HARRT Quarterly* (fall/winter): 3.

Lake, David. 2000. "On the Web Training." (13 September) http://www.thestandard.com/article/display/0,1151,18447,00.html.

Mailick, Sidney and Stephen A. Stump. 1998. *Learning Theory in the Practice of Management Development: Evolution and Applications.* Westport, CT: Quorum Books.

May, Kevin. 2000. "The Learning Curve." *Eduport.kiosk* (winter) http://www.edeport.com/community/kiosk/20001/default.htm.

Meister, Jeannec. 1998. "Ten Steps to Creating a Corporate University." *Training & Development* 52 (November).

Rand, Alexandra. 1996. "Technology Transforms Training." *Employee Training* 73 (November).

Reingold, Jennifer, Mica Schneider and Kerry Capell. 1999. "Exec Ed: Learning to Lead." *Businessweek Magazine Online* (18 October) http://www.businessweek.com/1999/ 99_42/b3651026.htm.

Shein, Esther. 1998. "Continued Learning: An IT Priority." *PC Week* 15 (7 September).

Urdan, Trace A., and Cornelia Weggen. 2000. "Corporate E-learning: Exploring a New Frontier." *WRH + Co Weekly* 2, 10 (10 March) http://www.wrhambrecht.com:80/research/coverage/elearning/ir/ir_explore.html.

Westerbeck, Tim. 2000. "Corporate Education Herald." http://spiderman.quisic.com/academy/ index.htm.

Wolinsky, Howard. 2000. "Students Crowd E-Classrooms." *Chicago Sun-Times,* (1 May).

Zielinski, David. 2000. "Online?" *Training* March: 65-75.

Endnotes

[1] No consistent terminology has emerged when discussing technology-based learning. This chapter uses the term Web-based or Online learning to cover all learning activities delivered over Internet, Intranet or Extranet. Electronic learning is a broader term that encompasses not only Web-based learning but satellite broadcast, interactive TV, CD-ROM. A still broader term is distance learning which, in addition to all of the above, includes courses conducted via written correspondence.

[2] The effectiveness of Online training has also improved with progress in software and hardware. Lotus's LearningSpace 2.0 and Macromedia's Authorware 4, WBT Systems' TopClass, IP-compatible multimedia course ware authoring systems are all noted for their ability to exploit the potential of the Internet and Intranet - flexibility, manageability, animation, special effect features, and ease of use. PhotoShop, Dreamweaver, Flash, composer and other technologies provide the underlying material for creating a truly effective web course. Technologies such as real-time chat and multimedia video and audio features help create virtual conversational pathways and provide a platform for the integration of various skills that will make it easy for learners to get access to online courses, not handicapped by spatial constraints.

[3] It should be noted that differences in estimates are the norm rather than the exception. TheStandard.com, an authoritative source of data about the internet economy in a recent report stated that U.S. corporations would spend $66 billion in 2000 on corporate training. Estimates of total expenditures for corporate training range anywhere from 62 to 70 billion and Web-based training as constituting anywhere from 1.5 to 4.0 percent of that amount. Experts expect rapid growth in the use of the Web for delivery of corporate training.