

# Forensic Science Education for the Civil and Criminal Justice Communities

Susan G. Zucker

Effective planning and development of distance learning programs are discussed in this article. The focus is on differences between distance education and Web-based learning, factors to consider when planning distance education, course management system (CMS) features, deciding whether to use synchronous or asynchronous teaching tools, partnering with other institutions, and integrating multiple learning formats into distance education. This information is applicable to distance learning initiatives in other organizations.



## DIFFERENCES BETWEEN DISTANCE EDUCATION AND WEB-BASED LEARNING

The main difference between distance education and Web-based learning is that distance education is achieved through many forms and actually *includes* Web-based learning. One is a subset of the other.

## DEFINING DISTANCE EDUCATION

There are many ways to define distance education, but it always involves a separation of teacher and learner and the use of technology. In its most broad definition, distance education implies any learning that does not take place in-person and does not necessarily include sharing ideas between teacher and learner.

However, the definition used by the United States Distance Learning Association (USDLA, 2005) to define distance learning guided the author of this article. The definition is: "The acquisition of knowledge and skills through mediated

information and instruction, encompassing all technologies and other forms of learning at a distance." The key word here is "mediated," which means that ideas between teachers and learners are exchanged and that learners are guided through material.

The technology used in distance education commonly involves two-way interactive telecommunications systems and communication that is synchronous, but most often asynchronous. Distance education actually combines both modalities. To achieve distance education, teachers and learners are connected via systems making instruction possible via video, data, and voice instruction in both synchronous and asynchronous formats. Examples include: course management software (CMS) such as Blackboard and WebCT; live e-learning and collaboration software such as Horizon Live, Elluminate, and Merlin; and Web-based presentation software such as Cast:Stream, Mediasite Live RL, WebEx, and Microsoft Producer. Other distance learning technologies include: CD-ROMs, DVDs, video and teleconferencing, audio and video tapes, live Web streaming, Web-based archived presentations, and Websites designed specifically for the delivery of distance education.

### **DEFINING WEB-BASED EDUCATION (WBE)**

Also known as Web-based instruction (WBI), Khan's (1997) definition is "a hypermedia-based instructional program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported" (p. 6). Relan and Gillani (1997) define WBI as: "the application of a repertoire of cognitively oriented instructional strategies ... utilizing the attributes and resources of the World Wide Web" (p. 43). The common theme of these definitions is that WBI takes advantage of

the Internet and World Wide Web to deliver instructional information.

Note that the World Wide Web (Web) and the Internet are not the same. The Web is a graphical user interface (GUI) that sits on top of the Internet. The Internet is the infrastructure that enables communication between servers and computers worldwide.

### **FACTORS TO CONSIDER WHEN PLANNING DISTANCE EDUCATION**

There are many aspects to consider when planning a distance education program, including: (1) identifying the needs of the target audience including their familiarity with technology, (2) the accessibility of various technologies such as videoconferencing or Web-based classes via a CMS, (3) the need for testing, progress tracking, and continuing education, (4) topics considered necessary and important, (5) cost of developing distance learning programs, (6) quality control, (7) accreditation, (8) marketing the program, and (9) hiring technology personnel who will implement the program.

### **COURSE MANAGEMENT SYSTEM (CMS) FEATURES**

There are many features of a CMS that allow instructors to plan and manage their courses and allow students to track their progress using an easy interface that requires no knowledge of HTML. There are a couple ways for teachers and students to interact: synchronous chatting is one; asynchronous usage of the internal e-mail system and threaded discussions capabilities is another.

CMS features are designed for instructor-led learning. A virtual learning environment is created that is equivalent to taking semester long classes given at the typical college or university. As such, most of the tools are geared toward assisting in

the delivery and administration of a formal learning experience.

### **DECIDING WHETHER TO USE SYNCHRONOUS OR ASYNCHRONOUS TEACHING TOOLS**

Determining the format to which your target audience will be most responsive depends on various factors including but not limited to: hardware capabilities, time constraints, technical expertise, and continuing education requirements. Synchronous communication requires much more advanced planning than asynchronous communication because everyone has to be online together. Synchronous communications are made more difficult with slower access to the Internet, by time constraints, and limited technical and keyboarding expertise. Some continuing education requirements require that there be some form of "live" interaction to earn continuing education units (CEUs).

### **PARTNERING WITH OTHER INSTITUTIONS**

Institutions most commonly host their own operations within content management systems (CMS) such as Blackboard or WebCT or have the CMS managed for them for a fee by the representative companies. There are instances in which two or more institutions will cosponsor a degree or certificate program and one institution may pay the other a fee to offset the cost of hosting the online program.

For example, law schools can take advantage of having their online Blackboard and TWEN courses hosted at no cost through their affiliations with comprehensive online database providers Lexis Nexis and Westlaw. Lexis Nexis features online hosting of Blackboard courses; Westlaw features online hosting of TWEN courses.

### **INTEGRATING MULTIPLE LEARNING FORMATS INTO A DISTANCE EDUCATION PROGRAM**

Media such as CD-ROM, DVD-ROM, audio and video tapes, print media, live and archived Webcasts, programs offered via video-on-demand, and presentations made via tele- and videoconferencing are often used in combination to deliver instruction. Mixing various event-based activities including face-to-face classrooms, live e-learning, and self-paced learning constitutes models of distance learning. Synchronous and asynchronous methods in combination often produce a textured, varied, and effective approach. Distance education takes many forms, and combining different formats often meets learners' needs best.

Using more than one delivery method in a single course, combining online and face-to-face approaches, and/or mixing various event-based activities, including face-to-face classrooms, live e-learning, and self-paced learning is called blended learning. Blended learning is categorized into three models: (1) skill-driven learning, which combines self-paced learning with instructor or facilitator support to develop specific knowledge and skills; (2) attitude-driven learning, which mixes various events and delivery media to develop specific behaviors; and (3) competency-driven learning, which blends performance support tools with knowledge management resources and mentoring to develop workplace competencies. A more dynamic learning environment that allows different options and expressions of educational materials is created when different media are combined (Distance Education Clearinghouse, 2005; Valiathan, 2002).

Learners seeking a degree or a certificate may take entire instructor-led courses managed and maintained online through a CMS with minimal in-person contact. Progress is tracked through a digital gradebook, and permanent digital records are

kept. Learners seeking information unrelated to a degree or a certificate use the same media and the same methods, such as blended learning, as those who are involved with a formal program usually with the exception of courses offered via a CMS. It is imperative that those planning distance education programs understand their target populations' capabilities and needs to achieve maximum effectiveness.

### **A CASE STUDY ... NCSTL GETS STARTED**

The National Clearinghouse for Science, Technology and the Law (NCSTL) at Stetson University College of Law is currently developing a distance forensic science education program for the civil and criminal justice communities. To determine learner preferences in receiving information and to inform the most effective ways of delivering instruction, a survey was designed and distributed to the relevant constituency comprised of lawyers, judges, law enforcement, scientists, engineers, teachers, and others.

### **THE SURVEY**

The questionnaire was designed to determine the hardware capabilities of the target audience, the accessibility of time and interest to the target audience, their comfort level with technology, and their preferences with respect to online learning. Adult and distance learning theories were supported by those responding with regard to preferences in receiving information. These preferences are summarized: in-person, Web-delivered, DVDs, and other asynchronous media. The responses will assist NCSTL in making most of the initial determinations for the Web-based learning program.

### **RESPONDENT DATA**

This group of diverse learners prefer in-person learning environments as most

adults do because they provide social and networking opportunities. However, other learning options are considered valuable due to their portability, convenience, and time- and cost-effectiveness. These other options include both synchronous and asynchronous learning environments and use of the media listed on the first page in the section "Defining Distance Education."

### **ANALYSIS OF THE DATA**

The research indicates that a vast majority of respondents have the hardware needed to participate in an online program at home or at work. While a majority of respondents have a DVD drive in their computers, a sizeable minority (41%) do not.

Approximately one third have dial-up access at home rather than fast access to the Internet (cable, DSL, ISDN, T-1). This means that there is a group of people who cannot take full advantage of Internet materials from home; such as, video and live Web-streams require more bandwidth than text and pictures. Most people, however, use a computer at work and have high-speed access there.

Eighty-nine percent regularly do work-related research on the Internet and 74% have used specific work-related research environments such as searchable databases. Fifty-nine percent indicated that they have never participated in online training or courses but had participated in Web-conferences and/or videoconferences. Of the 59% who stated that they had never participated in an online training session or course, 25% had participated in a web conference and 41% had participated in a videoconference.

Of the 41% who had participated in online training or courses, 52% used a learning platform such as WebCT or BlackBoard. The majority of respondents indicated that they would like to use audio, video, printed materials and CD-ROMs; 88% expressed a preference for CD-ROMs.

Half preferred reviewing materials on their own, and 31% had no preference. Interestingly, though respondents indicated that they had had some experience with synchronous training sessions, many indicated unfamiliarity with asynchronous learning materials.

Most respondents indicated a preference in accessing live online training sessions "during the day on weekdays" or no preference. Over half (57%) stated that they would access prerecorded courses during the day. This indicates that online Web materials such as video, audio, and graphics that require fast Internet service could be produced and be accessed during the day.

Regarding the amount of interactivity desired in an online course, 68% indicated that they would like to communicate with others taking the same class. Of those who preferred to work on the materials on their own, 66% still indicated that they want interaction with others who are working on the same content and 56% of those who had no preference in whether they worked on material alone or were instructor led indicated that they wanted interaction with those taking the same class.

## RECOMMENDATIONS

Findings and issues raised in this article are recommendations that will be helpful to other organizations. They include: (1) Commence by providing learners with

asynchronous self-directed learning materials; (2) Introduce materials that can be provided both asynchronously and synchronously in a Web-based environment as the program matures; (3) Offer live lectures (delivered over the Internet) and perhaps instructor-led courses in the future; (4) Use easy-to-use training materials in conjunction with asynchronous delivery because many are unfamiliar with asynchronous learning. Specifically, the first materials should be distributed on CD-ROMs rather than DVDs until DVD technology is more widely used.

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