

E-Learning for Real Learning

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Abstract

In order for e-learning to become “real learning” it must be designed thoughtfully and carefully. E-learning should be approached with many of the same best practices used in instructor-led training. This means the focus should be squarely on the learner and instruction should be planned with a sound understanding of learning theory. Examples from research and practice, guidelines for selection, design and content approaches are examined in the context of e-learning. Learning theories, from long-established to emerging, are discussed and addressed. A case study exemplifying good principles in learner-centered design demonstrates key ways that theory can successfully be applied.

Key words: E-learning, workplace learning, rapid e-learning

E-Learning for Real Learning

In a recent interview with *T & D*, the American Society for Training & Development's magazine, e-learning "guru" Jay Cross describes how he became a disciple of the power of e-learning in 1998: "I'd been in the training business and adult education for more than 20 years, and when the Web came along, I was blown away; I fell in love. Learning and the Web were made for one another, and I wouldn't let go of it. I was a man obsessed" ("Jay Cross", 2011, p. 72).

The enthusiasm for e-learning has only grown since Cross's epiphany. E-learning is seen as a cost-efficient means to deliver training: once prepared, a training session can be used over and over without a facilitator. E-learning eliminates the need to send workers off site for training, and, particularly with new development tools, can be created in house and deployed rapidly. Economic pressures can partially explain the growth of e-learning in workplace training, but companies are also investing in e-learning simply because they believe this mode of delivery to be more effective (Dable, 2009). However, just as classroom learning relies upon a symbiotic relationship between learner and facilitator, e-learning should not be seen as one-way delivery of information from an expert source to a passive learner. Individuals bring existing skills and knowledge, mental maps, attitudes, and life's hard-earned wisdom to any learning activity. As e-learning presents new and rapidly growing opportunities for training and human development, it is more important than ever to keep the learner firmly at the center of the endeavor.

This paper will explore how sound principles of instructional systems design can guide effective e-learning. First, the discussion will explore some key learning theories from John Dewey through leaders in adult learning methods, including Knowles, Houle,

and Brookfield. These principles begin with an understanding of how people learn and they focus particularly on the kinds of barriers that are raised when adults face new and potentially uncomfortable learning situations. A definition of e-learning, along with an assessment of where it stands in workplace training today, is discussed. The paper will then offer ways in which those who design e-learning can marry both practice and pedagogy in producing asynchronous, online training that is designed to be learner-centered, allow for the retention and transfer of information to the workplace, and is informed by research-based guidelines for the use of graphics, sound, and content. Finally, a case study exemplifying learner-centered design, *Connect with Haji Kamal*, is examined for its use of best practices in e-learning.

Learning and E-learning

As a basic level, learning is often defined as the process of acquiring knowledge, skills, or abilities. Others see learning as growth, change, or adaptation to new situations. Defining what makes good e-learning must begin with a consideration of what it means to learn.

Defining Learning

Definitions of learning abound, from the philosophical to the purely scientific. Dewey (1964), whose ideas about democracy and education revolutionized American schools at the turn of the 20th century, says that “learning is learning to think” (p. 245). He urges educators to consider the connection between the process of and the product of thinking. While to a certain extent, to learn means to take in and digest information,

Dewey says, knowledge can't be used in new situations unless individuals truly comprehend the information, requiring "constant reflection on the meaning of what is studied" (p. 249). Few see learning as a purely cognitive process. For example, Galbraith (2004) defines learning as "a cognitive process that is influenced by existing or prior knowledge, attitudes and beliefs, and the state of the learner" (p. 33). Thus, each individual brings his or her own experiences—for better or worse—to any learning activity.

Some adults may have decades of experience to bring to the training situation, so it is important to consider theories that offer insight into how adults learn. Houle (1996) defines learning as a "cooperative" and "practical" art and advocates educational activities that reflect the experience of the learner. Vella (2000), Mezirow (1997), and Knowles (1980) see learning as transformational, best achieved in partnership with a naturally self-directed learner. Vella (2000) further emphasizes that learning starts with a genuine respect for the learner and his or her goals. Here, the overarching goal is to enlist the participant as an equal partner in the learning activity.

The business world links learning to improved performance with tangible benefits for the organization. Here, perhaps the most important definition of learning involves the ability to transfer new information to long-term memory and apply it on the job. This can be hindered when adult learners cling to stubborn beliefs and practiced ways of doing things, so existing knowledge needs to be held up to the light of inquiry. E-learning pioneer Elliot Masie (cited in Addison, 2009) suggests that today's technology has already changed the nature of learning because ready access to information has made learning more "curiosity driven" (p. 18). Therefore, learning may be considered a

process of focused inquiry. Just as Socrates used dialogue to foster meaningful inquiry, even in today's digital world learning takes place when people formulate their ideas and talk about them with others. "Conversation," says Jay Cross, "is the most important learning technology the world has ever seen" ("Jay Cross", 2011, p. 7).

Within the broader realm of a rapidly changing workplace, definitions of workplace learning continue to evolve. The types of skills required today demand a focus on what Chacon (2005) distinguishes as "deep learning," that which allows restructuring of mental maps and schema. Fenwick (2005) argues that today's so-called knowledge economy requires workers to innovate and experiment, while Mezirow (1997) champions the cultivation of the "autonomous" thinker: one who is capable of making independent judgments related to his or her job and organizational goals.

This discussion of e-learning focuses on an understanding of workplace learning that goes beyond the surface level to challenge individuals, to consider what they bring to the learning situations, and to carefully consider learning as a cognitive process.

Defining E-learning

From a novelty in the early 1990s, web-based training has continued to grow. ASTD's 2010 State of the Industry report on training and development (Green, 2011) reported on information gathered from 400 organizations. Concerning the mode of training delivery, the survey found that 70 percent of workplace training is still delivered in a classroom; 60 percent of that training is delivered by live instruction. While the report tracked a decline of technology-based instruction, from 36.3 percent in 2009 to 29.1 percent in 2010, a dramatic surge in e-learning is expected with the economic recovery (Green, 2011, p. 50).

Growth in higher education online learning, meanwhile, has continued at a dramatic pace, in part to accommodate the pressures of enrollment growth and cost control. According to U.S. Department of Education statistics (Radford, 2011), the percentage of undergraduates enrolled in at least one distance education course grew from 8 percent to 20 percent between 2000 and 2008, while Ubell (2010) tallies at four million the number of students in distance education. This growth has clear implications for the coming generations of workplace learners who are comfortable with learning online and on their own.

The training and human development field generally recognizes three basic types of e-learning: synchronous, asynchronous, and blended. Ordonez and Lane (2008) further identify three types e-learning by learning objective and mode: (1) rapid, deployed for urgent matters, and developed in three weeks or less (2) traditional, usually comprising static content, and developed in three to eleven weeks and (3) strategic, requiring four or more months of development, and geared for sophisticated workplace knowledge, skills, and abilities.

Among the newest developments in e-learning, so-called “rapid e-learning” is a force to be reckoned with, as the proliferation of authoring software, cloud-based computing, and new collaborative tools factor in the ease of creating learning modules. Some in the broader industry define “rapid e-learning” in terms of the length of the module itself. For instance, the Rapid Learning Institute offers “six- to 10-minute programs focused on a single learning concept” (Rapid Learning Institute, 2012). Others believe that the “rapid” in “rapid e-learning” refers to the length of time it should take for the learner to absorb the material (Karrer, 2006). However, the most common usage of

the term “rapid e-learning” refers to the length of time it takes to produce the e-learning module and the level of expertise required to produce it.

E-learning will continue to grow, and those in the ISD field must bring their expertise and knowledge of how people learn to help shape effective e-learning. The remainder of this discussion will establish some key areas deserving attention and further study before embarking on the selection, design, and implementation of e-learning modules.

Learning Theory in Action in E-learning Design

Adult learning benefits enormously when learners are empowered to be active instead of passive. This is achieved by giving them the ability to control the pacing of training and the opportunity to make decisions for themselves along the way. Several techniques and approaches can be used to implement this, including better navigation design and varying information delivery with engaging activities.

Meaningful Learner Control

One of the most highly touted advantages of e learning is that even in its most basic of formats, it offers a measure of learner control that classroom training typically has not. Learner control, a term created by Mager in 1961 (Derouin et al., 2004), encompasses everything from navigation through a self-paced, asynchronous module to having a say in how the content is presented or what method (discussion format, WIKI, interactive quizzes) is used. While the trainer standing before a group of adults has to direct training to all present (risking boredom for some and difficulty for others), e-learning gives the individual many options in approaching the training—including, to be honest, the option of skipping everything to take the assessment at the end simply to have it done.

Yet not all online training has meaningful levels of control beyond the trainee's ability to press "forward" and "back" arrows, and that may be because an individual's natural urge to make choices and act independently are not thoroughly considered. After a lifetime of passive education, adults may accept (even welcome) training that does not really involve them in a meaningful way, but that also may mean they do not learn anything (Knowles, 1980). Though Dewey (1964) was talking about the classroom and not a computer, he urged educators to allow their pupils to test things out for themselves: "There is innate disposition to draw inferences and an inherent desire to experiment and test" (p. 253). While Knowles advocated the case of the self-directed learner long before e-learning came into view, he said that this self-directed learner needs help to emerge. He offers four ways to prepare individuals to learn: (1) relationship-building exercises that orient the learner (2) a cognitive map of self-directed learning (3) skills-building exercises and (4) constructing a learning contract. These ideas are easily adapted to the online classroom. For example, merely including an opportunity for learners to introduce themselves and state their goals is a way to provide an orientation to an e-learning situation. A learning contract can be as simple as a check box in the first module that asks learners to participate fully, complete all the exercises they believe are necessary for their learning, and to ask questions if they have them.

DeRouin et al. (2004) analyzed research that showed learner control sometimes improved learning outcomes, but not always. Issues such as motivation and relevance factor in this failure, but sometimes learners "are poorly equipped to use [learner] control" (p. 149). DeRouin et al. developed 15 research-based guidelines for design that begin with giving learners the time to adjust to e-learning when this mode is new to them.

Learner control options should also be calibrated to the skill and ability of the learners to lessen frustration when the material is new or difficult. Individuals should not have to return to previous modules to handle the material in new ones, and care should be taken not to “lose” any participants because of confusing navigation. Genuine learner control occurs when training designers—keeping in mind that adults want material to be relevant to their jobs—involve trainees in selecting the context or learning scenarios to be used (DeRouin et al., 2004).

Addressing the Fear of Failure

Workers can (and often do) approach training with a fear of failure. A learner who is steeped in anxiety will be blocked from learning. Research has shown that high levels of the stress hormone cortisol impairs learning (Jensen, 2000). Especially for learners with limited computer skills, good e-learning makes sure that the individual is challenged in a way that enables learning but does not cause undue stress.

Presenting something that is new or novel releases a moderate amount of stress hormones that can actually result in better learning. A reasonable challenge is an example of a positive stress (Jensen, 2000). Goals can be effective in motivating learners, but only if the target is set at an appropriate level. The goals should be “challenging, but obtainable” (Jensen, 2000, p. 85). Workers are even more empowered if they play a role in setting the goal, as by the use of a learning contract (Knowles, 1980). There has to be enough feedback so that the learner can make corrections. The learner must have enough confidence to persevere in the face of negative feedback. She must also have the necessary skills and workplace support (Jensen, 2000).

Carnes (2012) proposes that motivation is increased when the learning is clearly and obviously connected to greater organizational goals and mission. This can be during a pre-lesson email, during the registration, and/or on the first slide of a webinar (Carnes, 2012). However, if too much focus and importance is placed on goals, this can increase the stress level of learners and cause them to make simple mistakes and fail at assessments of material they actually know (Jensen, 2000).

Learning for Effective Problem Solving: Mental Maps, Schema and Metacognition

Complex training situations may be more successfully approached by considering what adults know about *how* they learn and by encouraging an awareness of the process of learning. When metacognition is active during e-learning (Hill & Wouters, 2010; Tsai, 2009) students gain the ability to monitor their progress and gain more control over the learning situation. Not only can learners spot errors, but they also learn to recognize why an error was made. While learners vary widely in their metacognitive abilities, skillful instruction can draw these out in all learners (Osman and Hannifin, 1994).

Dobrovolny (2006) studied corporate e-learning in which participants voluntarily chose to take asynchronous training they believed would aid them in career advancement. She asked them to identify how six strategies were used in e-learning: (1) conversations (2) reflection (3) metacognition (4) prior experience (5) authentic experiences, which allow learners to practice skills in a context related to their own job and (6) generative learning strategies, those that allow the learner to make connections (such as analogies) through active learning. While learners reported using all of these strategies, metacognition topped the list. For adults, Dobrovolny concluded: “self-paced,

technology-based training, starts with, and is sustained by, metacognition. . . .Thus, instructional designers need to create frequent opportunities for adults to self-assess and self-correct, that is, include questions or self-checks, practice exercises, and/or simulations (“interactivity”) in all instruction” (p. 165). Learners need to ground their new knowledge in experience, Dobrovolny says, and must have post-course access to review key concepts when they need them.

Collaborative teams are part of today’s workforce, bringing varied perspective to issues and problems. E-learning, therefore, must draw out these valuable skills. Alonso et al. draw ideas for e-learning from Keller’s ARCS model: attention, relevance, confidence, and satisfaction. Here, the use of “good problems”—those with multiple solutions and collaborative teamwork—contributes to real learning. However, they advocate going beyond asynchronous training. Positing that critical thinking is best served through live interaction with others (either in video conferences or one-to-one mentorship), they recommend building these opportunities into training. In their model example, an eight-week training course for instructional technology professionals, they blended online learning with face-to-face classes and assessments scheduled at the beginning and end of the sessions. Throughout the training, they augmented self-paced modules with live chats and video conferences. This type of engagement and support—beyond the self-paced module—should be pursued for deep, reflective learning.

Encouraging Creativity

Allowing for creativity and fun in the learning process engages learners, and this can be accomplished with technologies such as games, simulations, virtual worlds, and

other meaningful activities. Bonk and Zhang (2008) developed R2D2 (Read, Reflect, Display, and Do), which among other things, addresses the lack of hands-on activities in the online classroom. They promote the use of carefully designed activities that promote higher-order thinking skills. These include ideas such as mock trials, role-play, and digital storytelling. Quinn (2005) suggests delivering experiences (especially those that encourage decision making), in course design. Rather than PowerPoint slides and repackaged lectures, include well-designed games in training, Quinn advises. By actively making decisions throughout the game, adults grasp and have the opportunity to reinforce learning concepts. Karl Kapp (2011) encourages designers to tailor content carefully given the learning situation: is the training geared to developing declarative, conceptual, procedure, or problem-solving skills? Among Kapp's suggested approaches for problem solving, for example, is role play: give the learner a situation (for example, a bank manager discovers someone has been embezzling), limit the information available to him and her, and encourage the learner to see the situation through to the end, digging deep into personal experiences to put new knowledge into action.

As younger workers continue to join the workforce, e-learning developers may turn increasingly to virtual worlds, using avatars to enhance experiential learning for a generation of gamers. Francheschi et al. (2009) studied the use of virtual worlds in business education and found these activities are successful in developing critical thinking and creativity. The "virtual presence" individuals gain in their communities engage them in a way that discussion boards and other activities do not. They also have the advantage of interacting with others in an expressive way, using body language, facial expressions, and gestures to support their position. Testing a group of students in a

collaborative exercise, they found that online students performed better and were more engaged in their virtual worlds (Franceschi et al., 2009).

Designing E-Learning for Learners: Graphics and Tools

While planning engaging content begins with the learning objective, learner-centered graphic design eases the learner's journey through the material. Issues of motivation, working memory, retention and transfer will be addressed here. In some cases, special attention must be devoted to novice learners with little or no experience with online learning, or when designing training for workers with varied knowledge of the subject matter.

Motivation and Learner Satisfaction

Thoughtful graphic design can help improve motivation and learner satisfaction with the learning experience. Levie and Lentz's 1982 research found that illustrations can "enhance enjoyment and other affective reactions" (Lohr, 2007, p. 27). Rieber identifies two overall types of graphics: those serving an affective function and those serving a cognitive function (Lohr, 2007). Because decorative visuals make instructional content more enjoyable, attractive and interesting (Lohr, 2007), they are useful in making a good first impression on the learner by gaining her attention and motivating her to continue (Lohr, 2007).

Personalizing e-learning means the various steps one can take in e-learning to embed social cues instead of having a more neutral or computer-generated voice. This includes using a first- or second-person voice instead of third-person, polite phrases,

voice quality (if audio is included), images of instructors or hosts and collaborative activities done online (Clark, 2010).

Human brains are hard wired to pay more attention and devote more mental effort to social messages. In order to ensure their survival, humans have historically had to focus more deeply and consistently on interpersonal messages so they could reap the benefits of mutual cooperation (Clark, 2010). This means that more personalized information is more likely to make its way into long-term memory. Clark (2010), citing experiments with American learners by Mayer (2009) and Wang (2008) advocates the use of a conversational and polite tone for better learning outcomes.

Working Memory: What it Means for Design

Sometimes a learner becomes discouraged and unmotivated because the training has been designed in a way that is inappropriate for how their brain processes information. Good e-learning must be paced, structured and designed for how the learner actually retains and applies information on the job. For learning to occur, information has to be transferred from working memory to long-term memory.

Working memory is defined as the “the conscious part of your brain that thinks, solves problems and learns” (Clark, 2010, p. 30). Good learning design allows this to happen by not overtaxing working memory and by allowing adequate time for the knowledge to be transferred. While long-term memory has infinite capacity, working memory can hold between five and nine items (Lohr, 2007). When a learner reaches his or her limit, processing capabilities slow down; beyond that limit, cognitive overload occurs.

Good graphic design lessens the amount of mental work learners have to do to understand the lesson, allowing them to focus on what is being learned. Working memory has dual channels: separate areas for storing visual and auditory information. Using both these channels enhances working memory, but simultaneously displaying the same text and audio leads to a redundancy effect and actually diminishes learning (Clark 2008).

Visuals can either enhance or depress learning, depending on how they are used. Graphics that may look impressive from an artistic standpoint may actually be detrimental to learning. Just as too much text or audio can overtax working memory, too many graphics (especially irrelevant ones) will have the same effect. Particularly when novice learners are approaching complex content, a simple line drawing is preferable to complex three-dimensional graphics (Clark, 2010). Similarly, simpler animation has proven more effective than more complex movies (Clark, 2010). Graphics that are merely decorative overtax working memory (Clark, 2010), a conclusion also of Levie and Lentz's 1982 research, which found illustrations that "simply embellish content do not enhance learner understanding" (Lohr, 2007, p. 27).

Proximity (simply arranging graphics and text close to each other) lessens the strain on working memory. This is especially important for novice learners. Those with extensive previous knowledge of the subject matter may already have a picture in their minds of the concept being presented (Clark, 2010). For novices who haven't yet formed this visual picture, good graphic design is even more important to avoid cognitive overload (Clark, 2010).

One way that information moves from working to long-term memory is through repetition, or “rehearsal” (Lohr, 2007). In e-learning, rehearsal might involve having the learner listen to information multiple times, chunk it into more manageable segments, look at a picture of it, organize it or find an analogy to something they already know (Lohr, 2007).

When the training objective is to build skills, the use of examples is particularly important. In this kind of training it is important to regularly alternate practice and examples, building in adequate time for reflection. Too much practice can overtax working memory and not allow it the opportunity to absorb the new skill into long-term memory (Clark, 2010). In addition, Carnes (2012) suggests supplementing positive examples (showing what should be done) with negative (or “error-based”) examples to transfer learning to on-the-job action. Among the examples she provides is the use of a learning scenario in which a video depicts a manager doing everything incorrectly while delivering an employee’s performance review (Carnes, 2012).

Knowledge transfer is also improved by pre-exposure to what will be learned. This step provides a foundation to which the learner will be able to connect the new knowledge. Therefore, providing background knowledge can help accelerate learning. Jensen (2000) suggests such tools as video previews, museums visits, library exploration or reviewing the text the professors will be using before the first day of class.

If the learner already has some background knowledge, it is helpful to assist her in recalling it prior to introducing the new knowledge. Techniques used to recall prior knowledge could include role-playing exercises, skits, making mind-maps, and

brainstorming. Novice learners have different needs than ones with pre-existing knowledge of the subject since they have less foundational background knowledge.

Preliminary research shows that adding stories to training can increase learning outcomes, but only when the stories are directly related to the learning goals and objectives. When they are indirectly related they can have a detrimental effect, as they distract from the content and overtax working memory. Since stories can be more compelling they are more likely to make it to long-term memory (Clark 2010).

Different types of content require different approaches. “Show-and-tell” type training is defined as training that involves little or no interaction and is meant to simply convey information. It can be either an instructor-led lecture, PowerPoint (or its e-learning equivalent), or a documentary film. This kind of training can cause anybody to reach cognitive overload if it goes on too long—in general an hour or less is recommended (Clark, 2010). Jensen (2000) recommends building into a lesson “brain breaks” after every 20 minutes (p. 124).

Adding interactivity at a regular basis is beneficial. However, length between breaks should be even shorter with novice learners, as their lack of background knowledge will cause them to reach cognitive overload earlier. Similarly, they will reach a state of cognitive overload more quickly with problem-based or immersive learning as well (Clark, 2010).

Training to build procedural skills is best structured in a stair-step or “directive” architecture. This kind of training is structured to “tell, show, do, correct.” It is especially well suited for novice learners when it breaks the training into “small steps and frequent corrective practice” in order to minimize cognitive load (Clark, 2010). “Show-

and-tell” type training as defined as training that involves little or no interaction; it is best suited for learners who are advanced in their fields already. This is because it is easier for them to “assimilate the new knowledge into their long term memory structures” (Clark, 2010, p. 46).

Case Study: Connect with Haji Kamal

It has been established that good training puts the learner firmly at the center of any training activity. Best practices take into account important learning theories, such as the cognitive and affective dimensions of learning, and enlist participants as true partners in this endeavor. Designers of the best e-learning know that learners must be challenged, but not overwhelmed; they must be presented with many new facts, but not drowned in information; and they must have some control in what they learn and how they learn it. The use of graphic design, the selection of content and activities, and the proper use of self-assessments improve the chance that learning can be retained and applied in the workforce.

Effective E-learning in Action

Connect with Haji Kamal (<http://www.worldwarfighter.com/hajikamal/activity/>), an e-learning scenario developed by Cathy Moore and Kinection for the U.S. Army, is an example of best practices in e-learning design for many reasons. Part of a broader effort to teach cultural competency and decision-making skills for American troops, the training includes classroom discussion to allow for reflective learning (Moore, 2010). In this example, workplace learning demands successful retention and transfer, as issues of life and death shape the learning objectives.

Learner motivation is addressed in graphic design, pacing, and learner control. The interface allows users to read the scenario and make decisions at their own pace. The look and feel of the piece are modern enough to attract attention and inspire confidence in its importance. However, it is technologically simple enough to avoid distracting the learner with unnecessary bells and whistles. The comic book format should be familiar to many of the learners, and have good associations for them.

The quest to motivate the learner begins with the very first slide. Participants learn that the scenario is “based on real events,” making it relevant to their roles. Next, the game’s explanation that there are “12 paths through the game with 2 ways to win” presents the learner with a challenging, but achievable goal. Stating that the module will only take 10 minutes reassures the learner that they will not be cognitively overloaded.

The use of branching scenarios increases learner involvement and thus better develops critical thinking skills by forcing participants to make numerous choices and consider how they will defend them.

Good graphic design does not overtax working memory. It displays information in a clear, easy-to-read way and establishes a manageable pace. In this game, the use of a limited range of colors simplifies processing of the images, thus not distracting from the content presented.

The module is short enough to allow adequate time for reflection. The use of comics instead of photos allows the learner to generalize more about types of people they might be facing instead of being distracted by focusing on the specific features of individuals. This choice helps learners to personalize the experience, as they can more

easily project the identities of those they know on general types of characters than specific individuals in photos.

Personalization also occurs by structuring the course so that the learner is addressed as “you” and must imagine himself or herself in the role, instead of experiencing it from a third-person perspective. An immersive architecture is used, which is appropriate for a situation where the learner needs to apply critical thinking skills on the job.

Conclusion

As Carnes (2012) states in her webinar: “Training is a process, not an event.” Many principles and best practices that apply to instructor-based training also apply to e-learning. In particular, one should not expect that merely compiling information into learning modules—whether it takes three weeks or three months to design the training—will necessarily result in true learning. Delivery of information must regularly and carefully be mixed with other types of activities that engage the learner, with time for reflection built into the training. Presentation of information should be no more than 50 percent of the learning activity (Jensen, 2000). Therefore, e-learning is far more effective when incorporated as part of a larger lesson plan than as stand-alone training.

“Rapid e-learning” warrants special scrutiny because of the intense marketing focused at companies who seek to cut costs and development time; much of the work in this emerging and profitable area of training is not of high quality. Training professionals recognize that good training takes time and careful design. It is often penny wise and pound foolish to quickly generate large amounts of training material if little is absorbed

or applied. The content will just have to be retaught at another time or the organization will pay the price in trainees who haven't acquired the intended skills.

E-learning can be very effective when the training objectives, the technology, and the learner all come together in synchronicity. When this is the case, all that remains is to design the right learning activities. However, this synchronicity is often elusive, so e-learning is not a "one-size-fits-all" solution. If blended learning opportunities are not possible because of time, distance, or costs, then support systems created through blogs, discussion boards, wikis, and other e-learning technology should be utilized to augment what asynchronous learning itself could not provide.

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