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E-Learning in Business

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e-Learning is replacing face-to-face classroom instruction in a growing number of businesses, but what is the prospect for the continued proliferation of e-learning in business? On one hand, the quality of instruction, the cost-effectiveness of new technology, a supportive e-learning educational culture, an expansion of the Internet, an increase in online courses, shorter business cycles, mergers, and increasing competition encourage business use of e-learning. On the other hand, employee reticence in using learning technologies, insufficient corporate investment, lack of business-relevant university courses, narrow bandwidth, and Internet access issues are constricting the business use of these technologies.

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. We all have a role to play. It is time we collectively move the power of the Internet for learning from promise to practice.

Web-Based Education Commission, December 2000

At the local, national, and global levels, technology is reshaping the conduct of business. The communications revolution and the Internet have opened new opportunities for businesses to connect with

their subsidiaries, employees, customers, suppliers, advertisers, consultants, and competitors. The revolution is influencing the ways business is conducting training, professional development, and continuing education from senior management to line workers. Businesses are searching for ways to use evolving technology to maintain a skilled, competitive workforce. Learning technology—hardware, software, and delivery vehicles—is opening cost-effective, educationally sound learning formats to the traditional company convention in Las Vegas. Learning technology is transforming the way business thinks about educating its workforce. Nowhere is this seen more clearly than in the use of e-learning.

This article explores the growing role that e-learning plays in business, the challenges business faces in using e-learning technologies, and the ways business is overcoming these challenges. In so doing, it surveys the history and business use of e-learning, examines forces affecting business use of e-learning technologies, and discusses the growing role that e-learning will play in business.

Historical Background of e-Learning

Learning at a distance is not a new phenomenon. In some ways, learning at a distance became possible when human thought was transcribed on papyrus. In ancient Greece, education was restricted to what could be learned through conversation in homes and in the *agora* (marketplace). When these conversations were transcribed into print, it became possible for distant scholars and students to learn from Athenian historians, playwrights, orators, and philosophers. Guttenberg's invention of the printing press accelerated the process of making available books and manuscripts in monasteries, universities, and private libraries to a wider audience.

Learning at a distance received a push when universities in the 1700s began to offer formalized learning through written correspondence courses. These courses offered nontraditional students the opportunity to continue their education free from the encumbrances of university attendance—at a distance and by mail. However, it was not until the 20th century that the communications revolution enriched and provided alternatives to the correspondence course. Thomas Edison's invention of the motion picture camera and the phonograph meant that multimedia could be used to enrich correspondence courses. By the early 1960s, educational television

offered courses at a distance. In 1961, 53 stations were affiliated with the National Educational Television Network. Member stations offered coursework, shared films, and coordinated course scheduling. By the late 1960s, the Midwest Program on Airborne Television Learning televised its *Flying Classroom*. It broadcast educational programs to Indiana public schools and to schools in five surrounding states. At its apex, it reached 2,000 public schools and 400,000 students (Jeffries, n.d.).

Television and the evolution of communications technologies transformed learning at a distance into e-learning. The proliferation of the personal computer in the 1980s and the development of the Internet created an alternative to the correspondence course and to educational television: online e-learning. These technologies also altered the essential nature of e-learning. Correspondence study and educational television were essentially static educational media. Each was predicated on the assumption that texts or a televised teacher disseminated knowledge to the student: There was no interaction. However, personal computers and the Internet added a dynamic feature. Now it was possible for students and teacher and students and students to interact effectively in the learning process. They interacted synchronously (in real time) or asynchronously (at different times). Audio, video, graphics, video conferencing, and lectures could be integrated into these courses to enrich the learning experience.

What are the defining characteristics of e-learning? The work of Garrison and Shale (1987) outline three criteria that define distance education as it relates to this e-learning discussion. First, a majority of the communication between student and student must take place asynchronously. Today, e-learning allows a significant measure of interaction between student and student as well as teacher and student. Teachers usually respond to a student's work (in written, audio, or video formats) or they guide and craft communication between students. Occasionally students and instructors may chat in a real-time environment, although this is more atypical of the online learning environment. Second, two-way communication between student and teacher facilitates and supports the educational effort. Whereas correspondence courses and educational television make communication a one-way affair with instructors providing information and students completing work and submitting it for grading, e-learning technology makes two-way communication possible. Not only can

students and teachers interact via e-mail and video conferencing, but some e-learning courses use traditional forms of communication: the telephone and fax machines. Third, technology mediates communication. Not only does computer-based technology provide new approaches to learning but also gives teacher and student the possibility of using a variety of media to convey, synthesize, analyze, and create knowledge. Teachers may be able to use shared data pools, simulations, audio or video clips, or peer feedback activities to promote the educational process. Similarly, students can use these to demonstrate what they have learned (Garrison & Shale, 1987).

In short, e-learning transforms the concepts of correspondence study and educational television into a 21st century educational technology. It appropriates the ideas of learning characteristic of correspondence study: freedom from the restrictions of place and time. It incorporates the benefits of two-way interaction between teacher and student, and it effectively uses modern technology—the computer, Internet, the use of video and audio, and multiple communication channels—to deliver an interactive and media-rich learning package. It synthesizes these into a series of e-learning experiences directed by a teacher, freeing the student from the traditional constraints of time, distance, and expenses; in addition, mediated by modern technology, e-learning has become popular with businesses, universities, students, employees, and professionals precisely because it is an effective teaching method adaptable to many learning contexts.

Forces Expanding and Constricting Business Use of e-Learning

Data from the 1990s show that business used modern learning technologies (e-learning) to educate and retrain their workforce. The American Society for Training and Development's (ASTD) *2000 State of the Industry Report* describes the increased use of technology-driven learning formats among member industries. Broadly, the report found that many businesses are committed to providing training to their employees by developing their own training programs or outsourcing to professional education firms. Employer-developed training grew at a 20% rate in 1997 and constituted 2% of payroll expenditures. ASTD expects that this level of growth cannot be sustained, and there will be a shift to outsourcing employee training.

ASTD reported that employees experienced an average of 29 hours of annual training. Employee training is highest in the transportation industry (35 hours), public utilities (35 hours), and government (32 hours), but lowest for trade (22 hours), durable and nondurable manufacturing (24 and 25 hours), and health care (26 hours). Training investments are made most heavily in the following areas (in percentages): technological skills and procedures (13), information technology (13), managerial and supervisory skills (11), and professional skills (9) (American Society for Training and Development [ASTD], 2000).

The *Report* (2000) also found continued growth in the use of technology-delivered training. In 1998, 78% of corporate training took place in the classroom whereas 9% was conducted via learning technologies (e.g., e-learning, interactive television, teleconferencing, groupware, videos, or interactive CD-ROMs). The *Report* projected that by 2001, 64% of all learning activities would be spent in the classroom and 19% with learning technologies. Thus, ASTD believed that firms are making a rational choice to use more learning technologies and less classroom learning. As with corporate commitment to employee training, the use of learning technologies varied with the type of business. Manufacturing, trade, and technology sectors used learning technologies more often than did the health care industry (ASTD, 2000).

IBM, an innovator in e-learning courseware, delineates the corporate-level forces propelling e-learning into the business community. Shorter business cycles, faster product rollouts, more mergers and reorganizations, and increasing competition mean that employees will have to be retrained. With faster product rollout cycles, e-learning can quickly inform the sales force about new products. Mergers and reorganizations require employee recertification, regulatory compliance, managerial training, and retraining in new systems and training processes—activities that lend themselves to e-learning solutions. In addition to these forces, shorter knowledge life cycles, the increased quality and effectiveness of e-learning courseware, access to knowledge on the Internet, and the cost-effectiveness of e-learning have led business to invest in e-learning technologies. As a result, businesses are making greater use of e-learning and teleconferencing to retrain their workforce. Between 1996

and 1998, classroom learning increased at a 3% rate, whereas e-learning increased at a 16% rate (IBM, 2000).

There are also external forces driving business to e-learning, most notably, an educational culture supporting e-learning, Internet and Intranet networks, and the growing number of universities offering e-learning courses. Cultural support for e-learning is driven by research suggesting that there is no difference (Institute for Higher Education Policy [IHEP], 1999; Russell, 1999, 2000) between the learning from quality e-courses and those offered face-to-face. In addition, the case has been made that as we begin to better understand the critical role the instructor plays in the online environment, distance learning courses will become even more effective in providing quality learning options (McEwen, 2001; Worley, 2000). As a result, many public and private agencies are investing in network-based learning. For example, the Army's 2005 training plan will place laptops in the hands of all soldiers and provide them access to the Internet (Carr, 2000). Corporate use of e-learning will be stimulated by the increasing number of Internet courses offered worldwide by colleges and universities. The Web-Based Education Commission (2000) estimated that 84% of colleges and universities would offer e-learning courses in 2002—up 62% from 1996. State-of-the-art knowledge in business, economics, and politics—developed by leading scholars at the world's greatest universities—will be accessible to employees wishing to understand the evolving global business environment.

The e-learning horizon is not completely rosy, however, and a word of caution is in order. Methodological concerns and gaps in the literature raise questions as to the completeness of the emerging area of e-learning research. First, small numbers of students and courses and the limited time we have had to study the impact of distance learning provide only a partial picture of e-learning (Worley, 2000). Details related to learner characteristics (prior learning, learning styles, and incentives to learn) and a more thorough understanding of the appropriate applications of e-learning are needed to complete a more complex picture. For example, concerns such as cultural bias (Cody, Dunn, Hoppin, & Wendt, cited in Wardrobe, 2001), social isolation and socially inappropriate online behaviors (Dyrud, cited in Worley, 2000) and matching learning outcomes to the appropriate tools and applications are but a few of many factors affecting the

success of distance learning students. Continued careful and rigorous research that spans the complex dynamic of teaching and learning online is critical in deepening our understanding of the online environment.

In addition to the concerns previously mentioned, there are several challenges that need addressing to make e-learning an application of corporate choice. The ASTD believes that the growth in business use of learning technologies will level off in the near future (ASTD, 2000). Constrictions on this growth have to do with corporate obstacles to implementing learning technologies. Despite research to the contrary, there are still concerns about the effectiveness of e-learning, as well as employee reticence about using new learning formats, insufficient corporate leadership promoting e-learning, and insufficient corporate resources dedicated to developing and distributing corporate courses (Coulter, Feldman, & Konold, 2000; IHEP, 1999; Weigel, 2000). Likewise, there are environmental factors limiting business willingness to invest in e-learning. Universities have only recently embraced e-learning; as a result, there is not a plethora of e-learning courses suitable to the corporate world. Furthermore, with the quality and complexity of effective learning materials evolving faster than the Internet's ability to quickly transmit them, limited bandwidth can hamper efforts to build and effectively use e-learning applications. Broadband access provides better data packet-handling capabilities and better data casting of primary and supplemental course materials (e.g., software, reference guides, databases, audio, and video). Failure to provide broadband access to all workers limits the ability of workers to take e-learning classes. Finally, employees must have access to the Internet at home. In August 2000, the percentage of homes with Internet access stood at 42. Minorities, however, have less access to the Internet, with only 19% of African American homes and 16% of Hispanic homes connected to it. Home access is important in e-learning because homework and online discussions with teachers and classmates cannot be confined to the workplace (Web-Based Education Commission, 2000).

To summarize thus far, e-learning technology has been built on the strengths of earlier forms of learning at a distance: correspondence courses and educational television. Using computer-based technology, sophisticated courseware and software, and networks, e-learning now provides an effective method of learning.

Businesses have begun to see the advantages of distance education: cost-effective learning, global access to courses, worldwide distribution of corporate learning materials, and continuous retraining of the workforce. Deeper penetration of e-learning into business will depend on addressing corporate and external factors that limit its use. For these, and other, reasons the Web-Based Education Commission (2000) wrote, "It is time we collectively move the power of the Internet for learning from promise to practice" (p. 134).

Prospect for Continual Growth of e-Learning in Business

What are the trends in e-learning, and what implications do they have for continued growth in business? Can business overcome the organizational inertia and external forces to e-learning? This section answers these questions and provides an assessment of the prospect for continual growth of e-learning in business.

Internal Factors Influencing Business Use of e-Learning

Dating back to ancient Greece, new teaching technologies have spun advocates and critics. This is no less true of e-learning. In the last 15 years, more than 3,000 studies have focused on some aspect of e-learning: the effectiveness of learning, student and faculty satisfaction, efficacy of media, student achievement, and the demographics of e-learning users. e-Learning detractors focus their critique in five areas: student isolation online, high student dropout rates, increased time and money to create and teach online courses, intellectual property rights issues, and pedagogical soundness of e-learning (Dyrud, 2000). Of particular interest to faculty in schools of business is whether e-learning is an effective medium for teaching experiential skills, such as business negotiations and conflict management. There is a parallel between the constraints of traditional education that led professional development programs to extend learning beyond the classroom by incorporating practical, real-life experiences (student teaching, apprenticeships, and residencies), and similar pedagogical constraints that may affect the online classroom. Wardrope (2001), for example, maintained that skills such as listening, team building, mentoring, or exercising leadership cannot be taught online. He nonetheless concluded by saying that "neither avoiding distance learning nor relying on it exclusively seems advisable" and allowed that strategic use of highly interactive technologies may be a

possible alternative to face-to-face interaction. Although imaginative uses of simulations and virtual reality are beginning to create multisensory, lifelike environments (Loftin, 1996), a line can be drawn between content that thrives in the online environment and content that demands "eye-to-eye and knee-to-knee" interactions (Johnson & Johnson, 1994). With respect to learning restricted to the classroom, however, the overwhelming majority of studies concludes that there is no significant difference between college-level e-learning formats and classroom learning. Student achievement in each form of learning is very similar as is student and teacher satisfaction with distance technologies and face-to-face learning (Russell, 1999). In addition, e-learning environments may be particularly congenial to female business students. Based on a comparison between a classroom-based and Internet-based MBA class, J. B. Arbaugh (2000) found that the participation patterns of women in e-learning courses revealed that women conversed more in asynchronous discussions than in traditional classroom discussions and that the e-learning environment increased networking opportunities for women. He suggested, therefore, that the more supportive online environment may be used to attract more women to pursue MBA degrees.

Although achievement in e-learning classes compares favorably with face-to-face classes, certain student characteristics tend to correlate with the successful completion of these courses. Successful individuals, for example, not only tend to be women but also believe they are persistent in completing tasks, view failing a serious problem, are highly literate, well-organized, independent learners (Powell, Conway, & Ross, 1990; Russell, 1999). Similarly, Katherine Cennamo and John Ross (2000) and the University of Idaho College of Engineering (1995) reported that success in e-learning is associated with postsecondary goals, high expectations for grades, high levels of motivation and self-discipline, more serious attitudes toward courses, employment in industries where coursework will provide an on-the-job edge, previous degree completion, willingness to contact teachers, and being older. On the whole, successful e-learning students are highly motivated and self-directed, intellectually more mature, self-disciplined, serious, older, and interested in coursework from which they will materially benefit.

Although not all students will benefit from e-learning classes, several features of e-learning can contribute to making it an effective

educational strategy. First, effective e-learning classes are well organized. Contemporary research demonstrates that the organizational structure of the e-learning class, the communication management system employed, and the strategies for knowledge sharing are all positively related to student achievement (Berger, 1999). Second, in addition to conventional texts and class discussions, effective courses use multimedia to engage the learner through different senses and capitalize on a variety of intelligences. To be effective, multimedia (audio and video clips, animation, games, audio/video lectures or vignettes, teleinterviews, PowerPoint presentations, video conferencing, and simulations) must be integrated judiciously into a course. Third, e-learning courses that take advantage of interactivity promote higher achievement. In the e-learning environment, interactivity refers to the ability of students to use courseware to correct misunderstandings of material they have learned and deepen their knowledge by using courseware to identify what new information should be explored (Clark & Craig, 1992; Fletcher, 1990; Kozma, 1994). Fourth, effective courses require teachers to be trained in the online delivery of learning. Teachers must view themselves as facilitators; as such, they must communicate effectively with students, personalize the learning environment, serve as a discussion leader, and manage the course. Effective online teachers must be able to write well and provide unambiguous directions to individual students and teams. Faculty successful in the online environment tend to fit the now commonly used adage "guide on the side; not sage on the stage," thus creating collaborative, interactive learning opportunities (Arbaugh, 2000). By personalizing the environment, they make students feel that the teacher is there to help them and to provide a valuable learning experience. Having a sense of humor; writing in an informal, conversational manner; and taking an interest in the work and professional goals of students provide a personal touch that is often missing in the classroom environment. As managers, effective teachers have a record-keeping system available to each student, set and maintain a sense of timeliness, and enforce course rules, guidelines, and deadlines (Schweizer, 1999). The preponderance of evidence suggests that the quality of online teaching is a determinant of student achievement in e-learning courses. Rebecca Weiner (2000) reported that student achievement is higher for those teachers who have 10 or more hours

of training versus teachers with 5 or less hours, and the Idaho University's College of Engineering (1995) associated teacher effectiveness with training in e-learning technologies.

When the previous stipulations are met, e-learning is an effective method for retraining the business workforce. Business professionals, with busy lives, family responsibilities, inflexible work days, and no time to waste are particularly suited to pursuing online training that can help them stay competitive in an ever-changing workplace (Clarke, 1999). Well-written and organized courses, taught by qualified teachers, and taken by mature workers can help maintain an educated workforce. As the effectiveness of e-learning courses becomes more widespread, business is likely to use it increasingly as an alternative to face-to-face meetings and conferences. Interactive e-learning can also save money when compared to face-to-face courses by reducing training time, improving retention of learned material, and providing better applications of knowledge. (DigitalThink, n.d.).

Employee reticence to embrace e-learning is the second internal force limiting the penetration of e-learning into business. Employees who are unfamiliar with e-learning technology, who are accustomed to classroom learning to upgrade their skills and knowledge, and who are less self-directed are likely to avoid using e-learning formats. Nevertheless, our deepening understanding of the learning process has enhanced e-learning applications, resulting in user-friendly courses that can be effectively navigated and completed by the more reluctant learner. By understanding employees' needs and learning styles, it is possible to craft courses that reduce the barriers to e-learning for all but the hardcore computer illiterate.

An understanding of employee needs opens the door to e-learning. Dr. William Glasser (1999) identified four basic psychological needs that influence the ability of the learner to learn. These needs are (a) freedom, (b) fun, (c) love and belonging, and (d) power. When effectively integrated into the e-learning environment, employees become less resistant to experimenting with e-learning formats. In her article "Technology Training for Salespeople: Seven Secrets of Success," Fran Berman (n.d.) offered ways of encouraging employees to use software. She spoke, for example, to the importance of providing initial orientation sessions with rewards and enjoyable activities (fun); providing opportunities for teams of employees to get involved in the software (belonging); and demonstrating how the

software can make their work more meaningful and productive (power). Through such means, employee resistance can be overcome.

Because e-learning courses can threaten an employee's need for security, we must provide training in the technologies and encourage risk taking. Because most businesspeople more than 30 years of age view education as largely a classroom experience, some employees find it disconcerting to go back to school and take a course in a new medium (Web-Based Education Commission, 2000). Nevertheless, carefully constructed e-learning courses can mitigate this fear, but it does not happen without a well-thought-out plan and a lot of hard work.

First, e-courses must be built with the learner in mind, thus easing the transition from a face-to-face to an e-learning environment. This means appealing to individuals with different learning styles to make the material more accessible and more easily mastered. Online technology allows designers and students to take advantage of multiple means of representation by using text, graphics, animations, or even poetry. With multiple means of representation and expression, online students are less likely to suffer the boredom of "sit and git" classroom training. Simulations, models, and visualization tools help the student bridge abstract textual concepts. Issue-oriented assignments offer students guided, reflective inquiry (Web-Based Education Commission, 2000).

Second, well-constructed online courses alleviate the concern that students who participate in online courses may experience problems with social isolation. Employees taking a course want to feel the presence of their classmates and facilitator or mentor. Course designers have a number of tools at their disposal to promote a sense of belonging. Personal student Web pages, team-building exercises, cooperative learning activities, liberal teacher office hours (online), and access to e-mail and the telephone are ways in which designers promote healthy interaction between students and between student and teacher. Finally, teachers can set the tone of the course by making personalized responses to student queries. In the e-learning bonding process, students become supportive of each other's participation in the course. In fact, evidence suggests that students can develop stronger bonds in online classes than in the classroom (Whipp & Schweizer, 1999). By promoting a sense of belonging and the

educational support that comes with it, e-learning courses offer inducements for employees to take and successfully complete them.

Third, compensating for the unfamiliarity of the media is the fact that e-learning frees the employee to complete coursework at her or his leisure. Online courses are accessible at work or at home, and this flexibility allows students to determine when and where they complete assignments. Because 90% of corporate and government training takes place on paid time and because online courses are easily accessible at the workplace, online coursework can be integrated into the workday (Web-Based Education Commission, 2000).

Finally, the empowering potential of well-developed online courses quickly becomes evident to the participant. Such courses provide employees with the knowledge and skills that give them the sense that they have greater control over their work life and that they can contribute more effectively to company strategic objectives. These courses provide the learner with up-to-date knowledge of the business environment, how to use new software, new theories of management, and other skills necessary for an employee to be an effective member of the business team (Schweizer, 1999; Whipp & Schweizer, 2000). A growing number of corporations are developing online courses providing continuing education that will empower their employees to support strategic planning goals. Thus, employers can reduce employee reluctance to take an e-learning course by providing opportunities that respond to various learning styles, counteract social isolation, conveniently fit a busy lifestyle, and are intrinsically empowering—all the while meeting the organization's need to maintain an educated workforce.

The lack of effective corporate leadership has been cited as an additional reason for the lagging use of e-learning in business. When corporate leaders understand the advantages that e-learning can bring to their business, e-learning can be integrated effectively into corporate strategic planning objectives. Richard H. Lytle (1999), in his essay "Asynchronous Learning Networks for Knowledge Workforce Learning," makes the following observations: Today's workforce often lacks the knowledge and skills necessary for tomorrow's businesses; businesses do not develop learning strategies based on business strategy; the education and training industry are often disconnected from the workplace; and in-house training staff do not have the knowledge to deliver new learning vehicles. Senior managers need to

identify which personnel need to improve their skills and what those skills are. Then the training team should determine where e-learning technologies could be best applied, recognizing that not all learning outcomes are best met in the e-learning environment.

By bringing together corporate strategic goals, appropriate content, proper delivery techniques, workforce collaboration, and assessment of learning outcomes, business can create a powerful tool in educating their workforce to compete effectively in tomorrow's global economy. The strategic benefits of e-learning, for example, were recognized by IBM executives when they held a virtual conference for 2,000 employees using online registration, videoconferencing, chat rooms, discussion boards, and learning exercises to educate their employees. During a 3-week period, 430 virtual sessions and 30,000 learning hours took place. During that time, sales representatives remained active in the field (Masie, 2000).

The American Productivity and Quality Center (APQC) (1999) surveyed corporate management strategies for promoting effective technology-based training. It concluded that creating a training strategy, ensuring proper course design and delivery, and implementing and assessing training results were hallmarks of good corporate technology-based training programs. For a training strategy to be effective, trainers must understand organizational training needs and leverage training where it will have the greatest impact. By employing the appropriate learning technology (including e-learning, e-text, multimedia, and interactive CD-ROM and videoconferencing), employees can be effectively trained. Trainers must understand the best way to design and deliver courses. Knowing the strengths and limitations of the traditional classroom and modern educational technology allow trainers to deliver customized, just-in-time courses. Finally, trainers must understand the level of employee technological skills in developing a corporate training program. This will allow them to develop the kinds of courses that will be effective with workers having varying technical skills (APQC, 1998).

In short, effective corporate leadership is needed to promote the delivery of relevant knowledge and skills. Linking training to corporate strategic objectives and developing a training plan that utilizes the most effective cutting-edge technological delivery systems will provide business with the kind of knowledge that will help it remain competitive in the global economy.

Finally, lack of investment in educational technology has limited the penetration of e-learning technologies into corporate training centers. Certainly the growth in corporate universities suggests a growing commitment to developing human capital. Between 1998 and 1999, the number of corporate universities quadrupled from 400 to 1,600 (Heterick & Twigg, 2000). Although it is the case that the cost of upgrading hardware and software, hiring educational technologist specialists or consultants, and developing corporate-level courses can be quite high, e-learning can provide a cost-effective way of delivering knowledge and skills. Costs can be reduced if the training packages are targeted to corporate strategic goals that can effectively provide employees with the kind of training that will increase the corporation's competitiveness. A benchmark study of corporate universities (Newhouse, McMorow, Sieger, Cunningham, & APQC Institute for Education Best Practices, 1998, pp. 7-8) found that corporations implementing e-learning must take these purposeful steps to be successful:

- develop learning systems that "fit the mission, values, and culture of the organization"
- have "commitment by senior management to development and education of the workforce"
- involve business units in all aspects of the learning process"
- develop training programs that are driven by business strategy
- separate human resource activities from training
- become cost centers
- develop appropriate strategies for learning interventions
- carefully select the appropriate educational technology after careful consideration of the business process
- create clear training goals "after identifying desired outcomes"
- use benchmarking
- have a goal of creating and managing knowledge capital

Businesses that commit to human capital development through learning technologies are aware of the evolution of these technologies. Concerning online courseware, businesses can choose between a

variety of authoring systems. The characteristics of these authoring systems are similar: They provide units of learning (learning modules); integration of audio, video, and graphics; teacher management tools (student access to their grades); personal spaces for student Web pages; chat rooms; and media centers. Each program, however, has its own strengths, and each business must select an authoring system that fits its educational needs. For example, some authoring systems offer a simple tutorial style; others provide for advanced flowcharting, animation, and visual graphics; and still others offer a real-time audio chat capability. In addition, corporations will be able to take advantage of university digital libraries. The university library is undergoing a revolution. It is quickly becoming a place that provides access to information resources: archives; government, academic, and private sector databases; e-texts; and e-journals (Marcum, 2000).

The forces that currently restrict the use of e-learning are likely to abate the future. User-friendly, effective courses, workers less inhibited with the use of educational technology, senior management committed to the application of modern educational technology, and corporate investment in human capital will increase the use of e-learning. Will forces external to the business limit the ability of business to use new learning technologies?

External Factors Influencing Business Use of e-Learning

Despite advances that will be made in the business community to incorporate e-learning into training programs, the absence of business-relevant courses, inadequate bandwidth, and restricted home Internet access have the potential for limiting use of e-learning technologies. However, will the market and technological advances mitigate the impact of these factors?

Inadequate access to business-oriented courses is sometimes cited as a reason why e-learning will flounder in the corporate world. In the 1990s, the lack of business-relevant courses constrained business use of distant learning technology. Market forces have encouraged the development of business-related courses. In 2002, 2.2 million students are expected to enroll in e-learning college-level classes compared to 710,000 in 1998 (Web-Based Education Commission, 2000). The number of universities offering graduate-level courses is also increasing, and many are in education, the social

sciences, and business. Entire MBA programs are now available online, and that number will increase in the future as institutions imaginatively respond to the demand. Cardean University, for example, is a virtual institution that offers postsecondary, business, and executive programs, including one leading to an MBA. Part of the lure of Cardean's program is that it offers business and management courses from some of the world's leading universities: the London School of Economics and Political Science, the University of Chicago, Stanford University, Columbia University, and Carnegie Mellon University. Students can take advanced, graduate-level classes in business strategy, organizational management, marketing (including Internet marketing and Web site design), finance, assessing profitability, and risk assessment. The courses are highly interactive and designed by the world's leading scholars in business (www.cardean.edu).

Clearly, a worldwide market for e-learning courses—including business-related ones—exists today. Researchers, however, can only speculate on the size of the market tomorrow. Publicity on the effectiveness of e-learning has undoubtedly contributed to increasing interest in e-learning technologies. Access to high quality, university-level courses worldwide is stimulating the e-learning market as well. Finally, e-learning courses are comparatively less expensive than attending a university, and this also stimulates demand for e-learning courses. Students taking Cardean University's courses, for instance, pay between \$380 and \$500 dollars per class. Increasing demand for e-learning courses will prompt colleges, universities, consortia, and professional organizations to offer more just-in-time courses.

Another concern is that inadequate bandwidth threatens to limit the e-learning market. With the development of e-learning courses that take advantage of videoconferencing, multimedia, audio and video sound clips, advanced graphics, and animation, an increasing amount of bandwidth is necessary to transfer data. Enhanced bandwidth is also necessary for effective computing, connectivity, and communications technology that are used in smaller wireless devices. As telephone, radio, television, and computer technologies are merged (digital convergence), the need for more bandwidth capable of carrying large amounts of electronic data will increase. Limited bandwidth remains a problem. Even in the United States, broadband technologies are not available to all citizens. Broadband penetration is greater in central

cities and urban centers than in rural areas. Where broadband is available, it is expensive, and the cost limits access to those able to pay for the services. According to a recent article in *BusinessWeek* ("Broadband: What happened?", 2001), local cable companies that provide high-speed cable access are hiking prices rather than cutting them. Although limited access to broadband has a minimal impact on the delivery of e-learning courses today, in the future, it will be required for more sophisticated, media-rich, and interactive e-learning courses. Lack of broadband access would clearly limit the market for these kinds of courses (Web-Based Education Commission, 2000).

Finally, access to the Internet is an issue for employees interested in taking e-learning courses from home. The Web-Based Education Commission (2000) reported that from December 1998 to August 2000, the percentage of homes with Internet access increased from 26% to 42%. Yet, the gap between the national average and African American households grew from 15% to 18% during these years. The gap grew for Hispanic households, too: from 14% to 18%. Using another measure of Internet access, about one third of the U.S. population reports home use of the Internet; however, that use is much smaller for African Americans (19%) and Hispanics (16%). Because e-learning classes often require access to the Internet during the evening and on weekends, home access is important. It is clear that those who are economically and technologically marginalized in the United States will have less access to e-learning courses than those who are not. This problem is partially alleviated by public library access to the Internet. However, even then, libraries often limit the time patrons can use computers, and often (especially in rural areas) they are not open in the evening when traditional workers may need to use the Internet (Web-Based Education Commission, 2000).

What are the implications of limited Internet access at home for business use of e-learning? Ninety percent of businesses provide training on company time. To the extent that coursework can be completed at work, home Internet access is less important than business support of training on company time. Even at work, trainers need to be cognizant of the technological skills of the worker. Workers lacking the technical skills to navigate e-learning courses limit their utility in the workplace. When employees take Internet courses offered through colleges, universities, professional organizations, or consortia, home Internet access is critical. Employees without Internet access will

undoubtedly limit the demand for Internet courses. In addition, income, technological sophistication, access to hardware and software, language barriers, attitudes toward education, socioeconomic status, and education are important considerations. Trainers need to be aware of those who are least able to use or have access to e-learning courses.

Conclusion

It is clear that e-learning is an effective technology for educating and training the workforce. Business use of e-learning has been growing and will continue to grow in the near future. The quality, just-in-time delivery, and cost-effectiveness of e-learning classes drive corporate interest in this technology. Although internal and external forces threaten the expansion of this technology, many of these are offset by the nature of e-learning courses, corporate commitment to e-learning, the expansion of business-oriented course offerings, and evolving technologies. It is fully expected that e-learning courses will remain educationally effective vehicles for corporate training and retraining. As broadband access spreads globally and as interactive courseware is developed to promote effective learning, the business community will expand their use of e-learning courses. More graduate and undergraduate business courses will become available for all management levels and for those in specialized offices, such as public relations or graphics. The number of e-learning courses will increase as senior management uses it to promote corporate strategic objectives. Finally, as the technological sophistication of the workforce increases, employees will more readily embrace e-learning as the preferred learning format. In short, business will "move the power of the Internet for learning from promise to practice."

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