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Training Delivery Options and Media

Regardless of the setting, adult educators must recognize the many different avenues of delivery. Each avenue has inherent characteristics as well as different learner demographics and motivations that all WLP professionals should be comfortable with. It's valuable for WLP professionals to understand all of the different delivery options so that they have some control over the presentation. The facilitator also should be able to provide insight and make recommendations regarding the delivery of the content.

Today, a multitude of technology-based learning options are available and this advent of new technologies is changing the way that learning occurs not only within but also outside of organizations on a daily basis. For WLP professionals to craft the most appropriate learning solution for learners to access information and instruction anytime and anywhere, they need to be well versed in the various delivery options and media that today's technologies now provide. This chapter provides a primer of the characteristics, value, and applicability of each technology-based learning option.

Learning Objectives:

- ☑ Define blended learning.
- ☑ Discuss two examples of when classroom learning or e-learning are most appropriately used and explain why.
- ☑ Define environmental considerations that ensure optimal classroom learning.
- ☑ Discuss the benefits of message boards and chat rooms to learning groups and online communities.
- ☑ State two benefits of e-learning and list two requirements with regard to audio and video plug-ins.
- ☑ State the purpose of an electronic performance support system (EPSS) and discuss when to use or not use an EPSS.
- ☑ Explain what is meant by self-directed learning (SDL) and provide two situations in which SDL is most appropriately used.

Blended Learning

Blended learning is an instructional strategy for delivering on promises of learning and performance. Blending involves a planned combination of training delivery options, such as coaching by a supervisor, participation in an online class, breakfast with colleagues, competency descriptions, reading, reference to a manual, and participation in workshops or online communities.

As noted by Rossett et al, a study by Peter Dean and his colleagues found that providing several delivery options and media for learners, in addition to classroom training, increased what they learned. In 2002, Harvard Business School faculty DeLacey and Leonard reported that students not only learned more when online sessions were added to traditional courses, but student interaction and satisfaction improved as well.

How can e-learning complement a classroom course or vice versa in a blended approach? In traditional classroom training, instructors must focus their attention on the typical learner—and they can rarely meet the needs of all individual learners. To address this limitation, instructors can develop course websites with remedial material to give slow learners additional opportunities to master the content. Similarly, for learners who need to adapt the material to specific needs or want to continue working with the material, instructors can use a website for enrichment material.

Some online learners have difficulty with course material, even though it might have been tested extensively with prospective learners. Other learners might need gentle reminders to motivate them to complete courses. In these cases, personal coaching provides assistance to help these various learners with their needs. The coach is a person with whom the learner interacts. In some cases, the coach is available in person, and in other cases, the coach is available online or by telephone.

When designing a blended-learning solution, Elaine Biech, author of *Training for Dummies* (2005), offers some key considerations to meet the needs of the organization and the participants:

- Blended learning optimizes resources, providing the most effect for the least investment. Remember to consider the organizational culture and how receptive it will be to changes in delivery formats.
- The blended-learning solution should be solution focused—what is the business problem to be solved and what is the best way to solve the problem?
- Technology capabilities drive at least some portion of the blended-learning solution, but remember to include the learners' characteristics (time available, how motivated, learning style) and the characteristics of the content (the SMEs, type of content, whether skill based or knowledge based, how soon it will be out of date).
- Almost all blended-learning solutions require a communication and marketing plan before deployment.

E-Learning

E-learning is an umbrella term used to describe a variety of methods to deliver technology-enabled training via methods including CBT, CD-ROMs, DVDs, videos, learning portals or online communities, virtual classrooms, message boards, chat rooms, and mobile learning (i.e., podcasts, vodcasts). E-learning allows trainers to hold classes in much the same way they would in the classroom, with a few additional considerations related to the technology. Trainers can use these methods to deliver the content:

- web-based (internets, intranets, learning portals, and online communities)
- disk-based (CD-ROM, DVD)
- TV-based (satellite, teleconferencing, cable)
- network-based (mail, collaborative tools)
- simulator-based (virtual reality and tactile gear)
- mobile learning (PDAs, podcasts, vodcasts, cell phones, teleconferences)
- EPSS systems (help systems, job aids).

When to Use E-Learning or Classroom Training

Although some people express concern that e-learning might spell the end of classroom training or that it's inferior to classroom training, e-learning will ultimately complement it. Training and human performance improvement (HPI) professionals use classroom training for what it does best and do likewise for e-learning.

When to Use E-Learning

E-learning is outstanding for teaching rote skills; it has the infinite "patience" needed to do so. With the privacy of the computer, slower learners can have the extensive remediation they need, and fast learners can speed through a course, unencumbered by their classmates.

E-learning also is an excellent tool for teaching prerequisite material. Instructors can require learners to take a prerequisite course and pass a pretest before coming to the classroom. In that way, the instructor can begin the classroom course at a higher level, sure that each learner has completed the prerequisite learning. As a result, the classroom course can offer an in-depth learning experience, a shorter learning experience, or both.

When Not to Use E-Learning

E-learning should not be used when a technology analysis indicates that the current equipment and infrastructure aren't adequate to support the bandwidth and other technology needs of e-learning.

In addition, e-learning should not be used with people who aren't prepared for it. For example, participants who are technologically challenged might have difficulty accessing and logging in to a web session successfully. The facilitator should use participant analysis to understand the population to be trained before assuming that e-learning is the best solution.

E-learning should not be used if participants' self-directedness is low. A lack of self-direction is one reason that self-instructional media, such as CD-ROMs and WBT, have failed.

Finally, e-learning also can be a difficult medium when facilitating classes where face-to-face practice is a critical element for learning.

When to Use Classroom Training

Compared with e-learning, the classroom provides an opportunity to develop higher-order thinking skills and stimulate interpersonal exchanges. Although these goals can be accomplished online through simulations and asynchronous learning, they often have more effect with learners in the classroom.

In some cases, classroom training might not be the most efficient intervention to address knowledge and skill deficiencies. These are the drawbacks of classroom training:

- Training is expensive.
- Training is hard to schedule.
- Training is temporary. Learners don't retain knowledge or skills unless they have an opportunity to practice.

If possible, a trainer should consider a blended approach and multiple solutions to help provide learners with all the skills and knowledge needed to perform effectively on the job. Some additional interventions include job aids, performance support systems, and self-directed learning programs.

Classroom Training

With today's technologies becoming more robust and less expensive, technology-based learning is truly a solution that can augment and support classroom-based learning. Technology-based learning will never replace classroom training. They both have their strengths, and each can be appropriate depending on the situation. However, sometimes the constraints of a project (time to develop and deploy, cost, geographical location of the target audience) dictate when classroom or technology-based learning is most appropriate to meet the learners' needs and expected outcomes.

When classroom training is part of the learning solution, WLP professionals should consider a multitude of factors when planning a classroom training program, including the physical environment.

It's a common scenario: The meeting room is too hot, the lights are too dim, and the coffee is tepid. The trainer seems miles away, the slide projector doesn't focus, and employees attending the training program grumble to one another in small groups about it being "a waste of time."

The physical environment can have a major effect on the success of any training program. No matter how well the session is designed or how talented and entertaining presenters are, a good session in a poor environment could add up to a waste of time and money for everyone involved.

Selecting the Facility and Preparing the Environment

Before beginning the facility selection process, a trainer, facilitator, or program coordinator should identify participants' learning goals and plan the physical setting that matches those objectives. Presentation techniques need to be adapted to the ways that adults learn.

Most rooms in which training takes place accommodate an amazing range of uses. They also serve as movie theaters, storage rooms, classrooms, and even restaurants. Given the inevitable limitations, trainers should strive to make the facility the best that's possible. Chairs must make people comfortable (but not too comfortable), and tables must be capable of being moved yet be stable. Restroom facilities must be available for use by a large number of people in a short period. They must also be wheelchair accessible.

The Space

Selecting the best space for the program's particular needs is no simple task. Facilitators should remember to consider the requirements listed in Table 4-1, depending on what they are planning.

Table 4-1. Space Guidelines

Type of Activity	Space Needed
Reception	9–10 square feet per person
Meal	12–13 square feet per person
Theater seating	9–10 square feet per person
Classroom seating	15–17 square feet per person
Conference seating	23–25 square feet per person
U-shaped seating	34–36 square feet per person

Screens

Another way to check the adequacy of room dimensions is to judge all distances from the width of the screen to be used for visual presentations. These are some guidelines:

- The distance from the screen to the last row of seats should not exceed six screen widths.
- The distance from the screen to the front row of seats should be at least twice the width of the screen. Participants who are closer than that will experience discomfort and fatigue.
- The proper width of the viewing area is three screen widths. No one should be more than one screen width to the left or right of the screen.
- Ceiling height is important. The room's ceiling should be high enough—a minimum of nine feet—to permit people seated in the last row to see the bottom of the screen over, not around, the heads of those in front of them.
- Try to use screens that recede into the ceiling and raise and lower automatically.

Peripheral Facilities

When making facility arrangements, a program coordinator should understand the communication requirements of those involved in the session. Arrange to take messages and tell participants that outgoing calls can be made only during breaks. To facilitate this, the instructor should take the following steps:

1. Make sure an operator is available to take incoming messages.
2. Create a message board in a central location and place messages on the board. Ask participants to check the board during each break.
3. Never install a telephone in a meeting room. If a telephone is already in the room, have it disconnected.

Restroom Facilities

If training is conducted in a location that lacks sufficient nearby restrooms, the instructor should direct people to facilities on other floors and make sure to schedule enough time for this travel. If the meeting is in a hotel, the instructor should ensure that restrooms are large enough to accommodate the group and are located nearby.

Seating Arrangements

An important factor in determining the success of any training session is the seating. Placement of chairs and tables can contribute to accomplishing learning objectives.

Determining where people will sit can influence the level of participation. Some seating arrangements make it difficult—if not impossible—to interrupt a facilitator. Other

arrangements encourage participation of the entire group. So depending on how much control instructors want, or to get a group's direct involvement, they should use one of the seating arrangements shown in Table 4-2. Some of these seating arrangements give participants the most involvement in training sessions; others are more traditional arrangements that give the facilitator more control.

Table 4-2. Examples of Seating Arrangements

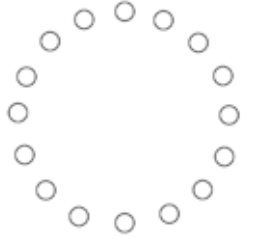
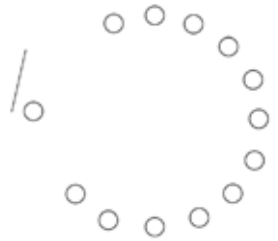
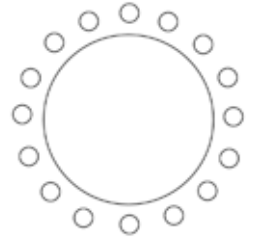
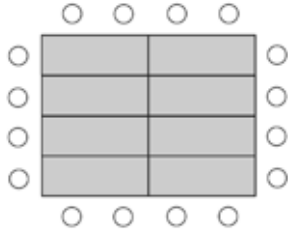
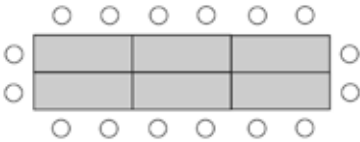
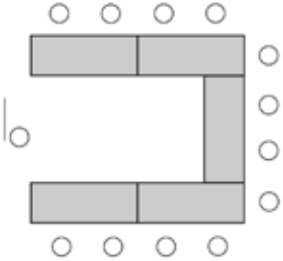
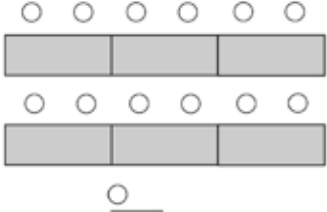

Name	Description	Example
Circle	A plain circle of chairs is often used to foster an intimate relationship between participants in which they can interact in a more friendly setting. This arrangement has no physical setting for a trainer and creates an equality of participation.	
Broken circle	Many trainers use this configuration because it offers the advantages of the full circle yet affords a measure of control. This arrangement allows for a flipchart and a standing trainer.	
Circle and table	This combination takes advantage of the circle's informal aspects but gives participants a place to put papers and books. The table also removes the sense of vulnerability some people feel in a plain circle of chairs. Studies show that when the same people sit at a round table rather than in a circle with chairs only, they participate more in the session.	
Square table	Square tables are a first full step toward a formal meeting arrangement. They are often used when there are "sides" to be presented. Research indicates that a solid square table seems to encourage conversation across the table.	

Table 4-2. Examples of Seating Arrangements, continued

Name	Description	Example
Rectangular table	At a rectangular table, no one can see the faces of all the people at the ends of the table, whom participants expect to control the interaction. Rectangular tables can be effective for some kinds of training sessions, but they highlight the tensions felt by two sides facing each other.	
U-shaped table	This configuration is popular for seminars. A U-shaped table gives everyone taking part the sense that they are equal. This layout, however, gives the opening in the U a position of power and can provide space for someone at a flipchart to take notes or serve as a recorder.	
Classroom style	For years, conferences have relied on the conventional classroom style for training programs. This arrangement gives facilitators—especially if they stand on raised platforms—a lot of control, and it's hard for people to talk to anyone except those seated beside them. This arrangement accommodates many people in a fairly small room and is effective for one-way communication.	
Theater style	Theater or auditorium seating is used when the planner wants to maximize the number of participants in one room. It's not a good arrangement for stimulating group discussion or participants.	

Materials and Equipment

The instructor should have handouts and visual aids prepared early enough so that they can be proofread thoroughly and checked to see whether they are in the correct order.

Even if someone else is responsible for setting up the room, the instructor should arrive at least one hour early on the day of training. This gives time to set up materials and tend to any last-minute crises. The instructor may be the one who actually tidies the room, arranges (or rearranges) furniture, sets up and tests equipment, and makes last-minute arrangements.

Care of Environmental Factors

When selecting a room, a facilitator should assess whether any possible distractions or obstacles will affect setup. A room that is free of distractions and noise establishes an environment that's conducive to learning. The trainer should also be sure to select a room without structures, such as posts or pillars, that could obstruct participants' view.

Distance Learning

Distance learning is a system and a process that connects learners with distributed learning resources. Although distance learning takes a wide variety of forms, all distance learning is characterized by

- separation of place, time, or both between instructor and learner, among learners, or between learners and learning resources
- interaction between the learner and the instructor, among learners, or between learners and learning resources conducted through one or more media; use of electronic media isn't necessarily required.

Electronic Presentation and Distribution Methods

As technology-enabled learning solutions continue to make more delivery options available, WLP professionals need to have a solid understanding of the differences between presentation methods and distributions methods when crafting learning solutions.

Table 4-3 divides the technologies into two major categories: presentation methods and distribution methods.

Table 4-3. Electronic Presentation and Distribution Methods

Presentation Method	Distribution Methods
Audio	Network-based (LAN/WAN), web-based (Internet, intranet, extranet), disk-based (CD-ROM/DVD), voicemail, audio, and mobile technologies (podcast, vodcast, phone, and cell phone)
Web Conferencing	Network- and web-based, and mobile technologies
Electronic text	Network-, web-, and disk-based
EPSS	Network-, web-, and disk-based
Multimedia	Network-, web-, disk-, and simulator-based
Online help	Network- and disk-based
Teleconferencing	TV- (satellite, cable), and network-based, and mobile technologies
Video	TV- (satellite, cable), network-, web-, and disk-based, and mobile technologies

To better understand the distinction between presentation methods and distribution methods, think of the various ways to get a message to a friend in a distant country. The ***presentation method*** may take a number of different formats, including

- text
- pictures
- symbols
- sounds.

For each presentation method, one or more distribution methods exist for actually transmitting the formatted message to the friend. These ***distribution methods*** include

- email
- telegram
- fax
- phone call
- videotape sent by overnight courier.

Certain presentation methods can be transmitted by using only one distribution method (for example, a telegram distributed via telegraph), but others can have an array of distribution options (such as a letter distributed via fax, air mail, or express mail). Some

restrictions could prevent using a certain type of distribution methods. For instance, overnight courier services might not service the friend's country.

Regardless of which process is chosen, the decision ultimately pairs a presentation method with a distribution method. A key question, therefore, underlies this distinction: Is this technology the format of the material (presentation method) or a means of transmitting the material (distribution method)?

Technology-Based Learning Benefits

Many factors drive the trend toward increased reliance on technology for training purposes, including the following:

- **Cost-effectiveness:** Although the costs of developing technology-based training programs are higher than those for instructor-led classes, distribution costs often offset development costs—if the programs are implemented correctly. More people can be trained more often with different online learning tools. Travel costs can be reduced and productivity increased because no time is lost in travel to and from on-site training. In addition, subject matter experts (SMEs) can be brought in without leaving their hometowns.
- **Accessibility and application:** Speed and mobility are the essential ingredients of competitive success. Requiring employees, especially part-time employees, to spend hours or even days in training causes an unnecessary hardship and often leads to turnover in the first few weeks of employment. By using learning technologies, organizations target their training efforts toward the precise knowledge that employees need to solve job-specific problems.
- **Access for learners:** The developing world economy has blurred traditional international boundaries. Employees of multinational corporations are dispersed in both time and geography. Expecting employees to coordinate their schedules for group training is often not practical. Technology can help bridge this gap by offering learners access to more resources, which adds to their body of knowledge in a given topic.
- **Self-direction for learners:** E-learning puts adult learners in the driver's seat to find new ways, tools, and courses that provide the foundation for self-directed learning. This learning can take place anywhere and often at any time.

Technology-Based Terms and Definitions

The following list of terms provides a useful introduction to technology-based learning vocabulary.

Asynchronous learning: E-learning that does not require the trainer and the learner to participate at the same time. Examples are self-paced courses taken over the Internet or with a DVD, online discussion groups, and email.

Audio: One-way delivery of live or recorded sound.

Technology-Based Terms and Definitions, continued

Blog (weblog): An extension of a personal website consisting of journal-like entries posted on a webpage for public viewing. Blogs usually contain links to other websites along with the thoughts, comments, and personality of the blog's creator.

Browser: A software program for finding and viewing information on the Internet. Internet Explorer and Netscape Navigator are two common examples of browsers.

Chat room: A synchronous process in which the learners and trainer are online at the same time. Chat rooms are similar to electronic bulletin boards, but bulletin boards are asynchronous.

Collaboration technology: Software, platforms, or services that enable people at different locations to communicate and work with each other in a secure, self-contained environment. May include capabilities for document management, application sharing, presentation development and delivery, whiteboarding, chat, and more.

Community of Practice (CoP): Serve as organizing structures and platforms for entire workplace-based learning effort. CoPs are trusting groups of professionals united by a common concern or purpose, dedicated to supporting each other in increasing their knowledge, creating new insights, and enhancing performance in a particular domain. Much more than chat rooms or discussion threads, CoPs are more fully integrated into actual work.

E-learning 2.0: New ways of thinking about e-learning inspired by the emergence of Web 2.0.

Electronic bulletin board: Also called a **threaded discussion**, the computer equivalent of a public note board. Messages can be posted to a bulletin board for viewing by other users.

Electronic performance support system (EPSS): A computer application that's linked directly to another application to train or guide workers through completing a task in the target application. More generally, it's a computer or other device that gives workers information or resources to help them accomplish a task or achieve performance requirements. These systems deliver information on the job, just in time, and with minimum staff support.

Electronic text: The dissemination of text via electronic means.

Mobile learning: Learning that takes place via such wireless devices as cell phones, personal digital assistants (PDAs), or laptop computers.

Multimedia: A computer application that uses any combination of text, graphics, audio, animation, and full-motion video. Interactive multimedia enables users to control various aspects of training, such as content sequence.

Technology-Based Terms and Definitions, continued

Online help: A computer application that provides online assistance.

Podcast: A series of digital-media files distributed over the Internet using syndication feeds for playback on portal media players and computers. The term podcast, like broadcast, can refer either to the series of content itself or to the method by which it is syndicated; the latter is also called podcasting. The term derives from the words “iPod” and “broadcast”; the Apple iPod being the brand name of the portal media player for which the first podcasting scripts were developed.

Simulations: Highly interactive applications that allow the learner to model or role-play in a scenario. Simulations enable the learner to practice skills or behaviors in a risk-free environment.

Synchronous learning: Learning that involves the trainer and the learner participating at the same time.

Teleconferencing: The instantaneous exchange of audio, video, and text between two or more people or groups at two or more locations.

Video: One-way delivery of live or recorded full-motion pictures.

Virtual classroom: An online learning space where learners and instructors interact.

Virtual world: A computer-based simulated environment intended for its users to inhabit and interact via avatars. These avatars are usually depicted as textual, two-dimensional, or three-dimensional graphic representations, although other forms are possible (auditory and touch sensations for example). Some, but not all, virtual worlds allow for multiple users.

Web 2.0: The use of Internet technology and web design to enhance information sharing and, most notably, collaboration among users. These concepts have led to the development and evolution of online communities and hosted services such as social networking sites, wikis, and blogs.

Wiki: A collection of webpages designed to enable anyone who accesses it to contribute or modify content, using a simplified markup language. Wikis are often used to create collaborative websites and to power community websites.

Asynchronous Versus Synchronous Training

E-learning is often described in one of two categories—that which occurs with a live instructor and that which does not.

The first category is often classified as *asynchronous*, self-instructional, self-paced, self-directed, or a number of other terms; its key characteristic is that an instructor does not interact with the learner simultaneously. Using email is one form of asynchronous training. The greatest benefit in asynchronous training is its flexibility. Learners can fit a course into their schedule rather than the instructor's.

The second category is often referred to as **synchronous** training and refers to when the learner and instructor participate at the same time via a computer.

Learning Groups and Online Communities

Early collaboration tools included chat rooms and electronic bulletin boards which allowed for threaded discussions and two-way communication. Collaboration tools that enable learning groups and online communities have come a long way since those early days.

A learning group or an online community is a meeting place on the Internet for people who share common interests and needs. Online communities can be open to all or be by membership only, and they may or may not be moderated. Learning groups and communities are supported by various collaboration tool capabilities enabling these groups to capture and share expert knowledge through frequently-asked questions, discussion groups, knowledge bases or direct contact with experts via chat or instant messaging capabilities. Social networking sites (e.g., Facebook and LinkedIn) are examples of these online communities.

Communities of practice (CoPs) often serve as organizing structures and platforms for workplace-based learning. CoPs are trusting groups of professionals united by a common concern or purpose, dedicated to supporting each other in increasing their knowledge, creating new insights, and enhancing performance in a particular domain. These are people who need to work with, learn from, and help each other achieve business goals (Hessan and Vogt, 1999). Much more than chat rooms or discussion threads, CoPs are more fully integrated into actual work. Most recently, Community of Practice has become associated with knowledge management as people have begun to see them as ways of developing social capital, nurturing new knowledge, stimulating innovation, or sharing existing tacit knowledge within an organization. It is now an accepted part of organizational development (OD).

Wikis are generating a great deal of excitement in learning circles. A wiki (Hawaiian for quick) is a software tool that supports collaborative knowledge creation. Wikis allow groups of people to contribute and edit content in a knowledge base that has been defined and structured by a group, practically in real time, without the need for any programming knowledge. The most popular wiki by far is Wikipedia, the online encyclopedia, where almost anyone can contribute, edit, and manage information.

Wikis present a group opportunity for communities of people to create knowledge bases in very short order. Project teams, subject matter experts, market managers, and other groups of workers—often spread out geographically, can quickly use wiki technology to create and maintain repositories of information.

Blogs, short for “weblogs,” are, for the most part, online diaries or web journals that allow authors (bloggers) to easily and quickly “speak” with large numbers of readers who then collaborate with the author by adding comments, links, and other insights and material that might be useful to the conversation. Blogs can be powerful learning tools in maximizing how new ideas are disseminated and discussed by a larger audience. Although it

is important to ensure that those doing the blogging know what they are talking about, there is no need to restrict blogs to just a few “anointed” subject matter experts. Project managers can use a blog to keep team, or even entire organizations, informed about a project’s status. Much better than email updates, blogs form a permanent, organized record of activities and progress that can be archived and referenced. WLP professionals can use blogs to chronicle course activities that they are facilitating, perhaps over multiple offerings in which insights from one course would not be lost to the next.

Audio and Video in E-Learning

According to Metcalf (2000), there are two basic types of audio and video for delivery of just-in-time training materials over the web: “The two basic techniques—downloadable files and streaming—are used to deliver audio and video content. Downloadable audio and video files must be sent to the user’s computer in their entirety before they can be presented; streaming formats allow the audio or video content to be played as it is downloaded to the client with only a short delay at the beginning.”

Using audio and video in e-learning can add depth and pizzazz to an e-learning project, as Thomas Toth, author of *Technology for Trainers* (2003), points out; however, the designer must remember a few guidelines when designing or deploying e-learning and working with a developer:

- The learner must have a sound card and speakers to hear audio. Without the necessary hardware, don’t bother incorporating audio files because users won’t be able to hear it.
- If background music is used throughout an e-learning program, give learners a way to turn down or turn off the music from within the program. Don’t expect learners to be able to turn down the audio feed from their workstations. Inexpensive speakers don’t always have an attached volume control.
- Don’t use audio to highlight correct or incorrect responses during interactions. This feature falls under the category of “just because you can doesn’t mean you should.” If every correct answer is greeted with the sound of applause or every incorrect response is greeted with a loud honk, learners quickly become annoyed by the program. Although these sounds might be humorous once or twice, 10 or 20 such responses won’t generate laughs.
- Audio is easy to design and compress. Just remember that higher sound quality means higher bandwidth. Reduce the quality of sound files to reduce file size.
- When incorporating video into e-learning, consider how and why it’s going to be used. Because of bandwidth restrictions and large file size, consider restricting video segments to instructive elements. Long video sequences can be broken into smaller segments and each piece presented on its own.
- The design and development of video is an art form unto itself. Some excellent software packages are available for editing video segments, but the video seg-

ments must be converted into a different file format. Most videographers use digital media to capture and edit their productions. The designer must request that the professional videographer deliver the final product in an appropriate file format, most likely as an .AVI or .MOV file, to use the video file in an e-learning project.

Plug-Ins

Plug-ins are software programs that add functionality to a web browser (e.g., run movies or view animations) or to view special content (e.g., view PowerPoint or Word files). Some e-learning content may require plug-ins in order to run correctly. The term *plug-and-play* refers to the ability of a personal computer's operating system to recognize and install—with little or no intervention by the user—new peripheral devices that are added to the computer.

Early e-learning content often had special audio or video elements, which meant that a learner's PC could not immediately play the content. Learners would need to find the right plug-ins, then install them—and often the content still wouldn't play smoothly. The PCs required additional software or devices to be installed, which often left learners frustrated and unable to start or complete the e-learning content due to these challenges.

Today, almost all PCs have “plug-and-play” capabilities supported by their operating systems, in which the computer will automatically locate any software or drivers needed to play content, prompt learners on what needs to be done, and complete the task by having learners click an “install” button.

How does this impact the design and delivery of training? WLP professionals should use audio and video to enhance content—not for the sake of including these elements—and ensure that they understand the configuration of learners' PCs to keep any technology challenges or barriers to a minimum.

Performance Support Systems

What if the tools and systems in a work environment were available for a learner to access exactly the information required to perform the steps needed to complete a task better or faster?

Marc Rosenberg, author of *E-Learning: Strategies for Delivering Training in the Digital Age* (2001), points out that one major goal of performance support systems is to bring individuals up to speed on their work as quickly as possible with minimal support from other people. Essentially, performance provides the means for more efficiently accomplishing jobs or tasks, or for accomplishing a specific task directly without necessarily having to learn the intricacies of the performance.

As Rosenberg notes, performance support has been around for a long time, especially in the form of checklists, forms, reference cards, and other types of “job or performance aids.” What is relatively new is using technology in this way.

Two examples of performance support systems include job aids and EPSS.

Job Aids

A **job aid** (also called a **cheat sheet**) is a storage place for information that performers use while performing a task. A job aid provides a signal—audio or visual—to the performer about when to carry out a task and steps, reducing the amount of recall needed and minimizing error. In everyday life, people use job aids when they are at the ATM or self-serve gas pump, for example.

Job aids reduce training time and support learning. For example, in a commercial airplane, pilots use a job aid (a checklist) to make sure the proper speed is maintained, wing flaps are pitched properly, and other vital tasks are performed to ensure a safe flight. The key to creating good job aids is to organize the information according to how users will actually use it, step-by-step.

When to Use Job Aids

Job aids are not limited to a particular type of task. Job aids have been developed for linear tasks, such as equipment assembly and filling out forms, and for complex tasks, such as medical diagnosis. The amount of information available in a job aid is not limited; a job aid may be one page or many volumes.

These job performance tasks are ideal candidates for job aids:

- **A task performed with relatively low frequency:** A task performed on a monthly basis or less often is considered infrequent.
- **A highly complex task:** A task with numerous steps is more complex than a task with few steps. A task might be qualitatively complex if it involves discrimination of stimuli, if it requires recognizing different stimuli belonging to the same class, or if it's a series of binary discriminations, as when inspecting or troubleshooting equipment.
- **A task with a high consequence of error:** Some tasks have criteria that would result in a high consequence of error if they weren't met. These criteria may be high financial loss or loss of life, for example. Preflight checklists fall into this category.
- **A task with a high probability of change in the future:** The way in which certain tasks are performed is likely to change because of changes in technology, policy, or equipment. In these cases, other variables being equal, devoting time and other resources to the costly, time-consuming process of storing information in memory may not be worthwhile. For example, why bother trying to teach a person how to operate a machine in a factory if a whole new line of machines is coming out next month that operate entirely differently than the current ones? It would make a lot more sense to just give the person a job aid so that he or she could get by until the new machines arrived.

When Not to Use Job Aids

Certain tasks are inappropriate for job aids, such as those with strict time requirements. The response time of a pilot during flight must be immediate, for example, and could not be guided by a job aid. Another inhibiting factor might be the performance environment. A scuba diver could find it difficult to manage a booklet in dark, wet conditions, and a surgeon would face the problem of how to render a job aid sterile. Social barriers might be another inhibiting factor in the use of job aids. If bosses, peers, and customers give more credit to recalling information from memory, the job performer might not use a job aid, no matter how appropriate it is for the task at hand.

EPSSs (Electronic Performance Support Systems)

An **EPSS** is a computer application that's linked directly to another application to train or guide workers through completing a task in the target application. More generally, it's a computer or other device that gives workers information or resources to help them accomplish a task or achieve performance requirements. These systems deliver information on the job, just-in-time information, on-demand information, guidance, examples, and step-by-step dialog boxes to improve job performance with minimum staff support.

An EPSS is, in other words, a comprehensive computer-based job aid. EPSS applications often include

- a database of job-related information, organized to facilitate rapid access and optimize clarity
- calculators and wizards that simplify and automate procedures
- decision support modules that provide intelligent assistance with problem solving
- embedded tutorials and simulations that provide instruction in work-related concepts and procedures.

Just as a hand tool leverages physical capabilities, an EPSS leverages cognitive capabilities. An EPSS can provide adaptive support for a full range of cognitive tests. In effect, it makes performers smarter.

A well-designed EPSS is more than an electronic page turner or multimedia document. It incorporates the decision support of expert systems, the information accessibility of electronic text retrieval systems, the individualized instructional capabilities of CBT or WBT, and perhaps advanced communication features.

An EPSS—or any other job aid, for that matter—addresses the same performance needs as training, the primary related intervention. In fact, when performers lack the knowledge or skill to perform the job at hand, only two interventions are possible: doing training and using job aids. Of course, performance opportunities aren't generally either/or situations; training and job aids are often used together as complementary interventions.

When to Use EPSSs

All the following should be true before using an EPSS application:

- A performance problem exists that's caused by a knowledge or skills deficiency.
- Tasks related to the performance problem are relatively difficult to perform.
- The tasks are performed infrequently.
- The tasks don't have to be performed in emergency situations.
- There are serious implications if the tasks are performed inadequately.
- The performance environment accommodates the EPSS hardware.

EPSS applications are especially useful when the performance is cognitive rather than psychomotor. Also, when supported tasks involve software, EPSS applications fit well.

When possible, an EPSS (or another job aid) should be used instead of training to address knowledge and skills deficiencies. As mentioned previously, there are three problems with classroom training:

- Training is expensive.
- Training is hard to schedule.
- Training is temporary. Learners don't retain knowledge or skills unless they have an opportunity to practice.

A job aid is a permanent company asset that doesn't require scheduling. Almost always, it costs less to address knowledge and skills problems with a job aid than with training. When all costs are considered, this is also true of most EPSS applications.

When Not to Use EPSSs

An EPSS should not be used just to have a technology-based solution. A conventional job aid (paper based) can do the job more simply and cost effectively.

Self-Directed Learning

Self-directed learning (SDL) is a general term that usually refers to self-paced training programs that use a wide variety of delivery media, ranging from print products to web-based systems. SDL also can refer to less formalized types of learning, such as team learning, knowledge management systems, and self-development programs.

When to Use SDL

Use SDL when

- the group of learners is large, dispersed, or both
- the subject matter is mostly cognitive in nature

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- learners have many individual needs
- the resources for classroom-based training aren't available
- just-in-time training is required
- the time to do proper design is available.

In its behavioral and psychological aspect, SDL is one of the foundation concepts for any intervention that's individualized to the point that each participant is responsible for some or all of the decision making. Learners' self-directedness must be analyzed and, if necessary, augmented if the intervention is to succeed.

The level of self-directedness in learners and, therefore, the ability to apply self-directed behaviors, is a key factor in interventions, such as creating a personal development plan, determining what newly learned knowledge should be placed in an organization's knowledge management system, or taking full advantage of a company's e-learning facility. These self-directed behaviors include self-confidence; inner directedness; achievement motivation; reflection; and effective skills in goal setting, decision making, observing, listening, and reading.

When Not to Use SDL

SDL should not be used with people who aren't prepared for it. If their level of self-directedness is low, simply putting them into a self-directed situation is not going to change that. As mentioned previously, this is one reason that self-instructional media, such as CD-ROMs and e-learning, have failed. It's also why personal development programs and knowledge management systems do not fulfill their potential.

In addition, SDL should not be used unless a program with a self-directed design is in place. Self-directed designs require more emphasis on objectives and criterion-referenced evaluation than classroom designs do. This requirement in turn means a stronger upfront analysis and a higher degree of specificity in content. Normally, the usual facilitator guide and participant guide aren't enough detail for the average SDL program. Because the instructor is removed from the learning process, the instructional designer must do a better job of anticipating questions about the content and the delivery mechanism (for example, the technology and the job aid).