

E-Learning: When and Why

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Many technical communicators are moving their careers toward instructional design, particularly the design of e-learning. Some are interested in the field; others want to expand their skills and job opportunities; still others are being dragged into the field by managers who say, "You can write--just put it online as training." Regardless of their reasons for making the move, technical communicators have a responsibility to help companies determine when e-learning is an appropriate training solution. This article discusses several factors that affect e-learning and suggests criteria for making informed training choices.

Kinds of E-Learning

E-learning is the current term for training delivered in an electronic form, whether via a CD-ROM, DVD, the Internet, or a company intranet. It can occur synchronously (that is, all learners participate at the same time even if not in the same location, as in a Webinar) or asynchronously (learners take the course at their desktops at different times and do not interact with other learners). Instructional designers need to consider the factors and criteria discussed in this article for both synchronous and asynchronous e-learning; however, these two forms of training have different requirements and meet different needs. For simplicity's sake, this article focuses primarily on asynchronous e-learning. For more information about the differences between synchronous and asynchronous e-learning, please see *Multimedia-Based Instructional*

Design (Jossey-Bass/Pfeiffer, 2000) by William W. Lee and Diana L. Owens, and *E-Learning Tools and Technologies* (Wiley, 2003) by William and Katherine Horton.

Time

Time is one of the main factors used to advocate e-learning as a training vehicle. Studies have shown that training time for e-learning is approximately two-thirds to three-fourths that of classroom training time for the same content. However, standard *development* times for e-learning range from 100 to 800 hours for one hour of "seat time" (the time a learner spends completing a course), while classroom training ranges from twenty to fifty hours of development for one hour of classroom training. Many factors contribute to these wide ranges, including media and methods used, tools used, the skill sets of designers and developers, and team and project management factors.

In terms of development time, therefore, e-learning is more time-consuming than classroom training. But several factors may compensate for the amount of development time e-learning requires. For example, e-learning reduces the administrative time needed for scheduling and facilities management, and the decrease in training time for e-learning means that less learner/worker production time is lost. Learners can intersperse e-learning with other job tasks instead of leaving their desks for long periods, or they can take training in off hours or at home. They can also take training on a need-to-know basis, thus maximizing the effects of training through immediate application on the job.

Cost

Saving money is one of the primary motives for companies to move training to e-learning. Many of these savings result from the reduced delivery cost of e-learning. However, when salaries or contractor rates for development time are considered, the costs of e-learning are often staggering.

Yet, over time, well-designed and -targeted e-learning does result in cost savings. These savings stem from shorter seat time, which allows workers to be productive for longer periods; elimination of travel and related expenses for both learners and instructors; reduction in instructor salaries; reduction in training facility cost, either through room rental or maintenance; reduction in cost of training supplies and equipment; and cost savings resulting from savings in time associated with all these factors.

Availability

Another important factor in the decision to develop asynchronous e-learning is its around-the-clock availability. If learners forget a key point or task, or if they haven't performed certain tasks for some time, the course is always available as a reference. For companies that give their employees remote access to their network or provide the training on a CD-ROM, the training is also available anywhere the learner has a computer and/or network connection.

Content Factors

So far, most of the factors that we've considered suggest that e-learning may be the answer to a company's training woes. However, we must also ask whether e-learning is

appropriate for all types of training. Assuming that the goal of training is improving job performance rather than simply imparting information, let's look at some of the content factors that affect the decision to use e-learning.

Need for Consistent Delivery

For proper training, some tasks require consistent delivery. To avoid complications, content involving safety and legal issues often must be delivered in a set way. Delivering training in these critical tasks via e-learning ensures that every learner receives the same information in the same way, whereas consistency in classroom training depends entirely on the instructor's competence, which varies from instructor to instructor. Other tasks, such as those involving judgment, are often best taught in a classroom setting, where flexibility in examples and open discussion enhance the learner's ability to apply the training.

Types of Tasks

Some tasks require hands-on training with equipment or other people. You wouldn't want a surgeon to operate on you if she had learned the operation over the Internet, nor would you want a mechanic to install new brakes on your car if he'd only seen it done through e-learning.

Other tasks do not require hands-on training with the equipment itself. Training for software applications, for example, can easily take place in an e-learning environment in which the course simulates the system and offers learners an opportunity to practice to-and-learners can achieve a level of comfort and proficiency. The medical profession has been successful at developing e-learning using the cognitive apprenticeship model that places learners in a case study

environment in which they have to solve a "real-world" problem. These courses provide all the resources for learners to use, along with realistic feedback and coaching for the chosen solution.

In short, for all tasks, you must evaluate the importance of providing training with real equipment versus-and "live" interaction versus simulated situations.

Interactivity

When evaluating e-learning solutions, be sure to consider the level and type of interactivity required to learn the content. For learning to occur, learners need to interact with the course, equipment, peers, or the instructor; when learning a software application, learners need to interact with the application. These interactions can occur through software simulations in e-learning as well as through hands-on exercises in a classroom.

When practicing in a classroom, all learners must maintain the same pace, whereas in e-learning, individuals can progress at their own pace. For some topics, such as interpersonal communication, interaction with the instructor or peers through discussion or role-playing might be critical to learners' abilities to apply concepts and develop skills. These interactions are often most effective in a classroom but can occur in distance learning through chats and message boards.

Stability of Content/Systems

There are no clear-cut guidelines regarding the suitability of unstable content for e-learning: You'll have to assess each project on a case-by-case basis. For example, when a software application is not stable, e-learning deployed over the Internet or an intranet may be a

good approach because you can easily update one or more Web pages in a short time.

Distributing the same course on CDs would not be a good approach--it's expensive and time-consuming to re-burn CDs for courses with constantly changing content, and you have no guarantee that users will replace the old CDs.

Changing a few Web pages takes considerably less time than reprinting student and instructor guides to accommodate changes for classroom training; however, an instructor in the classroom can often address last-minute system changes through instruction and handouts.

Technical Factors

The appropriateness of a company's infrastructure as well as the configuration of individual workstations should be primary factors influencing the decision to develop e-learning. Instructional designers need to work very closely with their company's IT department to discuss the technical factors that affect a course's delivery and usability. Questions designers should ask about technical factors include the following:

- How will the training be distributed, installed, and run (CD-ROM, Internet, or intranet)?
 - Does the course require tracking student progress, test scores, and assignments? If so, how will these record-keeping tasks occur? Is there an existing learning management system to house courses and facilitate registrations and record keeping? Will you need to purchase and implement one? Will IT cooperate in this venture?
 - Does the IT department have the equipment and space to deliver e-learning?
 - Will the network's bandwidth and pipeline be able to handle the e-learning traffic? Have these factors been tested?
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- Is there enough IT staff to support the e-learning initiative? Do they understand the technical issues involved in delivering e-learning?
- Is a firewall in place that prevents access to the Internet? How does this factor affect e-learning decisions, especially the design of courses that require Internet use?
- What type of workstations do learners have--operating system, CPU type and speed, monitor, hard disk space, memory, sound cards, CD-ROMs, browsers, connectivity type and speed, and plug-in players? How should you design the course to accommodate workstations with the most limiting functionality?
- Does the company's intranet already provide for chats, message boards, threaded discussions, mailing lists, attachments, and application sharing?

In general, the answers to these technical questions will determine whether e-learning will be delivered synchronously or asynchronously, on CD-ROM, or via the Internet or intranet. The answers will also affect the specific design (the methods and interactivity) of the course. At worst, the answers could rule out e-learning until the IT department can make the improvements necessary for learners to have an easy, enjoyable, and effective experience.

Learner Factors

Sometimes management and designers are so focused on time and cost factors that they forget to consider the effects of a delivery method on learners. Yet, if learners do not embrace the method, the company will not realize any of its benefits. Following are some factors critical to the success of e-learning:

- Learners' readiness for e-learning and any prior experiences that may make them wary of it.
- Learners' comfort with learning at their workstations.
- A quiet environment.
- Time to learn.
- Learner support mechanisms such as mentoring, chats, threaded discussions, message boards, and feedback from an instructor or expert.
- An easy way to register for and access appropriate courses.
- Engaging instructional methods that are conducive to learning and job transfer, such as frequent interactions, self-tests, and other ways to compensate for the lack of an instructor.
- Degree of change associated with the need for training. Many people are afraid of change, and sweeping changes such as major system overhauls or restructurings of an organization might make learners afraid of losing their jobs. A live instructor for all or part of the training can address learners' concerns, listen to their complaints, and allay their fears. E-learning cannot meet human emotional needs the way an instructor can.

The assessment of these factors will provide a great deal of insight into the appropriateness of e-learning as a training option. You may decide to use e-learning but need to address some of the negative factors prior to deployment.

Development Team Factors

Many individuals who are asked to "just put it online" lack knowledge of the development process and skills required to create an effective e-learning course. As they gain an appreciation of the process and skills, they are often overwhelmed by the complexities of e-

learning as compared to developing classroom training or writing a manual. To develop an engaging, job-focused, user-friendly e-learning course, an individual or team must have skills in the following areas:

- Project management
- Instructional design, specifically for e-learning
- Graphic design
- User interface design
- Usability testing
- Screen layout and design
- Writing for e-learning and perhaps more specifically for audio
- Media production for audio, video, graphics, and animation
- Programming
- Software testing (like software development, e-learning development requires unit testing, in which reviewers test parts of the course, and integration testing, in which reviewers test all parts or units once they have been combined into an entire course)

Team members need to understand that e-learning course design and development is different from systems development or classroom training development. For example, programmers must know the design reasons for some of the specified programming, while graphic artists must create illustrative and instructional art. And instructional designers must understand the development cycle for e-learning--its specific stages, time requirements, and overall scope.

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If a team does not have the necessary skills or perspective on e-learning development, the company either has to train the team or risk creating ineffective courses. Although ultimately responsible for ensuring that the team has the necessary skills, management is often ignorant of the complexities of e-learning, and the task of educating management often falls to individual designers.

Management Factors

Management needs to be aware of all the factors and trade-offs to consider in developing e-learning. Following are additional questions that the instructional designer needs to ask management to assess the appropriateness of e-learning:

- Will management support learners by providing time and space?
 - Is management aware of time and development factors?
 - Is management committed to training that results in job transfer and performance improvement, or do they just want to "get it out there"?
 - Is management willing to invest in the training and development of the instructional design staff and e-learning team?
 - Is management willing to provide support from other involved departments, including IT and training content areas? Will management help identify appropriate SMEs?
 - Will management support the method of training and the skills to be learned, or will learners hear, "Forget half of what you learned in training--this is how we'll be doing it"?
 - Does management have plans for rolling out and maintaining the training?
 - Is management willing to support the initiative with adequate time and money?
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- Is management aware of all factors that will affect an e-learning initiative?

All or Nothing?

This article has described the choice between e-learning and classroom training as an either-or proposition. In the real world, however, as the hype over e-learning dies down, instructional designers need to take a more practical approach and ask tough questions about when and why e-learning is appropriate. We need to be prepared to propose courses that incorporate the best of all worlds into blended learning solutions. For example, perhaps learners first use e-learning to obtain background information and use simulations, and then come into the classroom or lab to make the final transfer to the real world. Or perhaps learners start with classroom training to work through their fears of change and then move on to e-learning for systems training. Lest we limit our choices of the proper delivery method, let us not rule out other options, such as job aids and other nontraining methods of improving job performance. Myriad combinations will suggest themselves as instructional designers help their teams and managers discover the possibilities and work through solutions.

Suggested Readings

The references below are only a sampling of the many good sources available on instructional design, e-learning, and Web design:



Clark, Ruth. *Developing Technical Training: A Structured Approach for Developing Classroom and Computer-Based Instructional Materials*. Washington, D.C.: International Society for Performance and Improvement, 1999.

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Hall, Brandon. *Web-Based Training Cookbook: Everything You Need to Know for Online Training*. New York: Wiley Computer Publishing, 1997.

Horton, William. *Designing Web-Based Training*. New York: John Wiley & Sons, 2000.

Horton, William and Katherine. *E-Learning Tools and Technologies: A Consumer's Guide for Trainers, Teachers, Educators, and Instructional Designers*. Indianapolis: Wiley Publishing Inc., 2003.

Lee, William W., and Diana L. Owens. *Multimedia-Based Instructional Design: Computer-Based Training, Web-Based Training, Distance Broadcast Training*. San Francisco: Jossey-Bass/Pfeiffer, 2000.

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