

ENCYCLOPEDIA OF

# E-Leadership, Counseling and Training



**Victor C.X. Wang**

**Volume I**



# Encyclopedia of E-Leadership, Counseling and Training

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# Chapter 11

## Using Technology in Providing Effective Training

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### ABSTRACT

*The key to an organization's abilities to provide effective training in the 21st century is by infusing technology into their training programs. Before technology infusion can occur, there must be a clear understanding of the dynamics of learning with technology and of the instructional culture of the organization. Developers of effective training programs infuse technology based on four phases—development, integration, implementation, and evaluation. The development phase involves the analysis of the organization, the creation of training goals and objectives, and the design of the training program. The integration phase determines the organization's technology levels and allows developers and trainers to expedite training methods suitable for particular needs. The implementation phase consists of the actual delivery of the training. The evaluation phase is ongoing through formative evaluation, and it ends with a summative evaluation. Future trends of technology in training show promising models for effective individualized training in virtual environments.*

### INTRODUCTION

With buzzwords such as the “21st century digital economy” and “going global” floating throughout the media outlets, businesses and organizations reassess traditional means of preparing trainees for

challenges in this digital age. From communication to providing services, technology has reshaped the business landscape. Traditional means of training are no longer satisfactory nor as effective or efficient when preparing organizations to do business in the current economy. To make training truly effective, businesses and organizations must utilize technology in providing training, but

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technology infusion into a training program is not a simple matter. It requires an understanding of the role of technology in the learning process and the importance of instructional technology culture of the organization. With this proper understanding, business leaders, designers, developers and trainers can then infuse technology into the training program by going through the phases of development, integration, implementation, and evaluation outlined in this chapter.

### **Background of Effective Training**

What is effective training? Multiple definitions for effective training exist. Some definitions could be as simple as teaching the trainee to master certain content. Others can include assisting with the removal of gaps or deficiencies in reaching specific organizational learning goals. For this discussion, effective training meets the needs of the organization, motivates the trainee, and utilizes the appropriate delivery system. Effective training is cost-efficient, knowledge building, and becomes a long-term asset by increasing the overall productivity and efficiency of an organization or agency (Machin, 2002). Most importantly, effective training provides positive outcomes for the organization.

### **Dynamics of Trainer, Trainee, Content, and Technology**

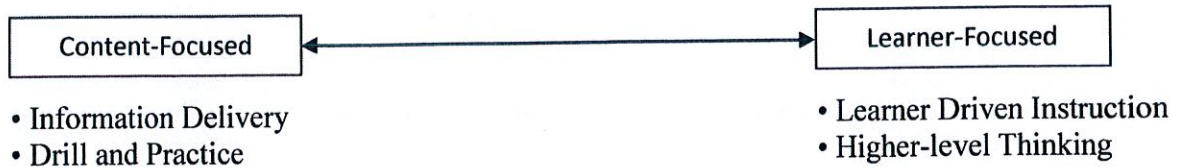
Prior to developing a training program using technology, it is important to understand the role of technology in terms of the dynamics of the trainer, trainee, and the content. A full discourse about this topic would require an entire book to explore different views, perspectives, and the impact it has on the learning process. For the purposes of this chapter, there are three main components: (1) the trainer, (2) the trainee, and (3) the content (Brewer, Dejong, & Stout, 2001). Much of the discussion centers on the importance of each component and the utilization of delivery methods.

With the induction of technology and on-line learning, some pundits have touted that it would revolutionize the learning process by eliminating traditional methods for instruction and training (Siegler, 2010; Bonk, 2010; Knobel & Wilber, 2009). Similarly, claims like these have been around since the days of the advent of motion pictures and recording machines (Oppenheimer, 2003). Experts of that day pronounced new technologies were the gateways to revolutionizing education and training. The reality is that new technologies provided and supported additional methods to assist the learning process. Today, pundits say on-line training will supplant traditional classroom training environments, but, as history has shown, today's technology provides more avenues of support and additional methods of training to accomplish the organization's training objectives.

Fundamentally, technology is a tool to aid and support the learning process. Technology adds value by providing support to the dynamics of trainer, trainee, and content. Research on computer-assisted instruction shows that there are positive effects beyond simple traditional instruction (Blok, Oostdam, Otter, & Overmaat, 2002; Torgerson & Elbourne, 2002). Also, computer use for instruction typically supports existing teaching styles (Cuban, Kirkpatrick, & Peck, 2001). Understanding that technology is a support tool allows trainers to avoid adding technology to training just for the sake of technology. Instead, best practices of technology inclusion concentrates on finding the best training delivery system to assist in meeting the learning objectives. For example, just because on-line training is the most recent innovative instructional advancement does not mean that trainers should incorporate it into their particular training situation. Training developers need to ask questions, such as "Does the technology support the learning process?" or "Are learners better served by another method?" With the proper perspective about technology in the



Figure 1. The content-focused versus learner-focused instruction spectrum



learning process, trainers can avoid the pitfalls of adding technology for technology's sake.

### Content-Focused Versus Learner-Focused Instruction

Trainers need to address another key aspect of training, the differences between content-focused and learner-focused instruction. Researchers point out that computers are a simple medium for traditional content tasks such as drill and practice, word processing, and searching for information (Ertmer, 2005; Sandholtz, Ringstaff, & Dwyer, 1997). Researchers also suggest that the computer has enormous potential as a cognitive tool to support a constructivist or learner-based approach. (Richardson, 2003; LaJoie, 2000). Some professionals could speculate that all instruction focuses on both—the content and the learner. However, when discussing training using technology, the difference is where the emphasis is placed. The best way to visualize this idea is by placing instructional concepts on a continual spectrum with content-focused instruction on one end and learner-focused instruction on the other as shown in Figure 1. The highest priority for the delivery of information to the learner is on the content-focused end of the spectrum utilizing delivery methods such as drill and practice. Training participants are required to memorize needed content and provide specific answers for real world problems. On the other end of the spectrum, learner-focused instruction would place the highest priority on higher-level thinking and knowledge development by the trainee. The trainee would drive the training process and provide analytic results for real-world problems.

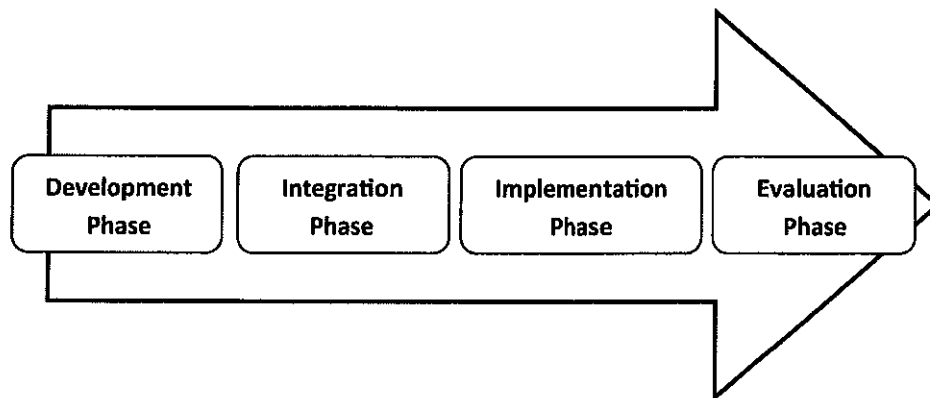
### Instructional Technology Culture

Training processes do not occur in vacuums. It is essential to understand the importance of an organization's instructional technology culture. Technology culture encompasses attitudes and beliefs of the people within the organization towards technology and helps to define aspects of the utilization of technology in the training environment. Familiarity and previous exposure to technology influences technology culture. Research has shown that technology-related training influences worker's attitudes towards computers (Becker, Ravitz, & Wong, 1999). The level of comfort using technology can also affect the attitudes and beliefs in an organization.

Over the years, there has been much discussion about the technology adaptability of the *digital native* as compared to the *digital immigrant*. The "digital native" is a term coined by Prensky (2001), which means a person who has grown up with technology in almost every aspect of their life, and therefore, is highly comfortable with it and can adapt to technology changes easily. Generally, the *digital native* is from the younger generation. The "digital immigrant" is a person who has not grown up in a technological world but attempts to adapt and learn the rules of the technology culture. Often times, this term focuses on the older generation who encounter new technology with adaptation, which is often more difficult and slower.

The terms *digital native* and *digital immigrant* may appear, at first, simply as a generational divide, but there could be cases where a person from a younger generation without exposure to technology is a *digital immigrant*. Even though

Figure 2. Four phases of implementing technology into training



there still may be discussion on who exactly is a *digital native* or *digital immigrant*, the concept is important when considering implementing technology in a training program.

Questions to ask before training development begins are “What is the comfort level towards technology of the people participating in the training?” and “Is the overall technology culture favorable to technology?” If the technology culture of the organization is favorable to technology then the organization will have an easier time integrating it into training programs. If there is not a favorable culture, the learning participants of the organization could become resistant to accepting learning delivery utilizing technology and the trainer from implementing technology within the training environment.

### Technology Infusion into a Training Program

For this discussion, infusing technology into a training program is divided into the following four phases. As shown in Figure 2, they are: (1) Development Phase, (2) Integration Phase, (3) Implementation Phase, and (4) Evaluation Phase. An important characteristic of the different phases is the implication of a chronologically ordered set of distinct steps. However, this does not necessitate exclusivity or sequential order. Nevertheless,

they do provide a good framework in developing a training program.

### Development Phase

The most vital step to implementing technology into a training program is the development phase, which lays the groundwork for a solid implementation process. The development phase has three important parts—analysis, goals or objectives, and design.

### Analysis of Current Organization Status

The first step in the development phase is the analysis of the current technology status of the organization. Stone and Koskinen (2002) suggests a mistake to avoid is choosing a method of training before thoroughly analyzing the needs of the organization and the participants. For example, choosing web-based training as the method of training may seem like a practical model for training. However, questions that need answers are “Will it meet the needs of the participants?” and “Will it help fulfill the goals and objectives?” The organization’s training analysis indicates which technology, whether it is no technology, online training, or video conferencing, would best deliver content in the particular training situation. Other facets of the organization that need thorough



Table 1. Things to consider when using technology training

<b>Questions for Analyzing Needs</b>
1. What are the current needs for the organization?
2. What are the goals of the organization? What gaps exist from its present state to its desired goals and how can they be accomplished?
3. What is achieved by adding technology into the training program?
<b>Questions for Analyzing the Audience</b>
1. Who will be the participants in the training?
2. What are the competency levels of those working with the technology?
3. What are the skills levels of the training participants?
4. Is there training needed to assist participants in utilizing the technology?
5. What are the training participants' learning styles?
6. Are there special needs to consider for the visional or hearing impaired or learning disabled, if applicable?
<b>Questions for Analyzing the Technical Aspects</b>
1. When will the training participants be available? At what location will the participant be available? Will the training method utilize on-demand or live delivery?
2. What type of infrastructure is in place for the technology?
3. What is the training delivery method—DVD, completely on-line, teleconference, combination, etc.?
4. Is the training content development in-house or outsourced to a third-party training developer?
5. Is the delivery method development in-house or outsourced to a third-party training developer?
6. Who will facilitate the delivery method?
7. How much trainer and training participant contact is required?
8. What is the accessibility of the technology to the training participants?
9. What are the hardware and software requirements?
<b>Questions for Analyzing the Cost and Benefits</b>
1. What are the initial costs of developing the training utilizing technology?
2. What are the long-term savings of using technology?
3. What is the likelihood that utilizing technology will improved training participant performance?
4. Will the improved training translate into better competitive performance and customer satisfaction?

analysis include technical aspects, costs, benefits, and effectiveness (Stone & Koskinen). Table 1 provides questions to ask when analyzing an organization for a technology-training program.

### Determine Training Goals

After a thorough analysis of the organization, the next step is to develop the goals for the training and the technology use. The training developer should establish a relationship between the training goals and the overall goals of the organization. They should address the needs found during the

technology analysis. The developer of the training goals categorizes them into specific objectives, which are benchmarks to measure the technology training effectiveness. The objectives should include a specific timetable to accomplish and facilitate specific action. The developer lists specific actions to accomplish the objectives. Following these precise steps of training development, an organization has a systematic plan of action beginning with analysis and ending with accomplished objectives of effective training.



## Design of the Technology Training Program

Once the technology-training program has solid goals and objectives in place, they provide a framework for the design of the training program. The design stage gives the developer the opportunity to select the technology utilized during the training. An extensive list of possible technology methods appear later in this chapter. In addition, during the design phase, developers and trainers make decisions about technology integration and the role technology will play. Questions to ask during this stage are “Will the training be primarily using technology, trainer-directed learning, or a combination of both?” and “Does the training require instructions on how to use the technology before training implementation?”

One of the first design steps includes development of templates and storyboards to map visually content of the training course. Along with this map, the designer builds a timeline to group the training activities, and allocate time for each training step (Schank, 2002). By utilizing the map and the organized timeline, the designer can build a prototype of the training program. The prototype then undergoes testing to make sure that it is viable. In some cases such as web-based training, testing will create several evolutions of the training module, as *alpha* versions and then as *beta* versions until a reliable and smooth running version becomes available. Once a viable training program is ready, the trainer integrates it for use within the organization.

## Integration Phase

The technology integration phase allows an organization to establish and use technology, particularly computers and other computer-based electronic equipment, to achieve particular goals. Technology integration is an ongoing process that is continual and ever changing. When applied to an organizational training curriculum, it becomes

a powerful way for trainers to provide up-to-date primary source material efficiently and effectively. Levels of integration, blended learning, content-focused instruction, and practical designs for integration are components in carrying out effective training. The importance of understanding the organization’s present level of integration develops building blocks toward advancement of effective learning in aspects of content, learning, and the use of technology in learning.

## Levels of the Integration Phase

Developers and trainers wishing to integrate technology into the training environment focus on a model of integration that consists of clearly defined components based on levels of technology use and goals of the learning environment. Table 2 shows the levels of technology integration in the scope of training goals exemplifying these relationships. Developed based on Brown and Ford’s (2002) model of learning outcomes, University of South Florida Center for Instructional Technology’s (2007) matrix, and Gallivan’s (2001) stages of assimilation model, Table 2 describes levels of integration. It illustrates how levels of integration correspond to training goals. As levels of technology integration become more complex, greater participation is required of the learner, which Brown and Ford refers to as active learning. For example, once technology integration reaches the adaption level, the trainer no longer drives learning exclusively. For instance, a learner using flowchart software would create a diagram to illustrate a given process. While the trainer drives the assignment, the learner drives the outcome for purpose. The importance of understanding the organization’s present level of integration develops building blocks toward advancement of effective learning in aspects of content, learning, and the use of technology in learning.



Table 2. Levels of technology integration in the scope of training goals

		Levels of Technology Integration				
		Entry	Adoption	Adaption	Infusion	Transformation
Training Goals		Unidirectional (from trainer to student)	Unidirectional (from trainer to student via software)	Multidirectional	Multidirectional (reciprocal between learner and trainer)	Total Immersion
	Skill-based training	Drill and practice	Production driven	Purpose driven	Learner driven in blended learning environment	Virtual/Blended Learning
	Cognitive Learning	Information delivery	Construction of prior knowledge	Modification of knowledge base	Integration of established knowledge	Higher-level thinking and knowledge (unattainable without technology)
	Affective Training	Assigned activities for real-world problems	Content-specific for real-world problems	Problem-solving for real-world issues	Self-developed, authentic solutions for real-world problems	Total inclusive, analytical results for real-world problems

### Blended Learning

Blending learning combines face-to-face instruction with centralized computer-mediated emphasis (Graham, 2006). The importance of the degree of technology integration relates to concepts of blended learning. Graham explains that widespread availability and adoption of learning technologies have led to integration increases in more traditional learning environments. As the levels of technology integration increases, it is only logical that at some undefined point, blended learning gives way to e learning, discussed later in this chapter.

### Content-Focused Instruction

Understanding learning objectives is the first line of defense when attempting to determine the most appropriate delivery method of training instruction. Some training topics do not lend themselves to a computer-generated venue, for example, a nursing student learning to give shots. An effective blended learning experience will focus on identifying and understanding the learning objects and develop a complementary content-focused

instructional design. When given a specific level of technology integration, providing effective training means combining content-focused design with appropriate technological delivery to arrive at a pre-determined training goal (Singh, 2006).

### Practical Integration Designs

After understanding an organization's technology integration level, the next step in integrating technology into a training environment is to develop and apply practical integration. Liu and Velasquez-Bryant (2003) developed an integration design model that considers planning, design, implementation, and evaluation as four components essential to the life cycle of technology integration. In the design phase of the model, an objective is to match learning objectives and needs to instructional strategies with use of available technology. Brewer, DeJonge, and Stout (2001), illustrates how delivery methods of technology can relate to training goals. Table 3 displays these concepts. For example, group discussions can take content to high levels of cognitive learning goals but does not assist with skill-based outcomes. Use



Table 3. Technology methods and training goals

		Technology Integration Methods				
		Lecture	Demonstration	Group Discussion	Simulation	Role Playing (Virtual Classroom)
Training Goals	Skill-based training		X		X	X
	Cognitive Learning	X	X	X	X	X
	Affective Training	X		X	X	X

of appropriate technology delivery methods can affect training outcomes and learner participation.

### Strategies for Funding and Support

Whitehead, Jensen, and Boschee (2003) notes that strategies emerging for the support and funding of technology include developing proper technology planning, utilizing effective leadership, instituting staff development, and managing established financial resources. Whether your training environment includes corporate centers, classrooms funded by grants or state support, public outreach or workshops and other educational events, communicating with stakeholders is an important activity for success. As it applies to technology integration, a thorough communication plan includes a mission statement, analyses of the weaknesses and strengths of the plan, objectives and strategies to fulfill the mission, and action plans based on individual responsibilities (Psencik, 1991; Whitehead et al.).

### Implementation Phase

After integrating technology into an organization, the next step to effective training is implementation. Implementation is providing a comprehensive plan of action with the most appropriate options to support and facilitate the organization's strategic training plan. It includes decision about technology use and the type of technology methods.

### Technology Use in the Training Environment

Specific types of technology-assisted training delivery have two components in common—communication and intervention of an electronic device. Communications is the foundation to any technology-based training environment. Whether the delivery method is email-based, threaded discussions, corporate intranet, or types of e-learning, some form of communication stands out as a necessity. Fundamentally, technology-assisted training activities in organizations have two types of communications, either *synchronous* or *asynchronous*. *Synchronous* means conducted in real time and *asynchronous* means in delayed time, in other words, not in real time. Additionally, technology-assisted training communications, whether synchronous or asynchronous requires intervention via an electronic device, most often, computers.

### Communication-Assisted Training Applications

Communications is an important component in providing effective training. It is important in face-to-face training, blended learning, or e-learning. Differences exist only in the facilitation of communication. Applications that assist in facilitating effective training communications included email, group discussions, instant mes-

saging (sometimes called chatting), collaborative support systems, and voice/video conferencing (Rothwell et al., 2006).

- *Email.* Email (or e-mail) sends messages from one individual to one or more individuals for the purposes of relaying types of information. It replaces the inter-office memo, frequent time-consuming meetings, and phone calls. Email messages can contain a variety of different types of information such as documents, photographs, and voice/video media files as attachments. During training, email enables direct communication exchange between trainer to trainee where they disperse all information uniformly and identically. Similarly, communication from each student to the trainer is an efficient and effective management tool for the trainer to expedite classroom communication.
- *Group Discussion.* Threaded discussion (sometimes called group discussion) is an asynchronous communication tool usually developed around a particular question or statement pertaining to the training topic or similar related issue. It allows students, and sometimes the trainer, to exchange comments, questions, stories and other related information such as help and advice in a continuous flow similar to a verbal conversation. These types of discussions can augment classroom participation, further technology-assisted training, and assist in developing frequently question and answer sessions.
- *Instant Messaging.* Instant messaging (IM) is a synchronous communication tool that expedites the exchange of information immediately. Individuals use this form of communication to create a real-time, electronic meeting for the purpose of gathering opinions, making group decisions, and gaining insight to additional training needs without additional complications related to response

time. The advantage of using instant messaging is the ability to work collaboratively in a real-time environment.

Expanding the concept of instant messaging, collaborative (sometimes called group) support systems combine the abilities to communicate in real time with the ability to compute, facilitate decisions, brainstorm, discuss, create and write in a synchronous learning environment. Trainees create group formations over long distances, which can combine different learning objectives into a seamless engaged classroom process. Rothwell and his colleagues (2006) suggests that learners can be divided into groups, sometimes anonymously, to facilitate broader interactive activities that can be shared among groups, which can effectively increase productivity while maintaining a continuum of training.

- *Teleconferencing.* Teleconferencing has many definitions; therefore, it becomes important to establish a clear definition when discussing this topic. In this section, teleconferencing includes audio conferencing and video conferencing, which allows communication between people at two or more locations.

Audio conferencing requires the capabilities of exchange of voices using conventional telephone services or technologies that facilitates the process over the Internet. It requires specific facilitating technologies to make the actual connection between participants and typically occurs through service providers. Users of audio conferencing rely on it where video conferencing is not reliable because of lack of or limited strength of an internet connection. Effective training using audio conferencing is focused on creating an environment that generates group bond for learning through voice only interaction.

Video conferencing facilitates the exchange of both voice and video using technologies developed



over the Internet. Users of communication in a training situation accomplish it by utilizing one-way or two-way methods. In a training environment, trainees could see the trainer without the trainer seeing the trainees; the two-way method would allow both trainees and trainer to see each other. The two-way method of communication increases interactivity between trainer and trainees and thereby boosts group collaborative learning environments.

### Classroom Technology-Assisted Training

This section examines technologies that exist in the classroom for the purpose of expanding training instruction. According to Rothwell et al. (2006) advances in technology that can enhance a trainee's active engagement and can facilitate trainers delivery methods include projectors, digital displays, electronic whiteboards, document viewers, interactive group response systems, cellular phones, PDAs and other mobile devices.

- *Digital Projectors.* Projectors are digital devices that deliver face-to-face content in most classroom settings. When used with other devices such as display units, electronic whiteboards, computers, DVD players, and many other pieces of electronic equipment, they become the preferred tool in today's classroom. Three types of commonly used digital projectors include an LCD unit that connects via cable to a computer, a wireless unit that require no cables, and a networked projector that operates through an organization's network eliminating the need for connectivity to other devices.
- *White Boards.* Electronic white boards (sometimes called smart boards) are large, touch-sensitive interactive units that connect to a digital projector and a computer for the purposes of exchanging information visually. While they can display many types of infor-

mation, the added-value with the white board is its ability to capture written annotations, notes, drawings, corrections, and changes in the display, and then subsequently, save, email or print the altered file information.

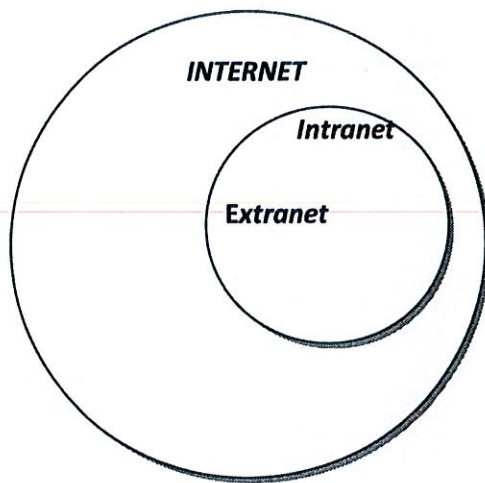
- *Document Viewers.* Document viewers replace overhead projectors. Trainers can display detailed drawings, photographs, and 3-D objects with such features as zoom, image capturing, and other optical features. The availability of document viewers in the classroom allows trainers the opportunity to utilize limitless presentation materials.
- *Response systems.* Interactive group response systems (also called audience response systems) enable trainees to respond individually to questions and opinions during the training session. A trainer uses these devices to increase trainee participation and attentiveness, and consequently creates an engaged learning environment.

### Web-Based Technology-Assisted Training and Distance Learning

In understanding the rapid advances in technology-assisted training, it is important to understand the impact that the development of the Internet has had on organizational training. Connecting organizations and individuals worldwide has fostered the delivery of learning and created distance learning through various pathways facilitating web-based technologies, such as web collaboration, web conferencing, webcasting, and mobile learning (Rothwell et al., 2006). No longer is the training model uniformly specific of trainer to trainee in a simultaneous location and time.

*Internet, Intranet, and Extranet.* The Internet is a series of pathways using data systems, independently built, for the purposes of the exchange of knowledge. Distribution methods include the Internet and the World Wide Web, *intranets*, and *extranets*. As seen in Figure 3, the Internet encompasses all other networks; it is an

Figure 3. Relationship between Internet, Intranet, and Extranet



integrated network of other networks. The World Wide Web is the vehicle that allows all networks to communicate to each other for the purposes of information sharing, and requires web-browsing applications to facilitate the exchange. *Intranet* refers to a network owned by an organization solely for the purposes of limited accessibility to members of the entity. Authorization to the *intranet* is required and administrators of the *intranet* can control further access to the larger, dominant Internet as well as access for an *extranet*. An *extranet* is essentially an *intranet* that allows limited public access to an organization's *intranet*, in other words, allowing partners of the organization to connect to the *intranet* for the purposes of sharing information, resources, and tools relevant to the partnership and is determined by the level of relationship between partners. Sophisticated models of differing capabilities and accessibilities between members of the organization, partners, and customers exist depending upon the needs of all the stakeholders.

Trainers often utilize *intranets* for training purposes because of the authority to centralize proprietary information and training content. *Intranet* capabilities also allows for private use of software technologies such as learning manage-

ment systems and learning content systems developed specifically for certain organizations, which allows for organizational knowledge building and sharing.

- *Webcast*. Web-based technologies assist in delivery methods of webcasting, web conferencing, web collaboration, and mobile learning. A webcast is a media file containing audio and/or video information that is either broadcasted through the Internet on-demand or live. The technology that drives webcasts is called streaming technology. Live webcasts are only available when scheduled in real time; on-demand webcasts are available at the discretion of viewers and the producer who determines availability. The advantages of webcasts as a method of training include delivery of information simultaneously to a large, diverse, and expansive learning population, in asynchronous or synchronous delivery method, and the capability of included multiple webcast to build an infrastructure of learning modules (Piskurich & American Management Association, 2003).

Web conferencing, webinars, and web collaboration are meetings conducted over the Internet enabling two or more individuals to simultaneously hear and/or see the same content utilizing computers. The differences between the three are the degrees of interactivity among participants. Web conferencing are small interactive meetings that utilize such features as presentations, application and file sharing, messaging, and one-way and two-way audio/video conferencing. Web collaboration expands the concepts of web conferencing into a group collaborative effort. Small groups connect through the Internet for the purposes of conducting group activities with other groups.

- *Webinar*. A *webinar* (short for *web-based seminar*) is a type of web conferencing allowing participants to give, receive, and



discuss information; and a moderator typically facilitates the communications during the event (Webinar, 2010).

- *Mobile learning.* Since becoming popular, mobile devices, such as smart phones are important to mobile learning (sometimes called m-learning.) Mobile learning enhances activities to support front-line workers in such areas as retail, repair, facilitation, and others giving significant information, learning materials, and expertise real-time knowledge in a variety of locations at critical times (Piskurich et al., 2003). Most mobile devices can browse the Internet, participate in online discussions, send and receive informative emails, access multimedia streaming, and create and edit documents such as word processing and spreadsheets. The clear advantage of mobile learning using mobile technology is the ability of content to be available to the trainee at all times in all places.

## E-Learning

E-learning is short for electronic learning but has no declarative definition (Fee, 2009). For this section, the e-learning definition is having characteristics that utilize web technology through an electronic device for the purposes of delivery of learning. In general terms, e-learning is technology-assisted learning facilitated through online delivery. E-learning could include infinite characteristics such as asynchronous learning, synchronous learning, trainer-delivered, webcast modules, self-paced or webinars.

- *Virtual classroom.* A virtual classroom is a learning environment that delivers instructional content through synchronous delivery (Rothwell et al., 2006). A live trainer integrates learning material such as presentations using graphics with individuals who registered for the training sessions.

During the sessions, live interaction, email exchanges and chatting functions are available along with other types of technologies. Similar to simulations, the virtual classroom is essentially a conceptualized classroom produced in a virtual (not physical reality) world, led by a trainer and attended by trainees. An example of an all-inclusive virtual classroom is *Second Life*, it's free persistent virtual environments enable trainees to work together synchronously and then return, individually or as a team and amplify learning beyond traditional capabilities and other web-technology delivery methods (Second Life, 2009).

- *Blended learning.* Blended learning, mentioned previously, is face-to-face instruction combined with e-learning delivery methods. For example, a training course delivered by a trainer once a week in a classroom setting and then supplemented with online content or activities, such as an on-demand webcast is considered blended learning. Sloman (2003) describes blended learning as trainees interacting with the trainer and other trainees, while online content supports additional instruction where appropriate.

## Delivery Methods

Implementers of effective training utilize many different types of delivery methods. At the point of implementation, planners, designers and trainers have already made decisions influencing which deliver method to utilize in the appropriate learning situation. Trainers may utilize one delivery method or combine various methods to produce needed results. Table 4 summarizes e-learning delivery methods and gives a short description of each.

## Evaluation Phase

When using technology in providing effective training, there are several evaluation models to

Table 4. E-learning delivery methods

Method	Description
ebooks	Electronic formatted books; available for computers and mobile devices (Smart phones, Kindles, iPads)
Podcast	Similar to webcast with the exception that the user listens to content on an iPod or like device
Online content including online testing	Documents, spreadsheets, databases, multimedia content, graphics, quizzes, exams, etc. retrievable online
Demonstrations	How-to videos, YouTube videos, step-by-step instructions
Simulations	Imitating a real phenomenon or situation for practice
Interactive resources	Such as calculators and dictionaries
Subject-specific games	Math drills, interactive skill games
Streaming media	Audio and video downloaded in real time from the Internet without the ability to save it
Video/audio conferencing	Conferencing using multi-media on an electronic device(s)
Email	Electronic messages that are relayed between individuals
Wikis	Collaborative web pages containing continuous works by many authors. Similar to blogs except wikis can be modified by others. Example: Wikipedia—the online encyclopedia
Blogging/moblogging	Interactive commentaries typically suited to ownership and can include media postings
Collaborative group learning	Sharing applications, notes, ideas, tasks, and learning activities in groups
Discussion groups	Threaded asynchronous conversation about a specific question or common topic
Skyping	A free Internet-based one-on-one video/audio telephone call via the Internet (microphone and camera required) Conference calling available soon
Virtual classroom	An online learning environment where trainees and trainers interact
Listservs	An automatic emailing service to individuals who joined as a member an interest group

assess instruction and learning. The type most frequently used is the Kirkpatrick's Evaluation Model. According to Brewer (2009), this Model has been the "most widely recognized and used for evaluating training programs" (p. 132). Evaluators look at four separate levels when considering training program effectiveness. Level 1, referred to as the *Reaction Level*, allows one to assess how the training participants react to the training. The benefits to conducting this level of evaluation are assessing trainee satisfaction, the use of technology, and trainers who provide the training. Level 2, known as the *Learning Level*, assesses the extent to which the trainees change their attitudes, increases their knowledge and/or skills. This level allows one to assess whether the "learning transfer" has occurred. Some questions to consider at this level would be "What knowledge was learned?" or "What skills were

developed or improved?" and/or "What attitudes were changed?" Level 3, The *Behavior Level* (sometimes referred to as the *Impact Level*) addresses the extent to which change in behavior has occurred. This occurs after the trainees leave the formal training session and are implementing what they learn while in their work environment. Level 3 assesses the job impact of the training that the trainee completed. The final level (Level 4) of Kirkpatrick's Model deals with the *Results* of the training. This is the most important level and perhaps the most difficult of all because the trainer is training to assess the bottom line impact of training. Brewer (2009) notes that amounts of information increase as one proceeds from one level to another. This systematic approach to the evaluation of training programs is important because it will measure such factors as trainee satisfaction, learning proficiency, application skills, and



overall program effectiveness. Some researchers have added a Level 5 to Kirkpatrick's Model that is entitled "ROI—Return on Investment." Over time, the need to measure the dollar value impact of training becomes a very important factor in providing training activities to an organization.

## **FUTURE TRENDS**

Future trends in effective training using technology are difficult to predict. It entails many factors such as the development of technologies, integration of technology into organizations, and the ability of organizations and trainers to develop effective training programs. Questions that lead to predictions and future trends include "Who will do the training?," "Where and how will the training be offered?," "Will the training be on-demand or live?," and "What is the need for the training?" Answers to these questions will lead to better understanding about where training with technology is going in the future.

Other questions that may shed light on the future trends of training are question not yet developed. The role of technology and the advances not even thought of today may influence beyond our limited scope of thought. For example, the role of satellite systems, mobile technologies, virtual and artificial intelligence are all areas in their infancy and likely will influence future technology developments.

A component of technology that stands out among many – is online training, which is changing the way adults gain knowledge and move forward in their professional development. Using mobile learning, web-based continuing education, and e-learning will continue to play a significant role in training. The need for trainers will always exist. Without a director, the play cannot go on. Trainers will need to develop new skills for the online and mobile environments.

## **CONCLUSION**

The future for utilizing technology in training has many possibilities, but the core principles of infusing technology into a training program discussed in this chapter will hold true. Businesses and organizations must remember the role of technology in the training process and the importance of the institutions technology culture. They will need to develop, implement, integrate, and evaluate the technology to infuse it properly into the training program to make it effective. Most importantly, businesses and organizations must avoid the pitfalls of the traditional ways of doing things and be brave enough to change themselves to meet the challenges of these 21<sup>st</sup> century times.

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## KEY TERMS AND DEFINITIONS

**Asynchronous:** Occurring in delayed time, not in real time.

**Blended Learning:** Face-to-face instruction combined with computer-mediated instruction

**Digital Immigrant:** An individual who has not grown up with technology and must adapt and learn to use technology.

**Digital Native:** An individual who has grown up with technology and feels highly comfortable adapting to technology.

**Extranet:** An intranet that allows limited public access to an organization's intranet.

**Intranet:** A limited access network owned by an organization solely for the organization's use.

**Synchronous:** Occurring in real time.

**Webcast:** A multi-media file that is broadcasted through the Internet on-demand or live.

**Webinar:** An interactive web conferencing seminar conducted among a facilitator and participants.