This chapter discusses the current environment of online learning in business and industry, followed by a case study from one of Intel Corporation’s training organizations.

Meeting the Needs of Consumers: Lessons from Business and Industry

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Human resource development (HRD) initiatives are used by business and industry as a means of improving the workplace performance of employees. Online learning using the Internet and computer technology is one tool that is significantly altering how training and development initiatives are being delivered. Within business and industry, globalization, advances in technology, shifting demographics, economic change, and the ever-increasing need for skilled workers have cultivated an environment that is receptive to online learning. Companies that need to develop employees at sites around the world have used online learning as a way to provide consistent, equitable training.

Advances in computer and networking technologies have allowed business and industry to support learning by expanding training approaches and engaging learners in new ways. Companies are seeking efficient ways to train their employees and see online learning as a tool that is geared to the needs and interests of the individual learner. Online learning has shown potential for reducing the costs of workplace-related education and training.

The chapter begins by describing the current environment for online learning, followed by a discussion of the benefits and challenges of using online instruction in business and industry. Two issues affiliated with online learning, blended learning and standards, are highlighted. The chapter ends with a case study of a manufacturing organization’s experience with online learning.

The Current Online Learning Environment

Although many companies can claim to report admirable cost savings and increases in productivity due to online learning, other companies are still
struggling with how to make online learning effective (Croft-Baker, 2001). Concern over high attrition rates among e-learners, the high cost of implementing online learning, and the lack of standards are all problems that must be dealt with.

Several trends are fueling the growth of corporate learning and the adoption of online learning (Moe and Blodget, 2000). These trends include

- A shift to a skilled workforce, along with a skills shortage among workers
- The widening wage gap between high school and college graduates
- The fast pace of technological change and shortening product life cycles
- Increased globalization
- The changing perception of corporate learning from its being a cost to being an investment

Technology-intensive industries, employers demanding relevant skills, and employees seeking opportunities for advancement and career development are creating an environment for the growth of online learning in business and industry. Various initiatives in the current business environment have also fueled the demand for online learning. More and more companies are engaging in enterprise resource planning and implementing complex systems to manage the planning. Organizations have a greater interest in knowledge sharing and in knowledge-management systems, which can become integral components of online learning. As reported by Wentling, Waight, and Kanfer (2000), McCrea, Gay, and Bacon corporate learning and the corporate learning organization have a strategic position in the context of managing and growing enterprises. E-commerce requires companies to maintain networks of customers and suppliers, which involves the responsibility of educating those customers and suppliers about products and processes. Online business practices have led business and industry to online learning.

According to the American Society for Training and Development's (ASTD) State of the Industry Report 2001, the percentage of organizations using the Internet for training purposes grew from 3 percent in 1996 to 38 percent in 1999. For intranets, the growth rate was from 3.5 percent to nearly 40 percent. As the use of online learning continues to grow, it's beneficial to look at ways in which online learning is used.

How On-Line Learning Is Used in Business and Industry

Online learning is used for situational learning, just-in-time learning, collaborative team learning, and scenario training. Online learning has also benefited specific organizations within a company that have geographically dispersed employees, such as sales organizations.

One of the first areas that received attention from online learning was sales training. Companies with extensive sales organizations have struggled
with how to provide ongoing training and product information to geographically dispersed salesforces. Traditional instructor-led training has been the norm. Salespeople were expected to attend multiday training sessions at a company headquarters, adding up significant training costs. Now that companies have the option to provide online learning, salespeople receive consistent, immediate training. One example is MetLife Financial Services (MLFS) (Rossi, 2001). MLFS’s training and development organization needed to find a method to deliver learning to a dispersed salesforce. MLFS sales reps were required to prepare for mandated examinations and had to learn new-product and procedural information in a timely manner. An online learning delivery system was developed that would allow sales reps the opportunity to access interactive, real-time classes on their laptops.

In addition, online learning is being used as a method to deliver simulation training. Simulation training is an effective tool, especially for training that would otherwise be too costly or hazardous to provide (Jackson, 2001). One example re-creates a simulated technology manufacturing plant where students start as new employees in a warehouse division as shipping and receiving clerks, move next to materials handling, and finish as material assemblers building and testing electronic equipment (Jackson, 2001). FedEx (Douglas, 2003) uses computer simulations to teach couriers to complete airway bills. Couriers learn the skill online and then practice in a classroom with real labels.

Companies are also turning to online learning to provide training to customers and supplier partners. Educating customers can provide benefits to a company in the form of increased customer satisfaction and increased sales. Companies are recognizing the importance of their partners’ success and are discovering that they can extend their learning process to partners through online learning. This improves partner relationships and deepens the commitment between companies. It can also help in the development of consistent standards across partnerships (PrimeLearning, 2001).

Major strategic initiatives have served as an impetus for the use of online learning. The implementation of enterprise resource planning (ERP) and customer resource management (CRM) processes have led major learning efforts. As the number of companies undergoing implementation and upgrading of these processes continues, they are searching for online learning platforms to support training (Galagan, 2000). PriceWaterhouseCoopers built a learning platform to support an ERP upgrade that included the installation of SAP (an ERP software package), I2 (a supply chain package), and Siebel (a CRM package). The online learning platform combined a learning management system and a learning portal with SAP’s content management system (Galagan, 2000). As companies continue to find ways to use online learning, they are becoming more adept at its design and implementation. But making online learning available to employees isn’t enough. Companies want to know if the learning is effective, and the only way to know that is by evaluation.
The Evaluation Challenge

Evaluation of online learning still challenges business and industry. Evaluation is necessary for demonstrating that online learning is worth the effort.

An effective evaluation plan is an integral component of a successful online learning program. Organizations want proof that an investment in online learning will improve productivity and will ensure that learning has occurred; the measurement of ROI has become a concern on corporate leadership. As stated in a research report by Merrill Lynch (2000), the 1999 ASTD study of corporate training directors found that “tangible ROI results” was the number-one criterion for choosing a learning provider of online learning. Online learning ROI is an important issue within companies, and training departments are given the task of measuring the impact of online learning (Harris, 2003).

In ASTD’s A Vision of E-Learning for America’s Workforce (2001), it is recommended that new measures be developed for assessing and evaluating the effectiveness of online learning. These measures should be outcome-based, with less emphasis on utilization and completion rates. The most common variables used for measuring the effectiveness of online learning include learner satisfaction, technology satisfaction, measuring learner outcomes, and cost-effectiveness (Wentling, Waight, and Kanfer, 2000).

Measuring learner satisfaction involves measuring the level of participation and interaction, the feedback that a learner receives, the actual learning environment, and the learning environment. Measuring technology satisfaction looks at how the different components function together. These functions include the delivery method, how well the tool supports the learner, and the look and feel of the interface design (Wentling, Waight, and Kanfer, 2000).

When measuring learner outcomes, each learner's instructional objectives should be considered. Self-evaluations, pre- and post-tests, exams, peer evaluations, tracking completion times, and automatic recording of learner data are all methods that have been used for measuring learner achievement (Wentling, Waight, and Kanfer, 2000).

In measuring cost-effectiveness, Wentling found that significant financial savings are associated with the use of technology-based instruction, but cost savings should not be the only measure of effective training. Besides measuring hard cost savings such as in travel, materials, and administrative time, there are also more difficult measurements to consider (Harris, 2003). Improved productivity, employee retention and morale, and shorter learning curves can also be relevant measurements. There are no standard formulas, but these measurements should be given consideration when planning for evaluation.

In order for online learning to be successful, evaluation must play a role. It is one of the important success factors for online learning.
Successful Factors for Business and Industry

In addition to evaluation, several other factors influence the success of online learning in business and industry. These include (1) organizational culture, (2) partnerships with IT, (3) links to business strategy, (4) management involvement, and (5) the effort to meet learner needs.

Organizational Culture. Before any discussion can take place regarding what factors are necessary for online learning to be successful, organizational culture must be considered. Learning should be a priority, and an organization’s values and culture should support it. Online learning alone will not create a learning organization (Galagan, 2001).

An organization’s culture guides behaviors and decision making. For online learning to succeed, organizational culture must support employee self-directedness (Wentling, Waight, and Kanfer, 2000). Employees won’t be sitting in a traditional classroom; they may be participating in learning at their desks or at home. The open exchange of information and sharing of expertise is central to a supportive organization culture.

Rewarding and recognizing online learning and knowledge sharing are also common behaviors in an organizational culture that supports online learning. So is providing incentives and marketing to keep learners engaged (Weaver, 2002).

Partnerships with IT. Top management in an organization may not see their own training department as a key player in the development of online learning initiatives and often turn to the IT department (Barron, 2000; Weaver, 2002). If a training organization is to be successful with online learning, it’s important to recognize the value of partnering with IT. The IT department can provide expertise on the impact that online learning has on the organization’s technology systems. They can help decide which tools and which infrastructure to use. Partnering helps avoid the situation of the training organization developing something that meets a business need but can’t be technologically implemented or the IT department designing something that meets a technical need but is inadequate for learners. At Cisco Systems, the IT department and the Internet Learning Solutions Group partnered to implement online learning solutions. Company leaders believe this partnership is one of the key factors affecting the success of their online learning initiatives (Galagan, 2002).

Links to Business Strategy. Online learning should be a key component of a company’s business strategy. For online learning to succeed, it has to be linked to the specific business results that an organization is trying to achieve. These results could be a successful new-product introduction, increased customer satisfaction, improved productivity, or decreased safety incidents. A training organization needs to have an understanding of business strategies and be involved in strategic planning.

Management Involvement. Along with being aligned to business strategy, online learning must also have the active engagement of senior stakeholders. The involvement of senior management ensures that employee
learning is a component of the overall strategic plan. Online learning doesn’t involve just technology decisions. It has to account for culture issues, leadership decisions, business challenges and trends, and long-term business results (Galagan, 2001).

ASTD’s “E-Learning: If We Build It, Will They Come?” study (2001) revealed that opportunity remains for stronger manager support of online learning. Without manager support, the learner doesn’t see the value of the course. The study suggests that a manager can play an essential role in supporting online learning by

- Explaining why the course should be taken
- Linking the course content to business objectives and future career opportunities
- Displaying an interest in online learning and giving it the same status as attending a classroom course
- Helping transfer the learning to the workplace
- Assigning peers to provide support

**Efforts to Meet Learners’ Needs.** Completing a thorough needs analysis is the first step in understanding the learning and performance needs of the learner. An analysis can ensure that the content of the online learning will address the performance gaps of the learners. Learners may need to develop new skills in order to participate in online learning. Along with being familiar with using a computer and browsing, learners may also need to be prepared to be more self-directed learners. These issues can be identified and planned for during the analysis.

For the learner, online learning must be easy to use, engaging, personalized, and customized and must provide high-quality content (Moe and Blodget, 2000). Providing learners the opportunity for interaction and collaboration is critical. Chat rooms and threaded discussions can provide opportunities for interaction. Tutors and mentors can also add value (Moe and Blodget, 2000).

Organizations can increase participation and satisfaction in online learning by providing learners the time and space to learn on company time (American Society for Training and Development, 2001). Examples of ways an organization demonstrates its support for meeting the needs of learners include providing an environment in which peer support is widespread, making the effort to provide synchronous and collaborative courses, and tying career advancement to online learning.

Johnson and Aragon (2002) offer a number of principles for making online environments effective for the learners. They suggest that the learning environment should (1) address individual differences, (2) motivate the student, (3) avoid information overload, (4) create a real-life context, (5) encourage social interaction, (6) provide hands-on activities, and (7) encourage student reflection.
Organizations should consider these success factors when planning for online learning. The absence of one or more of these factors could have an impact on the effectiveness of an online learning program.

**Trends in Online Learning**

Along with being aware of various success factors, it's important for organizations to be informed about trends in online learning. Two widely discussed trends at this time are (1) blended learning and (2) the adoption of standards.

**Blended Learning.** One trend that is discussed a great deal in the current literature is blended learning, that is, a combination of multiple learning formats and methods. Traditional instructor-led learning can be combined with online learning. This trend recognizes that online learning will not replace all other forms of learning. The benefit of blended learning is that training organizations can be creative in developing learning experiences that will satisfy the needs of a wider variety of learning styles (Taylor, 2002). The key to successful blended learning lies in selecting appropriate delivery methods for specific learning outcomes and effectively combining diverse learning events (Valdez, 2001).

Wyeth Pharmaceuticals (Click2Learn, 2002) developed a blended learning program for their salesforce that combines online lessons, readings, and one-to-one training. This training covered new-employee orientation topics such as company procedures, product information, selling technique, and regulations. New salespeople received the training online and in face-to-face mentoring sessions. This type of blended learning provides more opportunity for personal interaction, collaboration, and feedback.

**Adoption of Standards.** For online learning to become more accessible, consensus will have to be reached on shared technical standards. One of ASTD's recommendations in the report *A Vision of E-Learning for America's Workforce* (2001) is to “adopt common technical standards aimed at promoting open and equitable access while reducing development costs” (p. 23). Common standards will enable communications among different platforms, operators, providers, sites, and individuals. Standards can also help reduce the time and cost of production, customize instruction, and easily transfer materials across technology (American Society for Training and Development, 2001). Online learning professionals believe that the development of standards will be the most critical factor in the success and adoption of online learning (Taylor, 2002).

One solution to the standards issue has been SCORM. As an initiative of the United States government, the Sharable Content Object Reference Model (SCORM) was developed as an attempt to furnish a set of common specifications and standards for technology-based learning. The intention of SCORM is to provide recommendations for consistent implementations of technology-based learning by the vendor community; some parts affect
vendors for learning management systems and content-authoring tools, as well as instructional designers, content developers, and training providers (Advanced Distributed Learning, 2002). As SCORM and other standards continue to expand and become more refined, the expectation is that there will be more integration and interoperability of online learning technology.

It is evident that online learning will remain a primary method for facilitating learning in organizations. Consequently, the more we can learn from practitioners in the field, the better we can understand the trends and the impact that online learning has on HRD initiatives.

In the section to follow, one of the authors shares her experience from a corporate training management perspective as to how online learning has made, and continues to make, changes to the training delivery landscape.

**Intel Corporation’s Technical Training**

One of Intel Corporation's computer microchip manufacturing facilities successfully implemented an online delivery, learner evaluation, and tracking process using a component of their existing learning management system. The results yielded significant gains in cost-efficiency for labor and for improvement in measurements of learner competency.

**Company Profile.** Founded in 1968, Intel Corporation supplies the computing and communications industries with chips, boards, systems, and software building blocks that are the “ingredients” of computers, servers, and networking and communications products. Intel is a leader in semiconductor manufacturing and technology and has established a competitive advantage through its scale of operations, agility of its factory network, and consistent execution worldwide. Intel has twelve fabrication facilities (Fabs) and twelve assembly and test facilities worldwide.

**Situation: Need for Greater Cost and Learning Effectiveness.** Challenging economic times for the technology industry from 2001 to the present led Intel's computer-chip-making Fab in Colorado to look for greater cost-and-learning effectiveness in its delivery of technical procedural change training. In the fast-paced, high-tech manufacturing environment, critical changes to work procedures for technicians and engineers occur frequently. Consistent understanding and application of new knowledge and skill across multiple shifts with regard to safety, equipment operations, and quality-enhancing procedures is essential to cost-effective production. In addition, there were increased time pressures demanding that procedural change training reach the target audience, usually consisting of hundreds of technicians who were working shifts across a 24/7 schedule.

Intel's network of Fabs provided extensive training and a robust certification process for technicians, including a blend of formal classroom training, Web-based training courses, and structured on-the-job training for new hires and existing employees moving to new job functions as a result of promotions and turnover. The Colorado Fab took pride in the quality, rigor,
Figure 8.1. Technical Training Change Request: Traditional Methods

Change is involved:
- Training trainers
- Face-to-face training sessions
- Logistical challenges for trainees trying to balance work demands with less flexible training session schedules
and results achieved through their initial training and certification process; they had no intention of allowing a weak postcertification skill and knowledge transfer process to dilute the results of the initial training or negatively affect performance.

Ensuring that changes to existing procedures were identified and taught and that the learning was evaluated to ensure basic competency had always been a labor-intensive process. The process was bogged down by a great deal of face-to-face delivery time, variability in trainer assessment of learner understanding, and time spent tracking completion status. Although the training content was critical to ensuring quality performance, the actual delivery itself was often very brief, taking only fifteen to twenty minutes to deliver, with rarely a need for clarifying questions, yet required hours of logistical preparations to bring trainer and learner face-to-face. This process is illustrated in Figure 8.1.

**Solution: Online Usage Strategy.** Intel’s Colorado Fab needed an improvement to its procedural change training process, providing cost, time, and learner effectiveness. The Fab’s existing certification tracking database, a component of a larger learning management system, provided easy access to employee certification records, including levels of certification, job types, and shift alignments, as well as interfaces to e-mail, Web sites, and servers. In addition, the target populations were very comfortable with accessing online information and navigating Intel’s intranet environment, as well as using other e-learning products such as Web-based training courses and simulations.

The Fab’s training department categorized the procedural change training into two primary types. The first type required knowledge and skills training, two-way interaction (questions-answers) between trainer and learner, and hands-on practice or demonstration of learning. The second type required a transfer of knowledge and few-to-no questions from the learner (one-way exchange to the learner). Both categories required tracking status and completion, as well as assessment of learner understanding.

An analysis of past procedural training change types indicated that approximately 80 percent of the training fell into the latter, one-way exchange category. It became clear that if technicians and engineers could access the training content, they could self-administer the training; face-to-face time and the corresponding logistics weren’t really necessary.

Because the certification tracking system interfaced with existing communication systems, it was modified to notify any specific target audience via e-mail that a “self-administered” training session for a procedural change was available to them and required completion within a specified timeframe. Upon receiving the e-mail, the employee would access the certification tracking system, where an online training session could be accessed (a variety of software applications could be used, depending on the content and training objectives); once the training session was completed, a brief assessment was administered. Successful completion of the assessment was required before the system granted “credit” for training and updated the employee’s
Figure 8.2. Technical Training Change Request: Online Enhancement

Training change is identified; request is submitted to Training Department

Training need is analyzed; content expert is determined

Target audience and content-appropriate delivery method and assessment requirements are determined

Trainer required

Trainers identified and trained; delivery sessions are scheduled

Trainers deliver training; learner understanding is assessed as each student or small group is trained

Trainers enter completion status into tracking system

Online system tracks completion status

Training is complete

20% of requests

Only changes involving the need for two-way communication or actual demonstration and/or practice of skills involved:
• Training trainers
• Face-to-face training sessions

Changes requiring primarily one-way procedural training with knowledge assessments to ensure understanding involved:
• Self-administered, online training modules available when the time is convenient for the learner
training history as complete. This new online enhancement process is represented in Figure 8.2.

It took a few months for the technicians and engineers to become familiar and comfortable with this new online method, but once established, enthusiasm for the process grew rapidly. Supervisors saw efficiency gains as technicians accessed their training change information when it was convenient for them instead of having to schedule their work around a training session taught face-to-face. Once a training change was released, it was available to the entire target population immediately, with no scheduling challenges. Finally, the online assessment feature ensured that every learner had indeed understood the core content, reducing the variability of trainer-to-trainer assessment results.

**Results.** The use of the self-administered versus the traditional face-to-face delivery categorization provided substantial gains in efficiency and reductions in labor costs (see process flow comparisons)—approximately $430,000 in the first year alone. The consistency provided by the use of an online learner evaluation linked to completion tracking reinforced a focus on learner competency as an objective rather than a mere completion of training. In addition, the exploitation of a previously unused feature within the existing learning management system was viewed as role-modeling cost and effectiveness results. Due to the efficiency and quality successes of this program, a number of other Fab training organizations view the process as a best practice and are currently reviewing implementation plans for their respective sites.

**Conclusion**

Technology has altered the way training and development is delivered in business and industry. The various benefits of online learning have influenced the increasing use of online learning methods. As organizations address the challenges of online learning, better evaluation methods and standards will be developed. The future success of online learning will depend on being a key component of the organization’s strategy. Organizations must have a supportive culture, partnering abilities in those involved in implementing online learning, and management involvement, and must ensure that the needs of the learners are met.

**References**


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