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John D. Solis

University of Northern Iowa

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Implications of Face-To-Face And Web-Based Asynchronous Staff Development Approaches

Abstract

As more institutions of higher education invest in technology, an increased number of educators have to keep up with those technologies. Technology opens new opportunities to teach and to learn. However, if technology is to be used to support learning, educators must first be comfortable using technology. In order for educators to become comfortable and to effectively use technology in their own teaching, staff development opportunities must be set in place. Staff development programs need to be relevant to the specific needs of educators of higher education. Because technology is rapidly changing, it is impossible for educators to know all of the "nuts and bolts" of applying technology into their classrooms. However, educators can participate in activities that are specific to their own needs. Staff development programs need to do just that. Although traditional face-to-face staff development approaches have a poor track record, the use of the World Wide Web has provided new avenues of delivering staff development opportunities to educators. Research has concluded that, although both face-to-face and web-based staff development approaches have advantages and disadvantages, there is no one approach that will meet the staff development needs of all educators. Staff development must be tailored to a specific group of educators if programs are to be successful. This review will attempt to answer the questions, "what staff development approaches, face-to-face or web-based, are effective for training educators in technology use; and what are the areas for future research in professional development for the use of technology?"

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Implications of Face-To-Face And Web-Based Asynchronous Staff Development Approaches

A Graduate Review

Submitted to the

Division of Educational Technology

Department of Curriculum and Instruction

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

UNIVERSITY OF NORTHERN IOWA

By

John D. Solis

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This Review by: John David Solis

Titled: Implications of Face-To-Face And Web-Based Asynchronous Staff Development Approaches

has been approved as meeting the research requirement for the

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Date Approved

J. Ana Donaldson
Graduate Faculty Reader

April 22, 2003
Date Approved

Sharon E. Smaldino
Graduate Faculty Reader

4/23/03
Date Approved

Rick C. Traw
Head, Department of Curriculum and Instruction

Abstract

As more institutions of higher education invest in technology, an increased number of educators have to keep up with those technologies. Technology opens new opportunities to teach and to learn. However, if technology is to be used to support learning, educators must first be comfortable using technology. In order for educators to become comfortable and to effectively use technology in their own teaching, staff development opportunities must be set in place. Staff development programs need to be relevant to the specific needs of educators of higher education. Because technology is rapidly changing, it is impossible for educators to know all of the "nuts and bolts" of applying technology into their classrooms. However, educators can participate in activities that are specific to their own needs. Staff development programs need to do just that.

Although traditional face-to-face staff development approaches have a poor track record, the use of the World Wide Web has provided new avenues of delivering staff development opportunities to educators. Research has concluded that, although both face-to-face and web-based staff development approaches have advantages and disadvantages, there is no one approach that will meet the staff development needs of all educators. Staff development must be tailored to a specific group of educators if programs are to be successful. This review will attempt to answer the questions, "what staff development approaches, face-to-face or web-based, are effective for training educators in technology use; and what are the areas for future research in professional development for the use of technology?"

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Introduction

No Significant Difference

The use of the World Wide Web for educational purposes is widespread and rapidly growing. Thousands of university courses have been developed to be delivered entirely via the web. This trend will continue to accelerate as more colleges and universities urge faculty to create online versions of their face-to-face courses.

Some educators believe that the use of the World Wide Web can provide opportunities to learners who would otherwise have to do without, and they believe those courses can be of a quality comparable to traditional face-to-face courses (Dutton & Dutton, 2002). However, there are educators who are suspicious of such courses and have significant doubts about an instructional medium that does not include face-to-face interaction between an instructor and a learner (Dutton & Dutton, 2002). Because of this concern, research has focused on whether or not learners perform better in online courses versus traditional face-to-face courses. Studies have been conducted comparing online and face-to-face courses that indicate, on average, learners perform at least as well in classes with an online component (Boulet & Boudreault, 1998; Davis, 1996; Dutton, Dutton & Perry, 2001; Liu, MacMillan, & Timmons, 1998; Navarro & Shoemaker, 1998; Russell, 1999; Spooner, Jordan, Algozzine, & Spooner, 1999).

Staff Development and Technology Use

With institutions of higher education investing in classroom technology, there has been a growing realization that these expensive technological resources will never be used to their fullest unless educators are provided professional development to guide their

use (Grant, n.d.). Many institutions have faced this challenge by sending teachers to training sessions on the use of specific technologies. The problem has been that traditional face-to-face training sessions, or "one-time-only" workshops, have not been effective in making educators comfortable with integrating technology into their curricula (North Central Regional Technology in Educational Laboratory, 2000). Technologies continue to be used sporadically by educators despite the expectations of staff developers, administrators, and the teachers themselves. In the majority of instances, traditional staff development approaches have not been effective with regards to effective technology integration. The purpose of this literature review is to examine traditional face-to-face staff development approaches and web-based asynchronous staff development approaches with regards to technology use in the classroom.

Methodology

Finding reliable and valid sources of information on staff development was a challenge for the researcher. The researcher used electronic databases using keyword-searching methods to locate traditional and online sources on the topic. The primary database used to locate sources was ERIC (Educational Resources Information Center). The ERIC database was useful in locating full-text articles from well-known research journals and publications. ERIC is a database that focuses on retrieving sources related to education. This uniqueness simplified finding sources on adult learners, distance education, technology use, and staff development. Another database used to locate sources was the University of Northern Iowa's Rod Library Catalog, known as UNISTAR. The researcher used UNISTAR primarily to locate traditional sources such

as books and some research articles. The third source of locating traditional sources was the faculty within the Educational Technology Division at the University of Northern Iowa. The researcher was able to review books from respected researchers in the fields of staff development, distance education, and instructional technology. The final source of locating information was the use of World Wide Web search engines. The researcher was able to locate full-text research articles from online journals using search engines. The challenge of citing resources from the World Wide Web is that the researcher had to check for the credibility of the information found. This was an important issue because the researcher recognizes that anyone can publish information online that is false or misleading. To check for credibility, the researcher found background information on the authors of the online sources and determined if the information was credible. To determine further credibility, the researcher entered the authors' names into the ERIC database and found that many of the authors have several publications in the fields of staff development, distance education, and/or instructional technology.

The primary rationale for selecting the sources described above was reliability. The researcher recognized that he had access to human and electronic resources that would make locating sources of information fairly easy. However, it was the researcher's responsibility to determine the credibility and the validity of the information to be referenced in this literature review. The second rationale for selecting the above sources is the researcher's own interest in the topic of staff development and use of technology. The researcher intends to use this literature review as a foundation for future research in staff development in the area of technology integration.

The researcher developed a list of criteria for evaluating the information cited throughout this review.

1. Is this the actual writer/author of the information? (Credibility)
2. Is the information verifiable and authentic? (Validity)
3. Has the information been used in other research?
4. Is the information based on previous research?
5. Does the information cite well-known researchers on the given topic?
6. Is the information presented in a clear and organized manner?

Analysis and Discussion

Purpose of Educational Programs for Adults

According to Caffarella (1994), educational (or staff development) programs for adults are conducted for five primary purposes:

1. Encourage continuous growth and development of individuals.
2. Assist people in responding to practical problems and issues of adult life.
3. Prepare people for current and future work opportunities.
4. Assist organizations in achieving desired results and adapting to change.
5. Provide opportunities to examine community and societal issues.

Educational programs sometimes serve more than one purpose. Regardless of the five purposes, change is the ultimate outcome or result for conducting educational, or staff development, opportunities. Caffarella (1994) also describes three categories of change. The first *is individual change* related to the acquisition of new knowledge, building of skills, and examining personal values and beliefs. The second type is *organizational*

change resulting in new or revised policies, procedures, and ways of working. Finally, there is *community and societal change* that allows for differing segments of society (for example, members of the lower economic class, ethnic minorities, women, the business sector) to respond to the world around them in a variety of ways.

Even though change underlies all educational and staff development programs, the reality is that most programs are not an integral part of a larger program planning process (Caffarella, 1994). Instead, staff developers and planners assume that learners will apply what they have learned to their work situations. Perhaps this *assumption* is why many staff development programs fail even though they may be well structured.

Defining Professional Development

There are many interpretations of the term *professional development*. The ERIC database defines professional development as "activities to enhance professional career growth,"(Educational Resources Information Center, 1979). Activities may include individual development, continuing education, in-service education, curriculum writing, peer collaboration, study groups, and peer coaching or mentoring. Fullan and Steigelbauer (1991), expands on ERIC's definition to include "the sum total of formal and informal learning experiences throughout one's career from pre-service teacher education to retirement" (p. 326). Grant (n.d.) suggests a broader definition of professional development in a "technological age:"

> Professional development goes beyond the term 'training'with its implications of learning skills, and encompasses a definition that includes formal and informal means of helping teachers not only learn new skills but also develop new insights

> into pedagogy and their own practice, and explore new or advanced understandings of content and resources. This definition of professional development includes support for teachers as they encounter the challenges that come with putting into practice their evolving understandings about the use of technology to support inquiry-based learning. Current technologies offer resources to meet these challenges and provide teachers with a cluster of supports that help them continue to grow in their professional skills, understandings, and interests. (p. 1)

With changes in the definition of professional development, an opportunity exists for those who provide professional development to look at new frameworks of meeting the developmental needs of adult learners. In addition, learners may have the opportunity to experience staff development opportunities that demonstrate the importance of shared responsibility, collaboration, and continual learning (Zahner, 2002).

The North Central Regional Educational Laboratory (2000) gives suggestions on what components need to be integrated into any effective staff development approach on technology use. These suggestions include:

1. *Connection to the educator's learning.* The goal of professional development is to improve learning. The use of technology facilitates the following: enabling educators to implement new teaching techniques, helping their own learners work collaboratively and develop higher-order thinking skills, encouraging those learners to be engaged in the learning process, assisting those learners who have various learning styles and special needs, and exposing those learners to a broad range of information.

2. *Hands-on technology use.* Hands-on technology use allows educators to develop confidence in their skills and comfort levels with the technology.

3. *Variety of learning experiences.* Learning experiences can come in a variety of forms, such as mentoring, observation, workshops, online courses, WebQuests, and many others as discussed in this review. Whichever format is used, effective professional development incorporates adult learning theory. Adults require relevant, concrete experiences with adequate support, appropriate feedback, and long-term follow-up (as cited in Speck, 1996).

4. *Curriculum-specific applications.* If technology is to be used to improve student achievement, educators need to see the link between technology and the curriculum for which they are responsible (as cited in Byrom, 1998). An effective professional development approach is job related and tied to learning goals. It provides activities in the context of practice.

5. *New roles for educators.* Educators take on new roles both outside and within the classroom. Within the classroom, technology supports student-centered instruction. The teacher takes the role of a facilitator while his or her students work collaboratively. Outside the classroom, technology can support teacher collaboration.

6. *Collegial learning.* A staff development approach that helps educators integrate technology for learning, develop students' higher-order thinking skills, and communicate ideas is fairly new and demanding. To make this happen, however, educators need to work collaboratively with other educators. In addition, educators need

time to discuss technology use with other educators whether face-to-face or electronically.

7. *Active participation of educators.* Staff development programs have to motivate educators to spend the time and energy necessary to develop technology competency. One way of doing this is to create incentives for technology use. Incentives may include pay, bonuses, rewards, or some other compensation system. Incentive systems have to be used carefully. Although group rewards may motivate some educators, individual rewards may increase competition among staff or lead to less equitable distribution of technology (as cited in Lockwood, 1999). The only way to ensure that students have the same opportunities is to require all educators to become proficient in the use of technology to support student learning.

8. *Ongoing process.* A high-quality staff development program for educators of higher education is conducted as an ongoing process; not a one-shot or one session approach. Educators need continued utilization to become comfortable with and to implement change, especially relative to technology.

9. *Sufficient time.* A high-quality staff development program provides sufficient time and follow-up support for educators to master necessary mechanical skills and integrate skills into practice. Educators need time to plan, practice skills, try out new ideas, collaborate, and reflect on ideas and implementation.

10. *Technical assistance and support.* Educators need on-site access to technical support personnel who are responsible for troubleshooting and assistance after the educator has completed staff development sessions and activities. Educators will

occasionally encounter hardware and software problems that are beyond their control or problem resolution skills.

11. *Administrative support.* Administrators must have a clear vision of technology to support teaching and learning and possess an understanding of the roles that all educators must play in achieving that vision with regards to technology use. Administrators should also participate in staff development activities so they are aware of how technology is used and what problems educators might experience.

12. *Adequate resources.* Educators and staff developers must have access to the necessary technical equipment to provide the hands-on experiences with technology. Educators also need equipment for their own learners to use in their classrooms.

13. *Continuous funding.* Finding funding for ongoing technology needs and staff development can be a difficult challenge. Funding sources may come from bonds, grants, federal and state programs, department budgets, and even businesses and other organizations. As a general rule, the costs of using technology to improve teaching and learning should not be considered a one-time investment but an ongoing expense.

14. *Built-in evaluation.* An effective staff development program uses evaluation to ensure that each activity is meeting the needs of the participants and providing them with new learning experiences. The goal of evaluation is to determine whether staff development promotes using technology to improve student achievement.

The key idea of the above fourteen suggestions is that meeting the specific staff development needs of educators is central to the learning process. The learner needs to be the focus in any staff development program to be successful.

Traditional Face-to-Face Staff Development

Looking beyond the training paradigm. Research on staff development is diverse. The field's early research has focused on staff development methods that followed a training model, or paradigm. Examples include short-term sessions and one-day workshops that are designed to train learners on discrete skills and techniques. However, under certain conditions, such as a workshop setting, training-based staff development approaches can be useful in delivering to educators certain types of information about teaching techniques and technology (Grant, n.d.).

In Grant's (n.d.) discussion, the stated problem with training-based staff development approaches is that the skills acquired through training may not help educators move beyond the *mechanical use* of curriculum and technology to become *facilitators* of integration (as cited in Lieberman & Miller, 1990; Little, 1993). In order for educators to move from a mechanical user to a facilitator of integration, staff development opportunities need to be structured in a way that allows for deep discussion, open debates, and a variety of possibilities for action (Little, 1993). In addition, educators need to understand that the transition from mechanical user to facilitator will allow them to experience first-hand how technology can be an effective teaching and learning tool for problem-solving, decision-making, and generating higher order thinking skills.

Workshops and classes. Many traditional staff development programs involve the *how to* of specific software applications and hardware utilization. This approach is an excellent opportunity for educators to explore new software and other technological tools.

In addition, workshops can involve activities that would not fall under the term *training*. Educators can experience first-hand how technology can support learning. According to Grant (n.d.) educators can:

1. explore technology use for their own learning in a cooperative group setting with hands-on experiences,
2. research their own questions and problems,
3. discuss how technological tools fit into their own experiences with teaching and learning, and
4. work collaboratively with others in creating curriculum-based technology plans for teaching.

These activities can help educators understand their own students' experiences of learning by experiencing how technology use supports how learners learn and how learners can use technological tools for communication, research, problem-solving, decision-making, and generating higher order thinking skills.

One of the major problems of traditional face-to-face workshops and classes for educators is time. Where do educators find time for professional development? Purnell and Hill (as cited in North Central Regional Educational Laboratory, 1997) identify six general approaches to allocate additional time for staff development.

1. Promote time outside the classroom (for example, use substitutes to take over class sessions so that teachers can attend workshops, conferences, and observing others educators).

2. Refocus the purpose of existing time commitments (for example, staff and department meetings).
3. Reschedule classes, if possible.
4. Increase the amount of available time (for example, use of supplemental contracts and stipends for educators to attend summer training sessions, extend participation beyond usual staff development hours).
5. Promote educators to volunteer some of their time (for example, create conducive conditions such as babysitting services, allocate space for professional development such as computer labs and other facilities).
6. Promote more efficient time use (for example, make meetings more efficient, use technology).

Although these six general approaches are geared towards K-12 educators, educators in higher education may also apply some of the approaches to allocate time for professional development opportunities. Other ways to create time for professional development may include releasing students early from class; collaborating with other instructors on the weekends; and creating incentives, or compensation, for taking time for professional development.

Another barrier that may also be a problem is location. Creating time and a place to conduct workshops and classes to meet the needs of all educators may be a difficult challenge. Geographic location can become a problem for both the learners (in this case the educators) and the staff developers or trainers. Often times workshops and classes are offered when technology coordinators or administrators deem them appropriate, rather

than tailoring times and locations to educators' needs for learning and follow-up activities.

Observation. Observation, sometimes called *peer coaching*, is based on the idea that relationships between educators can affect teaching practices and beliefs (Grant, n.d.). Feedback from other educators may not only affect teaching practices but also how technology is used to support learning. In a typical observation scenario, instructors pair up and take turns observing each other's courses. Instructors keep a record of their fellow co-worker, documenting what the instructor and learners say and do. This process may be done over a long period of time. This process is beneficial for both instructors because feedback can be used to give suggestions on how instruction can be improved or approached differently and how technology can be used to support instruction and learning.

The first challenge with observations is that an observer has to be available during specific class hours. Instructors may not be able to have a substitute in order to observe another instructor. Another problem is that if an observer is going to another school or institution, options may be limited and observation settings may be undesirable. Finally, observers may not see what they hoped to see during their observations. For example, an observer might have wanted to see technology used within a lesson that was being taught, but that never happened.

Mentoring. Mentoring is an approach where one novice and one experienced user of technology support each other on technology use in the classroom. Novice technology users may benefit in a mentoring relationship by considering an experienced instructor as

a role model in technology integration. Experienced users learn as they listen to novice users. In order to demonstrate and explain their practice in helpful ways, experienced instructors need to reflect on themselves and beliefs about teaching (Grant, n.d.). As a result, experienced users gain a sense of satisfaction when novice technology users apply what they have learned during a mentoring experience. Nellen (1999) determined common areas where educators most need technology training.

1. How to operate and feel comfortable using technology
2. How to effectively integrate technology such as software applications and hardware tools, i.e., Power Point, DVDs, and presentation devices
3. How to assess student work using technology
4. How to search the Internet

Mentoring is just one approach to meeting these objectives.

Like workshops and classes, time and place may pose a problem with mentoring. Mentoring may take a long period of time to be successful. The researcher of this literature has first-hand mentoring experience and supports the statement that time is an issue. Another obstacle is that the two mentoring instructors are not compatible. For example, one instructor may have different beliefs on teaching and technology use than the other instructor. This may have a negative affect on how novice technology users integrate technology into their curriculum.

Working with a technology specialist. Technology specialists can provide assistance and support to instructors on technology use. Technology specialists need to be aware of the meaningful use of technology for the classroom so that instructors can

apply these methods effectively. Working with a technology specialist may be similar to mentoring except that the technology specialist may or may not be an instructor him/herself. The guidance is more relevant and credible to the instructors they are working with when a technology specialist, sometimes called a *curriculum specialist*, is an instructor who understands the curriculum and culture of that particular learning environment. In addition, both instructors and technology specialists can work collaboratively in planning and executing effective technology integration.

The first difficulty with this approach is that a technology specialist may not be an instructor and may not understand the learning needs of a particular group of learners. This is not to suggest that a technology specialist who is not a teacher can not effectively work with instructors with technology integration. More time may need to be spent on planning and applying technology use for a specific learning environment. Another problem is that a technology specialist's skills may be limited. For example, a technology specialist may have a strong understanding of the needs of specific learners, however, their technical skills may be limited. Technology specialists need to take time to keep up-to-date with technical skills that may be important for instructors to integrate in their classrooms. The ideal specialist would have a strong technical skill base as well as an understanding of learning and curriculum needs.

Partnerships with outside organizations. Outside organizations may be in varied forms, from local businesses and educational agencies to other universities and consulting agencies. When establishing a partnership between instructors of higher education and an outside organization, there needs to be a stated goal of the staff development needs.

This statement needs to be recognized and understood by both participants in the partnership. Grant (as cited in Loucks-Horssley, Harding, Arbuckle, Murray, Dubea, & Williams, 1987) provides a description of a model used by the U.S. Corps:

> No matter what the goals, partnerships with businesses and institutions of higher education can build local capacity for school improvement. Partnerships can provide the opportunity to pool resources and can bring in additional resources for comprehensive and relevant staff development. Partnership can encourage teachers to try on new perspectives, protecting them from becoming too insular and from depending solely on other educators for new techniques and training. Partnerships for staff development can keep teachers in touch with a broader knowledge base and the realities of our society. All parties are enriched by the opportunity to become more familiar with the culture and ways of doing things in different organizations. (p. 122)

The first problem with this approach is that there may not be a local appropriate organization willing to establish a partnership. Second, establishing a partnership may be too costly. Third, an outside organization may lack the expertise that educators are seeking for professional development. In addition, outside organizations, like businesses, may have different ideas and beliefs of how technology should be used. This can pose a problem if the ideas of an outside organization differ from the ideas of educators in higher education. What a professor believes to be effective technology utilization may be different from what a local business believes to be effective technology use. Staff

development through a partnership needs to reflect teaching, learning, and technology use in the context of higher education.

A poor track record. As mentioned in the introduction, traditional staff development approaches have often proven to be ineffective in training educators to integrate technology into the curriculum. Many staff development programs are sometimes developed in a short period of time and are ineffective. In addition, technology continues to be used sporadically by educators. Administrators and trainers cannot expect educators to walk out of an inadequate training session on technology use and apply what they have learned into their teaching. Staff development approaches need to expand beyond the training paradigm and explore new ways of using a variety of technological tools that support how learners learn with regards to using problem-solving, decision-making, and higher order thinking skills. The traditional staff development approaches described earlier have failed to expand past the training paradigm and as a result educators have viewed staff development as a waste of time and resources (McKenzie, 1991). McKenzie continues to state that the traditional staff development approaches often give educators inadequate opportunities to practice new skills and offer little ongoing support or follow-up activities during succeeding months. Hence, there is a poor transfer of learning new skills from the traditional approaches to the educator's classroom.

There are many possible reasons behind the poor track record of traditional face-to-face approaches to staff development. First, staff development opportunities have focused on learning skills within the training paradigm (Sujo De Montes & Gonzales,

2000). Second, a lack of administrative support and lack of understanding of research that identifies the elements required to deliver a successful staff development program for educators (McKenzie, 1991). A lack of adequate resources, funding, and the evaluation process also contributes to the failure of many traditional face-to-face staff development approaches. Distance learning is an avenue for expanding beyond the training paradigm.

Web-Based Asynchronous Staff Development

What is distance learning? Distance learning is a form of education characterized by (1) a physical separation of learners from the instructor, (2) an organized instructional program, (3) technological media, and (4) two-way communication (Heinich, Molenda, Russell, & Smaldino, 2002). Barry (2002) provides a similar definition of distance learning.

> Within the context of rapid technological change and shifting market conditions, the American education system is challenged with providing increased educational opportunities without increased budgets. Many educational institutions are answering this challenge by developing distance education programs. At its most basic level, distance education takes place when a teacher and student(s) are separated by physical distance, and technology (i.e., voice, video, data, and print), often in concert with face-to-face communication, is used to bridge the instructional gap. These types of programs can provide adults with a second chance at a college education, reach those disadvantaged by limited time, distance or physical disability, and update the knowledge base of workers at their places of employment (staff development). (p. 1)

What is asynchronous learning? Asynchronous learning refers to providing learning opportunities and support that can take place or be accessed at any time and at any location. Through asynchronous learning technology, a staff developer or trainer can supplement classroom/workshop staff development with additional course or workshop information, lecture notes, presentation, links to related web sites, two-way communication tools, online reference materials, and provide immediate feedback to learners. One of the advantages of asynchronous learning is that both instructors and learners do not have to participate in learning activities at the same time. Learners can access information around their own schedules as he or she sees fits. The World Wide Web is the tool that many educators are increasingly using to combine distance learning, asynchronous learning, and staff development.

The World Wide Web and distance asynchronous learning. A staff developer/trainer can create exciting staff development opportunities for educators with the use of the World Wide Web. Staff developers can create a workshop/course web site for educators to access course information, exercises, schedules, and research references. Links can also be provided to access library catalogs or even to educators' personal web sites. In addition, educators can access discussion boards for asynchronous discussions and email tools for communicating with other individual educators and staff developers.

The World Wide Web provides a multimedia-enhanced environment that can enrich a learner's learning experiences. With advancements in web browsers, learners can access streaming video and audio, PowerPoint presentations, and relevant online resources from any location. The advantage of using a tool that brings multimedia

together is that the tool itself (course management software that is accessed through a web browser) can be used to accommodate a variety of learning styles (Maushak, Chen, Martin, Shaw, & Unfred, 2001). For example, if a learner is the type that learns by listening, then a trainer may create links on a web site that streams audio files of lectures. This is an excellent way of receiving a lecture from any location with a mouse click at any location. Accommodating the needs of visual learners is another example of multimedia use within a web browser or course management software. If a student tends to learn visually, then a trainer can incorporate images and text for these types of learners. According to Lamb and Smith (1999), the web provides a global presence for the exchange of information, ideas, and resources. Because the web can display multimedia elements such as text, graphics, video, animation, audio, and even virtual reality movies, it is an opportunity to motivate learners and reach the individual needs of those learners. In addition, the interactive nature of the World Wide Web allows learners to make connections with information and resources on a global level (Lamb & Smith, 1999). By providing an interactive learning environment at a distance, trainers and staff developers can design staff development opportunities that allow educators to take control of their learning. With a sense of control, educators can learn at his or her comfort level or pace.

Distance education at a glance. Sujo De Montes and Gonzales (2000) state that the diversity of today's students and educators call for diverse forms of education, such as online courses, that caters to the needs of a diverse population. There are many technologies that can provide staff development opportunities for educators in higher

education. Many of the face-to-face staff development elements, such as two-way communication, can be accessed by educators at a distance and learned at their own pace.

The web is a fairly new medium for delivering and developing activities that are included in a traditional face-to-face learning environment. Web-based instruction and multimedia can be effectively developed as instructional tools (Sujo De Montes and Gonazales, 2000). The web can also be a powerful tool that can bring learners together through communication and collaboration.

Use of online delivery packages. There are a number of software packages on the market today that can be used to deliver web-based instruction. Examples of packages include WebCT, Blackboard, E-College, Virtual-U, and Symposium. Marra and Jonassen (2001) point out that the features of these online delivery packages have a significant impact on teaching practices and learning. Packages that have been proven to be effective in distance learning have features that contain options in the following categories: web browsing, asynchronous and synchronous sharing and communication, student tools, resources, lessons, course information, data, administration, help desk, and technical information. With the cost of Internet access decreasing, more and more individuals are able to easily access course content on their own time given the appropriate computer hardware and software. Finally, the use of a web-based delivery package allows for students to collaborate at a distance. In a distant learning environment, where there may be little or no face-to-face contact, learners have to find ways to communicate and collaborate with other learners. Web-based delivery packages are tools that make this possible in a distant learning environment.

One of the most common problems for any distant learning environment, including online delivery packages, is technical support. To access and use an online delivery package, a computer system with Internet access is required. Occasionally, learners will experience technical difficulties that he or she has no control over. For example, a computer hard drive might fail and the learner has no technical expertise to trouble shoot the problem. Another common problem is that a computer is not connecting to the Internet. A technician may know how to adjust an operating system setting to solve the problem, however, the average learner does not have enough expertise with computers to troubleshoot many simple problems. Slow Internet connection speeds may be a problem for some learners as well. Many learners continue to use modem connections that may adversely affect the time it takes to access online course or workshop material. Ideally, all learners should have high speed Internet access given the decreasing cost in many areas. This is not the case in all distant learning environments. A staff developer has to take into consideration the download time of online content so that learners at a distance do not spend long periods of time waiting for information to appear on their computer screens (Recesso, 2002).

Another problem related to technical difficulties encountered by learners is access to hardware and software. Not all learners have the convenience of a reliable home computer with an appropriate web browser and high speed Internet connection. Many distant learners have to drive long distances just to access facilities with computers and Internet access. There is always the chance that the online delivery package could be down. Occasionally, file servers may be down and access is denied to course materials

and information. Although this is an issue beyond a learner's control, this problem occasionally arises during important online activities or during critical times when a leaner needs access to online information.

Finally, although collaboration is one of the most promoted and used activities in a distant environment, learners consistently report frustrations related to collaboration. Marra and Jonassen explains (as cited in Kitchen & McDougall, 1998-99) reports that learners who needed to make quick decisions within their collaborative groups were not satisfied with how the online delivery package supported this process. In addition, learners indicated that, in the time it took for all group members to respond to an issue posted online and coordinate or negotiate requirements online, group members could have done those tasks in a shorter time in a face-to-face environment.

WebQuests. WebQuests have existed for almost a decade and are an innovative method of creating collaborative activities for distance learning. A WebQuest is an inquiry-oriented activity in which some or all of the information that learners interact with is derived from resources on the World Wide Web (Dodge, 1995). Although WebQuest have been primarily used in K-12 education, there is potential for using WebQuests for staff development purposes. All that is needed to access a WebQuest is a computer system, a web browser such as Netscape Navigator or Internet Explorer, and an Internet connection. These are the same requirements necessary for using an online delivery package except an online delivery package is not a necessity since learners simply navigate to a specific web site.

WebQuests may not only describe course/workshop information and contain online resources, but they also may utilize human resources in order to complete tasks collaboratively. According to Dodge (1995), WebQuests contain the following six components:

1. *Introduction*: An introduction sets the stage and provides background information about the collaborative activity. The introduction can raise a learners interest by making the activity seem (1) relevant to the learner's past experience, (2) relevant to the learner's future goals, (3) visually interesting, (4) important because of global implications, (5) urgent due to the need for a timely solution, or (6) fun because the learner will be playing a role.

2. *Task*: The is a description of the task the learners will have completed at the end of the WebQuest activity. It is important that the task is doable.

3. *Process*: This is where an instructor suggests the steps that the learners should take in accomplishing the task. It may include strategies for dividing the task into subtasks, descriptions of roles to be played or perspectives to be taken by each learner. The instructor can also use this section to provide task-related advice and interpersonal process advice, such as how to conduct brainstorming sessions. The process description should be fairly short and clear.

4. *Resources*: The set of information sources needed to complete the task is provided in this section. Many, but not necessarily all, of the sources are web-based sources such as web sites or online databases. Sources might include web documents, the

use of email, and traditional media resources such as books, videos, or CD-ROMs that are available in the learning environment.

5. *Evaluation*: The evaluation section ensures that the instructor and learners will be able to measure the results of completing the task. Learners will be aware of the structure of how they will be evaluated or in some cases graded. Numeric scales and rubrics are common evaluation tools used in WebQuests.

6. *Conclusion*: A conclusion brings closure to the WebQuest activity. It reminds the learners about what they have learned and encourages them to extend the experience into other domains. This is not a critical piece of the WebQuest, but it brings a sense of closure to the learners. A good use of the conclusion is to suggest questions that a teacher might use in a traditional face-to-face discussion to conclude a lesson.

WebQuests may be structured in a way that learners can gain both technical and curriculum integration skills by working collaboratively with other learners and utilizing other human resources. They also promote the use of higher-order thinking skills, and supports group work and interaction in either face-to-face or online settings. Educators in higher education can use WebQuests to learn how to use software tools to support learning. For example, a professor can collaborate with another professor and learn the basic skills for creating a web site using Netscape Composer or other software program. As a result of gaining web development skills, professors may then teach their own learners basic web development skills to complete class projects. Educators need to recognize that by gaining new technology skills, learners will be able to learn in new

ways that would not be possible, or would be more difficult, without the use of technology tools.

WebQuests are designed to be collaborative activities to meet specific learning goals. Although, collaboration and group work may sound like an ideal component for staff development, not all educators may choose to learn in a collaborative environment. If, for example, a learning goal involves independent research, exploration, and study, then a WebQuest may not be an effective methodology for delivering a staff development session.

Similar to accessing web content through an online delivery package, WebQuests run the occasional risk of not functioning. For example, a file server may not be running or a learner experiences technical difficulty that denies access to web content. In addition, Internet access may be an issue, as with any distant learning environment.

Finally, because WebQuests are fairly new there is no research material discovered by the author that examines the effectiveness of using WebQuest for staff development purposes as opposed to other distant learning delivery methods. More research is needed to examine WebQuests as a staff development tool.

Video. Live video, streaming video, CD-ROMs, or videotapes of skilled practice can play a powerful role in offering demonstrations and modeling to educators when actual observations are difficult to arrange (Grant, n.d.). Video is an excellent way of observing educators using technology to support learning. The University of Northern Iowa's InTime Project (www.intime.uni.edu) is an excellent source of videos that demonstrate technology being used in the classroom. Although InTime focuses on K-12

education, educators in higher education can also benefit because the educators' teaching may affect K-12 pre-service teachers with regards to technology use. By a professor examining the implications of technology use in a K-12 setting, a potential pre-service teacher at a college or university can be better prepared to enter a K-12 learning environment and integrate technology into teaching and learning. The InTime videos are an example of using streaming video asynchronously. Educators can access the streaming video files from any location at any time.

Video can be a powerful way to help educators reflect on their own students as learners and on themselves as teachers. Grant states (as cited in Storeygard & Fox, 1995) that video can be a powerful tool for educators.

> Typically, tapes of teaching practice are developed to present models of what good practice should look like...Videotapes of skilled, real-life, teachers being interrupted by "stuff" of everyday classroom life, are definitely more accessible and identifiable. The personal connection these tapes produce generates engaging discussions about real life. (p. 29)

The use of video is a common way to integrate visuals and audio into a learning environment. Lamb and Smith (1999) provide additional advantages of using video at a distance.

1. There is a sense of presence. Learners feel closer to each other when they can see and hear their peers or co-workers.

2. People are more comfortable with the natural pauses of a conversation that includes a visual element. Video makes it easier for learners to pay attention when they have both the audio and video channel available for engagement.

3. There is the ability to show objects and conduct demonstrations. Multiple channels of communication can be used, including visual and audio elements. Unlike many other tools, video allows users to see movement and view the instructional environment.

4. Live video is the most similar to a traditional face-to-face classroom or workshop setting.

One problem with using video for staff development is the length of time required for production. First, it takes time to produce a video that effectively demonstrates educators using technology in the classroom. Second, analyzing videotapes can be a time consuming process when examining one's own teaching.

Although the use of pre-recorded video is an option for learning and teaching at a distance, live video is more commonly used in a distance-learning environment. The downside of live video is that it reduces the flexibility of the distance-learning environment because learners are limited to a traditional face-to-face class or workshop meeting schedule (Lamb & Smith, 1999). This also restricts live video to a synchronous learning environment. The only way video can be used asynchronously is if the live video is video taped for later viewing or if the video is digitally encoded to be streamed and viewed over the World Wide Web. The primary problem with viewing streaming video over the Internet is that the quality is poor and there is limited capacity for the

Internet to carry video signals (Simonson, Smaldino, Albright, & Zvacek, 2003). Other problems with video may include (1) lack of live interaction with an instructor or other students, and (2) the cost of video production equipment, as well as copying and distribution costs.

Conclusions and Recommendations

Which Approach(es) Is/Are The Most Effective?

This literature review is attempting to answer two questions: (1) what staff development approaches, face-to-face or web-based, are effective for training educators in technology use; and (2) what are the areas for future research in professional development and technology use? A number of both face-to-face and web-based asynchronous staff development approaches were examined. The literature reveals that all of the approaches have advantages and disadvantages for staff development purposes for educators in higher education. There is no one right answer to which staff development approach is the most effective. Any of the face-to-face or web-based staff development approaches can be effective if structured and applied in a manner that meets the training/development needs of educators and learners. If educators in higher education are to integrate technology in teaching and learning, the educators must first be comfortable using technology. Any of the professional development approaches discussed in this review should provide opportunities for educators to experience technology first-hand and to obtain support from staff developers.

Areas for Future Research

One area where research is needed is to examine the implications of using WebQuests for staff development. WebQuests have been primarily used in K-12 education. There is limited research on how WebQuests can be applied in training educators of higher education for acquiring technology mechanical skills and on technology integration skills. Another area for research is to study the effects of multimedia as a staff development tool for educators of higher education. Guskey (1995) states three viewpoints of what many researchers in staff development believe regarding what staff development should incorporate.

1. Some researchers suggest that staff development efforts designed to facilitate change must be practitioner specific and focus on day-to-day activities at the classroom level. Other researchers indicate that more systemic or organizational approaches are necessary.

2. Some researchers stress that reforms in staff development must be initiated and carried out by individual teachers and other personnel. Others emphasize the most successful programs are those guided by a clear vision that sees beyond the walls of the traditional classroom, since educators and personnel generally lack the capacity to conceive and implement worthwhile improvements.

3. Some researchers argue that the most effective staff development efforts advocate change in a gradual and incremental fashion; not expecting too much at one time. Others insist that the broader the scope of the staff development program, the more likely the program is to elicit the enthusiasm and support of teachers.

More research may be needed to examine these opposing views regarding staff development. As technology changes, research on staff development will also change.

As noted before, one solitary staff development approach is not the solution to delivering an effective program. A staff development program needs to be relevant to the educators needs. On a final note, staff development programs need to be developed as part of a larger planning process. This planning process identifies specific visions, missions, goals, objectives, needs of educators, activities, and evaluation in order to not only deliver an effective staff development program but to improve future staff development approaches and methodologies.

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