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ABSTRACT

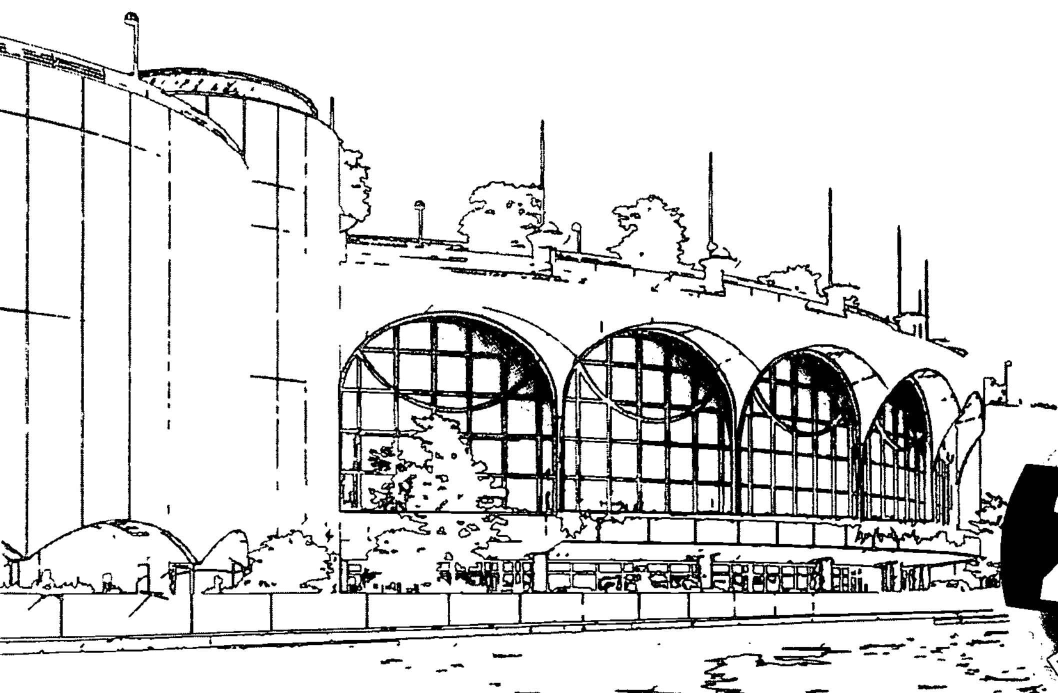
These proceedings contain 90 papers that address important human factors in distance education from several perspectives, provide insights into how those factors contribute to successful outcomes, and describe practical methods for implementing similar approaches in other settings. They include "Is Your E-Everything Accessible to Everyone?" (Anderson et al.); "Social Dynamics of Online Learning" (Baker, Woods); "Self-Directed Executive Education Courses" (Beatty et al.); "Managing the Development of Technology- Based Courses" (Bennett et al.); "Substituting for Yourself" (Bergmann, Bergmann); "Online Learning in K-12 Schools" (Blomeyer, Hemphill); "Faculty Preparation" (Brown, Henderson); "Management and Delivery of Technical BS Degree Completion and MS Degree Programs to Distance Learners" (Cockrell, Pearson); "PJs or Uniforms? Reaching Those Who Can't Reach You" (Coyne, Fitzner); "Design Issues, Standards, and Technology" (Culver); "Statewide Brokerage House for Online Education" (Deau et al.); "Faculty Development Models in Distributed Learning" (Greer); "Multipoint Videoconferencing" (Hayden et al.); "Building a Highly Accessible Web-Based Training Course" (Hedenblad, Rafferty); "Indepth Look at Strategies for Mentoring Online Adult Learners" (Jiang et al.); "Helping Faculty Develop Online Courses at a Distance" (Kahrhoff, Li); "Instructional Methods in Online High School Courses" (Keller, Cakir); "Instructional Strategies for Distance Education" (King et al.); "Online Education Investment Strategy" (Kraenzel); "Pedagogy, Multimedia, and Distance Education" (Krug); "Third Generation Online Courseware" (Kryczka,

Hughes); "Learning by 'Doing' and 'Experiencing'" (Lim); "Providing Direct Service Distance Education to Students with Disabilities" (Magnuson, Kuehn); "Designing the Blend for Audiences in Developing Countries" (Miller); "Games to Teach By" (Mungai et al.); "Development of a Software Tool for Multi-institutional Faculty with Minimal Computer Experience" (Namuth, Guru); "Building Effective Virtual Teams Using Selection Interviews and Peer Assessment" (Newman); "Delivering Interdisciplinary, Competency-Based Professional Education Online" (Olson, Tribby); "Concentric Model for Evaluating Internet-Based Distance Learning Programs" (Osika, Camin); "Strategic Planning Process Model for the Implementing of Distance Education in Higher Education" (Pisel); "Designing a Blended-Delivery Course for Higher-Order Cognitive and Affective Learning" (Powell, Pisel); "Designing Web-Based Case Simulations for Medical Students" (Relan); "Administrative Strategies for the Online Classroom" (Rhoda et al.); "Assessment in Online Courses" (Runyon, Von Holzen); "Becoming a Learning Community" (Santo); "Cooperative Design Fostering Diversity and Interactivity" (Sarlin); "Effectively Using Self-Assessments in Online Learning" (Schulze, O'Keefe); "Writing for the Web Using 'Just-in-Time' and Performance Support Strategies" (Sheen et al.); "Increasing the Quality and Efficiency of Web-Based Course Production" (Stein); "Creating Course Evaluations for E-Learning" (Stoll, Ellis-Brye); "Institutional Responses to Plagiarism in Online Classes" (Stover, Kelly); "Assessing Career Impacts of an Internet Degree Program for RNs" (Taube et al.); "Creating Virtual Communities to Support Online Instructors" (Tompkins et al.); "Evaluation of Student Satisfaction with Distance Learning Courses" (Wagner et al.); "Experiential Learning Activities in Distance Education" (Westera); "Are You Practicing What Research Is Preaching for Distance Learning?" (Wijekumar); and "Instructor and Student Perceptions/Attitudes on the Design of Instruction for the Internet and ITV" (Zheng, Smaldino). (YLB)

18th Annual Conference on Distance Teaching Learning

Conference Proceedings

August 14-16, 2002
Madison, Wisconsin



DISTANCE 2002 LEARNING

www.uwex.edu/disted/conference

18th Annual Conference on Distance Teaching and Learning

August 14–16, 2002
Madison, Wisconsin

This year the Annual Conference on Distance Teaching and Learning celebrates its 18th anniversary in serving as a forum for the exchange of information on distance education and training. In the past decade and a half, thousands of attendees have gathered in Madison to discuss key issues in using technology effectively. And hundreds of speakers have shared their knowledge and experience through papers, presentations, workshops, and roundtables.

Throughout its 18-year history, the conference's major aim has been to increase our understanding of factors that contribute to effective applications. While emerging technologies continue to offer new promise, the academic and corporate environments that use them are constantly buffeted by a variety of cultural and economic forces. Each year the conference brings together practitioners who creatively deal with the dynamic of adapting new technologies to changing distance education settings. This makes the conference experience and the resources it produces a unique view of the current state of affairs in distance education practice.

As in the past the keys to success reside in human factors—in what people do to plan, design, and support distance learning applications. This year's conference is no exception. The 18th Annual Conference proceedings contains 90 papers that address important human factors from several perspectives, including: learning environments, course development, blended delivery technologies, instructional design, faculty development, evaluation and research, learners and learner support, planning and management, and teaching methods. The authors, as experienced distance educators or trainers, provide insights into how those factors contribute to successful outcomes and describe practical methods for implementing similar approaches in other settings.

The field of distance education and e-learning is changing to meet new challenges with fresh approaches using promising new technologies. This year's conference focused on these issues with an expanded program made possible by our new location at the Monona Terrace Convention Center. Distance Learning 2002 provided more than 140 workshops, seminars, keynotes, information sessions, course showcases, and in-depth forums highlighting topics of interest for both new and experienced educators

My thanks to the many presenters who have contributed to this conference over the past 18 years. They are the heart of the conference. This book contains a current sampling of the rich sharing of information upon which the conference has built its reputation. The conference staff and planning committee look forward to expanding the availability of these resources to practitioners in the field by electronic means throughout the year as well as gathering new presentations for next year's conference.

William Winfield
Conference Director
University of Wisconsin-Madison

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Using Students' Learning Styles to Provide Support in Distance Education

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There are many learning style instruments that are used to determine students' learning styles. The two most widely used in education are the Kolb Learning Style Inventory (1984) and the Myers-Briggs Type Indicator (Myers, 1978). The Kolb Learning Style Inventory (LSI) looks at how learners perceive and process information while the Myers-Briggs Type Indicator uses dichotomous scales measuring extroversion versus introversion, sensing versus intuition, thinking versus feeling, and judging versus perception.

The first component in the LSI, perceiving, is the way we perceive and absorb the information around us. This can range from concrete experience to abstract conceptualization. Concrete experience relates to one's preference to learn things that have personal meaning in life. The second dimension of perceiving is reflective observation. Students who prefer this style like to take the time to think and reflect on the learning materials. The second component, processing, is related to how one understands and processes the information that is absorbed after perceiving the information. Processing ranges from abstract conceptualization to active experimentation. Learners who have a preference for abstract conceptualization like to learn facts and figures and like to research new information on different topics. Learners who have a preference for active experimentation prefer to apply what they learn to real life situations. They like to try things and learn from their experience.

The distance education instructor should include a variety of support strategies for the different styles to allow learners to choose the appropriate strategy based on learning style. Concrete experience learners prefer experiences in which they can be involved and they relate to peers and not to people in authority. They like group work and peer feedback and they see the distance education instructor as coach or helper. These learners prefer support methods that allow them to interact with peers and obtain coaching from the instructor. Reflective observation learners like to observe carefully before taking any action. They prefer passive delivery methods and see the instructor as the expert. They tend to avoid interaction with students. In terms of support, the reflective observation learners need the most direct support from the instructors since they see the instructor as the expert. Abstract conceptualization learners like to work with things and symbols and less with people. They like to work with theory and to conduct systematic analysis. Support from the instructor takes the form of coaching. Active experimentation learners prefer to learn by doing practical projects and group discussions. They like active learning methods and like to interact with peers for feedback and information. They tend to establish their own criteria to evaluate situations and things. For the Abstract conceptualization learners, the instructor should provide opportunities to learn by discovery and be behind the scenes during the learning process. Some initial support is required but the amount of support may drop considerably during the learning process.

Procedure

The subjects for this study were students enrolled in two courses in a graduate program at a distance education institution. The Kolb Learning Style Inventory (LSI) was administered to students in the two courses. The LSI was used to determine students' learning styles. Thirty-nine students (26 females and 13 males) completed the LSI.

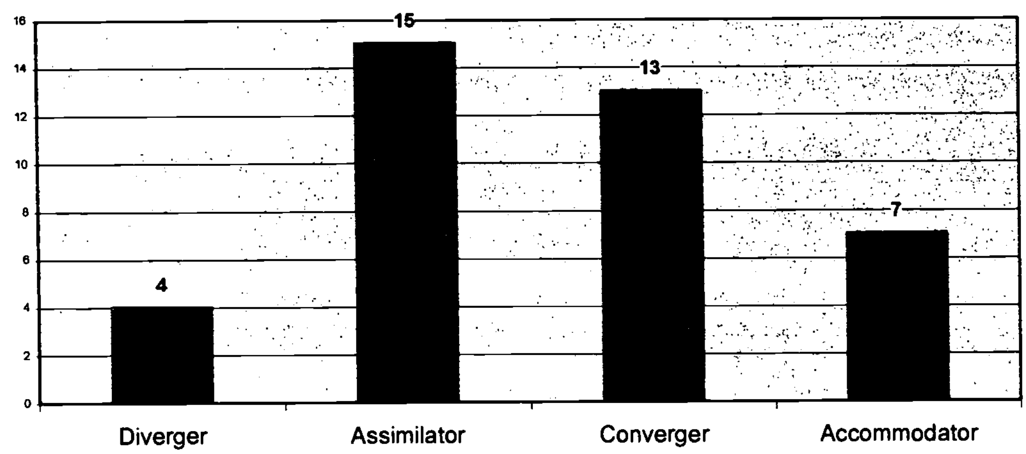
The support strategies in the course included computer conferencing, e-mail, and telephone communication. There were multiple computer conferences in the course where students exchanged ideas and the instructor acted as a moderator for the conferences. Participation in the conferences was mandatory and students were assigned marks for contributing to the conferences.

Results

Learning Style Distribution

Data from the analysis revealed an uneven distribution of learning styles for students (Figure 1). The largest percent of students were Assimilators (39%), followed by Convergers (33%), Accommodators (18%), and Divergers (10%).

Figure 1: Learning Style Distribution

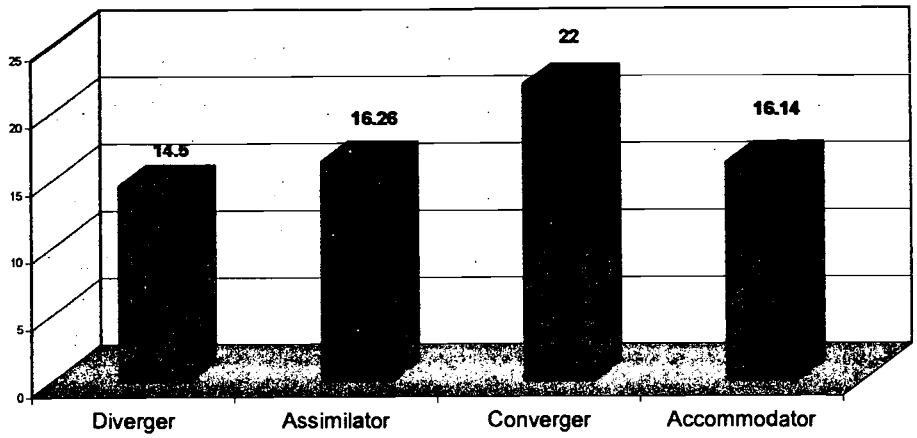


Mean Number of Computer Conference Comments by Learning Styles

One of the support strategies used in the graduate courses is computer conferencing. There were multiple computer conferences in which students had to respond to original discussion questions and provide comments to other students' comments. The computer conferences allowed for peer-to-peer, student-instructor, and instructor-student communication. The instructor acted as a moderator by responding to questions and comments, keeping the discussion on track, starting and ending each conference, and evaluating students' performance in the conferences.

Figure 2 shows the mean number of comments for all of the conferences by learning style. Convergers contributed more (M = 22) to the conferences than Divergers (M = 14.5). This was followed by Assimilators (M = 16.26) and Accommodators (M = 16.14). Convergers tend to try new things and like to solve problems. They are practically oriented and they like to test ideas before accepting them. One reason that Convergers provided the largest number of comments in the conferences could be because they like to test their ideas out with other students. As a result, they posted their ideas to get reaction from other students. On the other hand, Divergers tend to be people persons and are oriented to feelings. As a result, they may have found the non face-to-face conference discussion to be uncomfortable and it was difficult for them to connect with others.

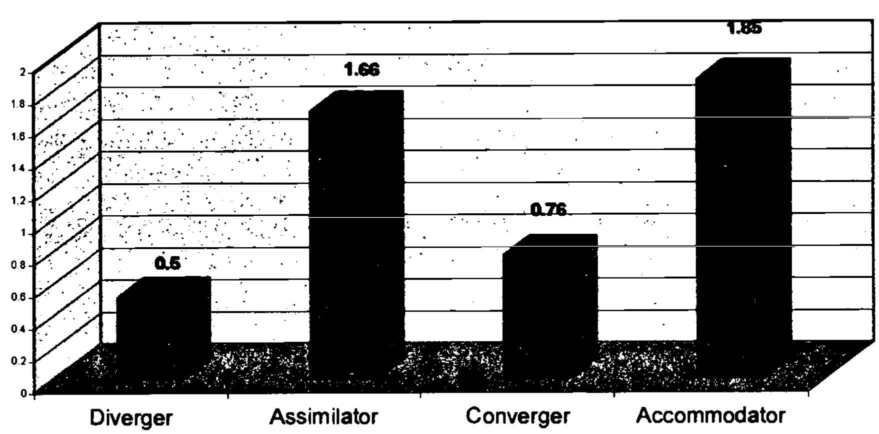
Figure 2: Mean # of Comments by Learning Style



Mean Number of Original Threads by Learning Style

In all of the computer conferences, the instructor posted the original discussion question and students were required to respond to this original posting; however, some students ignored the original discussion questions and started their own threads. As shown in Figure 3, the mean number of original threads was the highest for Accommodators (M = 1.85), followed by Assimilators (M = 1.66), Convergers (M = 0.76), and Divergers (M = 0.50). Accommodators tend to take a leadership role and are risk-takers. As a result, they took the initiative to start their own threads. On the other hand, Divergers had the lowest number of original postings. They are people oriented and they tend to respond to other students' comments and to provide support to other students. Hence, Divergers are less likely to start new threads.

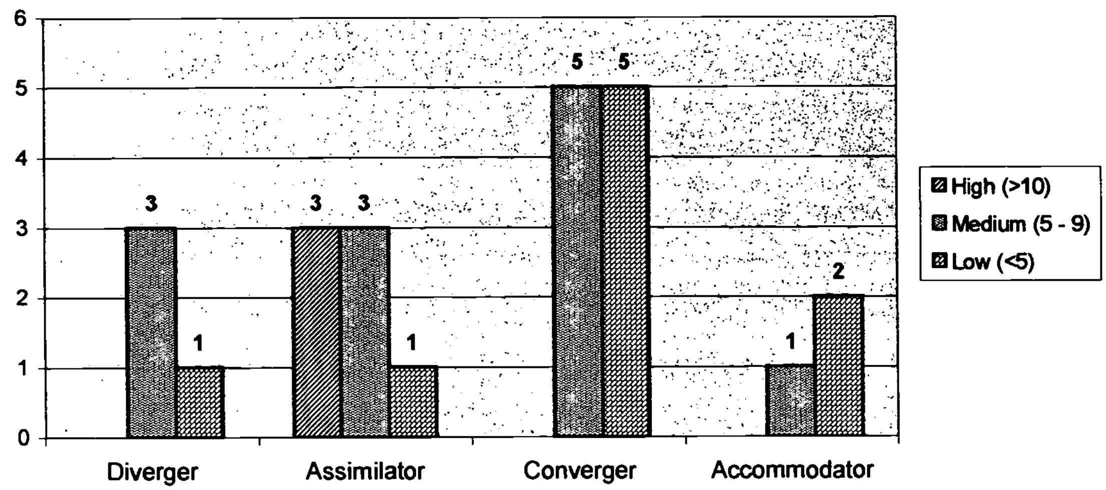
Figure 3: Mean # of New Threads by Learning Style



Level of E-mail Interaction with Instructor

For one of the courses in this study, the number of e-mail interactions between the instructors and students was tracked. The level of interaction was placed into three categories: High level of e-mail interaction, defined as ten or more e-mail interactions between the student and instructor; Medium interaction, consisting of between five and nine e-mails; and low interaction, less than five e-mails. Data analysis revealed that assimilators had the highest number of interactions with the instructor (Figure 4). This is not surprising since assimilators see the instructor as the expert and prefer to obtain information directly from the instructor. They interact less with their peers and more with the instructor. They are also goal oriented and like to interact with the instructor to set expectations for assignments, exams, and other course requirements.

Figure 4: Level of E-mail Interaction With Instructor



Conclusion

Based on the results of the study, it appears that Assimilators require the most support in a distance education course. They see the instructor as an expert; hence, they like to interact with the instructor rather than other students. Divergers and Accommodators may require less support since they tend to rely more on other students rather than the instructor, and they also interact with other people outside of the course. Analysis of computer conference participation showed Convergers being the most active while Divergers were the least active. One explanation for this result is Convergers like to share and test their ideas with others students while Divergers are uncomfortable sharing their ideas in the conferences. Divergers may prefer the face-to-face approach.

Distance educators must ensure that adequate support strategies are provided for students with different learning styles. Catering to the different learning styles could result in higher retention in distance education.

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Is Your E-everything Accessible to Everyone?
Tips and Tricks for Web Accessibility

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Division of Information Technology, UW–Madison

Blaire Bundy
Division of Information Technology, UW–Madison

Neal Ewers
Trace Research & Development Center, UW–Madison

Getting an Overall View of a Web Page

Imagine viewing a Web page made up of one giant block of text. There are no headers, no breaks for paragraphs or list items, and no differences in font size or color. Of course, no one would design a page that would look like this, although some of the pages I have visited come close. If you are using a small screen device such as a cell phone or palm pilot to view a page, certain isolated parts of the page may look totally unformatted.

Now, imagine that you are using a full screen device and the page looks a lot better. You can see major headings, paragraphs, and bulleted lists are obvious. The changes in font size and the use of color make the page quite understandable. You can determine the information you want to read first with a single glance.

Suppose, however, that you just returned from the eye doctor who put drops in your eyes, which made it hard for you to see for an hour or two. You need to read some information on a Web page so you ask a co-worker to read it to you aloud. The person can only read one word at a time, and they do not announce any of the visual elements on the page such as list items, headers, etc. You want to skip ahead, but you don't know anything about the part of the page you haven't read, so you can't ask the person reading to go to a particular place. You want to go back and review something you have read, but you can't quite remember what was said, so again, it's hard to ask the reader to go back to a certain point.

In fact, this is the way persons who use screen readers deal with Web pages every day. The synthesized voice can only read one word at a time. How then does the screen reader user know how to skip to or go back to something of importance to her? Of course, even with your temporary disability, you could ask your reader to make the page much more meaningful to you, you by telling you when they reached a new header, paragraph, list item, etc. And that's exactly what screen reader users need. The nice thing is, it takes almost no work at all to make it happen. Making it happen for screen reader users also makes it happen for people who use small screen devices.

Emerging Technologies and Device Independence

"Mobile devices and audiovisual media are changing the way people are interacting with the Web. Web technology can accommodate these innovations, since, from the start, the Web has been conceived as a universal system for distributing and accessing information" (Philipp Hoschka, W3C World Wide Web Consortium, Interaction Domain Leader).

Imagine accessing a complex Web page (or pages) with a cell phone or other text only device? It can be pretty disorienting and often frustrating to try to orient oneself to a complex page. In the not-too-distant past, Web designers were concerned with cross-platform and cross-Browser compatibility. Certainly, this is still important when considering the end-user environment. However, accessing information on the Web is no longer limited to the desktop computer. New and often ingenious devices such as cell phones, Personal Data Assistants, Web tablets and a variety of everyday appliances such as TVs, are allowing for access to the Web. As the user-base of these new devices increases, user expectations and demands for access (from multi-device and multi-location) will also increase.

It is safe to assume that for many users a high-bandwidth, high-resolution and multimedia-enabled desktop will continue to serve as the primary device for access. However, evolving technologies are allowing users to make an access choice, largely based on their environment or situation. Access needs are not limited to a controlled or optimum environment. Some users will find themselves wanting to access information under restrained or limiting circumstances, that is, in a noisy environment, in a sight-limited environment, or while in a hurry. Others may want to access the Web in a more free-form manner, for example, using emerging devices and even using hands-free and/or eyes-free devices.

The key to successful Web design is to design for flexibility and inclusion so that you do not exclude any particular audience; making the Web accessible to anyone, anywhere, anytime, anyhow. The Web Content Accessibility Guidelines (WCAG) available via the W3C World Wide Web Consortium, Web Accessibility Initiative, help to ensure that users can access your information regardless of device, situation or ability. In the continually evolving world of Web applications and Web technologies it makes sense to design your content and service so that it can be adapted quickly and efficiently to meet any new circumstance. Using existing design techniques like those in WCAG 1.0 will ensure that your message will be readily available to your changing (and expanding) customer base and new technologies they may choose.

Access Barriers

Increasing access to e-everything can be argued on ethical, legal and economic grounds. It's the right thing to do. There are legal mandates that state accessible means must be provided for Internet-based programs, goods or services. There are varying estimates of the dollar amount people with disabilities control, and those estimates continues to rise as the population in general ages—who can afford to ignore this revenue source? We also know that those accessing the Web using hand-help or new devices is also growing. We just cannot afford to ignore or exclude any audience.

Assistive technologies in the form of specialized hardware and software products allow individuals with a wide range of abilities and disabilities to use computing and networking technologies. These technologies do not remove all access barriers however. Planning for access when e-everything is being developed is much easier than creating accommodation strategies or retrofitting after the fact. Disabilities, age, race, native language, ethnicity, gender are a few of the potential characteristics that should also be considered when designing e-everything. Let's take a look at these.

Blind Internet users may be using a computer equipped with screen reader software and a speech synthesizer, which allows the text that appears on a screen to be read with a synthesized voice. A text-only browser or a Braille refreshable display that prints the text line by line. Images (including photographs, image maps, animations, symbols, scripts and images used a list bullets, spacers, graphical buttons etcetera) can not be read or interpreted by blind internet users unless text alternatives are provided.

Other visual impairments may limit the amount of Web page seen when special software to enlarge screen images and text are used. When pages are cluttered or the layout changes from page to page, the user can become confused or disoriented. Colorblind users cannot successfully navigate or understand content when it is necessary to *distinguish* between colors.

Deaf and hard of hearing individuals may benefit from Internet resources when they do not require the ability to hear. When audio output is required, text captioning or transcription is necessary (including videoconferences and streaming).

Speech impairments and deaf or hard of hearing individuals may experience barriers to interactive participation, requiring alternative means such as electronic mail, text telephone (TTY), or Telecommunications Relay Service (TRS).

Seizure disorders can induce seizures when Web pages include attention-grabbing features or flicker (often between 2 to 25 hertz).

Mobility impairments may prevent individuals from moving their hands. Alternative keyboard and mouse, or speech input could be used to gain access to Internet-based information or communication. Others may lack fine motor skills required to select small buttons on the screen. Individuals with slow response rate may also be unable to effectively participate in real-time "chat" communications.

Learning disabilities may impact an individual's ability to read, write, and process information. Speech output and/or screen enlargement systems used by individuals with visual impairments may also be used by those with learning disabilities. It is also difficult for some individuals with learning disabilities to understand Web sites when the information is cluttered or when the screen layout changes from one page to another.

Plan for Access

Considering the wide range of abilities, and Web access devices that exist as your e-everything is being planned and developed is much easier than creating accommodation strategies or retrofitting your site after the fact. Benefits extend beyond people with disabilities and those who have the latest nifty gadgets. For example, individuals with temporary disabilities and/or situational limitations, age, race, native language, ethnicity and gender differences also benefit. A person with computer system limitations is in a similar situation as a person who is blind. A monochrome monitor recreates a limitation that a colorblind person experiences. People multi-tasking (operating a computer and their hands are occupied with other activities) face challenges similar to those who use hands-free input methods because of a disability. People who have turned off their images because of slow modems, or because they want their pages to load faster, need text equivalents for all images in the same way that blind users do. A noisy environment that interferes with audio creates access barriers similar to those experienced by individuals with hearing impairments. When English is not the first language, reading difficulty similar to the experiences of some individuals with learning disabilities can occur. Providing multiple formats of information also addresses differences in learning styles.

Don't wait until someone asks about accessing your e-everything content, or worse yet, being a participant in a lawsuit because your site could not be accessed. Be proactive. Think about the wide range of abilities, disabilities and devices that exist at the design stage. Include information on your site about who to contact if someone is having difficulty accessing information on your site. Test your site using hearing or sight alone; navigate without using the mouse, use different browsers (including a text only browser), and with different validation tools (listed at the W3C World Wide Web Consortium site).

Use valid / correct html. Some screen readers allow the user to bring up a list of the major headers on the page. This basically gives the screen reader user the same ability you have to quickly scan the page and find the part of the material you want to read. But this only works if headers are tagged with the correct html code. Some screen readers announce items in a list with a different voice, but again, this only works if the correct html code for list items is used. In the future, it may well be that cell phones and palm pilots give the user some easy way to go to major sections of the page in order to compensate for the inability to see enough of the page to visually get an overall view of the layout. Again, devices can only do this if the correct html code is used.

Images and animations need to have a text equivalent (alt attribute / alt-text) to describe the function of each visual. Likewise, text used to describe links needs to be functional without being either too short to have any meaning or too long to allow clear comprehension. So, a link that simply says "Here," or "Click Here," wouldn't work if you were just browsing the link titles. If you went to a link that simply said "Research," you may not be thrilled to read a two-paragraph synopsis of the research only to find that it was not something you needed to take the trouble to click on. You might wonder why the link couldn't have said something like "Research on using computers by persons who are aging." Animations, multimedia, videos, steaming etc need captioning and transcripts of audio and descriptions of the video.

If you go to a page with a screen reader, a small screen or text-based browser, the alt-text that is used needs to give you the same ability to operate as you might if the graphics were visible. You would have a much more enlightening experience if the alt-text captured the function, and not just the description, of the graphical elements you can no longer see. So, if you were watching a slide show on a site you may have some difficulty figuring out what to do if the two alt-text labels simply said "Stylized arrow keys." You would, no doubt find it more helpful if the alt-text announced each arrow as, "Previous slide," and "Next slide."

Stay current with Web changes. The Web, as well as the tools and devices that create and access information on the Web continue to change. The Web is considered a necessary part of some people's employment, and a key tool for gaining information, services and goods for others. We've seen the Web, tools that create and access the Web and legislation or guidelines change at rates that boggle our minds. How can we keep up with it? "Just what direction is the Web headed? For the answers to these and other general Internet or markup language specific questions, tune your browser to http://www.w3.org/ for a vast and varied selection of information. Because the W3C establishes recommendations concerning the Web, this site offers interesting possibilities as to future directions for the Web. While the W3C does not exercise the influence of an official standards setting organization, they have been influential in bringing together industry members and other interested parties to develop solutions and circulate recommendations to the public and members." (Kim Moorman).

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Biographical Sketches

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Sometimes a Good Idea Isn't Enough: Implementing Student Services Programs for Distance Learners

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Introduction

The Kansas City Regional Access Consortium for Higher Education (KC REACHE) is a unique collaboration among 10 colleges and universities and the local public television station. This consortium enables collaboration and innovation between distance learning providers in the Kansas City region, noteworthy because it crosses not only institutional boundaries, and boundaries between community colleges and four year schools, but also crosses state lines. The multi-lateral exchange of ideas between universities has enabled an accelerated rate of articulation agreements between these institutions, and has allowed the schools to weave together different student service offerings enhancing the overall learning experience of the Kansas City area distance student. The 11 members of the consortium include Avila College, Johnson County Community College, Kansas City Kansas Community College, Metropolitan Community Colleges, Missouri Western State College, Northwest Missouri State University, Park University, Rockhurst University, University of Missouri-Kansas City, Washburn University and KCPT, Kansas City's Public Television station.

Addressing the Needs of Distance Learners in the Greater Kansas City Area

A sense of disconnection between the student and institution is a fairly common problem within distance learning. The Internet may bring education closer to students, but in some ways it pushes the institution farther away. Through collaboration and cooperation, the KC REACHE consortium was able to address this issue in the Kansas City area by offering two sets of conveniences to the online learner; education is delivered to the student's desktop via the Internet, and the physical campus is as close as the nearest member school, via the institutions network of shared services, including inter-library services, and shared testing services. 23 online degree programs and over 500 classes are offered among the 10 member campuses.

Research indicates that some of the most important educational forces in higher education are faculty members and other students (Pascarella & Terenzini, 1991). The Council for Adult and Experiential Learning (2000) notes that if an institution aspires to be adult learning focused, it must devise ways to build 'community' among its learners. KC REACHE is attempting to explore options for creating these connections for students in a virtual world -- grounded within the Kansas City geographic community.

Lessons Learned: Creating and Refining Student Support Services for the Distance Learner

The on-ground model for student services cannot merely be replicated for online students. When KC REACHE began to devise solutions to these problems, we decided to borrow the concept and the phrase 'brick and click' from the business world. Arthur E. Levine, president of Teachers College at Columbia University, believes that 'brick and click' will become the dominant model in higher education (The Chronicle, October 27, 2000) based on the idea that those most likely to succeed will be using combined face-to-face services at physical locations ('brick and mortar') with the convenience of online services ('point and click').

Occasionally, the concept cannot mature beyond the planning stage, due to logistics or lack of resources. Odds are, the initial idea will undergo several iterations and will morph dramatically, resulting in a program significantly different from the initial concept. In this case, as a result of funding from a FIPSE grant, the KC REACHE Brick and Click Project is becoming a reality. In the fall of 2001, KC REACHE's model for shared student support services was validated on a national level, upon the receipt of funding from the U.S. Department of Education, through a three-year FIPSE grant in the amount of $577,957. With this Brick and Click grant, KC REACHE's ability to expand its branch campus model for shared services was exponentially accelerated.

As a regional consortium consisting of 10 separate and competing institutions, multiple stakeholders with multiple perspectives and policies and procedures worked together to tailor and refine the service offerings. Student Services for online students implemented to date:

1. Inter-Library Loan Program: Distance students have reciprocal borrowing privileges at 9 different campus libraries.
2. Online Library Resources: Online students can access a digital collection of publications via the library website
3. On-ground Testing Network: If required to take a proctored exam, online students may schedule an exam at any of the 10 member institutions testing centers.
4. Student Organizations Websites: Three student organization websites have been implemented to encourage online participation within traditionally on-ground student groups.
5. Student events: Website established enabling access for online students at on-ground events at all 10 member institutions.
6. Student Leadership Group/Mentoring Service: A purely online student organization for distance learning students has been created. Members from this group will serve as mentors for new online students within the KC REACHE consortium.

Strategies for the Successful Implementation Student Support Services for Distance Learners

Once the concept has been formalized, a process for implementing the service program must be created, generating buy-in at the highest level of your academic institution, with the critical people within the institution involved in the process from the onset.

One of the biggest challenges is identifying the right people within your organization to get things done; an individual with the authority to sign off on the initiative and the ability to follow through and make sure it is done

In the case of KC REACHE, the high-level buy-in is not the issue. Student service deans from our member institutions meet regularly, our Steering Committee is comprised of Deans and provosts, and the Presidents at each college sit on the Board of Directors.

When it comes down to the actual implementation, however, more often than not, it is student services staff that will work with the program, not the administrators. We are in the process of creating a formal plan that will define the roles and responsibilities of each individual for the duration of the project, and are developing a framework based on the expectations and goals of the group.

So You've Built It: Now, Where Are the Students?

The idea and implementation of student services programs, themselves, are not enough to ensure the success of the program. How can you ensure that distance students not only know about the services available to them, but are also encouraged to take advantage and participate in the programs?

For example, several years ago, Kirkwood Community College was awarded FIPSE grant to create advising and tutoring services for their online students. Michele Payne, the project's director, detailed some of the issues she encountered while trying to launch these services. Payne saw that few students were taking advantage of their services, no matter how much their group "marketed, memo-ed and cajoled" (Payne, 2002). She suggests that just offering the support services to students will not necessarily result in service usage. In retrospect, she recommends colleges "rely on sticks, not carrots" to motivate their students to take advantage of the services put in place to benefit their performance. Similarly, after the first year of the Brick and Click Project, KC REACHE has encountered a lower than anticipated student participation rate, and we are not attracting the number of students we need to help us determine what is working and what is not.

In order to get the word out to distance students, each member of KC REACHE has posted a link to the KC REACHE website which can be accessed through the online class homepage at each institution. In addition, KC REACHE has hosted several faculty development workshops. At each workshop, faculty members are encouraged to inform their students of the services available through KC REACHE.

The Road Ahead

KC REACHE is approaching the second year of the three-year, FIPSE-funded 'Brick and Click' project.

Based on our first annual survey completed by participating online students, preliminary impressionistic results support our original hypothesis that adult online students are primarily interested in services that help them advance in their academic and career goals, as opposed to purely social student activities.

We have identified the need for a detailed project plan. We are in the process of creating a planning document with the Student Services Deans at each institution, where roles and responsibilities will be clearly communicated, allowing them to effectively and efficiently delegate activities to the appropriate representative at their college or university.

KC REACHE will use the lessons learned in our first year, coupled with the feedback gathered from our surveys to continue to tailor and refine our online services to meet the needs of our students. We will also focus our attention on creating a sustainable model, to ensure the continuation of our successful student services beyond our grant-funded period.

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Social Dynamics of Online Learning: Pedagogical Imperatives and Practical Applications

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Communication in the (Online) Classroom

Approximately 20 years before online learning emerged, scholars in two different fields made similar statements about the learning experience. In 1972 a doctoral student in adult education at the University of Wisconsin researched numerous educational programs where the instructor and student were physically separated and developed what is now called the transactional distance theory (Moore & Kearsley, 1996, pp. 199-203). Moore postulated that distance was a pedagogical, not a geographical, phenomenon. He also stated that one could overcome this distance through effective dialogue (i.e., instructor-learner interaction) and instructional design (i.e., structure). In a similar vein, three communication scholars authored a book in which they declared, "There is a difference between knowing and teaching and that difference is communication in the classroom" (Hunt, Scott, & McCroskey, 1978, p. 3). In other words, they concluded that the process of communication is at the heart of the learning experience.

These education and communication scholars understood that the learning experience wasn't primarily about the shape of the room, color of the chalkboard, type of font used for the syllabus, high-tech or low-tech equipment in the classroom, or the physical separation between the instructor and students (or the students from one another). Rather, the communication dynamics within the classroom environment were the critical factor in the learning experience. This is especially significant when considering distance education, where the call is often to develop directed learning opportunities in an independent learning environment. However, an independent learning environment is not the same as an isolated learning environment. One the benefits of online distance education that makes it superior to the older correspondence models, is that students can still learn in an academic community, albeit a virtual one.

Some might argue that distance education, by its very nature, requires self-motivated students to work well and therefore the students should be responsible for creating such interaction events. After all, some instructors within the traditional model simply show up for class, deliver their lecture to a sea of note-taking students, and then leave. Besides, it is typically the distance learner who is isolated, and not the instructor who is usually located on a university campus. Failure to address the social and relational dynamics within online courses may result in greater feelings of isolation among the distance learners, reduced levels of student satisfaction, poor academic performance, and ultimately increased attrition. Successful online facilitators face the challenge of finding ways to connect with students and for students to connect with other students in meaningful ways. More often than not, most students wait for the professor to "do" something that magically knits or binds them with others in meaningful ways. As a result, we believe that online learning puts an added responsibility on the instructor to foster a communication-rich learning environment. An understanding of social dynamics, including instructor immediacy and classroom community, can assist online instructors as they seek to develop the communal scaffolding necessary to support an effective learning environment.

Social Dynamics

Mehrabian (1969) developed the concept of immediacy, which he defined as "those communication behaviors that enhance closeness to and nonverbal interaction with another" (p. 203). Someone who demonstrates high immediacy behaviors such as maintaining eye contact during a conversation is likely to produce a more favorable affect and thus communicate more effectively. Immediacy has often been examined as a nonverbal construct marked by behaviors such as leaning toward another, assuming a position close to another, and looking into another's eyes. Verbal behaviors can also contribute to a sense of immediacy Similar to nonverbal immediacy, the use of verbal immediacy behaviors such as asking questions, using humor, addressing individuals by name, and initiating discussion increases psychological closeness.

A limited number of researchers have attempted to examine the role of instructor immediacy (or, more typically, social presence or high interactivity) in the online classroom. Gunawardena (1995) concluded that online communication can be perceived as interactive, active, interesting, and stimulating by conference participants, depending on the kind of interactions and sense of community by the participants. Furthermore, Gunawardena and Zittle (1997) found that social presence alone accounted for 60% of the explained variance when examining overall participant satisfaction in a computer-mediated conferencing environment. Vrasidas and McIsaac (1999) found that interaction was influenced by the structure of the course, class size, feedback, and prior experience with computer-mediated communication. One example of the negative effects of nonimmediacy was evident in their studies of feedback. "Students felt that the lack of immediate feedback in the online portion of the course was discouraging and contributed to their limited participation in the online discussions" (p. 33). They advised that teachers provide timely feedback to ensure high levels of interaction in the course.

Harasim (1990) stated that the computer-mediated classroom is an environment rich with the potential for interaction and collaboration among the participants. Palloff and Pratt (1999) declared, "Even in this virtual or electronic community, educators must realize that the way the medium is used depends largely on human needs . . . these needs are the prime reason that electronic communities are formed" (p. 23). They proposed seven basic steps for developing academic communities in online distance classes: clearly define the group's purpose, create a distinctive online gathering place, promote effective leadership from within, define norms and a code of conduct, allow for a range of roles, permit and facilitate subgroups, and permit students to resolve their own disputes (p. 24). Since the word community comes from the root communicare ("to share"), they suggest creating collaborative learning activities to enable students to share common experiences during the course of the online class.

McLellan (1999) postulated that the development of online communities would strengthen the online learning experience by fostering a sense of social presence among course participants (p. 40). Moller (1998) similarly encouraged the development of learning communities in asynchronous online courses. She stated that "the potential of asynchronous learning can only be realized by designing experiences and environments which facilitate learning beyond the content-learner interaction. To that end, it becomes necessary to create learner support communities" (pp. 115-116). Such online learning communities provide a framework for social reinforcement and information exchange while girding the learning experience with academic, intellectual, and interpersonal support (p. 116).

Developing Communal Scaffolding

Communal scaffolding recognizes that successful online instructors must structure social support if they are to maximize learning benefits for their students. Scaffolding is commonly used in building construction to provide support for the structure, add an element of safety to the project, and provide a secure place to stand for the workers. Similarly, communal scaffolding encourages and reinforces cognitive development in the context of social connection and facilitation. As interpersonal dynamics are fitted into the existing course and institutional structures – through various online and offline strategies – learners are able to extend their range of learning opportunities by collaborating with others to achieve goals and complete assignments not otherwise possible. Finally, the scaffold helps instructors and others isolate individual student needs and customize communication to address a range of learning styles and socio-cultural variables.

The idea of scaffolding has been used by others to describe the facilitation or transfer of knowledge from cognitive to practical applications in order to maintain optimal levels of challenge for students (Greenfield, 1984; Harley, 1993). In those instances it has been used to help visualize how the gap between task requirements and skill levels can be bridged. When we talk about communal scaffolding here, we are referring to bridging the gap of another kind – the gap between the task (cognitive, intellectual) and interpersonal (social, interpersonal) requirements of online learning.

In light of the social dynamics found within effective learning environments, here are several online strategies students that we suggest to develop a solid communal scaffolding:

- Personal Discussion Folders – We encourage you to begin your online experience by creating folders titled "Autobiographies," "Introductions," "Ice-breakers," or "Name and Face," where your e-personality can be posted. If possible, complete the passport effect by including a personal photograph. We've found that students report feeling closer or more connected to other students in the course when they can see their photographs. This is one of the reasons that we include our personal photographs as part of the faculty homepage.
- Immediacy – To give your classmates the impression that you are "present" with them, respond to e-mail or threaded discussion in a timely manner. We also recommend using the other person's first name in your reply to create greater interpersonal awareness. Even if you are just checking in to catch up on the day's postings, stop by one or more of the rooms and let your presence be known in some way, shape or form. Consider it akin to simply "showing up" for an on-campus course.
- Live Chat – If "virtual (live chat) office" hours are available through an online chat function, we recommend that you schedule an appointment at least one time a semester with your instructor. Students tell us that live chat of this kind helps them connect with us – at a safer distance than a phone call – early on in the semester in ways that e-mail or voicemail cannot.
- Personalized E-mail – Another way to connect with faculty and other students is to send personalized e-mail outside of regular class time or required course discussion. Personalized e-mail might be used to encourage a fellow student who made a solid contribution in one of the required discussion formats.
- Audio/Video: We've found that our tone of voice can be used to set the right mood for future communication. It becomes a perceptual framework through which subsequent communication (whether textual or otherwise) is filtered. The tone of an audio message sent just before an exam or final paper to another student can even help reduce anxieties. All you need is a microphone and a plug-in such as RealProducer, which is a free download on the Web. If you're really daring, you can use RealProducer or Microsoft Windows Movie Maker and add video.
- Create Private Places – This might sound strange at first blush, but to the extent allowable by the instructor and course management platform, create a separate private area for you and your assigned discussion group apart from general class discussion. This is the same idea as the personal discussion folders mentioned earlier, but for individual groups only. This is a space that the instructor may not enter unless invited. It is a group "safe haven."

- ❖ Regular Updates – Everyone likes to see fresh, new content, which is an important indication that value is constantly being added to your learning experience. As instructors, we send weekly updates to students related to course content and procedures. Some students adopt a similar model and send brief weekly updates to us about their progress on group projects and theses.

Group Discussion and Discursive Style – Last, but certainly not least, one of the most basic, but often most underestimated, online strategies you can use to build connectedness revolves around participation in required group discussion formats. If you're not careful, your discursive style in online discussion may prevent you from connecting with others. While it's valuable to critically challenge ideas, watch that you avoid accusatory language or leading questions that indicate your biases. Feeling "safe" to express one's views is an important part of building community. Safety is further enhanced by establishing early on in the course rules for appropriate engagement and conduct within required discussion folders.

Conclusion

So, how do we encourage active engagement on the part of teachers and learners, and how do we contribute to the kind of communal infrastructure that makes learning fun and exciting? Perhaps when it is all said and done the final answer resides in some of the key indicators of community. For example, do you know each other's names and are you comfortable engaging classmates and instructors in conversation? Does the conversation extend outside of the traditional instructional context? Do you share common goals and aspirations? Is there a sense that the "classroom" provides a safe environment for exploration and discovery? Are the learning outcomes ones that make sense to you and can you relate to them on a personal level? Have both students and teacher made an emotional commitment to the course? Is there a sense of shared responsibility? If most of these are present it is a good indication that your communal scaffold is a strong one and that you are well on your way to experiencing a rich learning community. It should be noted that there are no shortcuts to developing community. It takes time, and there is no substitute for time spent in communication with others—whether online or offline. Of course, time alone is insufficient. The time spent with classmates and with the instructor must be structured in such a way to facilitate the all-important transfer of intellectual and emotional capital.

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Dynamic Distance Learning: Using Content-Providing Organizations to Their Fullest Potential

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Introduction

The integration of supplementary interactive videoconferencing programming into existing curricula is providing K-12 educators and content providing organizations with greater opportunities for expanding their reach via distance learning technology. However, many teachers and content providing organizations are looking for distance learning applications that extend beyond "electronic field trips" and static, didactic interactions. Even though videoconferencing experiences have been growing in popularity (especially in the early grades), they are often single exposure interactions that lack the potential to truly enrich the curriculum. Distance learning instructors are already beginning to think beyond traditional videoconferencing uses and are considering worthwhile partnerships and collaborations with other distance educators and content providers. They have realized that successful videoconferencing events are built on appropriate design and delivery strategies that are key to innovative distance learning programming. This paper will examine these notions and will highlight exemplary strategies that lead to highly interactive programs.

The Impact of Distance Learning Technology

The Interactive Experience Model

Understanding the best methods for successful and innovative distance learning instruction first requires educators to examine how they currently approach their regular instruction. The Interactive Experience Model (IEM) detailed in Figure 1 provides a graphic representation of how the three contexts for learning form a foundation for an interactive learning experience. Although designed by Falk & Dierking (1992) to explain how learners interact in an informal learning environment, the IEM has implications for any classroom. The IEM is comprised of the Personal Context, the Social Context, and the Physical Context.

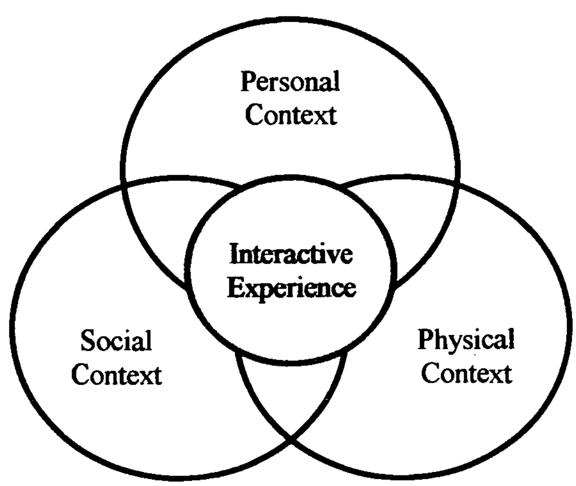

Figure 1. Interactive experience model: from Falk, J.H. & Dierking, L.D. (1992).

The personal context takes into account individuals' prior life experiences and expectations. Therefore, students with prior exposure to a particular topic will react and behave differently than novice learners. Additionally, students bring their own personal interests and understanding to the table, thereby influencing their interpretation of the information. As individuals come into contact with one another, they create the social context. This would include those interactions with family members, friends, peers, and teachers. Discussions that occur between learners further help the individual define the interpretation of experiences. The physical context is the actual setting, the physical environment. The classroom, chemistry lab, cafeteria, reading circle, and playground make up the physical environment as well as the materials that are held within those environments—desks, chalkboards, books, milk-cart, science equipment, maps, and so on. The physical context is the multi-sensory environment, those things that can be seen, heard, tasted, touched, and smelled. The combination of these three contexts provides the interactive experience. A learner takes into account prior life experiences, the influence of those around them, and their physical environment to generate understanding.

The Learning Environment Via Distance Learning Technology

While the IEM provides a framework for understanding how a learner is engaged in the regular education environment, the integration of distance learning technology can provide a unique quandary. Students involved in a videoconferencing experience, whether a single "electronic field trip" or semester-long "virtual course", still interact within the three contexts. They still bring with them a personal context of agendas, background experiences, and learning modalities. They still interact among a social group, whether collaborating on a presentation with an on-site partner or answering a question posed by a remote site peer. However, the physical context becomes a divided entity (Figure 2).

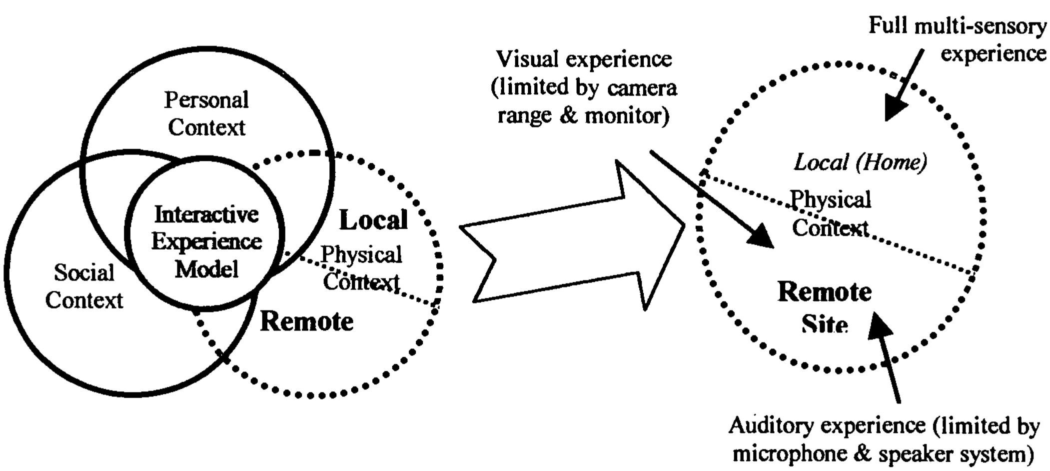

Figure 2: The IEM with learners participating in a distance learning connection: from Barshinger, T. A. (1999).

The technology has enabled the learners to experience and interact in two distinct physical contexts simultaneously. The students are now faced with not only interpreting the physical context in which their bodies are located, they must concurrently interpret the environment in which they are receiving a secondary source of auditory and visual stimulation. Therefore, learners must surmise a physical context while simultaneously experiencing two separate, yet connected, environments.

The remote site environment is also limited in the types of auditory and visual experiences it can provide. Auditory technology such as microphones and speakers can impede the sounds and voices that are being delivered. Similarly, a learner can only see what the remote site camera can fit in its range. Low-end monitors can jeopardize the quality of visuals that are being transmitted. Additionally, sensory competition from the home site can distract the learners from the content being delivered by the remote sites. Hallway noises, errant smells, and uncomfortable chairs can provide hurdles for attention. Further complications can arise simply from the technology itself. New users of the equipment may be more captivated by the workings of the technology than the content being delivered over it. The students' technical orientation becomes even more apparent should a technical glitch, such as lost audio or streaking video, occur. Attention is immediately focused to the equipment. Therefore, a difficult question arises:

How can a multi-sensory approach to learning be used to promote meaningful, relevant, and engaging experiences for students via a limited sensory technology?

The answer to the question above is not an easy one. No distance learning connection will ever replace the experience of an actual on-site learning environment. However, engaging teaching strategies and unique production techniques can help overcome some of the limitations of the equipment. Before utilize these strategies, distance learning educators should reexamine their understanding of their role as a videoconferencing user.

Going the Greatest Distance

Thinking Beyond

Entering the world of distance learning can be both ominous and exciting for educators. They are faced with unfamiliar equipment, new policies, different procedures, and that general feeling of uneasiness that often accompanies the thought of becoming a novice all over again. At the same time, teachers are presented with rare educational opportunities that may not have been available otherwise. When working with content providing organizations, such as a museum, zoo, or cultural agency, educators needs to think beyond the traditional modes of interaction and engage the content provider as a partner with whom they can collaborate, create, and instruct. Below are three suggestions for thinking beyond the typical engagements with content providers.

- ***Think beyond being just a recipient of information. How can you be an originator of information?*** The greatest feature of videoconferencing technology is its flexibility to synchronously deliver and receive information. Educators should ask themselves: "What content do I have to share?" and "How can I produce programming others would want to utilize?". By answering these questions, educators may discover the role their own expertise can play for creating original content programming.

- ***Think beyond "us" and "them." How can you be part of "we"?*** The nature of videoconferencing technology sets the stage for an "us" (near end) and "them" (far end) situation. Different physical locations contribute significantly to this interpretation. Teachers need to remember the power of collaboration when engaged in instruction via distance learning technology. This collaboration could include a team of educators designing a standards-based program on pond life with the local science center, or a group of students organizing research for a debate on the topic of conservation for a nature center in another state. The efforts made to create materials and activities that stimulate meaning exchanges are necessary for making the technology medium "disappear" and the concept of "we", as one group, viable.

- ***Think beyond what a content provider can do for you. What can you do for them?*** While some novice distance learning educators may eventually grow into originators of information, a greater challenge can be in understanding what you can provide for the zoos, museums, and other organizations from which you request information. There are the obvious public relations opportunities. Educator recommendations of quality programming to their colleagues increases a provides recognition and revenue. Just as important though, is the evaluative and community outreach resource educators become. Providers rely on feedback, obtained through evaluations and program requests, to assist in creating new events and revise existing ones.

Exemplary Strategies for Distance Learning Content Delivery

Raising the production level. While many educators may balk at the notion of bringing "Hollywood-like" techniques to the distance learning classroom, many simple production strategies can help raise the level of interest and quality for a distance learning event. These techniques are often overlooked as the average teacher or content provider educator lacks the knowledge for producing quality visual media.

- Lighting. Bring in external lights to help brighten dark spots at the broadcast site. Adjust window shading and/or overhead lighting to darken over lit areas.
- Sound. Wear a lapel microphone if available. Use multiple microphones when moving throughout a wide presentation space. Adjust sound mixers prior to a connection when using supplemental audio sources. Incorporate sound effects that can be delivered from a PC or other multi-media source.
- Camera placement. Avoid excessive backlighting by keeping the camera from pointing into a light source. Set presets for easy camera transitions. Use multiple cameras and video mixers for extra "wow" effects.
- Scripting. A scripted outline that includes recommended dialogue, suggested questions, and a cross-reference of camera shots and video sources can assist new users and provide consistency between programs.

Integrating pre-, post-, and program activities. Many educators and content providers have realized that single, isolated connections do little to increase students' understanding of a topic. Introductory and follow-up materials and activities are necessary to help reinforce the content presented during distance learning events. Many content providing organizations provide lesson plans, supplemental resource guides, and on-line activities and games to help supplement their event content.

Incorporating multi-media. Most videoconferencing hardware provides the flexibility to utilize supplemental video sources. In addition to VHS and DVD ports, PC centric systems and scan converter boxes for non-PC centric hardware can provide any user with access to a digital media source. Surprisingly, very few users take advantage of this capability. Some of the easiest ways to incorporate multi-media in a videoconference event include:

- Pre-produced video segments from a VHS or DVD player.
- Opening & closing "credit" sequences produced in Powerpoint, Director, or other similar applications.
- Live video streams from related web resources.

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Biographical Sketch

Timothy Barshinger is an educational consultant for IDSolutions, a visual communications and technology company. He has a master's degree in education with a focus on distance learning applications. This has enabled him to apply his former classroom teaching experience with a comprehensive understanding of videoconferencing/distance learning technology and applications. He works across corporate and educational markets with a special emphasis in the K-12 arena. As an educational consultant and trainer, he helps schools and content providing organization learn how to better integrate videoconferencing technology in their classroom and create enriching and exciting distance learning experiences.

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Self-Directed Executive Education Courses: Teaching Business and Strategy to Today's Manager

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Self-directed Executive Education courses are often used to teach managers and executives the skills they need to succeed in corporate leadership. The audience for these courses is typically the managers across a company or business unit within a corporation. Common course topics include leadership and management styles, strategies, and tactics, motivating employees, project management, business strategy, and many others. Executive education courses differ from traditional business academic courses in that they are generally shorter and do not offer academic credit for successful completion. We have created many executive education courses in our role as senior instructional designers for Option Six, Inc. In this presentation, we will describe one of the most successful course models we have developed and implemented. First, we will explain the pedagogical approach we have used. Next, we will describe relevant course features and discuss the instructional design challenges we have encountered. Finally, we will demonstrate the model by showcasing a recently completed course project.

Starting With Values

At Option Six, we've adopted a values-based approach to developing e-learning courses and other instructional materials. "Values-based" means starting out by identifying and describing our fundamental values about learning, values which frame the highest-level design context from which we develop specific instruction. Starting with values further means that all subsequent design decisions must support these values. When choosing between two or more generally equal design paths, the path that better supports these core instructional values is the preferred path to follow.

Just knowing our values isn't enough, of course. Once we've established our values, we are able to identify specific learning goals that are aligned with and support these values. Once learning goals are specified, alternative instructional methods are considered in order to create the most appropriate learning experience for the target learners. Specific contextual conditions resident in every development project (such as, audience characteristics, corporate culture, and client constraints) influence the selection of the best-fitting instructional methods in each case. By considering the situationalities (values, outcomes, and conditions) present in the learning environment as we choose specific instructional methods, we create instruction that is more likely to be effective than that designed without concern for the situationalities (Reigeluth, 1999; Beatty, 2002).

Fundamental Values

We've identified six interrelated fundamental values that all Option Six courses must uphold; learner-centeredness, flexibility, context driven, effective, solutions centered, and interactive. Some of these values overlap with each other, but each is important in its own right. (In our presentation, we'll discuss each of these in detail.)

The Importance of Engagement

In our experience, both online and in the classroom, students who are "engaged" in the learning process perform better on post-learning assessments – they learn better. Two important factors in engagement are motivation and interactivity (Kearsley & Schneiderman, 1998).

The single most important factor in learning is **student motivation**. Students who are not motivated are never engaged. Unmotivated students rarely transfer new knowledge into the work place. On the other hand, motivated students put forth extra effort to learn, follow the guidance of the course, and try to use all the learning resources provided in the course. In short, all successful students are motivated students. One of the most useful ways to think about student motivation is the Keller's ARCS model: Attention, Relevance, Confidence, and Satisfaction (Keller, 1979). **Interactivity** is not well-defined in the e-learning field (Rose, 1999; Sims, 1999). To us, interactivity refers to the student interacting with the course material at an intellectual level. Simply requiring a student to click to proceed to the next screen is not interactive, in our use of the term. Rather, challenging the student to consider a new concept, apply a concept to a new situation, and engage in a learning-focused activity at the same time (search for information, fill out a form, post a thought to a discussion, etc.), meets our criteria for interaction.

Theory Meets Practice

All of our online courses follow a similar pedagogical approach, custom-fit to specific content and clients as needed. In general, we believe in the supremacy of learning by doing as an approach to learning that can be effective with all students in every learning situation. It is our goal to challenge each student to perform – using relevant skills and abilities that apply newly acquired knowledge. Option Six courses implement four major instructional strategies – presentation, practice, assessment, and performance support.

Presentation

In all purposive instruction, there must be a method of content presentation, if the learner is expected to gain new knowledge, skills, and ability. In Option Six courses, presentation takes many forms, including text descriptions, diagrams, pictures, video explanations, multimedia demonstrations, audio clips (of information or examples), and on and on.

Embed objectives. It has been widely accepted that presenting a list of learning objectives to students at the beginning of a presentation helps them structure their learning efforts (Mager, 1984). In practice, however, we have realized that most students do not even read lists of objectives, let alone plan their learning around them. We have found that a more effective practice is to embed these objectives in the introductory "welcome" to the course. All students read this section. Of course, the instructional designer must use a set of formal learning objectives when designing the instructional experience, and these objectives should be available to the student who wants to see them, but they should not be used as the Gateway to learning.

Use multiple presentation media. Presenting complex concepts should be done in multiple modes. Simply writing 2-3 paragraphs of concisely worded, and technically accurate text is usually not enough. Often, we supplement text with a multimedia explanation, video demonstration, detailed graphic explanation, or audio explanation. In all cases, a text explanation should be available for students, since it is usually easy to print and read later and is also accessible to screen-reading software when needed.

Summarize key information. Occasionally throughout a presentation section, and especially near the end of one, it is important to summarize the key points presented to help the student remember what is "really" important. Presentation sections should be kept short enough that a student can easily remember 3-5 key points covered in that section, and so the student can synthesize several concepts learned together as the student completes practice activities. In the performance support resource section, the key points from each major topic should be provided for student use outside of the course environment.

Practice

Practice opportunities are essential to effective learning. Option Six courses provide many opportunities for student to practice applying the knowledge and skills they are acquiring, as they are learning them.

Learn by doing. Practice items challenge students to continue to learn as they attempt to "do" something with the knowledge they are gaining. Simulations, role-play scenarios, and other immersive activities are often excellent choices for practice (and assessment). These activities should be motivating, meaningful, allow for learning through mistakes, and provide robust coaching and feedback. Not every course topic needs an extensive simulation for adequate practice, of course. Sometimes, completing a simple spreadsheet or reading a short case with several decision-making questions is enough.

Support. Students should be supported (or guided) as they practice, though only as much as each individual student needs. In the beginning of a course, students may be expected to need a high level of guidance, though a few may not. Later in the course, many students may not need much support at all, though a few may still need a high level of support. It is important to try to meet the needs of both types of students in both practice situations.

Feedback. Feedback can come from many different sources, including the course system, an external mentor or instructor, or the student her/himself. Feedback can also be immediate or delayed. Providing immediate feedback is especially important when later practice builds upon the results of previous practice.

Progression. In general, practice opportunities should progress from simple to more complex, from easy to difficult, and from narrow to wide scope. Following a standard flow such as this helps students choose which practice items they would like to attempt, especially in later topics

Assessment

Assessment in Option Six courses is implemented in several ways. First, most courses use a **comprehensive pre-assessment** to help the student understand what they already know (and don't know) about the course topics before they start learning. Throughout the presentation phase of each course topic, small, **embedded self-assessments** help the student understand how well s/he is learning the course information, so that s/he knows whether to proceed with the next section of presentation, or to go back and review the current section. Practice opportunities (described above) provide another opportunity for assessment, as the student "tries out" new knowledge and skills, receiving feedback about their performance. Finally, most courses include a **comprehensive post-assessment** which helps the student understand which course topics they have learned well, and which topics they may need to review again.

Performance Support

To be truly effective, executive education courses should also be useful as performance support tools. This means that students must be able to use course material to aid them in the performance of their job duties after they have completed the course. One mechanism that facilitates this use is the course (or topic) "key points takeaway," a resource that summarizes the key learning points for a course (or topic) and provides other helpful hints or guidelines for them to implement outside of the course environment. Another helpful course feature is the ability to search and access course material by topic and sub-topic. When a student finishes a course, they should be able to return to the course to refresh their knowledge about a specific course topic or to retrieve a learning resource s/he may now need on the job. Another mechanism that is used for performance support is "downloadable tools" that the student uses during the course, but that are also useful on the job. These take the form of Excel spreadsheets, Word templates, job checklists, financial calculators, and more.

Implications for Design

We have developed a common interface that supports student learning in the self-paced, individualized online setting we have described above. Since we typically have a range of clients for a particular course, we leave room for customization to meet specific client needs (technical systems, collaboration requirements, etc.).

Course Sections

Even though we allow for customization, all of our courses support our fundamental values about learning, and most of our courses include the specific sections described below.

The **Introduction/Welcome** section introduces the course topic(s), explains overall learning objectives, and begins to engage the learner in the topic and context. The **Content presentation** section presents information about the course topics in multiple media, including text, animation, graphics, video, etc., and provides links to extra information (marginalia) and external websites. It includes short, embedded self assessments and instructive practice activities (guided practice). The **Resource center** section provides access to downloadable tools (if any), "Key Points" topical summaries, the course glossary, lists of other websites or readings that might be helpful, and an annotated bibliography of other useful resources. The **Practice arena** section provides access to all the practice activities for a topic (or course). These practice activities are also accessible from the content presentation section. Co-locating all the practice for a course in one place allows a student to re-try a practice activity from a previous topic, or attempt a practice activity from a new topic, without having to search through the content sections. Finally, the **Assessment** section provides links to the pre- and post-assessments. Students use this section to check their knowledge, reviewing content and revising their learning path (if desired) at the same time.

Evaluation and Conclusion

During the presentation, we will demonstrate the design features with an existing course, and present findings from our evaluation of the latest version of this course model. (This evaluation is in progress at the time this is being written.)

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Managing the Development of Technology-Based Courses: Success Factors From Eight Department of Defense (DoD) Training Courses

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Introduction

The distance education literature reports many success factors common to managing the development of technology-based university-level courses. Commonly cited success factors include effective use of changing technology, acquiring sufficient resources for development and operation of distance courses, creating effective course designs, effective staffing, conducting sufficient planning, accommodating the needs and characteristics of instructors and students, and acquiring sufficient technical expertise. Much of the existing literature focuses on technology-based traditional university training. In contrast with traditional university programs, technology-based professional training and certification programs face unique challenges, such as the requirement that sponsoring organizations pay student salaries while the students use the learning technologies. Also, the training investment is expected to transfer directly into job performance. Thus, incentives to create effective learning environments are very strong in professional programs.

Defense Acquisition University (DAU) provides professional education for the U.S. Department of Defense Systems Acquisition Workforce. More than 15 technology-based courses have been developed by DAU. Collectively, over 20,000 persons graduate annually from these courses. Annual graduation rates for each course range from several hundred to nearly 10,000 students. This study investigated success factors for managing the development of technology-based courses. The research team attempted to identify success factors that might be relevant to DAU courses. In order to pursue this research goal, a literature review of success factors was conducted, followed by a study of eight successful DAU technology-based courses. The eight courses studied were considered successful based on favorable student and instructor feedback, meeting or exceeding projected enrollment numbers, and high levels of management and stakeholder support. The courses studied range from lower level courses taken online with no required instructor interaction to higher level courses using sophisticated threaded storylines and hybrid (online and classroom) components. One course uses conference calls and an online forum tool to create a "virtual classroom," combining the convenience of "anywhere" with real-time instructor-student and student-student interactions.

The researchers used success factors described in the literature to help guide the data collection. The literature provided a rich background for the study of the successful DAU courses. After the literature review, interviews were conducted with the DAU course directors, followed by analysis of data. The success factors identified in the literature review were then compared with success factors identified by DAU course managers. The study provided a strong grouping of success factors that should apply to DAU as well as to the management of other government and traditional higher-education distance learning programs.

Review of Literature

To simplify review of the immense body of literature related to distance education, the selection criteria for the literature search was very narrow, focusing on reports of success factors for the management of distance education development projects. The search favored empirical results from controlled studies where possible. Additional literature that reflected collection of data from experienced distance educators was also included. All items reviewed had some discussion related to success factors for the management of distance education development programs. After a preliminary review, several of the items were reviewed in-depth, leading to an identification of general categories along with some specific success factors (Alexander et al., 1998; Bates, 2000; Brigham, 1992; Lopez & Nagelhout, 1995; Volery, 2001; Wagner, 1995).

Robinson's (2001) summary of common problems related to innovation with on-line distance learning provided a useful categorization of success factors. Based on the experience of 426 distance educators, Robinson classified distance education course issues related to innovation, leading to the four general categories of *resource availability, organizational issues, human resource capacity*, and *technology capabilities*. These four categories of innovation problems comprised a convenient organizer for the success factors found in the literature. Table 1 lists the success factors identified in the literature review, sorted according Robinson's categories (2001).

Table 1: *Literature Success Factors by Category*

CATEGORY	SUCCESS FACTORS
Resource Availability	Sufficient fundamentals: time, funding and personnel Proper infrastructure for technology support Use of deadlines to help manage resources Reasonable project scope
Organizational Issues	Involvement of appropriate organizational levels Appropriate organization for technical support Adequate coordination and administration practices Organization-wide strategies for the use of technology in teaching and learning Organizational support for learners and instructors Attitudes toward use of technology
Human Resource Capacity	Produce and support learning technology Apply systematic and analytical methods Think through and plan the details required for distance learning Ability to address specific student needs Use the technology to enhance learning in new ways Use a sound and well-integrated instructional strategy Provide learner support Design assessments appropriate for technology-based delivery Staff training/development in technology where needed
Technology Capabilities	Adequate technical support Software testing expertise available Software development expertise (where relevant) Copyright issue resolution Adequate / equitable student access to hardware and software Ability to absorb extra technology-related costs

Data Collection Method

The research design was largely qualitative, with a guided interview as the primary means of data collection, followed by data analysis and a correlation of findings with the success factors identified in the literature review. The interview protocol was designed to facilitate exploration of the course managers' experiences with general issues identified in the literature review. Thus, the literature review was used to help construct the data collection protocol. The protocol questions were designed to provide field-based inputs from the eight DAU developmental course managers, facilitating a comparison of their experience with the success factors identified in the literature review. The courses covered a range of subjects including management of acquisition programs, funds management, management of system testing, and software systems acquisition. The interview method was face-to-face sessions with some follow-on contact for elaboration where needed. A standard qualitative review process was followed for the analysis of data including review of interview transcripts with identification of key points, organization of key points into the main themes, selection of the most frequent themes as the candidate success factors, and review of the findings by a course manager. A post-hoc analysis was conducted to correlate the success factor data with the results of the literature review.

Results and Findings

The interview protocol was tested with an initial interview. All interview sessions were managed to make sure that each protocol question was addressed. The interviews were recorded and transcribed for analysis. The analysis of data included a review of the transcripts for identification of key points made by the course managers. The initial review produced 99 independent candidate success factors which were grouped in categories according to logical themes. The final theme categories were *management issues, development process issues, human resource issues, course design issues,* and *technology issues*. Next, an additional layer of themes was identified, creating sub-categories within the categories. The top 10 sub-category themes were selected as candidate success factors based on high levels of occurrence. These top 10 themes are not inclusive of all of the 99 issues raised, but they were the most recurrent themes across the DAU courses. The final list of success factors emerging from the data, organized by the final theme categories studied, is illustrated in Table 2.

Table 2: *DAU Success Factors by Category*

CATEGORY	DAU SUCCESS FACTORS
Management Issues	Project Planning and Management Techniques Integrated Development Team
Development Process Issues	Effective Blending of Technology Alternatives (also a technology issue) Effective use of Testing and Evaluation
Human Resource Issues	Staffing and Team Issues Availability of SME time
Course Design Issues	Selecting a Motivating Instructional Strategy Consideration of learning variables
Technology Issues	Configuration Control (also a development process issues) Long-term technology support

These 10 DAU success factors were then reviewed and rated by importance to each DAU course included in the study, based on the data collected. A rating of 1-5 was assigned to each success factor for each course in the study. The ratings were tabulated, and the success factors were then ordered by importance. The following success factor list is sorted in tabulated order of importance to the DAU courses. A description of each success factor is also included in the list:

1. *Configuration Control* – This includes document control, harmonizing design and development versions, ensuring that source documentation exists for all on-line materials. All course managers had to come up with a way to successfully manage configuration control issues.

2. *Effective Blending of Technology Alternatives* – This includes analysis of available technologies, use of the most efficient mix of technologies, classroom sessions, on-line courseware, and others, and consideration of future changes driven by new technology.
3. *Staffing and Team issues* – This includes the optimal team composition, a positive and supportive work culture, protecting the team from distractions, co-location of team members where possible, staff selection issues, and careful selection of working team member combinations.
4. *Availability of Subject Matter Expert (SME) Time* – In several cases the classroom culture of the faculty made it difficult to get dedicated SME support for online course development, but all course managers were able to eventually get the necessary support.
5. *Project Planning and Management Techniques* – This involves defining requirements for learning objectives before finalizing the course design, making management tradeoffs to achieve the optimum balance between quality and schedule, and using baseline measures to track course performance.
6. *Effective use of Testing and Evaluation* – This includes early usability testing, prototype demonstrations for organizational stakeholders, formative testing during design, and testing by both instructors and students.
7. *Integrated Development Team* – This includes building an integrated design and development team with a functional group review and decision-making process, as well as early inputs from all team members on critical design decisions.
8. *Selecting a motivating instructional strategy* – This is particularly critical for courseware and online interactions. Effective strategies used at DAU include the use of problem-based and scenario-based training mechanisms, including the use of elaborate stories as an instructional vehicle.
9. *Long-term technology support*– This includes long-term technology planning, consideration of future requirements for interoperability, ease of maintenance, and compatibility of courseware with future releases of browser "plug-ins".
10. *Consideration of learning variables* – This includes many factors such as planning adequate student time for course completion, matching the course level with the students' level of preparedness, and providing efficient and usable resources to the students.

Discussion and Conclusions

The goal of the study was to identify success factors that might be relevant to DAU courses. The literature review produced an empirically derived group of success factors that guided development of the data collection protocol. Interviews with the eight DAU course managers confirmed that success factors in the literature were generally involved during their course developments. The interviews also provided an independent group of DAU success factors. Both the literature and the DAU success factors address issues related to human resources and technology. The success factors from the literature review focused on organizational issues, while the DAU success factors addressed more general project management issues. The DAU list added several success factors that were important to the DAU course managers, but were not emphasized in the literature reviewed. These included configuration control, availability of SME time, the use of an integrated development team, and the blending of strategies and technologies. Taken together, the combination of the literature review and the DAU success factors are a reasonable group of issues for both new and existing managers of technology-based development programs to consider. Some of these success factors may be more applicable to specific institutions, and the interview data from the study suggest that the professional workforce training focus of the DAU environment may be responsible for the identification of the additional success factors. Future research should elaborate on the role of these additional success factors and clarify mechanisms for their application in ongoing distance education development projects.

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Substituting for Yourself:
The Art of Being in Two Places at Once

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Just this month, our faculty teaching online received an email announcing a very important workshop that we had scheduled with our consortium partners. These same online professors teach courses on our campus and the workshop coincided with the end of the first week of summer session. At least two of the faculty replied immediately that they could not attend because they would be teaching. Neither of them had thought of the possibility of using Blackboard in their absence although both are well versed in its use--after all, they teach online! In fact, one of them uses Blackboard regularly to support her campus classes.

Faculty who are active in their profession often have to be away from campus at least once a semester to attend conferences and engage in other professional activities. The traditional approach when faculty are gone is to cancel the class, have a guest speaker, give an examination, give an additional assignment, or have a colleague take the class. Most professors are really not satisfied with any of these approaches, but believe they have few alternatives. Canceling class is usually frowned upon by administrators and students discount the information received from guest speakers and faculty fill-ins. They respond by cutting the class and viewing additional assignments as busy work (their performance on these assignments often shows this perception).

WBLS as a Solution

Why is Blackboard or any other Web-based learning system (WBLS) a viable solution to those days you just can't be physically present?

- ❖ It guarantees that there's no discrepancy between what you think is covered in the class and what is actually covered. No two individuals teach exactly the same. They don't use the same examples. They don't give equal emphasis to ideas. Therefore, even if you have called in a favor from the best instructor on campus and carefully outlined the topic of the day, test questions based on that material are best avoided since students will inevitably respond, "that wasn't covered." But, if you have created the material, placed it in Blackboard, and observed and interacted with the students as they use that material, you know for a fact that "it WAS covered." In addition, with this approach, you don't have to burn up your goodwill among colleagues by calling in favors.

- ❖ It guarantees that the class progresses as planned. Who hasn't had an occasion when you absolutely have to miss a class and you've pulled out the videotape that is "somewhat" pertinent or scheduled that exam from nowhere. Those solutions fill the class time, but they are usually not the same instruction the students would have received had you been in your usual place at your usual time. Most professors distribute a relatively detailed syllabus the first day of class outlining what will be covered and a tentative time line. The scheduling of materials is usually done to optimize the learning environment for the student. Cases and other activities are likewise scheduled to maximize the leaning outcome for the students. When you must be gone and the schedules are adjusted or an assignment moved or substituted, it can disrupt the flow of the material. This happens when the professor substituting may not be comfortable with the material scheduled for that day and thus a topic is moved forward that he/she would prefer to lecture on for the class session. But, with Blackboard, you are virtually present and can utilize a time span rather than a particular time so that the class is right where you want it when you return. The material you want included is covered when you want it covered, and any activity you want to have integrated with the material can be.

❖ It guarantees that your students are involved and active during your absence. The substitute whose material won't be included in the test (students are pretty savvy about this) or the student showing the videotape that isn't quite pertinent is usually asked to pass around a sign-up sheet and verify that the number of bodies in the room matches the number of names on the list or human nature may prevail. Some faculty members do not tell students ahead of time if they are going to be gone because the absenteeism rate will be too high. But, your own material in Blackboard with student interaction that you can "tune in on" and participate in from wherever you may be is much more likely to assure your students' "presence" during your absence. By reviewing the interactions around the discussion issue you can determine the frequency of each person's input and the quality of their comments.

For faculty who have had little or no experience with WEBLS products like Blackboard, using it may appear as a daunting task. However, with a minimal amount of help from an instructional designer, converting course material is a relatively easy task. Instructors can take material for a class period or multiple class periods and convert it for the virtual classroom so that it becomes a seamless part of the class. The direct results include: 1) students receive the usual course content presented in a way chosen by the instructor, and 2) the instructor, as long as there is internet access, is literally in two places at once and can monitor and take part in the interaction that occurs within the class.

A Basic "How To"

The first step is to decide what materials you want the Web-based learning tool to provide to your students. It can be a lecture outline, a case, a PowerPoint presentation, links to WEB pages with directions for what to look for on those pages, links to online articles--just about anything you can imagine. Again, if you've used a tool such as Blackboard before, the process of putting the materials into the tool is the easiest part. If you have not used such tools, this is probably not the time to try to learn it unless you are planning your absence far in advance. Rely on your campus LTDC (Learning Technology Development Center) or similar unit to help you place the materials into the tool. Concentrate, instead, on how to use the tool in a meaningful way. The good news is that functioning within Blackboard or any WBLS is quite simple--especially if you are comfortable maneuvering on the WEB. Students are almost always either already familiar with the tools or quick learners. And online tutorials and manuals accompany the tools. In addition, your LTDC will likely have a quick and easy handout or online site that coincides with whatever tool your campus has available.

The next step is to determine how to make the WEBLS experience equivalent to the face- to-face classroom experience. Here are some essential things to remember:

❖ Think proportion. If you would normally have your class read one chapter and one article in preparation for class, don't assign five WEB readings. If your class is normally an hour long, don't require "discussion" that will take your students two hours to complete. Your students should spend about the same amount of time in the virtual classroom as they would preparing for and participating in the traditional classroom.

- ❖ Provide a natural flow of material between the literal and the virtual classroom. The articles or cases students read online, the WEB-sites they visit, the lecture notes that they study must fit naturally with what has been going on in the classroom. Students respond no better to add-ons and fillers than they do to substitute instructors. If they sense that the online experience is there just to fill time, they will respond accordingly.

- ❖ Introduce the virtual experience within the traditional experience. The students need to be told upfront what they will be covering online and what the expectations are. Since you are not there when they may be online, it is important to be overly prescriptive on what you want them to do and the level of performance expected. Within the traditional classroom, it is easier to clarify and provide immediate feedback to guide the learning. In the virtual environment, you need to carefully design your learning component prior to the session beginning. Unless you have highly self-motivated students, knowing they will "get credit" for participation in the online experience is helpful.

- ❖ Supply clear technical directives. This often entails a very brief handout (how do I reach the virtual class) and clear paths throughout the platform to direct the student from activity to activity. Here is a place where the LTDC can help if you are new to WEBLS.

- ❖ Require interactivity. Students who visit the virtual classroom once are much more likely to be superficial than those who must revisit the classroom, building on what they did in the first visit. So, minimally, set up a discussion where the students must make an entry and then return to read other entries and provide a response. The amount of time the students will be using the virtual classroom will impact the amount of interaction. It may be helpful to provide them with examples of what you would consider a superficial response. For example, "'Cool idea' or 'nice job' does not add to the growth of knowledge."

- ❖ Maintain a presence. No matter where you are, the Internet is likely there. Find a way to log on and check in. This might include comments on how the discussions are going or answers to posted student questions or even messages from afar (digital pictures).

- ❖ Provide closure. Again, for a full integration, the class that follows the WEB "classes" must flow from them, building on what the students learned and did in the WEB-based platform.

Examples of Success

In the case of our institution, a number of professors have taken advantage of Blackboard in this way. In fact, we found Blackboard indispensable when one of the faculty, because of his administrative position, had to attend an AACSB (The Association to Advance Collegiate Schools of Business) meeting out of state. He was teaching a one credit graduate elective course on discipline that met for only five weeks; he would be gone the third week. He informed the class the first night that weeks 1, 2, 4, and 5 would be traditional and week 3 would be virtual. In week 2, the class led up to the point where the online class would pick up. A technology support person came to class for the last 15 minutes that night and acquainted the students with online maneuvering by walking them through the online documents (a brief handout was also provided). As the technician projected a computer image showing each document on the screen, the professor briefly explained what would be required of the students. The activities included:

- ❖ Completing a 10 question True/False questionnaire

- ❖ Viewing a scale that, based on their answers to the questionnaire, identified what type of disciplinarian each student would be in a work environment
- ❖ Reading a "lecture" that was generously laced with charts and images
- ❖ Reading 3 cases
- ❖ Visiting the discussion area to answer brief questions about the cases
- ❖ Revisiting the discussion area and reading the answers provided by 3 other students for each case; then, providing feedback to those students that either expanded their answers, supported their answers with examples or detail, or offered alternative ideas (No "nice job" responses would count!).
- ❖ Taking a brief quiz that applied the lecture materials

Week 3, the professor picked up with a discussion of the students' findings regarding disciplinary types and provided a follow-up to their case results. He had been able to monitor their answers and their responses and make online comments during the time he was gone.

A similar procedure was used for an undergraduate Business Telecommunications class. In this case, however, a single 50-minute class was all that the instructor would miss, so the online work involved was less. The students in the class were already familiar with Blackboard from other classes (these were MIS students). They were simply told when the material would be available. The students were continuing a detailed case study project already begun in class. Previously they had developed a strategic plan. They were now at the implementation stage. Blackboard contained a document with new, essential information and a summary document of the previously covered relevant information. In the scenario, students were told they were to imagine they would be attending a meeting in which they would recommend the purchase of new equipment--the equipment would be expensive but the firm could afford it and it would be essential to their implementation. They were to outline the presentation they would make at the meeting and post it to the discussion area. They were then to return to the discussion area the next day and provide feedback to the two students whose outlines were posted below their own. The instructor provided feedback after the second postings.

Conclusions

There is no question that the "Be your own substitute via WEBLS" approach is more time-consuming than grabbing that video or calling in a favor and there are times when the video and the guest/substitute are absolutely appropriate. But the WEBLS approach is a viable alternative. And, it has some very positive features:

1. It is an advantage to both faculty and students because it allows faculty to use class time in the way they really want to use it.
2. It makes faculty more willing and able to accept projects that take them occasionally away from their classroom.
3. It stimulates interest and use of WEB-based Learning Systems by instructors.
4. It acquaints students with the full capabilities of WEB-based Learning systems, making them ready for the WEB-based courses which are likely to be part of their future.
5. It begins a "library" of materials for the faculty that become a ready resource to reuse and to build upon.

So, next time that conference beacons or that seminar is really too significant to pass up, or the Chancellor requests the honor of your presence, consider being your own substitute. You really CAN be in two places at once.

Biographical Sketches

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Online Learning in K–12 Schools: "What Works"

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Since 1996, enormous progress has been made toward achieving the U.S. Department of Education's goal to build a national technology infrastructure to support its vision for effective technology use in the nation's elementary and secondary schools. Significant increases in federal, state, local, and private investment in the national technology infrastructure have helped many teachers and students in elementary and secondary schools obtain access to and begin using a variety of powerful new online learning tools. These tools enable distance learning and technology-based instructional delivery systems.

Recent growth in national attention directed toward online courses and virtual schools underscores the importance of e-learning policy and online learning practices. The full complexity and impact of e-learning and online courses on policy and practice in K-12 schools and school districts is emerging only now as a subject for consideration and discussion by leadership in public education. It is imperative that state-level education policymakers become active participants in the ongoing conversations about K-12 online learning. Such participation will help ensure the systematic implementation of effective e-learning strategies in the nation's elementary and secondary schools.

Policy and Practice

At the CiTE Virtual High School Symposium, sponsored by the Center for Internet Technology in Education and held in October 2001, there was ample evidence that a vigorous and growing community of practice is building what could be called a virtual high school movement.

In his keynote address at this symposium, John Bailey, director of the Office of Educational Technology for the U.S. Department of Education, shared his views on education and technology and described the conditions required to achieve positive outcomes from e-learning in K-12 schools. He mentioned the following policy themes for online learning:

- "Anywhere, anytime" learning means that "education can now be delivered to students wherever they are located."
- Online learning should encourage schools to become "education centers" for their respective communities.
- "Every educational program is a technology opportunity, and every technology program is an educational opportunity."
- Online assessment in conjunction with online learning has the potential to significantly increase the effective use of instructional time and encourage "a system of education that isn't based on mass production, but is instead based on mass customization."
- "We need to be relentless in measuring and assessing the impact that technology has on education and on academic achievement. We need evidence that teaching and learning are

improved as the result of technology. Using technology to teach using traditional methods will only lead to traditional results." (Bailey, 2001)

Dialogues and conversations among attendees at the symposium centered around creating a consensus between practitioners and commercial developers of online learning products about the critical issues facing the online learning community. It was not apparent, however, that state-level policymakers or representatives from education agencies in the states developing virtual schools took part in these important discussions.

The National Association of State Boards of Education (2001) concurs that there is a lack of input from education leaders and policymakers with regard to e-learning development and implementation: "The uncomfortable reality is that education leaders are not currently driving the policy agenda" (p. 6). Without the substantial participation of state-level educational leadership, however, any possible contribution of learning technologies or e-learning to school improvement and reform may fall prey to the loose coupling that is apparent between many traditional state educational policies and visionary e-learning practice.

Findings and Recommendations

In the end, student access to online courses will be determined by local decisions that must be made by education administrators and policy leaders everywhere. These decisions will affect whether or not specific virtual courses will be approved (or afforded) for individual students who have particular rationales and reasons for requesting enrollment in online classes. In some cases, this situation may contribute to lower enrollment in regularly offered on-site classes, lower daily attendance, and shrinking instructional loads—with negative impacts for staffing and personnel budgets.

The following findings and recommendations offer some next steps for state and local policymakers.

Finding 1

Innovative leaders in the e-learning movement and established state education policy leaders have not established a basis for communication and dialogue on critical policy issues.

Recommendations

- Leaders in the e-learning movement and state education policymakers should initiate communications and begin working together to help shape e-learning practice. Such dialogue will help education policy leaders understand the unique dimensions of e-learning practice and also will enable e-learning to operate within critical educational policy constraints.

- Key state education agency representatives should be encouraged to participate in professional forums such as subsequent CiTE Virtual High School Symposiums. These forums provide common ground for critical dialogues between e-learning consumers, producers, and educational policy leaders concerned with the top-to-bottom articulation of e-learning policy and practice.

- State education agencies should be strongly encouraged to begin a thorough analysis of existing state education policies that have clear implications for support and regulation of online learning or e-learning in K-12 environments. In all cases, due consideration should be given to modifying or adapting existing policies to promote the equitable diffusion and implementation of online learning. The time-consuming development of new policies, in contrast, may delay or slow the adoption and effective implementation of K-12 online learning.

Finding 2

When provided with quality professional development opportunities and supervised online clinical experience, good traditional teachers also can become effective facilitators of online learning. Similarly, well-qualified and experienced online instructors can learn the more specialized instructional design and implementation skills that are necessary to create quality online learning materials based on their existing teaching experience and curricular expertise.

Recommendations

- Certified, experienced teachers who wish to become online instructors should be required to complete an approved professional development curriculum ensuring their competency as online instructors before being assigned responsibility for leadership in an online course.

- Experienced online instructors should be required to complete appropriate specialized professional development concerned with the design and implementation of online learning environments before undertaking the local development of online courses.

- Specialized professional development programs that provide teachers with professionally recognized credentialing as online instructors or developers of online learning often are costly and time consuming. Professional development costs for teachers should be shared or fully reimbursed, work release time should be provided to support preparation required before and during initial online instructional assignments, and teaching loads should be appropriately adjusted to compensate for online teaching or participation in online instructional development projects.

- School districts should avoid encouraging or requiring teachers to accept assignments as online instructors. They should not require teachers and other district employees to participate in the development of online instructional materials or course materials without appropriate financial compensation for assigned duties and due respect for copyright and ownership of intellectual property (see American Association of University Professors, n.d.).

Finding 3

Hybrid courses (combining face-to-face and online instruction) with smaller enrollments and clear linkages to approved curriculum practice seem to offer higher completion rates and arguably better quality learning outcomes than online courses alone (Cavanaugh, 2001). This finding suggests that online learning optimally should be used in some combination with face-to-face instruction, primarily from qualified and experienced teachers who are in physical proximity to enrolled online students.

Recommendation

- School districts, state education agencies, and the U.S. Department of Education should collaborate on development and implementation of a scientific research agenda related to the use of online professional development and e-learning with students in K-12 learning environments. This agenda should determine which resource configurations and instructional design practices optimize student achievement and authentic learning outcomes.

Finding 4

Optimal resource configurations and instructional design practices that promote effective e-learning outcomes in K-12 learning environments currently are not recognized, generally understood, or agreed upon by e-learning producers, consumers, and education policy leaders. Objective, researched-based guidelines and standards supporting the selection and screening of online courses are lacking. When seeking product information on online tools and advice about what works and what doesn't in K-12 e-learning environments, school districts and state education agencies may be dependent upon the vested interests that are developing and selling online learning services.

Recommendation

- All concerned parties and agencies should support the development and diffusion of standards and assessment guidelines for online learning. Such standards and guidelines can assist local school districts and state education agencies with the selection and acquisition of well-designed and effective online learning.

Finding 5

Existing educational research and program evaluations that examine and analyze the outcomes and impact of online learning in K-12 learning environments presently are very limited. The few available research summaries and meta-analyses currently available do not include published data from recent program evaluations and assessments from state and federally supported virtual high school programs.

Recommendations

- Existing research summaries and meta-analyses concerned with e-learning policy and practice should be expanded to include newly published findings on recent state and regional virtual high school projects.

- Support for additional professionally designed and executed program evaluations and scientific educational research should be given a high priority in all public and private agencies supporting effective implementation and use of online learning in K-12 learning communities.

Conclusion

In final analysis, e-learning isn't about digital technologies any more than classroom teaching is about chalkboards. E-learning is about people and about using technology systems to support constructive social interactions, including human learning. Although computers and other digital technologies clearly will play an increasing role in K-12 schools, e-learning may work best when it is combined with some face-to-face classroom experience. In the best of all possible worlds, an eventual goal might be for students to have their own notebook computer to support both in-school and at-home learning, as long as they actively pursue publicly available educational opportunities.

Books and traditional technologies certainly will continue to be important, along with telephones, satellites, compressed videos, audiotapes, and videotapes. But in all probability, today's newest educational technology approaches—e-learning and virtual schools—are destined to become tomorrow's established instructional delivery systems. New e-learning technologies will become increasingly common for people in all walks of life, and increasingly integrated as an invisible and ubiquitous part of U.S. global, cultural, political, and economic systems.

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Blended Web Learning: Advantages, Disadvantages, Issues, and Considerations

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The importance of a highly trained and skilled military has never been greater than today. Rising to meet this need is the capability to train personnel anywhere in the world at any time using distributed learning (TRADOC, 1999). In response, the purpose of this study is to understand how a blended or hybrid approach to e-learning impacted the professional development of students in a high-level military course. This study addresses e-learning from the perspectives of the course learners, the course advisor, and the instructors. Focus group discussions helped document distinct advantages and disadvantages from different components of the course. Issues and considerations for e-learning mentioned consistently across groups should help with future course design and delivery methods. In effect, this research might help in forming instructional design principles for the Web as well as the fine-tuning of this particular program and ones similar to it.

Methodology

At the U.S. Army Armor School in Fort Knox, Kentucky, the use of collaborative learning environments is taking center stage in the Armor Captains Career Course (AC3-DL) (Wardell & Paschetto, 2000). The purpose of the AC3-DL is to train captains to command companies and perform as assistant operations officers at command units such as a battalion. This training is conducted in three phases; the first two are online (Phase Ia: asynchronous, and then Phase Ib: synchronous), while the final phase is face-to-face.

Procedure

Interviews took place with two focus groups of four students who were completing the AC3-DL course as well as three instructors and the Distance Learning (DL) Education Advisor. Prior to the focus group meeting, the students completed a series of questionnaires related to their Internet backgrounds, attitudes toward working in groups, satisfaction and self-efficacy for the synchronous phase of the course, perceptions of the effectiveness of the online environment, and perceptions of task and interpersonal cohesiveness.

Results

Across the students, instructors, and course supervisor focus group sessions, there were a number of distinct advantages and disadvantages noted. Naturally, the students liked the flexibility of completing assignments on at their leisure, the immediate feedback, and the thoughtful commenting and reflection of this environment. However, they mentioned problems with the length of most course modules, technology downtime or incompatibility, and system inflexibility. The instructors found that they liked the ability to tailor strategies to individual student needs, provide immediate feedback and online mentoring, standardize the content, embed small group interaction, update content, and foster knowledge application. However, they complained about the high attrition, excessive time commitments for their students, and lack of instructor control over module size. The course designer noted that the online course can take track student learning, provide more authentic learning experiences, take advantage of advances in learning theory, and address individual student needs. However, she admitted that there were definite problems in these learning environments, such as the risks in committing to particular technologies or delivery mechanisms before the students begin to learn.

Ten key Web-based instruction considerations or issues mentioned across participants are listed in Table 1. These considerations or issues relate to feedback, content meaningfulness, content size, course development and organization, the role of the online instructor, structuring small groups, flexible and active learning, technology utilization, assessment practices, and general skills such as online communication, problem solving, and teamwork.

Table 1. Web-based Instruction Considerations and Issues

Web-based instruction consideration or issue	Student Advice	Instructor Advice	DL Education Advisor Advice
1. Feedback.	E-mail is important mechanism for contacting instructors.	Provide instant and consistent feedback with e-mail and other tools.	Involve direct e-mail feedback.
2. Meaningful and Real-World Content	The construction of online products should approximate real-world application.	Require students to produce products that instructors and peers can evaluate.	Include meaningful content and allow students to apply new skills to real-life exercises.

Table 1 (Con't)

3. Size and Scope of Content Materials	To maintain motivation and increase completion rates, divide asynchronous content and testing into smaller units or accomplishments.	To increase student completion rates, instructors need some control to change the size of content modules.	Utilize minimal extraneous content, graphics, or practice exercises.
4. Course Development and Organization	A pre-orientation session will help address questions and concerns about the online course. Students need lecture and direct instruction before project work.	Learn basic content in asynchronous phase ("crawl"), put knowledge to use electronically and on paper in synchronous phase ("walk"), and apply knowledge in real-life scenarios in residential phase ("run").	Carefully analyze target audience wants and needs prior to course development.
5. Role of Instructor	Instructor is helpful as a facilitator of learning. The same instructor should support students across all phases of online training.	Instructor role is more of a facilitator of the learning process; providing tools, means, and guidance to learn effectively. Indirect questioning, prompting, reminders, role playing, and direct requests are ways to engage and involve students.	Instructor provides feedback and sense that someone cares about their learning.
6. Small Group Structuring	In online role-play, rotate roles among group members.	Match stronger leaders and weaker students in role-play activities to boost performance and confidence. Provide instructions and information prior to online events such as role plays and product discussions.	Create active environment with role-plays and simulations, but must provide balance between flexibility and learner accountability.

Table 1 (Con't)

7. Flexible and Active Learning	Be flexible and allow students to complete online modules at their own pace; minimize need for instructor to certify students are ready for next step or phase.	Distance learning helps Army Reserve students fit training into busy schedules and keep up with active duty personnel.	Offer flexibility, choice, variety, meaningful contexts for learning, and student performance opportunities.
8. Technology Utilization	To minimize frustration and downtime, utilize basic functions or technologies, where possible.	Use asynchronous communications for learning basic concepts and synchronous communications for application.	Limit technological visions and begin to incorporate technology based on what it can presently accomplish.
9. Build General Skills Through Online Communication, Problem-Solving, Teamwork, and Identity	Small talk, introductions, and information sharing helps form team identity.	Communication skills, problem solving, and teamwork are general skill outcomes of interactive distance learning. Online tasks should involve teaching students how to work with each other on a team to solve a problem. Teamwork and virtual talk among small groups fosters interaction and participation.	Courseware structured to move from individual effort (asynchronous component) to application exercises in small group collaboration activities (synchronous component) to problem solving in collective efforts within units (resident component) is a useful framework for fostering student learning.
10. Assessment Practices	Online assessments should closely match real-world expectations. Focus might shift from quantity of learning or breadth across areas to quality or depth of learning in particular areas. Assessments should also cover smaller amounts of instruction or learning.	Asynchronous learning is more ideally suited for objective tests and measurements, while synchronous might be used for student performances or products and criterion referenced evaluations.	Online assessments can include automated pre-tests, post-tests, and practice exercises that provide immediate student feedback. Random feedback or assessment tools are also beneficial. While evaluation gates require application of learning, the learning management system needs to be more flexible and adaptable in regards to items missed on gate examinations.

While this focus group study provided some general information about the keys to success and failure on the Web, the coding of over 6,500 chat acts indicated that there were shifting patterns of interaction during the synchronous phase of the training. For example, while technology concerns gradually diminished, on task discussion peaked in the middle months and social interactions were higher at the start and end of the training. Overall, student chats were categorized as on-task 55%, social 30%, or technology-related 15%.

Final Comments

There are many avenues for course and tool development as well as student testing and evaluation within military e-learning as well as in higher education, K-12, and corporate settings. The present study provided one look at the advantages and disadvantages as well as many instructional considerations and issues within a unique online learning program. Other studies might explore completion rates, attitudes, and overall learning when one's career is not contingent on course completion. The years ahead will require a myriad of contributors, many focus group discussions, thoughtful critique of what works and what tends not to work, extensive teaching and research experimentation, instructional fortitude, and careful project planning and funding.

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Biographical Sketches

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Faculty Preparation: Getting Started in eLearning

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Internet-based distance learning has become popular among educational institutions as a method of offering courses and degree programs in place of campus-based face-to-face instruction. As distance learning has proliferated at a dizzy pace in all segments of education and training, the need for instructor training in teaching at a distance has become obvious. Student consumers have begun to discriminate among those courses that have simply been transported to the online environment without modification and those courses that have been modified or specifically designed for teaching at a distance.

As more and more instructors are being asked to place their courses online, they are concerned about how to effectively design their courses so that the highest level of student achievement and satisfaction is attained. Additionally, many faculty have found themselves with little or no experience with online teaching/learning and are often uncomfortable and intimidated in this new environment.

The purpose of the *Getting Started in eLearning Workshop* was to provide a vehicle for educators beginning their online teaching experience to become comfortable in this environment and to develop strategies for success in their first online courses. The workshop focused on helping faculty understand the need for modification of current course design for delivery in the online environment and provide strategies for the effective modification and delivery of their content. Three areas of instructional design were addressed. They were building an online learning community, content delivery, and interaction.

Professional Development Strategies

The *Getting Started in eLearning Workshop* incorporated two professional development strategies: (a) the mastery of specific concepts instead of exposure to many concepts, and (b) the importance of building background and experience in a new learning environment. It followed a hybrid course model (combining an online component and a face-to-face component).

Professional development specialists often face a dilemma in the instructional design of workshops. Faculty understand the importance of the lesson cycle in their own classroom (concept introduction, guided practice, independent practice, and conclusion), but often want the "down-and-dirty" when it comes to their own learning. All too often the tendency is to cram as many skills as possible into the time allowed, with no time for practice or application.

Our experience has shown that in the area of technology-based professional development, the courses that focused on the mastery of a few skills were more effective than courses that simply provided exposure to many skills. Practice and application of technical skills gave faculty confidence in their ability to use the technology effectively in their classroom. Practice and application is especially important when dealing with the online environment. Providing technical skills without a pedagogical use for the technology can be devastating in an online classroom.

The *Getting Started in eLearning Workshop* was designed for faculty who were just getting started teaching in the online environment. Many of them had never seen an online class and had trouble conceptualizing anything other than posting their PowerPoint presentations and lecture notes for students to download and to read. The online component of the workshop provided a chance for these faculty to experience an online class as a student. This was essential in building background for the potential of the online classroom. Not only did the faculty experience different strategies for content delivery and interaction, they also experienced the frustration of not having the technology work the way it should and recognized the amount of communication needed to encourage a frustrated student.

A hybrid professional development offering has many advantages. Readings and background-building material can be provided in the online environment. Thoughtful discussion can take place in a discussion area...all on the faculty's "own" time. Once background has been built and reflected upon, participants can come together in a face-to-face session where the technical and more in-depth applications of the concepts can be addressed.

Overview of Getting Started in eLearing Workshop

The idea for the *Getting Started in eLearning Workshop* developed through a review of current literature in the area of effective instructional design for online courses. Three critical areas formed a common thread throughout the literature. They were the importance of building an online learning community, the necessity in providing multiple modes of content delivery, and the need to plan specific and required opportunities for interaction within the scope of the course. Also, apparent in the literature was the lack of faculty awareness of these three critical areas and/or effective strategies with which to incorporate them.

In addition, faculty had been asking for a workshop on how to use online courseware (Blackboard). They wanted to know how to get their content online, change colors, make links, use the gradebook, etc. While technical knowledge and skill was a recognizable need, a pedagogical basis for the use of various technological components available on Blackboard was also needed.

As dialog and planning progressed for the workshop, it became clear that a traditional workshop would not effectively meet the goals set. Faculty needed to develop background experience in an online environment before they could understand the instructional design strategies to be discussed. An online demonstration component of the class seemed the ideal solution. After sharing several common experiences with community building, content delivery, and interaction from the perspective of a student, faculty would better understand the pedagogical theory behind the instructional design strategies that would be discussed in the face-to-face session. They would also have experience with the courseware interface and its technological possibilities, providing background for the technical "how-to."

Online Demonstration Component

The purpose of the online demonstration component of the workshop was for participants to experience various instructional and technological delivery methods for Internet-based distance educations courses from a student's perspective. Through their experiences as students, a better understanding of effective instructional and technological delivery methods were discovered and internalized.

The online component consisted of four weeks of activities. Activities were posted on Sunday. Participants completed the activities during the week. The activities were designed to take approximately one hour to complete. Each week the activities modeled different strategies in community building, content delivery, and interaction. Sometimes the activities covered more than one area.

Week One Activities included a student orientation of the Blackboard course site, building a student homepage, and participating in a discussion board. The orientation addressed both community building and content delivery. Students became familiar with their classroom and discovered if they could navigate external links, download a document, and email their instructor. The student homepage also addressed community building as it provided an opportunity for students to become familiar with their classmates. The discussion board topic (which addressed community building as well as interaction) asked students to share why they signed up for the *Getting Started in eLearning Workshop* and what they expected to learn in the class. Week One Activities addressed interaction in all three of the critical areas:

- ❖ student-to-content: student orientation
- ❖ student-to-teacher: email, discussion board
- ❖ student-to-student: student pages

Week Two Activities included a look at PowerPoint presentations that covered the same content in two different presentation design strategies. Browsing external web sites, an online quiz, and a discussion board posting summarizing an online article of choice were also included. Community building was addressed through the content of the PowerPoint presentations and external web sites identifying qualities that make a successful online student. Content delivery strategies included an examination of PowerPoint design, utilization of external links, and an online quiz. Interaction focused on student-to-content and student-to-teacher as participants chose a topic, read an article, and summarized it on the discussion board.

Week Three Activities focused on ways interaction and content delivery could be combined. Participants were asked to read two of the article summaries posted on the discussion board and post a response that included questions for further information. A session in the virtual classroom (chat) was also held. The virtual class session was offered at two different times during the week providing options for the participants. Rules of engagement to be used during the session were posted before hand and followed during the session. The session topic centered around the online experience to date and the instructional design concepts experienced.

Week Four Activities focused on various strategies for content delivery. Instructional design content was presented as a video, as a text document, and as a web page where the information had been "chunked" with Flash learning objects included. Interaction on the discussion board focused on student-to-student interactions as participants responded to the questions posted during Week Three and student-to-teacher interactions as they posted their reactions to the content delivery strategies.

Face-to-Face Component

The purpose of the face-to-face component was to examine the theory behind instructional design strategies of online courses (or an online component to a face-to-face class) in order to determine which designs should be included in future course development. This component also provided technical "know-how" needed to set-up a course using the Blackboard courseware interface.

The six-hour face-to-face workshop was divided into two distinct segments. The first dealt with instructional design principles. Participants divided themselves into three teams to explore one of the three design principles that were focused upon during the online demonstration class (learning community, content delivery, and interaction). The teams then split up and explored pre-selected resources to gain practical information on their chosen topic, focusing on things to do or not to do. (The resource list can be found at http://www.eighthfloor.org/resources/websites/online.htm.) After exploring the resources, teams gathered back together to synthesize information and to prepare a group presentation. Teams reported back to the whole group, and an analysis occurred of how that principle of instructional design was applied in the online component.

The second segment dealt with the technical creation of a Blackboard course site. Blackboard.com was utilized as faculty from multiple institutions were involved in the training. Participants individually created a course using components pre-developed for the workshop. A tutorial was prepared which guided participants through steps of course development including: creating of the course, modification and development of course structure, addition of instructional content (including basic HTML, web-authoring software, multimedia components, and zipped files), and enrollment/modification of students.

Workshop Results

Overall, the hybrid workshop has been very effective. Participants truly appreciated the background building and student perspective that they gained during the online component of the workshop while the face-to-face component provided motivation for an exploration of resources and an opportunity for "personal" interactions.

Comments from the online demonstration component of the workshop showed many of the activities modeled to create a learning community were helpful, especially the use of the student homepages and the technical support discussion board. An outstanding discussion resulted from the different strategies involved in content delivery. Participants were able to identify a strategy that worked best for them, but were also able to see that multiple strategies would be most effective in a class. Participants, however, were most impressed with the different interaction strategies presented. They liked the structure of the discussion boards, which focused on course content and did not get "off target." The rules of engagement for the virtual classroom helped many see that a synchronous discussion at a distance could be manageable and beneficial.

During the face-to-face component of the workshop, participants enjoyed the format of the instructional design activity. They liked exploring web sites on their own and discovering what the "experts" had to say about instructional design. Working in teams was an effective motivator. Animated discussions took place during the group presentation planning and during the presentations themselves. Participants were pleased with the technical tutorial with pre-made components, which allowed them to focus on the technical aspect of Blackboard without worrying about content or design.

The overall feeling of the group could be summed up by one participant's comment:

> This workshop did an excellent job of exposing us to a wide variety of issues in online instruction. I think whatever I manage to get together for the course I'm teaching ... will be greatly improved as a result of this workshop. I can also clearly see the need for ongoing tinkering in an online course and the CRUCIAL need for availability of the instructor and /or technical support people.

Biographical Sketches

Lynnda L. Brown works for Tulsa Community College in a regional professional development center, The Eighth Floor. The center focuses on training teachers in instructional technology and distance learning strategies. Lynnda serves as the Instructional Design Coordinator and Webmaster for the center. Recent graduate work includes instruction and research in the principles and practices of Distance Education. For the last four and a half years, Lynnda has been a state-level trainer for the implementation of a massive effort to prepare more than 48,000 Oklahoma educators in the most effective uses of telecommunications and distance learning technologies.

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Learning Objects: Resources for Learning

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The Wisconsin Online Resource Center Digital Library

In 1999, the Wisconsin Online Resource Center (Wisc-Online Digital Library) is the foundation from two innovative projects that have successfully developed and demonstrated a unique approach to impact the teaching and learning effectiveness of web-based curriculum and course design in post-secondary education. Wisc-Online was funded as an initial project of the FIPSE Learning Anytime Anyplace Partnership to design and develop a digital library of learning activities (learning objects) that correlate with the common competencies of the nine core courses of the WTCS General Education curriculum.

Faculty content experts from across the state are trained to formulate creative approaches to teaching and learning of their course competencies that optimized the power of the new multimedia and web-based technology into dynamic and interactive online learning activities. The ideas were shared with a multimedia instructional designer who then worked together with a web technician to technically design into a small unit of learning known as a learning object. The completed learning objects are placed in the digital library www.wisconline.org. Metadata tagging (designed to be SCORM, IEEE compliant) is used added to learning object to ensure that it can be searched in the following ways within the Wisconsin Online Resource Center Digital Library: by key word, by content area, by topic area, by author, by learning style. The learning objects can be linked to course competencies that can be used and reused as an enhancement or alternative to traditional teaching of competencies, including alternative learning styles and assessment options. The learning objects can also be designed and use as an aggregation of multiple objects into larger collections and reused in a variety of applications.

Faculty enthusiasm for this collaborative approach to developing learning activities and integrating technology into the classroom spread to the WTCS manufacturing faculty who envisioned a digital library to support the core concepts and courses that support post secondary and adult basic education throughout the sixteen technical college districts in Wisconsin. In 2000, the National Science Foundation - Advanced Technological Education Program funds a three year WTCS project to develop the Core Manufacturing Digital Library component of the Wisconsin Online Resource Center. Highly technical content and laboratory procedures correlated with core competencies are able to be captured using creative online features that integrate a wide variety of interoperable multimedia options including video, graphics, animation and interactive assessment and instructor communication techniques. Those faculty, who have not been the most comfortable with technology, have embraced this approach as an effective way to teach the most complicated and confusing topics as well as being a "safe" introduction to instructional technology that emphasizes their content, not computer, expertise.

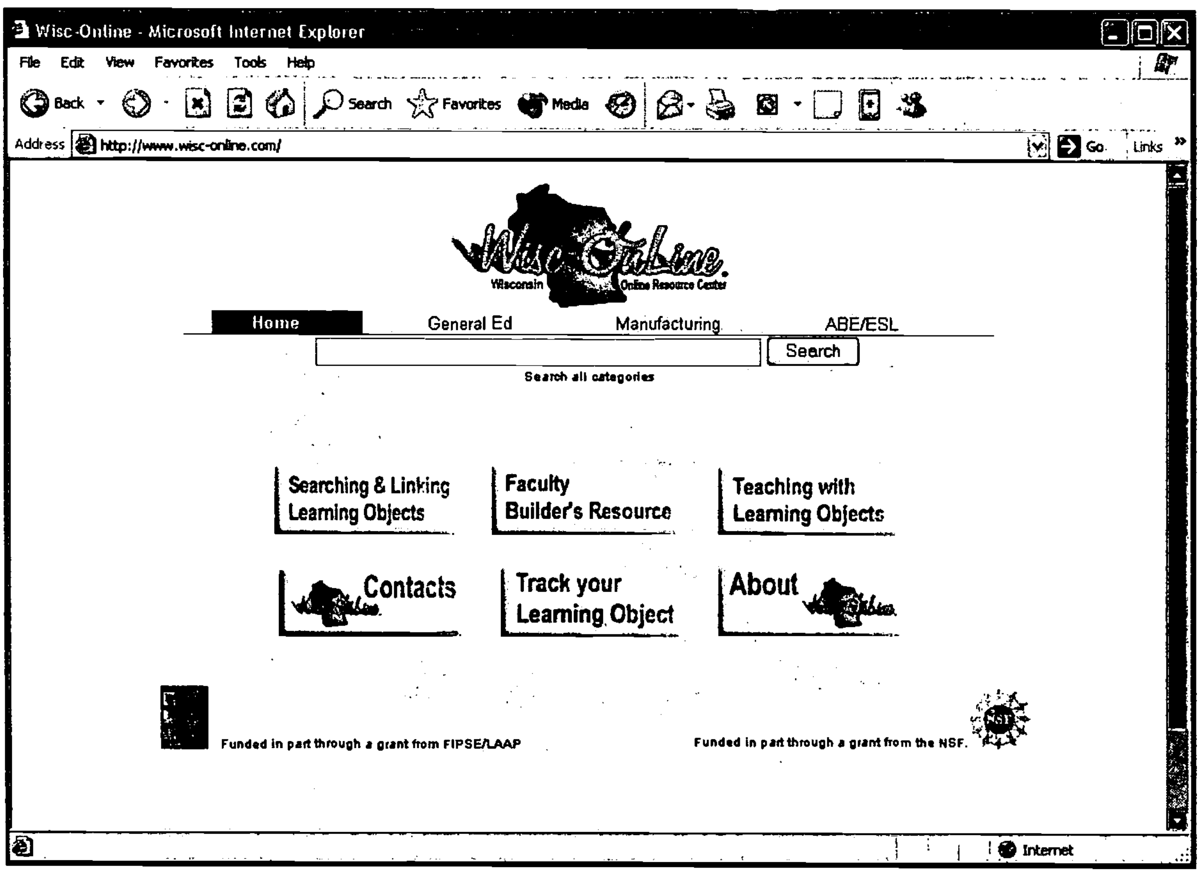
The student reaction has been overwhelmingly positive and impatient to have this learning approach available throughout their courses in every academic area. The seamless marriage of instruction and technology has been very effective in helping students learn the most difficult concepts and appeals to the increasingly computer literate student population.

Web-based resources are designed, built and linked to competency-driven/topic related curriculum. The digital library is developed with the collaboration of content-expert faculty and instructional technology specialists. The implementation of this collaboration is facilitated by faculty development to design multimedia based chunks of learning (learning objects) that can stimulate and accelerate student understanding of core concepts.

The project team for Wisc-Online Digital Library has witnessed how faculty who have become involved in the development of learning objects see this new concept as a viable part of the curriculum development and design processes. With instructional technician support, faculty are able to have their content moved from an analog version to web-based, high quality, peer-evaluated learning resources created for easy access and use. The learning objects that have been created by faculty who are tackling those "hard to teach" concepts are finding that a visual, multi-media approach is helping to increase not only learners' understanding, but is accelerating the learning in many cases.

Faculty have appreciated the fact that the project dollars support instructional technicians who are able to take the content provided by the faculty authors and web the content into multi-media learning objects utilizing the Macromedia Flash software. The learning objects are then housed in a searchable digital library for easy access and may be used by other faculty from any of the sixteen colleges. As of May 2002, over 100 faculty representing 15 technical colleges have authored over 500 manufacturing learning objects with another 200 in development.

The Wisconsin Online Resource Center Digital Library is found at www.wisconline.org,



The Wisconsin Online Resource Center defines a learning object with the following characteristics:

- A new way of thinking about learning content— Traditionally, content comes in a several-hour chunk called a course. Learning objects are much smaller units of learning, ranging, for example from 2 to 15 minutes.
- Small, independent chunks of knowledge or interactions stored in a database—can be presented as units of instruction or information.
- Based on a clear instructional strategy—intended to cause learning through internal processing and/or action.
- Self-contained—each learning object can be taken independently.
- Interactive—each learning object requires that students view, listen, respond or interact with the content in some way.
- Reusable—a single learning object may be used in multiple contexts for multiple purposes.
- Able to be aggregated—learning objects can be grouped into larger collections of content, including traditional course structures.
- Tagged with metadata—every learning object has descriptive information allowing it to be easily found by a search.
- Built to meet the Wisconsin Online Resource Center Quality Standards.
- Learning objects let you have learning that is:
  - Just enough—if you need only part of a course, you can use the learning objects you need.
  - Just in time—learning objects are searchable, you can instantly find and take the content you need.
  - Just for you—learning objects allow for easy customization of courses for a whole organization or even for each individual.

Digital barriers currently exist for a number of faculty and students within our country. With the demand and need on our educational institutions to integrate technology and adapt to technology, while at the same time institutions are faced with rising costs, the balancing act is challenged. The Wisconsin Online Resource Center is an open and free digital library for faculty to access and use. What become available to them are high quality, web-based resources through the Internet. Many faculty, within the Wisconsin Technical College System, who are teaching in store front operations or in incarcerated locations face the same barriers with the lack of hardware and access to the Internet. The Wisconsin Online Resource Center staff began to create CD ROMs with learning objects in order that faculty may use the learning objects with their students.

Multiple barriers continue to limit the integration of technology into the post-secondary curriculum. For most faculty members, it is neither appealing to adapt an already developed online course "off-the-shelf" that is created by another instructor or company. Most instructors are more comfortable with customizing their teaching and learning experiences for their students. In addition, there are often restrictions to using only portions of already developed courses or modifying certain components to meet specific needs. Practically speaking, existing online or digital resources often are prohibitive due to cost, uninviting password requirements or are instructionally incomplete having little meaningful use without major technology intervention, which effectively widens the digital divide. This factor inhibits the most disadvantaged individuals and institutions from access to dynamic and powerful technology-based resources to enhance those academic strategies where they are most needed.

Most educators find many of the digital collections or libraries are actually "flat files" of images or video-clips that in most cases have not been enveloped by comprehensive teaching and assessment aspects that lend them to be readily used and reused by faculty in their content area. The role of the instructional designers and technicians in higher education has been compartmentalized and often relegated to being a webmaster who is not connected with curriculum or student learning. Many assist with the development of online courses but are limited to using a singular software package to house the digital content. Rarely are they free to collaborate directly with faculty and access the plethora of digital solutions that can best convey a creative instructional idea in the most powerful pedagogical and technological manner.

The fundamental principle of the Wisconsin Online Resource Center approach is that faculty members value online educational materials that are peer-evaluated and collaboratively designed but not an entire course. The "buy-in" to this approach to instructional technology integration demonstrated by faculty members has created a growing demand in Wisconsin and beyond for training to expand the development of learning objects to new academic areas. Copyright and intellectual property rights that frequently emerge, as issues in the online educational arena have become a moot point due to the overwhelming faculty developers who have authored learning objects for Wisconsin Online Resource Center have belief in value of shared resources. The project team members respect the faculties' interests and desire to share their ideas, and are not interested in profiting from the creation of learning objects. With this philosophy, the copyright is held by the authoring faculty member's home college with a nonexclusive license to share and disseminate the learning object through the Wisconsin Online Resource Center. Educators are encouraged to use, reuse, evaluate and give feedback, but protection is assured from copyright infringement for unintended purposes.

Bibliographical Sketches

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Analyze Motivation-Hygiene Factors to Improve Satisfaction Levels of Your Online Training Program

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Introduction

One of the problems in Internet-delivered online instructional programs is high attrition. Despite the various potential benefits of online instruction, online learners tend to drop out of online instruction much earlier or more frequently than they do in traditional classroom instruction (Kember, 1995). There are various reasons for dropouts. For example, learners may stop attending on line classes because they think they have learned enough. Learners may stop enrolling in online courses because they have financial difficulties to support their continuous education. Learners may quit learning in online instruction because they are not satisfied with their online learning experience. It is critical to analyze the root causes of attrition before designing effective interventions to combat attrition (Chyung, 1999, 2001a, 2001b). If learners express dissatisfaction toward the online programs, the factors that cause dissatisfaction should be further investigated and eliminated. While isolating factors that cause dissatisfaction toward online instruction, it is also important to recognize factors that satisfy online learners and to continue to utilize those motivating strategies in online instruction. A helpful theory that guides such root cause analysis processes is Herzberg's motivation-hygiene theory.

This article is based on a 3-year long online training evaluation case study. In this article, Herzberg's motivation-hygiene theory will be introduced as the theoretical framework. Results obtained from the three-year case study will be presented. Based the results, hygiene factors that cause dissatisfaction toward the online training program and motivation factors that cause satisfaction toward the online training program will be explained. At last, general guidelines for conducting ongoing evaluations and continuously improving the motivational appeal of online training programs will be discussed.

Herzberg's Motivation-Hygiene Theory

In the 1950s, Frederick Herzberg and his colleagues studied factors that affected job attitudes. In one of their studies with engineers and accountants in the Pittsburg, Pennsylvania area, they interviewed individual employees and asked them to describe "sequences of events" happened on the job where they felt exceptionally good or bad about their job. Analyzing the interview data, "thought units" were identified. A thought unit was defined as "a statement about a single event or condition that lead to a feeling, a single characterization of a feeling, or a description of a single effect" (Herzberg, Mausner & Snyderman, 1959, p. 38). Thought units were then categorized according to similarity. The frequency percentage of positively or negatively stated items found in each category of thought units was used to determine the degree and direction of employees' attitudinal status toward their job. From their research, they concluded that there were two different sets of factors that affected positive or negative job attitudes. A set of factors such as achievement, recognition, work itself, responsibility, and advancement affected positive job attitudes. They called such factors motivation factors. Another set of factors such as working conditions, company policies, relations with supervisors, subordinates or coworkers, and pay affected negative job attitudes—they called such factors hygiene factors. The motivation-hygiene theory was established based on the research findings (Herzberg, 1966).

The motivation-hygiene theory has given a new perspective on job attitudes. The traditional perspective on job attitudes was that the opposite of job satisfaction was job dissatisfaction and the opposite of job dissatisfaction was job satisfaction. In other words, removing the causes that make workers feel dissatisfied would help them feel satisfied and removing the causes that help workers feel satisfied would make them feel dissatisfied. Herzberg's motivation-hygiene theory suggests that it is not true. In his theory, Herzberg explains that the opposite of satisfaction is not dissatisfaction but no satisfaction (i.e., neutral to either satisfaction or dissatisfaction), and the opposite of dissatisfaction is not satisfaction, but no dissatisfaction (i.e., neutral to either satisfaction or dissatisfaction). When the condition of hygiene factors deteriorates to a level where employees perceive it to be unacceptable, it causes job dissatisfaction. But improving the condition of hygiene factors to an optimal level does not necessarily make employees feel satisfied with their job. It is primarily the motivation factors that improve employees' job satisfaction (Herzberg, 1966, 1987).

Applying Motivation-Hygiene Theory to Online Training Programs

The conceptual model presented in Herzberg's motivation-hygiene theory that distinguishes hygienic and motivational factors that affect job attitudes is applicable to analyzing learners' attitudes toward online training programs.

In order to help online learners develop positive attitudes toward online training, one of the first things to do is to analyze what causes them to feel negatively about the online training program and to try to improve the condition of those hygiene factors. While maintaining the condition of the hygiene factors on an acceptable level, online instructors should recognize factors that tend to help online learners feel satisfied with the online training program and continue to utilize those motivating instructional strategies. When maintenance strategies and motivational strategies are systematically implemented, online learners' satisfaction levels will improve.

Described in the following section is a 3-year long case study conducted at Boise State University's Instructional & Performance Technology department. Similar methodologies used in Herzberg's research were adopted in the case study in order to reveal motivation factors that affect learners' positive attitudes toward online training and hygiene factors that affect negative attitudes toward online training.

Case Study: Analyzing Attitudes Toward Online Instruction

The Instructional & Performance Technology (IPT) department of the College of Engineering at Boise State University offers its entire master's degree program on line. The IPT online courses are delivered via Lotus Notes. The IPT department provides a week-long asynchronous online technical training program (a.k.a., IPT Boot Camp) to new online participants prior to their first semester. The IPT Boot Camp program is designed to teach them basic technical knowledge and skills for using Lotus Notes in IPT online course databases, and help them feel confident and become successful online learners (see Figure 1).

The IPT Boot Camp program is delivered a week prior to the first day of each of Spring, Summer and Fall semesters. Between Spring semester, 2000 and Summer session, 2002, eight (8) IPT Boot Camp programs were delivered to new online participants. At the end of each IPT Boot Camp program, the IPT Boot Camp evaluation was administered via the web. The evaluation questionnaire consisted of the following forced-choice questions (using a 5-point Likert scale) and open-ended questions.

- During the IPT Boot Camp, I learned the basic skills to utilize Lotus Notes database features. SD D N A SA
- The IPT Boot Camp task directions were clearly stated. SD D N A SA
- The number of tasks provided in the IPT Boot Camp was appropriate. SD D N A SA
- I feel prepared to use Lotus Notes database as a learning tool for my first IPT online course. SD D N A SA
- The IPT Boot Camp experience was valuable to me. SD D N A SA
- While you were completing the IPT Boot Camp tasks, was there a frustrating moment? If so, please describe.
- What components of the IPT Boot Camp program are you satisfied with? Please describe.
- Please provide any other comments you have about the current IPT Boot Camp program, or suggestions you may have for future IPT Boot Camp sessions.

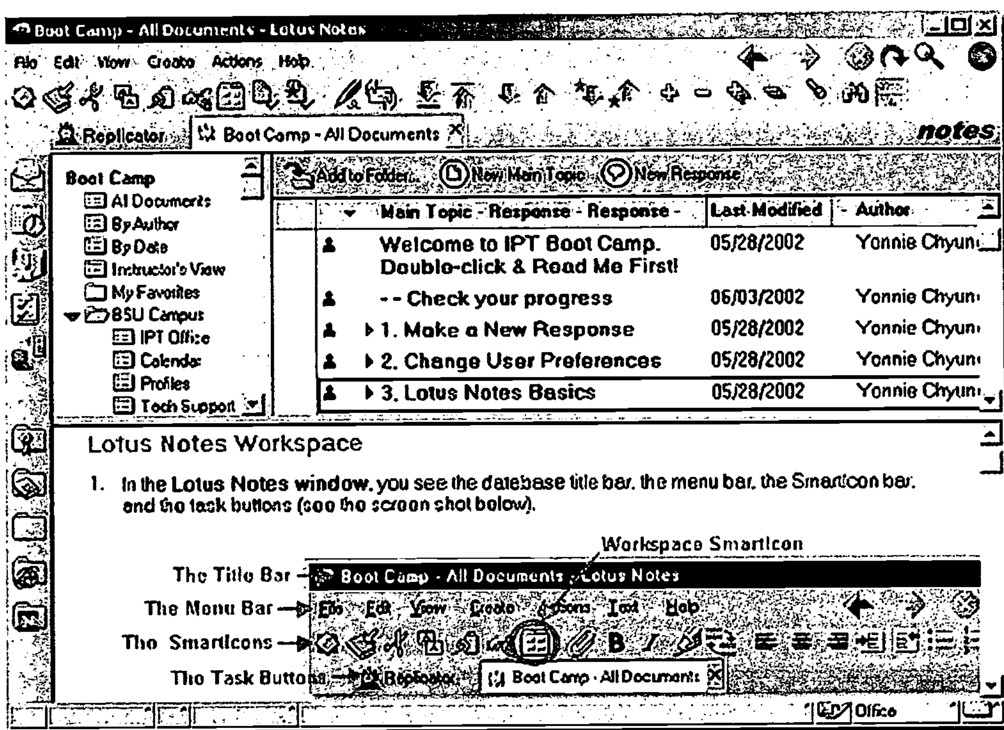

Figure 1. A Screen Shot from the IPT Boot Camp Database

Table 1. *Demographic Information of the IPT Boot Camp Evaluations*

Year	2000			2001			2002		Total
Semester	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	
Number of IPT Boot Camp Evaluation Respondents	14	9	29	44	17	32	46	19	210
Number of IPT Boot Camp Participants	53	16	38	48	17	32	46	19	269
IPT Boot Camp Evaluation Return Rate	26.4%	56.3%	76.3%	91.7%	100%	100%	100%	100%	78.1%

Two hundred ten (210) out of 269 IPT Boot Camp participants during the eight (8) IPT Boot Camp programs from Spring 2000 and Summer 2002 responded to the IPT Boot Camp Evaluation questionnaire (see Table 1). By analyzing responses to the open-ended questions, 'thought units' were identified. The thought units were then sorted into different categories according to their similarity. Events that affected learners to feel negatively during the IPT Boot Camp program were identified as hygiene factors. Events that helped them feel satisfied with the IPT Boot Camp program were identified as motivation factors (see Table 2).

Table 2. *Motivation Factors and Hygiene Factors Found in IPT Boot Camp* (Based on Responses to Open-ended Questions)

Motivation Factors	• Learning itself (i.e., learning new software) • Feelings of confidence (e.g., feeling prepared to start a new online program; getting more familiar with the environment) • Effectiveness of instructional materials (e.g., clearly written, well structured, easy to follow, multimedia) • Social Interactions (e.g., opportunities to interact with other participants) • Instructional feedback provided by the instructor (e.g., the information, the speed) • Flexibility/convenience provided in the learning environment (e.g., alternative Web access, asynchronous method)
Hygiene Factors	• Required amount of time to complete tasks (e.g., long downloading time) • Technology-related events (e.g., unexpected technical problems, a computer crash, a drink spilled on computer, a malfunctioning printer, web browser incompatibility) • Required amount of cognitive effort to complete tasks (e.g., things that made learning more difficult than expected, usually due to the unfamiliarity to or the complexity of the online environment) • Learner preferences on instructional design (e.g., the instructional sequence or the components of media used in instruction)

A Summary

Herzberg's motivation-hygiene theory suggests that motivation factors and hygiene factors are two different sets of factors that influence job attitudes. Herzberg explains that motivation factors are related to *what people do* on the job while hygiene factors are related to *the context or environment* in which they do their job. Presence of hygiene factors in a poor condition causes job dissatisfaction and maintaining hygiene factors on an optional level does not necessarily increase job satisfaction levels. Presence of motivation factors influences job satisfaction levels.

The conceptual model presented in Herzberg's motivation-hygiene theory was applied to analyzing factors that affect learners' attitudes toward the IPT Boot Camp program. The 3-year evaluation results seem to support Herzberg's research findings that there are two distinct sets of factors, one of which affects learner satisfaction and the other one of which affects learner dissatisfaction. For example, a long downloading time was identified as a hygiene factor. However, there was no evidence that absence of the poor hygiene condition would increase learners' motivation levels. The evaluation results also support Herzberg's idea that hygiene factors are *maintenance* factors that are environmental (e.g., downloading time, technical problems, etc.) whereas motivation factors are contributors to psychological growth (e.g., confidence, accomplishments, learning itself, etc.).

Recommendations: Rapid Processes of Evaluation and Intervention Design

It is critical to conduct ongoing evaluations on the effectiveness of online training programs for continuous improvement. An evaluation conducted at the end of a program (a.k.a., a rear-end analysis) will reveal learners' perception toward the training program, whether positive or negative. The rear-end analysis data will be fed back to the front-end analysis phase of the following cyclical revision processes and help redesign and improve the quality of the online training program. In order to improve learners' attitudes toward an online training program, it is recommended to implement cyclical rapid processes of conducting an evaluation, analyzing the motivation and hygiene factors, and revising the program accordingly.

Herzberg's motivation-hygiene concept is an effective guideline when analyzing causes of online learner retention and attrition. To be systematic, it is important to put initial effort on improving the condition of hygiene factors before implementing motivational strategies. While maintaining the optimal level of hygiene factors, additional effort should be put in order to improve the motivational appeal of the online instruction. A helpful guideline to enhance the motivational appeal of online instruction is John Keller's ARCS model. Online instruction can be redesigned by addressing the four factors; Attention, relevance, confidence, and satisfaction (for more information about the strategies, see Chyung, 2001b).

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Biographical Sketch

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Finding the Right Blend of Learning at PNC Bank

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Introduction

As companies expand in size and territory, training organizations are faced with the challenge of ensuring workforce competency while controlling the costs associated with the development of those competencies. PNC Bank is no different. We needed to control turnover, reduce expenses, and develop a workforce of 10,000 stretched across 6 states. We had to ensure that all employees had the skills, knowledge, and attitudes to be successful. PNC Bank's Regional Community Bank (RCB) Training department needed to find the right blend of training for our employees in order to satisfy them, while conducting training as economically as possible. The example that we will share with you is our Teller New Hire Program.

The Challenge

We were faced with three major challenges in developing the Teller New Hire curriculum. First, how would we build a foundation for success using a competency-based front-end analysis? Second, how would we determine the best method of delivery for each competency, as well as the best format? Third, how would we coordinate multiple project teams so that instructional designers would focus on their tasks and not their turf.

Step 1: Build a foundation for success through an extensive, competency based, front-end analysis using five key factors

- Define business need: In today's knowledge economy, organizations that understand and make best use of their knowledge capital are in the best position to thrive. Assessing what you know—and what you need to know—is a critical and crucial step in organizational growth as well as determining business need.
- Organizational culture readiness: A major benefit for an organization is the ability to protect core competencies by finding qualified candidates to replace highly skilled workers and senior managers due to attrition.
- Align skills with objectives and goals: Create job profiles and map to a specific set of skills and proficiencies, recommend specific learning to bring skills in line with your business goals, establish minimum proficiency requirements for a job profile, and update a person's skill proficiency upon completion of course or class.
- Improve strategic planning and overall strength: identify the skills that your organization needs to stay competitive, fully leverage the knowledge, skills, and competency of your people, and make sure you have the right mix of skills to meet your business goals.
- Individual career development: Allows the person to determine their skill gap, enables manager, subordinates, and peers to assess their skills (360 degree assessment), creates a plan to manage skill development, and identify job profiles and the skills associated with the requirements.

Step 2: Develop the RCB Teller Competency Model

The first step was to identify the teller competencies and list the key behaviors and tasks associated with those competencies. See table 1 for a list of the identified competencies and key behaviors.

Table 1

Teller Competencies	**Key Behaviors and Tasks**
• Focus on clients • Work efficiently • Solve problems • Manage time • Build relationships • Apply compliance knowledge • Maintain technical knowledge	• Interpersonal skills • Listen and speak effectively • Demonstrate Service Guarantees • Be aware of branch activity • Recognize client servicing and product needs

The teller competencies would be located within eNN, our learning management system. Based on the competencies, we developed a curriculum of the required courses to give the new teller the needed skills for success. Next, the delivery method needed to be identified.

Step 3: Delivery Methods

Examining the advantages and disadvantages for each delivery method, we structured the curriculum to be a blend of classroom and technology-based instructional delivery. Table 2 outlines the thought process that went into designing the structure:

Table 2

Course Structure	
• **Technology-Based** → Introduction that relates training to business goals. → Pre-test → Job-specific modules → Post-test to measure proficiency → Remediation	• **Classroom** → Modules that are task oriented → Instructors introduce lesson and objectives → Employees participate in exercises and role playing → Embedded questions for self-checks.

The course map, Table 3, outlines how each new hire receives 7 days of training using technology. Courses such as Basic Banking define terms associated with the financial services industry. Consumer Products gives the new hire the information pertaining to the products that they service and sell. Compliance reviews the regulations that the new hire must adhere to in their daily business transactions. The systems course allows the new hire to learn the system functions that they will need to use on a daily basis. All of these courses are completed on-line, with classroom follow-up and hands-on assessments. See Table 3 for a list of the curriculum.

Table 3

Teller Course Map

Day 1 **RCB Orientation**

- Introduction to eNN

Day 2 - 7 **In-Branch Experience**

- Basic Banking CBT
- RCB as a Business CBT
- Consumer Products CBT
- Compliance CBT
- Negotiability and Endorsements CBT
- A Day in the Life of a Teller CBT
- Service Guarantees CBT
- Systems CBT
- Debits and Credits CBT
- Security and Cash CBT
- Maintaining a Cash Drawer CBT

Day 8 – 12 **Classroom**

- Hands-on job specific simulation and role play in a classroom setting.

Step 3: Project Team Coordination

Set the scope of the project with the different partners. In this case, PNC RCB training and Pathlore were the partners. PNC provided project management and subject matter experts, which included the information technology piece of the project. Pathlore provided project management, designers and authors and technical experts. Using a team approach, we worked together to develop this blended solution curriculum. Each team member was accountable to the core team to develop his or her respective piece(s) of the curriculum. Through a free exchange of ideas and updates, we were able to bring all aspects of the development together, on time.

Conclusion

From executive sponsors to the end-users, each played a vital role in developing a program that lowered the cost to deliver this training, while increasing the retention of the lessons. We identified the overall business needs, objectives and strategies. The instructional design tasks included the development of the instructional goals, the delivery methodologies, and the instruction sequencing. Additionally, we developed lesson plans, the material to support the plans and invested in the technology required to run the CBT courses. All of these together were needed to ensure success. Now, how can we improve on this curriculum?

Biographical Sketches

Alan Coates has been in the banking industry for more than 7 years. As a training facilitator, instructional designer and training design specialist, he has supported the National Financial Services Center, Business Banking, the Branch distribution network and the Consumer Lending function. Alan designed and developed the outbound calling training which supported the calling of 1.8 million customers. Alan is currently one of three CBT developers at PNC Bank. He has also taught Principles of

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Christopher Taylor has been involved in the financial industry for 8 years. For the first 7 years of his career at PNC, Mr. Taylor was responsible for the design, development, and delivery for training initiatives impacting the origination and servicing of PNC Bank's Consumer Loan Portfolio. He has recently joined the Regional Community Bank's Development and Design Team as a Lead Instructional Designer. Christopher holds a bachelor's degree from Grove City College, a Pennsylvania State Teachers Certification in Business Education, and a Master's Degree in Communication and Information Systems from Robert Morris University.

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Management and Delivery of Technical BS Degree Completion and MS Degree Programs to Distance Learners

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This session will include a presentation on the management and delivery of a distance delivery technical bachelor's degree completion program and master's degree program. The management portion of this session will cover topics such as admissions, student advisement, and coordination of distance delivery. The course delivery section will consider the unique aspects of delivering a technical, laboratory-based program to distance learners. Methods used to transfer knowledge and experiences in a virtual laboratory environment using simulation and lab-in-a-box techniques in terms of student services will be considered.

This session will center on the unique relationship between a remote campus representative and the distance program director and course professor. Indiana State University has a number of programs delivered using distance education methods at the bachelors and masters level. Specific programs are technical in nature, including a bachelors degree completion program and a master degree, both in electronics and computer technology. Both programs provide some unique challenges such as the delivery of technical and laboratory-based course content. The increased number of students interested in these types of programs has created a void in the ability to service these students with advising, registration, and laboratory coordination activities. To provide these vital student services to students enrolled in the distance programs, the University employs local site directors. The presentation will cover some of the unique aspects used to provide services to distance students.

This session will benefit professionals in similar settings by presenting a model for the management and operation of a student services collaboration between an off-campus representative and the on-campus professor. Professionals from other areas might find the methods used by Indiana State University helpful in forming a similar program. Distance education professionals faced with the challenge of delivering technical, laboratory-based content might find the methods used in the session useful.

Distance Education at Indiana State University

Indiana State University (ISU) has a long and distinguished history for offering distance education programs in a number of disciplines. Ranging from associate through doctoral programs, the various degrees appeal to students interested in business, technology, nursing, and education, among others. Indiana State University believes that teaching at a distance is an integral function of university instruction. It has, therefore, incorporated distance education into the core functions of the institution and has its full-time faculty involved in the development and delivery of distance education programs. The distance courses/programs offer students additional opportunities to complete their educational goals. ISU is also known by the depth and breadth of the educational programs it provides through distance education.

BS Degree Completion Program

Indiana State University has entered into a partnership with Ivy Tech State College and Vincennes University to develop seamless program articulations. This is more commonly known as DegreeLink. The main intention of DegreeLink is to provide access to a baccalaureate degree for Hoosiers who unable to attend a residence campus program due to job, financial, and geographic restrictions. Students completing an articulated program can transfer to ISU as a distance education student. Those students selecting this program will receive courses through a variety of distance education technologies. The Electronics and Computer Technology Department (ECT) is a key part of the ISU partnership with Ivy Tech State College and Vincennes University. The ECT department offers students the opportunity to complete a four-year baccalaureate degree in Electronics technology through the use of distance education technologies.

MSECT Program

The Master of Science degree program in Electronics and Computer Technology with a major concentration in Instrumentation, Systems, and Automation is designed for persons preparing for career advancement or improvement. This program prepares students for careers in such areas as electronics quality control, technical sales, field representation, biomedical electronics, electrical power, or computer control of industrial processes. The degree can be earned through distance delivery to include Internet, videotape, and correspondence methods.

Delivery of Technical Content at a Distance

The nature of coursework in a technology program includes presentation of theoretical concepts that form the basis for the discipline. A major aspect of a technology program is the use of laboratory experiences to reinforce these technical concepts. On-campus students are afforded the opportunity to use state of the art equipment in high-tech laboratories. Obviously, distance students may not have these same opportunities. Some of the methods used to deliver valid laboratory exercises to distance students include simulation, lab-in-a-box, and local laboratory utilization.

Simulation

Simulation uses a software package purchased by the student or available online. The distance student will complete simulated exercises under the guidance of the instructor to meet the objectives of the lab. Examples of simulation packages used in the distance programs at ISU include LabView and Automation Studio.

Lab-in-a-Box

Pre-packaged laboratory equipment including instructions and data sheets is mailed to each individual student. The student completes the laboratory exercise and mails the package back to the instructor for evaluation.

Local Laboratory

Distance students are provided access to a laboratory near their home for the purpose of completing lab exercises. These labs may be located in a technical college, business, or industry. Agreements between ISU and the local facility are arranged before the start of the course.

Local and Remote Management of the Program

In order to gain and maintain student satisfaction and retention in distance education courses, the management of all areas regarding student services related to their education becomes of paramount importance. The student support services covered here are based on the initial needs perceived at the program's beginning almost five years ago and the subsequent changes and revisions adapted over time as the distance programs progressed. The input needed to incorporate these additions and modifications was supplied by student surveys conducted yearly and knowledge gained by everyone involved as the program grew.

Student Support Organizational Structure

The student support structure in composed of three main groups of people working together for the needs of the student. The first one on Indiana State University's main campus, has been established in the Division of Lifelong Learning to deal with inquires, mailings, questions, and/or problems that a distance education student might encounter. This department's interaction with distance students is primarily through telephone communications and mailings.

A second area of student support consists of a network of part time coordinators. These state wide coordinators are primarily located on Ivy Tech State College or Vincennes University campuses. They serve as a local contact for students. They provide information, answer questions, and refer as needed to either one of the three full-time ISU distance education coordinators or the student support group on campus. An additional advantage to this group of individuals is that they can interact face to face with distance education students.

The final element of the student support structure includes three full-time Distance Education Coordinators. These coordinators have students located in their geographic area referred to them by the previous two groups mentioned above. They are able to help the distance student in all areas relating to their education. The advantage to the distance student is that these three individuals are knowledgeable in all aspects of the University and can meet with them personally to provide information and guidance and refer to the appropriate people or departments as needed. Other functions of the Distance Education Coordinator are involved in the marketing of the University's distance education programs so those in communities are aware of the education opportunities that exist for them through distance education with Indiana State University.

Student Support Services On the Internet

In addition to the people involved in the support of our distance students, much information can be accessed through the web. Some of these include:

- Online undergraduate and graduate applications for admission
- My ISU portal
- Fee payment
- Registration
- Grades
- Financial Aid information
- Degree Audit Reports
- Schedule of classes
- College transcripts
- Email

- Access to Internet classes
- University information/notices
- Complete undergraduate and graduate catalog
- Textbooks
- Distance Learner's Listserv
- Technical support
- Library Services
- Student Handbook
- Distance Education web sites that includes all distance program information

Through the cooperation and communication between all parties involved in a distance students' education and the advances in technology, Indiana State University distance education students are finding success in their educational endeavors. High levels of satisfaction have been expressed regarding ISU programs as gauged by the responses to our annual surveys. Retention rates continue to climb each year.

Biographical Sketches

Gerald W. Cockrell is a Professor of Electronics and Computer Technology at Indiana State University. He has extensive experience in the development and teaching of technical distance courses for both university and industrial learners. He has written and presented numerous papers on the topic of distance learning. Dr. Cockrell is the director of the MSECT program offered both on-campus and at a distance.

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Developing, Archiving, and Disseminating Learning Objects: The Process

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Background

In 2001, an American Sign Language (ASL) course was developed by the University of Wisconsin-Milwaukee to be taught via the blended technologies of videoconferencing and Blackboard to learners in Milwaukee and at The Pyle Center in Madison. This ASL level one course was a pilot project and included a deaf instructor, a deaf site coordinator, a deaf evaluator, and other instructional design consultants. The course involved one meeting of three hours once a week via videoconferencing during a seven-week period, along with instructional activities on the web using Blackboard and a streaming video server. In addition to the synchronous and asynchronous nature of the course, 351 video-based "learning objects" of the ASL signs were developed and placed on a streaming video server so that the learners could practice the signs after each videoconferencing session. Following the course, the learning objects were edited, reformatted, and tagged for sharing through the Advanced Distributed Learning (ADL) Co Lab global knowledge repository. Further, other innovative ways for the learning objects were explored to allow increased accessibility and use. This session paper addresses the process and challenges of the development of video-based learning objects, their use as Web resources, their revision for handheld devices and CD-ROM, and their preparation for sharing through knowledge repositories.

Video-Based Learning Objects

"Learning objects" is a term that originated from the object-oriented paradigm of computer science. The idea behind object-orientation is that components ("objects") can be reused in multiple contexts (Wiley, 2000). For the purpose of our project, we define learning objects as video-based digital entities that are available via the Internet where individuals may access and use them simultaneously with a course or program, accessible through a CD-ROM for individual use via a computer at the person's own pace, retrievable from a knowledge repository for global sharing, and viewable on a handheld device for individual mobile use.

According to Wiley's (2000) learning objects taxonomy, the ASL video-based learning objects fall into the category of *combined-closed* type of learning objects because they are single purpose and provide users with instruction and practice. Each ASL video-based learning object is an entity unto itself. The parts that comprise each learning object (text and video images) cannot be separated or they would lose their meaning. Without the text the user would not know the meaning of the sign and without the visual image, there would be no sign.

Process and Challenges

The process of developing, archiving, and disseminating the ASL video-based learning objects involved four phases. Each phase utilized a different mode of accessibility for the use of the video-based learning objects.

Phase One:	Creation of 351 video-based learning objects for use on the web with the ASL pilot project course
Phase Two:	Editing of the video-based learning objects for global sharing and use through a repository of knowledge
Phase Three:	Placement of the video-based learning objects on a CD-ROM for the purposes of storage as well as learner use when the Internet was not readily accessible
Phase Four:	Revision of the video-based learning objects for mobile use in a handheld device

Phase One: Creation of Video-Based Learning Objects

During this phase of the process the instructor was videotaped performing the ASL signs. The signs were then edited into a video clip format in the following sequence:

- Sign description (text) on black
- A mid-shot of the instructor performing the sign
- A close-up shot of the instructor performing the sign
- Sign description (text) on black repeated

Signs were grouped into units and then into categories (e.g. nouns, verbs, sentences, etc.). The video sequences grouped into categories were saved as Real Media and stored on a Real Media server. A link to the Real Media server was created in the Blackboard component of the ASL course for retrieval by learners. The ASL learning objects served as a major review and rehearsal component of the course.

Phase Two: Editing of Video-Based Learning Objects for Global Sharing

During this step of the process, the categories of video-based learning objects created for the ASL course were divided and edited into individual signs for database searching purposes. Each learning object sequence was formatted in the following order using Adobe Premiere:

- 15 seconds of black at the opening
- Sign description (text) on black
- A mid-shot of the instructor performing the sign
- 15 seconds of black
- A close-up shot of the instructor performing the signs
- Sign description (text) on black repeated
- 15 seconds of black at the end

To ensure that the learning objects had high video quality, were readily accessible from different locations and across platforms, and provided rapid retrieval through modem, network, cable, and other high-speed connections, a prototype of four video-based formats (e.g., MPEG, Windows Media, RealOne Media, and QuickTime) was developed before making them available for the repository.

An evaluation chart assisted five evaluators in deciding on the effectiveness of the learning objects video format for the web-based repository. As a result of the evaluation, Real Media was selected for use. After the selection of the video format, all of the video-based learning objects were tagged using the following descriptions:

- Asset Name: 001_test_copyme.mov
- Asset Description
- Content Type: VIDEO

- Imported By
- Date: Imported: Asset Version: 1
- Is Latest Version: Yes
- Source: Reference
- Source: Phys Type
- Source: Phys Loc

One of the challenges we found was to decide on the description of the meta tags in order to provide an intuitive and accurate depiction of each sign. We tried to maintain the description of the sign to its basic meaning. The learning object files were then transferred to the Real Media server.

Phase Three: Placing the Video-Based Learning Objects on a CD-ROM

The decision to place the edited video-based learning objects on a CD-ROM was made for several reasons: storage, archiving, and retrieval by learners who were not able to access the learning objects through the Internet.

Phase Four: Use of the Video-Based Learning Objects in a Handheld Device

In order to reach out to a wide variety of users who like to learn in a self-paced and mobile learning environment, the video-based ASL learning objects were tested on a handheld device.
Initially the video-based learning objects were designed to run at 30 frames per second to fit the web and CD-ROM formats. It was necessary to reformat the previously used format for the handheld device.

After testing, the video-based learning objects were reedited from 30 to 15 frames per second for memory capability. This made it possible to load all 351 video-based learning objects into the handheld device. During the revision of the learning objects for the handheld device, we inserted several frames of black in the beginning and ending of the learning objects and between the two shots of the instructor signing. The purpose of these insertions was for clarity – to set off the text and more clearly differentiate between the two shots of the instructor and the text that explained the sign.

An important challenge to address was the selection of the handheld device that would offer the best picture and motion quality, and memory capability. Research by technical staff resulted in the selection of the Compaq iPAQ 3870 handheld device because of its picture and motion quality, and its extensive memory. The learning objects were loaded into the iPAQ using iPAQ software. Further steps and challenges, in progress, are devising a way to bulk import the video-based learning objects into repositories, populating metadata specifically for the objects, and exploring other issues such as compatibility with Management Systems.

Conclusions

There is a growing need for the use of learning objects to provide educational resources for faculty that enable them to enhance the learning experiences of learners. According to our experience in developing the video-based learning objects we realized how flexible and accessible these learning objects could be by using a variety of technologies. When we first made the learning objects available, they were limited to the use on the website by the learners in the specific ASL course. Because participants of the course gave high ratings to the video-based learning objects, we decided to pursue new ways to disseminate and share them.

The development of the ASL video-based learning objects has heightened our awareness of the need to design these objects to fit flexible modes of instruction in order to enhance their accessibility and use for learners. This process requires the use of standards, tests, evaluation, and often revision.

The actual use of the learning objects in the iPAQ has highlighted some new considerations. For example, while using the iPAQ 3870 we discovered that there are several accessories that would enhance the use of the learning objects: 1) there is an accessory that provides additional memory which will allow us to use 30 frames per second for the video sequences, providing an even better video quality for the learner; and 2) another accessory to the iPAQ will enable the learning objects to be projected from the iPAQ to a large screen. This will be an excellent way to demonstrate the instructional uses of the iPAQ to a large crowd.

Because of the value of the ASL learning objects, we are now considering developing ASL video-based signs for all five levels of American Sign Language. In addition, we hope that our experience will serve as a model for other designers and educators to create learning objects for other content areas.

(The creation of the ASL video-based learning objects was partially funded by University of Wisconsin System and became the collaborative effort of a number of UW institutions.)

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Biographical Sketches

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PJs or Uniforms?
Reaching Those Who Can't Reach You:
Teleseminar vs. Online Education!

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Introduction

The topic of "distance learning" is somewhat enigmatic in nature. It brings to many myriad concepts ... all with different applications and different meanings to different audiences. Reaching students who can't be "physically present" in a traditional learning environment (i.e., university classroom, corporate headquarters) remains a challenge to both academic and business environments. The purpose of this comparison—PJs or uniforms—is to collectively examine and evaluate ideas, methods, analysis brought to life with synchronous and asynchronous methods of delivery, while sharing success stories that will encourage participants to embrace "learning at a distance."

ANG SatNCOA

The Air National Guard Satellite Noncommissioned Officer Academy (SatNCOA) has provided a quality distance-learning alternative for enlisted members since 1994. This program is based on sixteen weeks of live, highly interactive instructional television, meeting two evenings a week for four-hour blocks. The program concludes with a two-week resident component. The traditional resident academy requires six weeks of full-time attendance at the Air National Guard Training & Education Center, located on McGhee Tyson Air National Guard Base, Knoxville, TN. This can be very disruptive to the civilian employment of traditional Air National Guard members. The SatNCOA offers an appealing alternative, which not only provides an outstanding academic experience, but also bolsters recruiting, retention and unit morale.

VCampus

VCampus Corporation is the leading provider of end-to-end e-Learning solutions. The company develops, manages and hosts turnkey, web-based learning solutions for corporations, government agencies and higher education institutions. VCampus enables these organizations to offer complete global distance learning solutions to their customers, employees, distributors, suppliers and students. VCampus' e-Learning solutions are designed to help clients deliver higher education programs to adult students; improve the performance of their distribution channels and suppliers; measure and develop their employees' knowledge, skills and abilities; and increase their customers' satisfaction and loyalty.

Comparison

The SatNCOA, however, offers a slightly different perspective to those interested in designing a course with the magnitude of VCampus. Rather than employing the typical "talking-head" syndrome used by so many programs, the SatNCOA utilizes a "team-teach" approach (very similar to a typical Sports Center broadcast), with a duo of professionally trained, dynamic instructors who concentrate on delivering curriculum through this innovative medium. Their tools are a combination of superior on-screen graphics, video clip examples, a large plasma screen between the instructors used for multi-media effect, and a behind-the scenes team of directors, producers and graphic artists. Although the SatNCOA's primary customers are students in an academic setting, the road paved by this program can be duplicated in many other training settings, regardless of goal or objective. The SatNCOA has attempted to exercise the "talking head, non-rehearsal, untrained talking-head demons" of the world and replaced them with highly skilled teachers who understand the difference between the traditional and distance learning classrooms.

VCampus Corporation distributes a courseware library of more than 5,000 web-based courses and has delivered more than 2.3 million courses to over 640,000 adult learners. Headquartered in Reston, VA, VCampus is a completely outsourced, remotely hosted and totally scalable distance education and training delivery solution. The services offered enable clients to easily manage the enrollment, registration, tracking, testing, grading, administration and certification of distance learners. Over the years, numerous other distance-learning methods have come to life, including computer-based training (asynchronous and synchronous) and on-line web-based curriculum designed to serve the needs of nontraditional students in all walks of life. Client feedback and evaluation come from a variety of partners to include the General Services Administration, Park University, University of the Incarnate Word, State Farm Insurance, Security College Online and more.

Join us to examine these programs that offer two environments and prospective, as we critique, evaluate and discuss a variety of topics throughout this presentation:

- Recruitment of instructors
- Technology and Equipment
- Support Services
- Diversity
- Quality and Academic Excellence
- Learning Community and Environments
- Faculty prospective and expectations
- Student learning outcomes
- Administrative prospective and functions
- Asynchronous vs. Synchronous
- Curriculums
- Growth Patterns
- Explore new partnerships
- Increased access and opportunities for its students
- Cost avoidance for their units, and quality professional education
- Advantages and Disadvantages form three different prospective:
  - Student
  - Faculty
  - Administration
- Time Zones
- Family Need
- Job/Professional commitments

Biographical Sketches

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Design Issues, Standards, and Technology: Can Online Assessments Measure More Than Recall?

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Good Assessment Question Ingredients

During the instructional design process, much time and attention is paid to conducting in-depth analyses, developing sound learning objectives, creating stimulating training materials and job aids, and then quickly throwing together some assessment questions designed to verify that learning took place. These questions, developed just before the project due date often consist of questions that are too obvious, too obtuse, and unfortunately, too often do not measure the intended learning outcomes. Sound familiar?

Generally, designers understand the purpose of assessments and agree that they are an important part of the design process. Although an intellectual understanding of the importance of assessments exists, often, the requisite skills needed to develop solid assessment questions is lacking. Instructional designers (in the corporate sector) come from varied backgrounds, and may have little or no formal training in learning and testing design. In addition to this challenge, many software development packages used to develop online learning severely limit designers' ability to create questions that can test to higher learning objectives. Because some development tools are very restrictive, the objectives are positioned at the knowledge/recollection level of the cognitive domain to ensure that assessment questions measure the desired learning outcome. In other words, the development tool dictates how learning will occur and at what cognitive level. These issues combine to produce assessment questions that are low on the cognitive domain and not truly indicative of whether meaningful learning was achieved.

Because of technology's influence, online assessment questions rely heavily on true/false and multiple choice as the models of choice. Both are valid assessment methods; however, the problem typically lies in the construction of poorly worded questions and distracters rather than the model choice. This results in assessment questions and answers that are of little value. For those who use the results of these assessments to determine training effectiveness quantitatively, accurate interpretation is dismal at best. Although technology capability does influence the design of assessment questions, fundamentally, well-written, measurable objectives and good assessment design create the foundation for meaningful, valid questions.

Taking technology constrictions out of the assessment development recipe, well-written objectives that are measurable in an online environment are the first essential ingredient. Unlike face-to-face training objectives, online training objectives are designed to measure outcomes not observe outcomes. Understanding the differences between measurable and observable outcomes when developing online training is critical. Designers and reviewers need to ask "what will learners be able to do when they have completed the course?" to ensure measurable learning outcomes. Depending on the online topic, it is possible to achieve measurable objectives within the application and analysis realm. When online training is coupled with a face-to-face training session using the concepts from the online session, higher cognitive levels can be achieved because the element of observation is available to the facilitator.

The second ingredient of the assessment development recipe consists of setting standards. Standards enable designers to verify that each question and distracter matches the intended learning outcomes, and fairly and accurately evaluates course learning. By establishing standards, the consciousness of the developers and reviewers is raised, and questions and distracters are more carefully scrutinized. Setting standards positively influences consistency, ensures that what is taught is tested and improves the quality of questions designed. Further, standards help reduce the use of obtuse or obvious distracters and aids designers in focusing on the truly relevant, core learning they intend teaching. Finally, standards can act as a catalyst for helping designers develop "fair" assessments. After all, the purpose of an assessment is to give learners the opportunity to demonstrate what they know (Suskie, 2000).

The last ingredient calls for training instructional designers and reviewers. The training needs to cover both the design of learning objectives and how to construct well-worded questions and distracters that match the intending learning outcomes. Designers need to be able to determine the cognitive level of an objective and then review assessment questions to determine if there is a match between learning intention and outcome. Once they feel comfortable determining this, given a set of standards, designers then review a series of questions and distracters to evaluate their effectiveness or ineffectiveness and suggest ways to improve them. When designers can identify what constitutes a good question and distracter, can determine the cognitive level of the objective and verify that the objective and assessment question match, conscientious application of this knowledge to assessment writing will result in better questions that more closely match intended learning outcomes.

Online Learning Assessment Question Types

Online assessment question types are closely tied to the technology capabilities of the development tool. Although there are exceptions, most online assessment questions are confined to three model types: multiple choice, multiple response (matching) and true/false. Each of these models has strengths and limitations. It is up to designers and reviewers to overcome these limitations until technology capabilities and accessibility are a non-issue.

Multiple choice assessments can be designed to measure higher order learning objectives by presenting practical or real world situations. A short paragraph can be used to describe the problem. Learners are then asked to review the listed items to assess the application of principles or evaluate alternative procedures (Kehoe, 1995, Poland 1999).

Multiple response assessment questions are useful for testing basic knowledge and are a variation of multiple choice questions. Multiple response questions have the reputation of being easy because learners can use the process of elimination to determine answers. Using an item more than once, or not at all, reduces the process of elimination tactic. To use this technique successfully, designers need to write very clear directions (Poland, 1999).

True and false assessment questions are overused and typically poorly developed. True and false statements are generally perceived as being easier to write, when in fact, good true and false assessment statements are difficult to write. In an effort to develop an accurate statement, designers carefully word it, which increases the probability that learners can guess the correct response. Typically, development models confine true and false statements to two questions per interaction. This further increases the likelihood of guessing the correct response and decreases the effectiveness of the assessment (Poland, 1999).

Assessment Question Standards

The purpose of standards is to provide designers with a series of guidelines they can use to determine if their questions and distracters match what was designed in the online course. Setting standards creates a performance expectation level and gives both designers and reviewers a benchmark against which to judge questions and distracters. These guidelines may include general standards, direction text standards, media/graphic standards, question/statement standards and distracter standards.

General standards may include guidelines such as:

- ❖ Assessments must test to the instructional objectives.
- ❖ Identify one content point to be tested. Do not introduce new material or test skills not directly taught.
- ❖ Focus assessment questions on key concepts, principles and skills that are essential. Avoid questions that only require recall of isolated facts.

Direction text standards and media/graphic standards may include guidelines such as:

- ❖ If there's one correct answer, "click (or drag) the statement/answer..."
- ❖ Use text-only models rather than audio models to present question information, unless the content dictates that audio information be presented to clarify the question. For example, a training session about telephone techniques should use audio models so that learners can hear tonal inflections to determine the best response.
- ❖ When re-using graphics from a lesson, ensure that the graphic provides enough information to be meaningful without making the answer obvious.

Question/statement standards and distracter standards may include guidelines such as:

- ❖ Construct questions/statements as either incomplete statements or direct questions that include noun/verb phrases. Exclude superfluous information as a way to introduce a question.
- ❖ Design questions so that learners are asked to choose what is rather than what is not. Do not use always or never in the question/statement.
- ❖ Arrange distracters in ascending or descending order of length. This prevents learners from immediately assuming that the longest answer is the correct answer.

Standards are based on design principles, not the technology being used to develop online learning. By taking technology out of the design equation, assessment questions – including true and false – become an effective tool to determine whether learning occurred.

Modifying Assessment Development Models

When technology is effectively used, it becomes almost imperceptible to learners. When easy to use development models are combined with quality content, it results in learners concentrating on what they are learning rather than how it is being presented on the screen.

Major revisions to online training development software are not necessarily needed to effect desired changes. For example, true and false statements are typically written as a single statement and represent one screen of online learning. This gives learners a 1:2 probability of getting the correct answer. However, if a total of four statements are used, now learners have a 1:4 probability of getting the correct answer.

To increase the effectiveness of multiple response questions, using models that include options for an even or odd number of response items allows designers to craft questions that either do not use a response or re-use a response to reduce the use of the process of elimination tactic. This is not suggested as a means of tricking or confusing learners. The goal of assessments is to determine whether or not learning occurred, not that learners are good at taking tests.

Implications for Designers and Reviewers

Writing good assessment questions is difficult, and because many designers lack the skills needed to develop effective questions, this odious task is often left until the very last moment in the product development timeline. The designers then hurriedly develop questions and distracters that may or may not measure the intended outcome, and reviewers are rushed in an attempt to read and edit the questions and distracters to meet the deadline. Delaying the development of questions and the subsequent review of assessment questions is not intentional. It is human nature to put off those things we despise doing. However, it is to the detriment of the product when the delays occur because designers do not know how to craft effective questions.

Fundamentally, good assessment questions are the result of good design first and technology use second. Choosing the appropriate type of question, multiple choice, true and false or multiple response directly correlates to the desired assessment outcome. Are learners being asked to recall facts or analyze and apply information? Is the content introductory or more advanced? Do the assessment questions align with the objectives and are they observable in a web-based learning environment? The implications of not asking these questions often result in the lack luster, ineffective assessment questions that abound in online training.

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Biographical Sketch

Laura E. Culver has worked as a training and development professional for over 15 years. Most recently, she was the Curriculum Manager for Intellinex, LLC, a division of Ernst & Young. In that capacity, she was responsible for researching and compiling content used by designers developing online soft skills training. Culver implemented the concepts and content presented in this paper to instructional designers located at the Golden, Colorado office. She obtained a M. Ed. in Organization Development at Kent State University, Kent, Ohio and completed doctoral studies in Educational Technology at Pepperdine University, Malibu, California.

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A Statewide Brokerage House for Online Education: An Education Business for Higher Ed. and K-12?

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There is a current and growing need for a statewide brokerage house for education. Have you found yourself asking questions like these?

- "We have five students that need AP Calculus. We've looked for a part-time teacher, but just can't find one. What are some other options?"
- "We are looking for virtual field trips to support our middle school science curriculum. Where can we go?"
- "We want to find professional development opportunities having to do with using an online environment to support teaching and learning. What's out there for us?"

Imagine being able to pose these questions and receive an array of options from other educational resources in the state such as:

- K12s
- Higher education institutions
- Technical colleges
- Libraries
- State and other agencies

If something isn't prepackaged, there may be someone willing to create it based on your need. What you need is a connection.

A statewide education brokerage house may be one such connection. It's purpose would be to create a forum for education entities to provide and receive content. It wouldn't be about making money. Content could be free in some instances, and not in others (i.e., tuition, for courses). It would be an environment that would bridge disparate issues and jargon and match a receiver's requirements with a provider's content, ideas and potential. This brokerage house would be a conduit to complete the transaction within the limits of each entity's business model. This concept is not a searchable database of quality content as with IDEAS, Merlot, or MarcoPolo[1]. It is a place where people could exchange, broker, purchase, or consume educational content. It could incorporate existing content, and facilitate content "made-to-order."

Is there is a need for an education brokerage house? Yes.

There have long been both producers and consumers of educational content. The perpetual challenge has been for each to find the other.

Is the need growing? Yes.

National trends indicate that online teaching and learning in the K12 environment is on the rise.

- 12 states have established virtual high schools (five more are under development)
- 32 states have an e-learning initiative
- 25 states have laws that allow online charter schools to be established (to date approx. 30 online schools have been established in 12 of these states)
- 50 states allow districts to sponsor e-learning initiatives
- 13 states regulate non-state sponsored learning initiatives
- Several thousand high school students in 23 different states are taking online courses in public schools

As this need continues to grow, where will these folks find quality content without having to develop it from scratch? An education brokerage house addresses this need by creating an environment for education to serve education. It would create a forum for education entities to provide and receive content. Suppliers and consumers need to find each other, they need a mechanism for compensation, and they need two-way communication that bridges issues and jargon unique to each institution. This isn't a traditional market model where one party "guesses" at the other's needs, then attempts to "sell" it to them. The forum bridges the receiver's requirements and ideas with provider's content, ideas and potential. Essentially, all parties need to be equal; whether you are the consumer or provider, or from higher education or K-12.

Examples

Officials from Madison Metropolitan School District in Madison, Wisconsin, are currently investigating the viability of developing their own online Algebra 1 course because of the difficulty in finding quality content to purchase. They are intrigued by the concept of creating their own course, seeing it reused within their own and other districts and perhaps even recouping some of the development costs.

Cooperative Education Service Area 10, (one of twelve Wisconsin Department of Public Instruction regional education service centers), currently brokers approximately $500,000 worth of content across its regional distance education network.

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[1] IDEAS – www.ideas.wisconsin.edu, provides Wisconsin educators access to web-based resources for curricula, content, lesson plans, professional development and other selected resources.
Merlot – www.merlot.org, a free and open resource for higher education. Links to online learning materials are collected here along with annotations such as peer reviews and assignments.
MarcoPolo – marcopolo.wordcom.com, provides no-cost, standards-based Internet content for the K-12 teacher and classroom.

Each fall, K12 school officials and administrators, guidance counselors, representatives from the University of Wisconsin Eau Claire and others gather to discuss what content should be offered to students for coming year. They state their needs and offerings and out of that conversation, create a booklet of offerings from which students can register to attend courses at a distance. CESA 10 serves as the administrative and billing agent for this process.

This is a working model for the education brokerage house concept, however, to do this state-wide, it needs to be a model that will scale to that degree. It needs to be able to grow, change, evolve and adapt to the community it serves.

It is important to remember that this concept is not a replacement for the existing searchable databases, repositories, referatories and the like. It is the next evolution or perhaps, next generation of those models. The concept is in its early stages and is still in development. It will require participation from all of education to make this concept work. Those that create content, those that consume it, those that support the educational process and infrastructure. It cannot be done by one entity alone. It will be critical for all of education to be involved to ensure a successful brokerage house. A working model would truly have *education serving education*.

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Biographical Sketches

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How Should We Talk?
Scaffolding the Work Process for Online Groups

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The familiar sound of student groans when a group project is announced may not be audible in the online class, but it remains present. Having students work in online groups is as simple as telling students they will work together. There are the regular challenges of group projects, such as ensuring a group is getting work done, getting along, distributing work equitably, and learning in the process. Each of these is a bit different in an online setting. Additional issues to be dealt with include finding ways of helping students meet and collaborate online, and helping them structure their work process.

From the student perspective, working in an online group poses many new challenges. They may be familiar with scheduling live meetings and discussing ideas in a face-to-face environment, but doing the same online is likely a new experience. Rather than let students flounder and figure it out on their own, which often results in frustration with the assignment and group members, instructors can provide structures that help students be more successful with their process, meeting not only the specific content-based learning objectives but also helping the learners become better online communicators and collaborators for future projects and work experiences.

Putting Together Groups

When grouping students for projects, it is important to take into consideration the likelihood that a group will be able to work together successfully to complete the task. This means that the group needs to have shared interests, adequate abilities across the members to complete the task, and the ability to communicate effectively with each other. These are not really any different than the concerns that face an instructor forming groups for a classroom-based course, but teasing out this kind of information about students may be different.

One idea an instructor might try includes having students discuss potential project ideas for a week before forming groups, which may help some students find others with common interests and begin the group formation process. I would recommend, however, not relying on this method solely for group formation as there will always be some students who do not automatically fall into place with a group. A brief survey — easily created using most online courseware; otherwise possible via e-mail — can be used to gather information about students interests as well as their preferred communication and collaboration modes (synchronous or asynchronous), writing styles (collaborative or divide and conquer) and scheduling issues (early bird or last minute writer; constraints that might preclude participation at a certain time). Armed with this information along with what the instructor knows about the students from their earlier class participation, groups that are likely to work well together can be formed.

Structuring the Assignment

At first glance, a group project in a classroom-based course might have little structure beyond a start date, an end date, and an end product. Because the students see each other regularly in class and the instructor may even allow some in-class time for project work, that may be all the imposed structure that is needed. In an online scenario, however, the impact of not seeing each other regularly can cause great procrastination amongst students, resulting in frustration for some and the inability to contribute to the group project for the others.

Requiring that groups generate and submit a work plan can be very empowering. It helps the group both plan its own path and lets the instructor know whether or not the group is setting itself up for success. Such a plan might consist of a proposal that outlines the project concept, a schedule, and a listing of what responsibilities each group member will undertake and a statement of the group's communication commitment. A model of a work plan may be provided to help students determine the types of agreements they need to make prior to working together.

Should the instructor not want students to structure their own work processes, they can build in specific, incremental due dates and deliverables for students. Breaking the project into smaller parts that are due at specific times helps keep students focused and requires them to check in with each other regularly. The instructor need not heavily assess these smaller parts, as that might be overwhelming, but they should be a required component of the project. One idea for ensuring students get feedback at such points is to assign other groups to provide peer responses. Everyone benefits from this situation, with each group receiving some feedback and getting the chance to see what others are doing and how they have interpreted the assignment.

Determining Communication Tools

There are many ways that online groups can collaborate and communicate. A tool such as Blackboard provides group spaces with discussion boards, chat, a file exchange and group e-mail addresses. Outside of these courseware tools, students might decide to set up their own e-mail lists, use free groupware such as yahoo groups, or use the telephone. In some instances they may even be able to set up face-to-face meetings. Planning modes of communication is really important; groups who do not plan can fall prey to the group member who does not check e-mail regularly or who does not know where group files are posted. Decisions need to be made regarding what tools will be used for what purpose and how frequently members are expected to check in via any asynchronous technologies.

Some successful groups set up a weekly time for synchronous communication via chat. While asynchronous tools seem to be more efficient for distributing documents and getting group commentary, synchronous tools can be useful for making decisions and assessing progress. Synchronous meetings typically go better if there is an agenda and if all members come prepared. Instructors can help students communicate effectively with their groups by providing these kinds of tips in advance.

Checking on Progress

Having students submit regular updates to the instructor — as a group or as individuals — is a useful way of ensuring that students stick to the structure that has been decided up on for the project. If progress reports are required for the group, a project manager may be designated with the responsibility of writing and sending the update. If they are required at the individual level, it becomes possible to get perspectives on how well the group is working together and determine whether or not any help or interventions are necessary. To make it easier on both the students and instructor, a web-based form can be used for the updates, asking students to answer particular questions based on what they should be working on at that time. This helps keep all responses in an ordered place and ensures the important topics are covered.

Assessing Process As Well As Product

These ideas for structuring group work make students focus heavily on their work process. A process-focused approach is likely to result in a quality product, but nonetheless it can be important to assess the students' process as well as the final documents that they turn in. Doing so often makes students more likely to undertake good work habits and reflect on the process that helped them complete their group work. It also helps the instructor learn more about how students approach that particular assignment so that the deliverables and the overall process can be better structured and articulated the next time the course is offered.

Closing Thoughts

These are some general ideas for how to help students be successful when working in online groups. The most important concepts include herein are the following:

- Students need help forming groups in an online class
- Students need help determining how to approach a group project, including how to chunk and schedule their work
- Students need help to learn what communication tools their groups should use for particular tasks.
- Progress reports are a useful way of keeping the instructor informed of group progress (and encouraging the group to remain focused and on schedule)
- Assessing student process as well as product can be a useful way of encouraging good student work habits and gathering formative evaluation data about the integrity and effectiveness of the assignment

These ideas for helping students are general in nature; each instructor needs to find the amount and type of structure that is most appropriate given the content, the assignment, the level and characteristics of the student and the instructor's own personal style and preferences. Above all else, most important is being sensitive to the students' need for assistance in approaching the process of online group work as well as for learning the material covered by the course.

Biographical Sketch

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Digital Delivery to the Desktop: Documents Anytime, Anywhere

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The Health Sciences Libraries, University of Wisconsin-Madison, are offering faculty, staff and graduate students an attractive alternative to traditional forms of document delivery. Based on high-speed transfer, Web-based interface and order tracking, Library Express combines recent technologies with a strong customer service orientation to provide easy and convenient access to local and worldwide collections

On a Big Ten campus spread out over 933 square acres, distance can pose a significant barrier to retrieving print resources from over 40 libraries. For those working off campus in the many research stations and clinics, students completing rotations and clerkships in other parts of the state or the nation, the challenges of access to health sciences materials become even more daunting. At the University of Wisconsin–Madison, a new document delivery service, Library Express, is bridging the distances and providing easy and affordable access to articles, book chapters and tables of contents from local library collections and beyond.

Library Express users can initiate their requests through a Web-based interface, track the status of their requests online and retrieve digital documents in PDF format from their networked computer of choice anytime, anywhere in the world. Four campus libraries currently provide this service to a potential combined user population of approximately 24,000 faculty, staff and graduate students. While the service is currently not open to undergraduates, exceptions are generally made for distance learners of any status. Libraries and their Library Express users are matched by subject area affiliation, major and, when necessary, by manual entry into the system. Authentication and access are determined by an active 11-digit campus ID. Within the Health Sciences Libraries (HSL) Library Express development occurred in three basic phases – an extensive planning phase, a carefully staged implementation phase and the final, fully operational phase with second generation software. The last phase opened the service to all faculty, staff and graduate students at the University of Wisconsin–Madison.

The HSL consist of three separate library facilities (main health sciences, pharmacy and hospital collections) which serve a diverse campus population including the Medical School, School of Pharmacy, School of Nursing, basic sciences, History of Medicine and other health sciences and related fields. User groups are very mobile, crisscrossing not only a large campus but also traveling the state, the nation and the world.

The HSL have a long tradition of making library materials readily accessible to primary user groups. For many years library users have had access to a shuttle van that stops twice a day at each of the three libraries to pick up and delivery library materials. Requested items are shuttled for convenient pick up at the site chosen by the user. This service provides one-day turnaround and is, for some, still the document delivery method of choice. While very efficient in getting the materials to the users in a timely fashion, the service has one major disadvantage. Physical items being transported are out of circulation for days and not available to others at the home library. With an increasing number of electronic journals available and readily accessible from our Web pages, HSL users are quickly adopting the idea of digital retrieval as a viable option. To broaden the scope of easy access to print-only titles/volumes, digital delivery to the desktop seemed the next logical step and a welcome replacement for other more manual and cumbersome methods of the past. Library Express also offers the opportunity to provide one point of access for multiple types of delivery services running in the background. When fully implemented, users will no longer have to ponder where to go and which forms to fill out for intra-campus or inter-campus services.

With the advent of appropriate and easy to use technologies, more comfort with computers and an articulated commitment to serving the information needs of our library users in a timely and convenient manner, the implementation of digital delivery to the desktop was given top priority. After 2 ½ years of operation, the service has not yet reached its capacity and continues to grow. The current manifestation of Library Express is viewed as a bridge to the electronic library of the future, as a road to the next generation of technology-enabled library services.

Planning for Success

Heeding lessons learned earlier in 1999 from a premature start and a quick retraction of the service in the spring of that year, the HSL put the smooth implementation of Library Express high on the list of the HSL priorities. The newly hired Head of Access Services was given the mandate to bring up a new digital delivery program in a timely and organized manner. The general components of the service would be based on an existing document delivery pilot already in place at another campus library. Early in the first planning process, Ophthalmology, a department of approximately 60- plus members, had expressed a desire and need for electronic desktop delivery to both on and off campus locations. Members of this department are widely dispersed and have a broad range of information needs, including clinical, instructional and research support. They had also agreed to work with HSL to get the bugs out of the program during the beta phase. The challenges posed by this department made it an ideal test group for distance delivery services.

At this point, the project management team consisted of a newly hired .5 FTE dedicated to the Library Express planning process, the Head of Access Services and coordinator of the hospital library who had experience with the first roll-out.

Clearly defining service parameters and setting service standards early in the planning phase, kept us on track, outlined basic expectations, reduced misunderstandings and streamlined staff training. HSL Library Express staff agreed to do everything humanly possible to make access to the service easy and effortless for our user groups who repeatedly listed a lack of time as one of their most pressing dilemmas to information retrieval. Our goal was to deliver articles from all three health sciences collections within 1-2 working days, 24/7. Articles would be ordered through a uncluttered Web-based interface, received by processing staff in email format, materials retrieved from the library shelves, scanned and delivered to the user with a link pointing to the PDF document sitting on the server. Adobe Acrobat would be used for scanning materials. Data storage and report generation would be MS Access-based. The main health sciences library, which has the largest collection of the three, would serve as the recipient and screener of all incoming requests. Requests for materials located at either of the other health sciences facilities would be electronically forwarded for processing and delivered directly to desktops. Requests for items from non-HSL libraries would be retrieved manually from other campus libraries whenever possible, returned and scanned for delivery to the user. Requests not found on campus would be sent to our HSL interlibrary loan staff for processing and then returned to Library Express staff for scanning and digital delivery. All requests would be delivered electronically. No paper delivery options would be available through Library Express. Links to scanned materials would be available on our server three weeks, then automatically deleted from the server. Color images would be delivered whenever requested and available. Status of requests throughout the processing queue would be posted to the users email box using canned messages manually generated by staff. No fees were charged during the beta phase in exchange for input from and the patience of our users. In summary, it was a very labor-intensive process for library staff.

Setting a realistic implementation timeline was of paramount importance to the project management team. Keeping a vigilant eye on the details helped us stay grounded and focused on the ultimate goal to provide a smooth and speedy document delivery experience for the user. A loose timeline was set at "as soon as possible, but not before we are truly ready." After one false start and a project cessation lasting 6 months, we needed a successful outcome to restore confidence and sustain momentum. A successful jumpstart was perceived as imperative to the extended well-being of the program.

During the fall and winter of 1999/2000 staffing and equipment demands were closely reevaluated. The library director made it clear that staffing as well as other forms of program support such as space requirements and equipment would be promptly provided. The .5 FTE hired in the fall to assist with initial project planning was no longer sufficient to handle projected development activities, staff training, setup, promotional and processing duties. The .5 was converted to a full-time position with a robust position description. Identical scanners (Fujitsu ScanPartner 600C) and software (Adobe Acrobat 3.0) were purchased and set up at each of the three health sciences libraries to assure uniform processing and training at each site when demand picked up.

Since one Library Express shop (Wendt Engineering Library) was already functional on the campus, the first few months of planning were devoted to familiarizing ourselves with the successful processes already in place and how we could adapt these to our HSL environment. We were able to emulate much of the workflow and "borrow" the home-grown software that allowed us to scan, mount and deliver image files with less effort. Library Express staff was trained to verify citations in a number of databases and to work with email clients, MS Access and Adobe Acrobat. Student assistants were hired to retrieve, scan and post articles to the server. Trouble-shooting and communication with users was limited to Library Express staff, closely monitored and carefully documented.

During this time a detailed procedures manual was designed to support training and to communicate best practices. A Web page was developed to provide a point of access and source of service information for our users. Promotional materials and other aids, such as a letters of introduction and a service brochure were also developed. Other functions and practices of the first generation system were worked out piece by piece in countless meetings and discussions throughout the 16-month beta phase.

Implementation

Starting out small afforded the project management team time to assess, tweak and fine-tune the service before moving on to serve a larger and more complex user group. We introduced the initial version of Library Express to members of the Ophthalmology Department (clinicians, faculty, residents, fellows and support staff) during February 2000 and opened the service to them March 1. Library Express staff conducted on-site demos, circulated letters of introduction, trained Ophthalmology staff in the efficient use of the service and closely monitored their progress. A Web-based tutorial was designed to provide an introduction to new users and refresh the memories of the occasional visitor. Technical issues were addressed immediately, often with an on-site visit to see first-hand what obstacles the users were encountering. Starting with a small group (approximately 60) with varying needs and varying degrees of computer comfort levels, allowed for more control, better communication and more immediate resolution of problems as they surfaced.

After working with Ophthalmology for two months, we added the School of Pharmacy to the Library Express test pool. The pharmacy graduate students doing clerkships throughout the state posed challenges – how to deliver large PDF files to users with minimal hardware configurations, through firewalls and over slow modem connections. Additional user groups were added incrementally throughout the year by invitation only. Promotion was very focused and controlled to keep activity levels in line with our ability to provide a high level of service. Staggered additions to the Library Express service roster included the

Department of Surgery, Student Health Services, Psychiatry and the School of Nursing each bringing with them unique demands and service challenges. Contacts were identified for each new group and asked to contribute to the on-site promotion and local trouble-shooting.

Although Library Express staff had been meeting often, we now felt a need to formalize the meeting calendar in order to include staff from all three libraries who were processing more requests. Staff hours during this time tripled as requests increased ten-fold. The first month of the beta period with only Ophthalmology on board, we received 129 requests. Sixteen months later during the last month of the free beta phase, we received 1881 requests. Business was booming.

The Library Express working group had now grown to include the Head of Access Services, the coordinator of the hospital library and front-line Library Express staff (1.5 FTE). Regular weekly meetings were helpful in keeping us on track, addressing problems quickly, making corrections immediately and communicating any changes in policies and procedures to all Library Express staff at all three processing locations. Regular meetings continue to this day, but less frequently.

Throughout the beta phase the Library Express team remained flexible yet focused, smoothing out the bumps in the road as they came up, willing to make changes, if needed, to improve the quality of service. Nothing was set in stone. Everything was up for evaluation. Attention to detail became our mantra. Staff scrutinized, assessed and evaluated each step of the process. We conducted a time study which tied staffing needs to volume processed. Daily, weekly and monthly statistical reports generated from MS Access were helpful in identifying trends (or the lack of them) and aided with scheduling, estimating equipment and space needs as well as planning for future service enhancements.

During the beta phase we also listened carefully to our users. Two questionnaires were sent out, one in May 2000 to approximately 100 users and the second in February 2001 to 350 users of Library Express. Beyond a high degree of satisfaction with the service, responses to the early survey also revealed a desire for color images, that faculty were doing their own requesting and that we needed to do a better job promoting the service. Responses to the February 2001 survey indicated that the suggested fee of $1 per delivered article would substantially reduce the number of requests. A majority of respondents clearly stated that they would exercise more caution when ordering to avoid the $1 fee. This was very useful in planning for short-term staffing needs. Other information uncovered from this survey included a need for 24-hour service, a desire to have tables of contents delivered and a confirmation that most Library Express users loved the service and found it extremely helpful in conducting both research and their daily business.

One of the most rewarding experiences during the beta phase was working with colleagues across campus to design generation two software and to open Library Express to all faculty, staff and graduate students served by four different libraries each with its own specific user group. During this time of collaborative development, the group made a wish list of Library Express features that each site wanted in place in the new version, both on the public/user side and on the processing/staff side. Out of these meetings came an end product that had a common look and feel, yet one that was able to retain some of the site-specific features and functions. For example, HSL had for most of the beta offered the option of color images. This was an important feature for our Ophthalmology group and others who needed the color variations of photos. Blacks, whites and grays were not always as useful. This feature choice was incorporated into the design for the HSL Web-pages, but not for other shops. The new software would be totally Web-based, eliminating the awkward interactions between email clients, home-grown programming, MS Access and other bits and pieces that had been cobbled together.

Working together with campus-wide Library Express staff also allowed us to share general document delivery experiences and philosophies. It strengthened our understanding of current practices in other document delivery areas on campus and created opportunities for further collaboration and partnerships beyond Library Express.

Library Express: The Next Generation

After testing the new software with a small sampling of current users, the second generation of Library Express software was activated July 2001. Bugs and potential enhancements were identified and scheduled for resolution. None prevented requesting or delivery, but did add to confusion on the staff side. We all experienced some growing pains. Reports were not in place when the new system was activated, resulting in continued data entry with MS Access. User and transaction data, now collected by a Web-based system, could not be harvested without considerable programming, which at this writing, is still in progress.

In anticipation of the $1 per article fee, users swamped us in the free periods of May and June resulting in our highest productivity to date—1513 and 1881 respectively. During the month of July, our activity level fell to less than half confirming what we had learned from our survey earlier in the year. Since July the number of monthly requests has continued to climb, albeit slowly, to leveling out at approximately 1000.

The new Library Express software provides a total Web-based environment for both users and processing staff. The only remnants of the previous system are the manual scanning process which we have found no way to streamline and the initial citation verification and location procedures. Users now have the ability to track the progress of their requests online limiting the amount of email generated in communicating request status with users. A built-in request forwarding feature allows requests to be moved to other Library Express shops for retrieval and processing. We no longer send students to other campus libraries to copy articles found there. This significantly reduces the turnaround time for those deliveries.

As the news of this new service spreads across campus, Library Express is rapidly replacing older, less automated levels of document retrieval and delivery. This successful program is a direct result of strong administrative support, careful planning, a staged implementation, continued attention to quality control, an emphasis on customer satisfaction and, above all, a well-trained and dedicated staff.

In April 2002, HSL Library Express staff celebrated a milestone. Within two years, we had processed more than 25,000 requests. As we gathered staff members from all three HSL libraries over pizza, homemade desserts and lots of stories from the "trenches," we congratulated ourselves on a job well done and looked toward the continued growth of a service that emphasizes convenience and eliminates the barriers of distance through digital delivery to the desktop anytime, anywhere.

Biographical Sketch

Ulrike Dieterle is Head of Access and Delivery Services and Senior Academic Librarian at the Health Sciences Libraries, University of Wisconsin–Madison. Previous positions have included Coordinator of Training and Distance Education Librarian at UW–Platteville and reference positions in general academic and law libraries. She holds an M.A. in German from the University of Cincinnati and an M.L.S. from the University of Alabama–Tuscaloosa. She is completing course requirements toward professional certification in distance education through the University of Wisconsin–Madison.

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Moving F2F Activities Online

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Introduction

Most educators are innovative classroom instructors but when it comes to moving activities to the Web they attempt to use the exercises as they are without realizing that there are aspects of an online learning environment which can make those activities frustrating for the learner and unproductive overall. Some online courses limit the amount of online activities, particularly those that involve peer-to-peer interactivity. Classroom courses that have a web component seldom incorporate online activities. However the power of online learning lies in its ability to enhance learning through interaction with the instructor and peers.

An instructor can clearly detect when students are engaged in an effective classroom activity. Both energy and sound levels are higher and students are reluctant to be re-focused back to another task. The synergy between collaborative partners is exciting to observe, as the discussion is animated and new connections are established. The big question is how do you create this exhilarating learning environment when you "can't see the whites of their eyes"?

Characteristics of an Engaged Learning Activity

If we know what it is after the fact (when we experience or observe it), then how do we design or choose an effective engaged learning activity as in integral part of the curriculum? We can begin to answer that question by listing the characteristics that were initially defined by Dewey a century ago. He defined engaging activities as:

- relevant to the students' lives and experiences,
- pertinent to the curriculum,
- involving critical thinking and problem solving,
- stimulating creative thinking, and
- supporting collaborative decision making by the group. (Tanner, 1997 p. xii)

These characteristics are still relevant to today's classroom or online environment. When each component is present, the resulting holistically-designed activity brings the student and instructor together in an engaged, relevant, and effective task.

The social construction of knowledge is an important element of effective activities. "The cognitive research reaffirms strongly that we learn best when we are actively involved in interesting and challenging situations, and when we talk about the learning" (Sousa, 1998, p. 8). The strategy of using dyads (two participants) and collaborative groups is conducive to effective learning experiences, yet the activity needs to be relevant to the students' interests while it challenges them to the next higher level of knowledge acquisition. Discussion as a component of an effective activity assists in making meaning (Sousa, 1998).

Synchronous Vs. Asynchronous Activities

Carrie Fisher once made the observation that the problem with instant gratification is that it takes too long. In our fast paced world, many of us feel the pressure to have instant answers to either e-mail messages or the meaning of life. Many educators favor synchronous, or "real-time" interaction because of the influence of the classroom paradigm. Often, the instructor attempts to replicate the face-to-face classroom in the online environment because it is difficult to imagine how an activity works when learners are not participating at the same time, in the same space.

Despite the fact that it does not happen within a shared unit of time, there are many benefits of asynchronous communication. It allows for reflective time prior to response. It also allows the instructor and learner alike to communicate at "peak" thinking periods in the day when thoughts are clearest and minds freshest. The individual chooses to define and interact in his or her "teachable moment. Asynchronous activities also allow each voice to be heard, whether in small or large group. This in and of itself can assist a learner in feeling part of a learning community. One danger of asynchronous communication is its inherent nature to go "on and on." There must be a distinct beginning and end to asynchronous activities in order to minimize learner frustration and information overload. When used appropriately, the opportunity for reflective thought and communication can produce far greater depth of learning than would occur in a solely synchronous environment.

There are some situations where synchronous activities are the most effective tools such as for team meetings or when obtaining group consensus. "It (synchronous communication) can be a dynamic and challenging setting in which to meet and can be especially useful in facilitating brainstorming and whiteboard sessions. (*Whiteboarding* is writing or drawing on a shared screen)" (Palloff & Pratt, 1999, p. 48).

Synchronous activities also can be utilized to effectively establish and maintain the learning community. For the first time user, the initial feelings of isolation can be lessened when the user has an opportunity to interact with other students and the instructor in real-time. "Synchronous communication allows the instructor to replicate much of a face-to-face setting with special attention applied to the need for creating an interactive learning community between and among all students and the instructor" (Herring & Smaldino, 1998, p2).

There are many challenges associated with conducting synchronous activities. "The challenge of conducting a synchronous meeting or seminar is to coordinate time with a dispersed group and to facilitate in such a way that all "voices" are heard" (Palloff & Pratt, 1999, p. 47). In our busy schedules, trying to coordinate a shared time is often difficult. This challenge is resolved by scheduling established times for interaction. A protocol can also be established and agreed upon by all participants as to what part of a session is curriculum relevant and what portion is social in nature. Each session should have an assigned facilitator whose duties include keeping the participants on task.

Another consideration is the structure of the discussion. It is easy for several topics to be active at the same time, which causes discussions to become fragmented. There also is the tendency for the fastest typist to be the loudest voice. The facilitator must ensure that all voices are heard. One strategy is for the facilitator to limit the discussion to one topic at a time and ensure that all participants have posted comments prior to a second comment being displayed. Numbering the participants allows easier tracking of this approach. A final summarization of the topic in discussion is beneficial prior to progressing to the next topic of interest.

One of the major frustrations for learners involved in synchronous activity occurs when the technology fails. If learners are unable to log in to a scheduled chat session they feel they have "missed class" and the sole opportunity to participate through no fault of their own. Logs of the synchronous discussions are imperative to minimize this de-motivating aspect of online "same time" communication.

Overall, it is important to use synchronous communication only when absolutely necessary. Learners do not need to watch the instructor type in his or her lecture notes. Synchronous communication is needed for quick exchanges of thought, which is not the predominant type of thought in most learning situations. A combined approach may be more beneficial. For example, lecture notes could be posted for all to view asynchronously. Small groups could choose to interact either within a synchronous chat or asynchronous discussion board and post a summary of their findings in an asynchronous discussion board weekly for instructor comments.

The choice of communications tool should be dependent upon the nature of the activity. Generally, limiting synchronous activities to a small group of participants is effective, while large group interactions work best within an asynchronous environment. Most importantly, the effectiveness of either choice will ultimately be dependent on the combination of the correct choice of the communications methodology and the expertise of the facilitator.

Using Activities Designed for the Classroom in the Online Environment

There is a need to recognize that converting a successful classroom activity into an online one is not an automatic one-step process. Whether an individual is riding a horse or steering a Ferrari, the road and the destination may be the same, but the expectations and experience will differ greatly. One approach is to consider each journey as a separate experience. "Indeed, instead of looking for ways to convert a course that has been successful in the face-to-face classroom, instructors are better served by approaching a course to be taught online as if it were a course to be taught for the first time-which in essence it is-while drawing on content knowledge and best practices" (Palloff & Pratt, 2001, p. 67).

As practitioners, the authors used to believe that course re-invention was the correct path to choose. We now believe that many of us have thrown out too many babies with the bathwater with this philosophy. We need not begin from scratch; objectives are the same and therefore, the types of activities which will support the learning are often the same. It's the execution of those activities that must change. For example, if a role-play activity is used in the classroom, the only component that changes online is that it becomes text-based and therefore, the rules for text-based communication must be used while the rest of the activity can remain the same.

There are some common situations that can be easily converted from face-to-face into online interactions. Brainstorming is one of the most obvious. To quickly "shout out" phases in an online situation, use the subject line of an e-mail or threaded discussion to enter the "thought." This allows everyone to quickly read the idea without having to open the document. Small group interactions can be facilitated in an assigned discussion or chat area with the instructor going from group to group and interjecting comments as is done in a face-to-face classroom or group reporting can be assigned to one individual for subsequent synchronous class discussion or summarization in an asynchronous discussion area.

Introductory activities can be converted to the online environment by asking each participant to share one digital image of him or herself in an asynchronous profile or discussion area. This sharing of images can assist in diminishing the sense of isolation for many of the participants. Dealing with the social aspects of a synchronous classroom can be addressed by assigning a pre- and/or post-time slot for greetings and personal interactions. Allowing participants to enter a chat area 15 minutes prior to the actual discussion elevates the existence of sign-on greetings and inquiries. Students and the instructor may also feel the need to process a discussion and explore new areas of thought synchronously after the assigned chat time. Post-discussion opportunities would allow this to take place.

Summary

In order to move activities between the classroom and the online learning environment the instructor must consider the characteristics of an effective engaged learning activity and the appropriate delivery methodology, synchronous or asynchronous. Awareness of the students' various learning styles and needs also influence the choice of appropriate activities for the online environment.

When incorporating online activities into a web-enhanced classroom the initial question asked by the instructor prior to conversion is whether an activity is best suited for participant interaction (synchronous) or for an outside class-time assignment (asynchronous). Activity selection can evolve into an exciting component to creating a meaningful student centered learning environment.

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Biographical Sketches

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Bridging the Divide: Distance Learning Options for International Organizations

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International organizations, including United Nations agencies, non-governmental organizations (NGOs), government donors, and university international extension programs, that are involved in humanitarian endeavors such as disaster relief, human rights work and international development have staff and stakeholder groups around the globe. Training and education of these groups are made difficult due to prohibitive costs, limited training budgets, travel, primary work demands that leave little for training, and geographical distances that separate training and education officers from their audiences. Spectacular advances in information and communications technologies coupled with decreasing costs can help overcome many of these constraints and help reach a greater number and more diverse group of people.

International organizations now enjoy unprecedented options—such as, video conferencing, the Internet, and e-learning courseware—for using technology to train, educate, inform and mobilize staff and other stakeholders. The Internet alone holds great potential due to the exponential increase in the number of users and its flexibility and growing popularity as an information and communication tool. As of February 2002, Nua Internet Surveys calculated that the world total population of online users was 544.2 million people—an increase of over 394 million people from the 150 million online users estimated in the 1999 UNDP *Human Development Report*. Despite this fantastic increase in the number of online users in just three years, we are still only a little more than halfway to the billion online users projected by the year 2005 (UNDP 2001).

While these innovations and trends bode well for distance learning, they also create new challenges and barriers to access, which can be referred to as the Internet gap, or, more commonly and broadly, as the "digital divide" (International Telecommunications Union 2002). Distance educators in international organizations must ask, "What is the nature of the divide and how will it impact the design of our learning programs?" "Are we building an all inclusive, widely accessible, and culturally sensitive distance learning program?" "How do we build a program that localizes content and builds on preferred cultural or personal learning styles?" "Which of our audiences will have access to this program, and which will not?" "How can we increase access to our program?" This paper describes the nature of the "digital divide" and presents creative and resourceful options that international organizations are using to bridge it. It is a work in progress based on our review of the existing literature and our training and distance learning experience.

The Nature of the Divide

Disparity in Internet Access

One of the major disparities with regard to the Internet is access, meaning our audiences' ability to connect to and access information on the Internet. At one level, this disparity exists between countries at different levels of development, as illustrated in Table 1.

Table 1. *Disparities in Internet Access.*

World region	Number of online users[1] (millions)	% of world total of online users	Total population[2] (millions)	Online users as a % of regional population
United States & Canada[2]	181.23	33.3%	320	56.6%
Europe	171.35	31.5%	725	23.6%
Asia / Pacific	157.49	28.9%	3,790	4.2%
Latin America	25.33	4.7%	534	4.7%
Middle East	4.65	0.9%	196	2.4%
Africa	4.15	0.8%	830	0.5%
World Total	544.2	100.0%	6,200	8.5%

1. The number of on-line users was obtained from Nua Internet Survey's research as of February 2002.
2. Estimates from the UN Population Fund (UNFPA 2002).

Table 1 further illustrates that these disparities exist not only between regions, but also within them. Within countries, disparities are based on socioeconomic status, gender, geographic location, level of education and age. The 2001 *Human Development Report* characterized the typical Internet user worldwide as: male, under 35 years old, an urban dweller, better educated, and from a higher income group (UNDP 2001). The digital divide, therefore, parallels socioeconomic disparities found in other areas of society such as education, health services, economic opportunity and welfare.

Quality of Internet Access

The digital divide is not just about Internet access, but also about the quality of access. Internet bandwidth is a good indicator of users' satisfaction with their Internet experiences—that is, the greater the bandwidth, the quicker the response times, the more satisfied the user (International Telecommunications Union 2002). While high-bandwidth lines are available in many parts of wealthier nations, such as United States and South Korea, this technology is not widely available in many countries, especially not in the least developed countries. A single, sophisticated, graphic intense web page that takes seconds to load on a high-bandwidth line in the U.S. can take five to ten minutes in Tanzania—if the user is not disconnected from the Internet during the download. Distance learners limited to low-bandwidth Internet access will either not bother with an e-learning course designed for high-bandwidth transmission, or will grow very irritated in the process of trying to take the course.

Cost and Availability of Computers

Over half of the world's computers are in the United States, even though the U.S. only accounts for about 5% of the world's population. While the cost of new and more powerful computers continues to decrease, computers are still a prohibitive expense for most of the world's population. A new computer with printer, Internet access, and various software programs costs the average income earner in the United States the equivalent of roughly one month's worth of wages. The same system would cost the average

[2] U.S. online users = 164.14 million out of total population of 288.5 million; Canada online users = 16.99 million users out of total population of 31.2 million

Bangladeshi eight years' of income (UNDP 1999). Most people in the world will never be able to afford their own computers, and most countries will not be ale to invest in the infrastructure or training required for efficient Internet usage (Uimonen 1997). E-learning courses and programs that implicitly assume unlimited access—both to personal computers and the Internet—will fail to reach audiences who must rely on expensive, sporadic Internet connections and group computers.

Language and Communication Barriers

Access and quality are both technological and economic challenges. Language and cultural differences present a different kind of challenge for the distance educator. One study estimates that approximately 40% of online users speak English while the remaining 60% speak some thirty other languages. After English, the next three largest online language populations are Chinese (9.8%), Japanese (9.2%), and Spanish (7.2%) (Global Reach 2002). In 1999, one study estimated that 80% of Websites were in English (UNDP 1999). Since people learn and express themselves best in their native language(s), e-learning courses delivered solely in English and meant for global audiences may fail to achieve their hoped-for impact.

Language is just one communication barrier. In addition, the Internet experience reflects a particular worldview and style of communication—that is, detached, individualistic, text/graphic based, technology-dependent, specific, democratic, decentralized and functional. The computer and Internet based e-learning experience also depends heavily on a confident, computer literate learner who values democratic, individualized and self-directed teaching and learning experiences. For those who are accustomed to, or who value, traditional, expert-led or professor-led classroom teaching, this kind of an experience can seem anarchic, superficial and/or threatening. E-learning has been slower to catch on in places (Middle East, South America and Southern Europe) where the culture and learners favor emotionally charged debates, holistic ' big picture' learning approaches, live experts and group collaboration (Quigley 2002).

Bridging the Divide

The above are just a few of the challenges that face teachers, trainers and course designers who are creating e-learning courses for global audiences. Challenges, like necessity, beget creative and resourceful solutions, which are the focus of this section.

Use and Establish Public Information and Communication Centers

Thousands, if not millions, of people in many developed and developing countries have access to computers and the Internet but only via their workplace computers, Internet Cafes, or community telecommunication and information centers. E-learning programs expecting to reach audiences in these countries must recognize this opportunity and build on it.

For example, the MS Swaminathan Research Foundation developed an innovative project in Pondicherry, India that allows fishermen and farmers to obtain useful market and other business-related information at rural information centers. These centers use solar and electric power and provide local communication and Internet access via wired and wireless communications. They have facilitated communication between villages and "have encouraged local dialogue on farming techniques, microcredit management, business and education opportunities, traditional medicine and religious events. About one-third of users are from asset-less households and about 18% are women" (UNDP 2001: 32-33). Community information and communication centers are just one example of an innovation that bridges the Internet Divide and that should be, and are being, duplicated by NGOs, churches, foundations, donors and governments.

Create Flexible Distance Learning Options

Good instructional design does not begin with the technology, but rather with an analysis of the course purpose, objectives, audience, budget, technology options, cost, etc. A flexible delivery strategy, using different media, including the Internet, can be especially effective when one wants to accommodate diverse audience needs and preferences, and to anticipate near-term trends. Brigham Young University's Teaching English as a Second Language (TESL) Distance Learning Project used a flexible and combined "high and low road" technology approach to meet the learning needs of a diverse group of volunteer English tutors (Henrichsen and Murray 1995). Most of the tutors owned a VCR and considered video their instructional media of choice. Therefore, a fundamental component of the project was a videotape series featuring a variety of teacher preparation topics presented using situation dramatizations followed by reflection. There was also a companion workbook that could be used in conjunction with or independent of the video. Because the project developers recognized that, in the future, more and more of their audience would be using computers and the Internet, they also planned to use more sophisticated media including CDs, interactive computer applications and the World Wide Web using hypermedia/hypertext.

Rely on Low-Bandwidth Internet Options

Even in places where high-bandwidth is not available and where connectivity charges are high, low-bandwidth Internet design options do exist. Such options include: 1.) Web pages with minimal and small file size (or optional) graphics, no (or optional) video and audio streaming, no frames and a user-friendly interface; 2.) Web-accessed and text-based (versus PDF) course files, readers, documents, and worksheets that can be downloaded quickly and then viewed, read and completed off-line; 3.) Learning communities, learning experiences, teacher/learner communication and information sharing that can be managed and accessed simply by using e-mail, as opposed to connecting to a Web page, since in poorer countries e-mail extends further than any other Internet-based technology.

In a similar vein, many distance learning programs have been implemented successfully, over the years, using low technology options that in many areas are more widely available than the Internet, such as print-based modules, cassette tapes, radio, television, and videos. In many cases, even where audiences have Internet access, their schedules, work and learning style may still favor these lower-tech options. The authors, for example, were involved in a WebCT self-study program that was based on print-based, independent study modules. While all participants had easy access to the WebCT course, an evaluation of this program revealed that the majority of participants who enrolled and completed the course did so using, not the WebCT option, but the print-based module which they also received when they signed up for the Internet course.

Use a Blended Approach

Blended learning approaches that combine traditional classroom with online and/or workplace learning experiences can serve to reinforce classroom learning, reduce classroom time and costs, and accommodate different learning needs and values (e.g. self-directed, group activity, teacher-led, social needs, pragmatist). A recent pilot blended training-of-trainers learning program designed for the International Labour Organisation by one of the authors consisted of a face-to-face workshop, preceded and followed by distance learning components managed entirely by e-mail and file attachments. Participants in this program were stationed in Lima, Peru; Dar es Salaam, Tanzania; and Geneva, Switzerland. Prior to the workshop, program participants received, via e-mail, a distance learning packet with instructions, a reader, assignment worksheets and deadlines for submitting completed assignments. After the workshop, program participants received another distance learning packet, again via e-mail, with assignment worksheets and guidelines instructing them to design and evaluate an actual training workshop or major training presentation that they were delivering in the upcoming four months. Upon completion of this training experience, participants submitted their completed worksheets, personal and peer evaluations, and report of lessons learned from their participation in the program.

Develop Local Facilitators

To overcome problems of language, cultural learning preferences, and costs associated with Internet-based global distance learning, course designers can recruit, train and prepare local facilitators. These local facilitators would be able to download training materials from the Internet course web site that they can then modify for local audiences. The Internet thus serves primarily as a distance training and resource tool for local facilitators who, in turn, train, educate and mobilize local audiences using print-based self-study and face-to-face workshops. In 1997 the World Bank Institute launched the World Links for Development, or WorLD, program, which has since been established as a separate nonprofit organization. The WorLD program aims to establish global, educational on-line communities for secondary school students and teachers around the world to expand distance learning opportunities, enhance cultural understanding across nations, build broad support for economic and social development, and train teachers to integrate information technology into the classroom. A key to the development of new pedagogical methods for teachers relates to the system of teacher training used by WorLD. WorLD Project Staff, who have easier access to the Internet and other high tech solutions such as video conferences with experts from other countries, train local teachers and school-based WorLD Coordinators in new pedagogical methods and in how to use technology to enhance their teaching. In addition, informal training among teachers is helping to bring about a change in pedagogical practices (McGhee 2001).

Conclusions

Many e-learning courses make erroneous assumptions about computer and online users and the quality and ease of their access to the Internet. E-learning programs aspiring to reach diverse global audiences will need to address existing economic and technological disparities as well as the diverse learning styles of users. Distance educators need to know their audiences and create e-learning experiences that are accessible; user friendly; interactive; locally relevant and sensitive to language, communication and learner preferences. Creativity and resourcefulness in instructional design can address technological constraints and socioeconomic disparities to harness at least some of the promise and power of technological innovations.

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Interactive Video Distance Learning in Ohio: The Ohio SchoolNet Telecommunity Model

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To create a statewide system so that all Ohio students, regardless of school, geographic location and socioeconomic background, have access to high-quality, concept-driven learning experiences. This state-wide system is intended to support and extend the overall state's vision of systemic reform in education.

The Ohio SchoolNet Telecommunity Vision

Overview

Historically, the Ohio SchoolNet Telecommunity (OSN TC) program has worked toward that vision by providing grants to help schools implement interactive video distance-learning technologies that link students with other schools, institutions of higher education, fine arts institutions, libraries, zoos, and other educational service providers. The OSN TC also provides grants to non-public and parochial schools to support the implementation of Internet technologies and information resources into classroom teaching and learning.

The OSN TC was originally founded in 1995 as one result of an "alternative regulation" proceeding and agreement between the Ohio Department of Education (ODE), the Public Utilities Commission of Ohio (PUCO), and Ameritech Ohio. In 1996, eight additional telecommunications providers joined the Ohio SchoolNet Telecommunity, also as a result of an agreement between the companies, the PUCO and the Ohio SchoolNet Commission. Participating telephone companies include: ALLTEL/Western Reserve, Ameritech/SBC, CENTURYTel, Chillicothe Telephone Company, Cincinnati Bell Telephone Company, Verizon, Orwell Telephone Company, and Sprint/United.

Oversight of the OSN TC is provided by a 21-member Policy and Oversight Committee consisting of diverse stakeholders including representatives from state university education faculty, Ohio educational technology agencies, Ohio educational television, the Catholic Conference of Ohio, ODE, the PUCO, the Ohio SchoolNet Commission, Ohio K-12 schools, telephone company funding providers, and other state and national experts. The Policy and Oversight Committee provides vision setting, oversight of grants, policy and planning, program evaluation, and approval and release of all program-related materials. Day to day activities are coordinated by a Program Manager and support staff at the Ohio SchoolNet Commission.

Through the first 5 years of the program, the OSN TC has provided more than $27 million in funding to approximately 475 schools in over 35 consortia for interactive video distance learning projects in furtherance of the OSN TC vision. The OSN TC also supports non-school content providers such as museums, zoos and other entities that provide K-12 educational resources. The Program has awarded 10 content development grants totaling approximately $3 million. In addition, 160 grants of up to $8,000 each have been awarded to non-public schools and community schools for the implementation of Internet projects. The program is expected to distribute over the life of the program more than $32 million to Ohio schools.

The Ohio legislature, with Ohio SchoolNet as the implementing agency, has provided over $850 million in additional infrastructure and educational technology programs. SchoolNet Plus+ has provided computers through grades K-6; the ONEnet infrastructure and connectivity program has provided ATM switching and T-1 level bandwidth support; and the Interactive Video Distance Learning program has resulted in an additional 350 schools provisioned with video distance learning equipment. Although the OSN TC vision remains that of promoting the establishment of a statewide interconnectable distance learning network, future programmatic support, will also include the nurturing of existing projects and schools with video distance learning equipment, as well as maintain a focus on high-quality content and professional development for existing program participants.

The Program

In the early days of the Telecommunity there were virtually no models of interactive video connectivity being used in the K-12 classroom with the exception of a small pilot project in northeast Ohio sponsored by Ameritech Ohio. That pilot focused on using video technology to expand high school course offerings, especially in foreign language instruction, where several schools might have a few students interested in a certain course that could not be offered because there were not qualified teaching staff available in each school. The OSN TC was established as a somewhat experimental competitive grant-giving program to expand the concept of teaching and learning via video conferencing technologies beyond the offering of specialty courses. The original planning and implementation grant opportunities requested proposals for new models and uses of video technology.

The Policy and Oversight Committee was and is interested in models that not only recognize specific course instruction, but also professional development, teacher collaboration, community involvement, career development and unique "field trip" opportunities to access educational resources and information otherwise impossible to access. The first grant opportunities included a "planning grant" and an "implementation/content grant." The planning grant provided support for a consortium of schools and/or content providers to research, design and submit an implementation project proposal. The implementation/content grant opportunity requested proposals from consortia of schools and content providers that demonstrated innovative and "cutting edge" models of using interactive video distance learning in the K-12 classroom and in the teacher professional development process. Support was provided for video and affiliated equipment, bandwidth infrastructure, oversight and management, professional development and content acquisition and development. More recently grant opportunities have been expanded to both new consortium applications and support for existing projects.

The original agreements with the PUCO and the ODE stipulated that funding would also be provided for non-public and parochial schools. While funding was provided for one large video-based experiment involving Ohio parochial schools, the main thrust of support for private and parochial schools is through the "Internet grant" funding opportunity. Non-public and parochial schools submit proposals for classroom teaching and learning projects that involve the use of computers in student activities and the use of Internet resources and information in the learning process.

At present the OSN TC offers the following funding opportunities:

- ❖ Implementation Grant RFP (public school consortia only)
- ❖ Content Grant RFP (non-K12 school content providers only)
- ❖ Support for Existing Projects (existing implementation and content projects)
- ❖ Adding Partners to Existing Implementation Grant Projects (implementation grants only)
- ❖ Internet Grants (non-public and parochial schools only)
- ❖ Professional Development Grants (non-public and parochial schools only)

Grant opportunities are offered twice each year, with RFPs and application materials being released in November and May. The Policy and Oversight Committee votes to release appropriate funding opportunities at every regular meeting. Not all RFPs are offered each grant round. Application deadlines are generally mid-March and mid-September. Letters of Intent are required for most grant opportunities. Contracted agreements are required of all consortium participants, outlining the requirements and deliverables for each award. Implementation and content grants are generally awarded as three-year projects, while Internet grants, professional development grants, support for existing project and adding partners are under one-year implementation timeframes.

The Evaluation Process: Criteria for Success

The importance of program evaluation is such that the OSN TC original agreements included an annual independent evaluation component. The annual evaluations look to review not only the operations of the program but also the effectiveness of grant implementation and the impact of interactive video technologies on the teaching and learning process. The first five annual evaluations were conducted by the North Central Regional Educational Laboratory (NCREL.) The Year 6 and 7 Evaluations will be conducted by Metiri Group. A report document is provided to the Telecommunity Policy and Oversight Committee and the Ohio SchoolNet Commissioners each year and is posted to the OSN Website.

The most recent evaluation looks at measures of successful interactive video Telecommunities (TCs) and reports several criteria for success:

1. Vision and Mission
   - ❖ Successful TCs have a strong, clear vision, widely shared and clearly communicated, for how IV technologies could be used to advance student learning.
   - ❖ They have clear vision and mission-important determinants of the degree of school and district ownership, buy-in, and administrative responsiveness, as well as the extent to which the TC is embraced by teachers.

2. Staffing and Organizational Structure
   - ❖ Successful projects have full-time managers/staff dedicated to the TC.
   - ❖ They establish Committee structures clearly aligned to the overall mission and vision of the TC.
   - ❖ They include a wide range of administrators and teachers in the TC governance structure.

3. Instructional Support
   - ❖ Successful projects have a support system that provides general technical and instructional services, including just-in-time classroom-based technical assistance and pedagogical support.
   - ❖ Successful TCs have systems of teaming, teacher partnerships, and PD that ensure adequate training and support for classroom strategies required for participation in the TC.

4. Professional Development and Training
   - ❖ Successful projects have strong, collaborative professional development programs that use interactive video as one method of delivery among others.
   - ❖ Successful TCs use professional development to facilitate inter-site collaboration and to instill a sense of ownership in each participating teacher.

5. Funding and Outside Resources
   - ❖ Successful projects have the ability to leverage additional funds and resources from a variety of sources.
   - ❖ They are savvy about bringing in partners and programming that add value to both the mission and participating schools.

❖ Successful TCs aggressively seek additional funds to support their goals.

6. Programming and Content
   ❖ Successful projects include an abundance of quality interactive video-based content drawn from a variety of sources, including intra-consortium partnerships, strong outside content providers, interactive partnerships outside the consortia, and university/consortia partnerships.

7. Changes in Teaching and Learning
   ❖ Successful projects generally show evidence of changes in teaching and learning attributable to the Telecommunity.
   ❖ Successful TCs consistently demonstrate that more student-focused missions are more likely to produce stronger results.

Summary

The Ohio SchoolNet Telecommunity (OSN TC) is a unique public-private partnership funded by SBC/Ameritech and Ohio's other large local exchange telephone companies. The program has historically and continues to provide grants and other support to assist Ohio schools implement interactive video distance-learning technologies that link students with other schools, institutions of higher education, fine arts institutions, libraries, zoos, and other educational service providers. While it is fair to say that interactive video technologies are still somewhat experimental and are by no means completely accepted and integrated into the Ohio K-12 curricula and teaching and learning process, the OSN Telecommunity program has demonstrated the tremendous value of video technologies to schools and will continue to make effective use of existing resources, both within the operational TC program agreements and through any resources that might come available, to support and promote interactive video distance learning as a tool to extend and enhance the educational experiences of Ohio students.

Biographical Sketch

Dr. Daniel L. Farslow is Program Manager of the Ohio SchoolNet Telecommunity Program and is also Ohio State Coordinator for the federal E-Rate Program at the Ohio SchoolNet Commission. Dr. Farslow oversees 40 interactive video consortia projects involving over 500 video systems in K-12 schools and educational content entities across the state. He also works with non-school educational content providers such as zoos and museums to develop high quality standardized, curriculum-based interactive video content for Ohio K-12 schools. Prior to joining Ohio SchoolNet Dr. Farslow served at the Public Utilities Commission of Ohio where he represented the Commission's interests in educational, digital divide and international relations issues.

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Faculty Development Models in Distributed Learning

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Success in distributed learning and all academic programs depends a great deal on faculty adoption and readiness (Waterhouse and Harris, 2002). The demands on faculty and staff who use technology in their courses are continuing to rise. Providing an environment which is supportive of faculty and contributes to their eventual success is critical. Distance education is an area where faculty members need assistance in learning how to use the new technologies (Cyrs, 1997; Thach & Murphy, 1995). Development of technology competencies can form the basis of good faculty professional development programs (Blue, Greer, Vetter, Irvine & Cole, 2000). While it is important that faculty understand how to use the tools of technology, it is equally vital that they understand the pedagogies underlying these tools (Laurillard, 1993; Palloff & Pratt, 1999).

The Division of Instructional Services at Collegis has worked with more than 70 clients in the past four years to develop faculty training and support strategies. We start with a good foundation via general pedagogical standards such as the Seven Principles of Teaching and Learning (Chickering & Gamson, 1996), the regional accreditation agencies' Principles of Good Practice (Council of Regional Accrediting Commissions, 2000), and general web usability standards. Faculty need to understand why they are learning the best practices and how these transfer to the web (Cravener, 1999). Often, they find that they can use what they learn in their traditional face-to-face classrooms as well (Fink, 2002). Sometimes institutional or program standards evolve collaboratively between the institution and the instructional designer. We find that faculty members are often relieved to hear about standards because it gives them a framework for course design so they don't have to reinvent the wheel.

Faculty development can be accomplished through either centralized or decentralized support (Ramsey & Breeden, 2001). All resources can be housed in a centralized office, and staff assigned on a first-come, first served basis. Or staff can be housed centrally, but specific individuals are dedicated to their own departments. A third alternative is that faculty development resources work in their own departments. Finally, if an institution has a contract with an outsourcer, the company can provide support through on-site staff or through centralized services, or a combination of both.

A variety of topics and competencies are covered during the course of faculty development. We have seen these competencies change over time. For example, initially institutions wanted more tools training. Now that many have faculty that know the basics of tool functionality, a desire exists for more pedagogy and train the trainer, as well as mentoring. Other issues include: Is training different if blended/hybrid courses are taught vs. fully online? What happens when you train different instructional technologies, such as interactive television, or face-to-face support—how many of the competencies change? The tools may change, but does the basic pedagogy stay the same? Should faculty be required to learn it all, or work in teams where instructional designers facilitate the development of their courses (Fink, 2002)? Are there ways to facilitate training, such as training to a specific curriculum template?

During the course of faculty development, we have discovered the value of:

- developing a training plan to inform the appropriate parties about what will be taught, and to whom, and by which staff during specific timelines (Bender & Craymer, 2001)
- faculty learning from each other - opportunities to share experiences (peers) or experienced faculty presenting to novice faculty
- showing many good examples in the discipline to give faculty a concrete understanding of what can be done
- working with early adopters to train or positively influence other faculty members
- training students to make faculty workloads lighter.

When courses are developed for faculty, we also need to continue to apprise faculty about teaching strategies in general, as well as about online course design, in particular. This includes everything from instructional design to web design to the nitty-gritty processes for designing and developing efficiently, using a team approach, and adhering to a defined timeline. Specific examples of what we teach include: learner-centered vs. traditional approach to teaching/learning, how to define observable outcomes and write learning objectives, how to incorporate discussion assignments and write effective discussion questions (general guidelines as well as discipline-specific variations), how to create effective group assignments, how to incorporate real-world scenarios and applications into assignments, how to incorporate opportunities for self-assessment (embedded questions with feedback, self-tests), how to communicate content via images and animation, how to use audio and video effectively, how to incorporate e-pack or course cartridge components from the publishers, how to structure an online course for usability, and how to use a prototyping process for efficient development.

Some of the lessons we have learned include: the importance of flexible scheduling (just in time coaching and use of a range of formal training times, from two-hour workshops to five day faculty "bootcamps "). Schedule early enough for faculty to work on their projects, but not too early that they forget what they have learned. Use the technologies involved to train faculty. One of the most critical things we have learned is to group cohorts with similar pre-requisite skills whenever possible. Also exposure to technologies should be limited for mainstream faculty who have not been on the leading edge of technology use—e.g. they shouldn't have to learn HTML. And provide faculty with just-in-time online and people resources they can refer to whenever they have a problem.

We have encountered the usual barriers to development: compensation and/or release time, time for training itself, lack of motivation for getting training, recognition for promotion and tenure, ownership, as well as infrastructure. It is important that the goals for development are effectively articulated. Faculty need to be involved in the planning process for adopting new technologies and using them effectively, while understanding the value of what they are doing. Communication is key! And if a teaching and learning center exists at the institution which does not focus or involve technology training, work closely with its staff to bring technology into the equation.

It's important to remember that not one set of strategies works for every faculty development situation. In order to be successful, however, faculty must be informed of how they can benefit from instructional technology and distance learning, and receive timely support where and when they need it.

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Biographical Sketch

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Moving From Online Courses to Online Programs Is Not for the Faint-Hearted

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Introduction

What happens when an institution moves from offering a somewhat random collection of online courses to delivering entire degree programs exclusively online? What are the rewards and the challenges? How can these challenges be met? These are the fundamental issues that will be discussed in this paper.

The primary objectives of the paper are outlined below along with a couple examples of relevant issues.

1. To outline some of the student support issues that institutions face when offering a degree program entirely online – academic advising, remote library access, acquisition of course materials.
2. To suggest proactive strategies that may ease the transition from on campus to online degree delivery—campus-wide advisory group, single faculty or other point of contact for online students, proactive communication with the online students.
3. To suggest reactive strategies when the courses are ready, but your institution is not prepared to offer all of its services to the online students – priority handling of online students, cultivating institutional advocates, developing an "I'd kill for their email addresses" mentality. Interestingly enough, some of the more innovative strategies come from the need to react to an immediate need.
4. To discuss the politics of institutional change – why you shouldn't wait until everything is perfect and all systems are "go" to launch the online program, what unexpected benefits might arise to traditional students, and how to keep the needs of the online students the center of your focus.

Institutions are encouraging faculty participation in online instruction by suggesting that they begin by enhancing their on campus courses by adding some Internet technologies (e.g., lecture notes online, asynchronous discussions, Web and data-base searches). As faculty become more comfortable and competent, they may be encouraged to move their courses to a delivery that is totally online. Typically, however, the students in these courses are dormitory or commuter students. For them, the availability of Web-enhanced or Web-based courses serves to decrease scheduling conflicts, increase convenience, and reduce commuting time.

What happens when the institution moves from offering a somewhat random collection of online courses to offering a full degree program delivered exclusively online? That is the subject of this paper, and the quick answer is "a whole lot."

Before looking at the specific topics, here are some general difficulties you will face. These are also reflected in the specific examples given later in the discussion. First and foremost, and probably already known to you, is the fact that your institution is not yet used to thinking institutionally in terms of distant students. A second and related difficulty is that the external organizations (for instance, governing boards, accrediting entities, state curriculum oversight groups, legislators) that impact program development are not any more advanced in their understanding of distant students and programs than your internal organization is. Some do have supportive stances. Governing boards and legislators like the concept because it opens access. At least governing boards of state institutions and their legislative friends like access to programs in their state by their citizens. In Texas, we do not seem to care much about attracting students from anywhere other than Texas. That's why we continue to charge non-Texas resident tuition and fees to distant students, but that's another story.

The remainder of this paper is organized into sections: enrollment, authentication, communication, and marketing. Within each section, the issues as they relate to the development and delivery of an online degree program are discussed, reactive strategies are shared, proactive solutions are suggested, and tactics for winning the game of institutional politics and policy are recommended.

Enrollment

So you've decided to put your program online. Your potential students will not be coming to campus for other courses. They won't drop by to pick up a fall schedule on their way from the dorm to the library. Are you set up to handle admissions, academic advising, registration, billing and financial aid at a distance? We weren't. One of the first things you realize is how many forms and procedures are paper-based and how rigid an institutional mentality that suggests the student "drop by" and fill out the form can be. But there are signs of progress. The forms, many of them at least, are now available online, usually in some handy format like pdf, so you can print them off, fill them out, sign them, and drop them by the office at your convenience! Right!

When our first program went online, the institution had no phone or online registration. The few distance students we did have faxed in their registration cards. Our reactive response as program administrators was to develop our own electronic versions of the admission and registration forms and to put them on our program Website. We then offered the electronic versions of the forms to the various units for their use. Not only did we provide an electronic version, we added a field for email address to every form as part of the required student demographic data. Proactive strategies certainly included raising the awareness of the institution to the fact that **all** students would appreciate and use enrollment services offered at a distance. As part of that strategy we built alliances. For example, the computer services folks didn't really want to drag computers to the gym for registration every semester. They were a bit tentative, but did join us in the call for institution-wide Web based registration.

Our biggest enrollment issues continue to be in the accounting office. It may just be our institution, but accounting's attitude seems to be "Don't pay your tuition. Fine. We'll just cancel your registration and drop you from your courses." If that happens during the first few days of the semester, it means that the student's access to the course is immediately denied. Do that on a Friday, and a student is shut out for the entire weekend. Reactive strategies included finding one sympathetic accountant, explaining over and over again that these students are not going to drop by to pay their bill, and providing that accounting person with email addresses for all online students. Our sympathetic accounting person has even floated students emergency loans without them knowing it, just to save their registration and course access for a couple of extra days. Proactive strategies include simply working with accounting to help them to think through what the distant students see from their end. Unfortunately, sometimes it's hard to anticipate changes that may negatively affect online students. One semester under a new Vice President for Business Affairs, the institution decided not to mail bills. Another semester we mailed bills that had no accounting contact information and no due date. Changes necessary in billing procedures resulting from our implementation of the Web based registration system simply escaped our poor accounting folks.

The single most successful strategy when dealing with any institutional unit that provides student support services to distant students seems to be the development of a relationship with a sympathetic point person in that unit, whether it be admissions, registration, accounting or graduate studies. Do the same thing with student advising. Designate one faculty or staff person to advise online students at least in the early stages of their degree program. If that person has a good understanding of and rapport with the other support units – admissions, accounting, etc., then you will be able to provide even better student support services.

A second strategy is to form an institutional committee made up of representatives from every unit whose services impact distant students. Our committee is chaired by our distance education program director who reports to the Vice President of Academic Affairs. The committee includes faculty representatives from each online program and administrative staff representatives from distance education, computer services, admissions, registrar's office, financial aid office, accounting office, public relations and the library. You might consider adding bookstore personnel, too. Meeting two or three times a semester, this committee is a good place to resolve recurring problems, brainstorm solutions for potential future problems, and build support for the distance education enterprise and empathy for the distant student. So many times a change in a procedure in one unit will impact not only the distant student but also another unit. In a very proactive way, these potential problems can be addressed and resolved among these committee members.

Authentication

"How do I convince people that I exist and am legit?" Everybody who has ever had control of a computer system and was responsible for providing secure access to it apparently believes the student would only ever want to access that one system and so will not be overburdened by keeping track of proper authentication information, usually a username and password. Until very recently, a distant student on our campus typically would actually have a username and password for the University's central computer system, the software system supporting course delivery, the on-line student information system, and the electronic databases provided by the library. If the student were taking a UT System TeleCampus course, then she would also need username/password combinations for the TeleCampus course delivery system, the student information system, and the System Digital library. One shudders to think about the student undertaking course work from more than one campus. Of course, the student is cautioned not to write any of this down anywhere, but to simply remember the information. Good question, but no, that won't work, either. You shouldn't use the same name and password all over the place anyway, and some of the systems insist on your using name and even passwords derived from a system-specific formula.

Encourage the information systems powers that be to consider a one-time campus sign in procedure that will allow access to the instructional software, the library, the student information system, and anything else the student may need having to do with your institution. This can be done using a proxy server, a device which can be signed into once and then used to fool the other services into thinking the student is a valid user. Unfortunately, it is often the case that the student's browser must be specially configured to deal with the proxy server. That is fine, if access is only desired to one place. If the student needs access to two proxy servers, the use of Netscape for one and Internet Explorer for the other is recommended. We have no answer for cases in which the student needs access to three proxy servers. You may also note that this may get some students in over their computer literacy level. Ah well, they are here to learn, aren't they? We recommend you investigate something like EZProxy, a proxy server that does not require special browser configurations.

A slightly different authentication issue appears when the student takes a course in which some sort of proprietary software is required. Since a word processor seems a nearly universal course requirement, almost all students are affected. In our situation, the UT System, like many other such institutions of higher education, has struck a deal with a major vendor to provide basic office automation software to students (and faculty and staff) for the price of, well, free. That is, the System has sent a large check to the vendor and students can purchase the software through the bookstore for the price of the CDs it comes on. Just drop by and get it when you drop off your registration card and please be sure to bring your student identification card with you so you can prove who you are. Our deal with the vendor is that you only get one copy and we must know that you are actually a student. These are understandable concerns for the vendor and therefore for the bookstore. Our first reaction was a rather cumbersome, but workable, scheme involving the student sending (faxing) a copy of a driver's license, a signed EULA, and a credit card number or check (Sorry, checks by fax are not accepted.) to the bookstore and the bookstore checking student rosters to verify enrollment. An online system allowing the student to order and pay for software and other course materials, with a mechanism to check the student rosters for enrollment verification would be better.

Communication

The need for communication among academic and service units at the institution as well as the need to be proactive in communications with students is real. Initially, nobody, in our institution had any experience with many of the problems discussed here and, of course, they were eager to learn – or not. Anyway, communication among the players (administrators, faculty and students) is crucial. As we mentioned previously, you should form a committee to encourage the sharing of information and include representatives from each of the academic and support areas involved in distance education. It is also important to identify someone in each office dealing directly with students as the "distance education" person. Dealing with distant students is very different and many procedures will have to change.

With respect to faculty/student contact, problem number 1 is getting the student's attention in the first place. Yes, you could just email them, send them enough information to get them started, and ask for their email address, if you had their email addresses. If you don't, you can just tell them (at the first class meeting ???) to send an email to you and you will capture the address. Our reactive solution has been less than wonderful. Our institution provides phone numbers on class rosters, so the students can be called and asked to send contact information. Obviously, this process will not scale very well. We have begun to collect email addresses from students through the Web based registration system. We print them on the hard copy class rosters sent to faculty.

Marketing

When student recruitment means visiting the local high schools and taking out an ad in the local paper, there will be a need for an institutional "rethink" about marketing. Marketing efforts aimed at attracting students who are far from your campus and who will remain so when they "come" to your institution are different in both method of distribution and in content. Unless your institution is going entirely online, you should target learners by program. For instance, the UT TeleCampus advertises in places such as the Southwest Airlines magazine, with copy aimed at the business traveler who might be interested in an MBA. There need be no pretty pictures of campus flowers and students and buildings. The message is that you can do the program while you are doing what you are doing right now – traveling on business. For the online kinesiology program, advertising is placed in professional journals and distributed at regional and national conventions of kinesiology professionals. This is a good model for any graduate level program and may be for some undergraduate programs as well.

However they are done and wherever they appear, real advertisements are expensive, so alternatives are important. Question: where do you think the prospective online student in likely to look for information about programs at a distance? Yes, of course, so it is important for you to set up an attractive Website for your program and to keep it current. One thing you want to be sure to do is to include descriptive information in your page metatags so the average search engine will easily find your site. Get your local Web administrator to place a link on the institution's front page labeled something like Distance Learning and leading to a page on which your program will be obviously displayed. Even better, get a front page link to your program specifically. Of course, if you do, everyone will want one and if your page is like ours, it would soon be overrun with links to distance learning programs. If a student is looking for distance learning opportunities, she is not going to search your whole site to see if you have them. Advertise on your own institutional home page.

Another valuable Web resource is GradSchools.com, which has been a very good source of prospective graduate students for us and is not very expensive (free, actually). There is a growing number of sites, sponsored by university consortia (such as SREB), state agencies concerned with higher education (Texas Higher Education Coordinating Board), and institutions (University of Texas TeleCampus) which maintain Websites listing programs and courses available online. Generally, since the sponsors of these sites have a vested interest in the availability of distance learning resources, the listings are free. Be sure your courses get listed on appropriate sites of this type.

A Final Thought

Hang in there. Persevere. In the wise words of a colleague, "We know we are making progress when the problems we are having this semester aren't the same ones we had last semester." Just keep the needs of your students in the forefront, and you will prevail.

Biographical Sketches

Dr. Lois Hale chairs the Department of Behavioral Science at UT Permian Basin. The department houses two online degree programs – a master's degree in Kinesiology (KINO) and an undergraduate degree in Criminology. She is the primary academic administrator for the KINO program, in affiliation with five other UT System universities and the UT TeleCampus. This program won the USDLA 2002 Excellence in Distance Learning Programming (Higher Education) Award. Over the past three years, she has been a strong advocate for institutional change to accommodate the needs of online students. She teaches online courses and has been an online student.

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Dr. Doug Hale is Director of the REACH Program Center at The University of Texas of the Permian Basin, the unit responsible for distance education at UT Permian Basin. He is Professor of Mathematics and Computer Science and the author of a Web-based statistics course used by students in several online graduate degree programs. He has also been an online student. Dr. Hale has worked closely with the UT System TeleCampus since before its formal beginning in the spring of 1998. UT Permian Basin was the recipient of the 2001 Commitment to Excellence Component Award from the TeleCampus.

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Questions You Should Ask Platform Providers and Probably Aren't

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Introduction

A key to providing quality support for online teaching and learning is the selection of and ongoing relationship with a courseware platform provider. Beyond staffing, this may be the most important and most expensive element of a distance education program.

Course Design

A courseware platform creates the parameters within which online courses must be designed. The platform functionality determines the way in which content is organized, the technologies which may be used for instruction, the communication formats available for faculty to student and student to student interactions and the ways in which students may be evaluated, among other things. In addition, the courseware platform determines the skills needed by faculty and staff, the ways in which faculty and staff must be trained, and the amount of staff support needed for course maintenance.

Faculty and Student Satisfaction

The quality of a courseware platform is, in many ways, a major determinant of the quality of the faculty and student experience. If a platform has the functionality needed by faculty and if students find the platform easy to navigate and use, both are more likely to have a successful online learning experience. If a platform is limiting, confusing, has bugs or other problems, frustration levels rise and the confidence in online learning of one or both groups may be compromised.

Resources, Options and Limitations

Many courseware platform companies provide ancillary services such as technical support, course hosting and access to staff for platform customizations. This can bring valuable resources to an institution. Some courseware companies require the purchase of these services. This can be limiting if one or more of the services is poorly designed or managed. On the other hand, purchasing these services from other companies—if not available through the courseware provider or if the provider allows the organization to purchase these services elsewhere—can allow the organization to provide the best of each service. But, this may be expensive and/or difficult to manage.

The UT TeleCampus

The University of Texas System TeleCampus (UTTC) is a centralized service organization that provides support for the development and delivery of online degrees and courses for the 15 component campuses of the U.T. System. Founded in 1998, the UTTC currently offers 7 master's degrees, a series of general education courses, a bachelor's completion program and several other higher education programs and certificates. With an inventory of about 150 higher education courses, the UTTC supported the teaching and learning of approximately 100 faculty and 6000 student enrollments during the 2001/2002 academic year.

The goals of the UTTC are to provide support services to distance learners, to expand the reach of the U.T. System within the State of Texas, to increase student enrollment at some U.T. System campuses, to extend outstanding programs to students beyond the originating U.T. System campuses and to use economies of scale to minimize the cost of distance learning efforts.

Request for Offer and Platform Selection Process

Vendor Questionnaire

As the three-year contract with the UTTC's first courseware platform provider came to a close, the UTTC staff to begin a process to select a new courseware platform provider. The UTTC staff included 36 questions in the RFO to which courseware providers were asked to respond. Those questions are listed below.

1. Explain in detail the attributes of the courseware platform you propose.
2. Describe the ways in which content can be entered into, deleted and modified within the courseware.
3. Does the courseware have a built-in HTML editor or wizard for use in creating course content?
4. Describe the ways in which multimedia elements may be integrated into the courseware. What are the abilities and limitations of the courseware regarding multimedia elements (e.g., Java, Shockwave, etc.)?
5. How are interactive elements integrated into the courseware? What are the abilities and limitations of the courseware regarding interactive elements?
6. Describe the courseware content organizational structure.
7. Does the platform have the capability of linking or branching within the courseware?
8. What components of the course, if any, may be modified while the course is being offered? Can faculty members make the modifications?
9. Describe the course navigation abilities and flexibility.
10. Describe the student assessment and evaluation attributes of the platform. Is branching from test responses available (feedback on responses, remediation, etc.)? Can evaluation elements be timed or dated? Can test pools be used? Can test questions be randomized?
11. Describe the student tracking abilities of the courseware platform.
12. Is there a gradebook within the courseware? Describe the attributes of the gradebook. Will the gradebook link to evaluation elements within the courseware? Can the faculty member add scores from external evaluation elements? Can the gradebook design be modified while the course is being offered to students (addition or deletion of elements, weights of items, etc.)?
13. Describe the method by which your system can be tied into our student information system. Specifically address your proposed method to automate the registration (granting of access) of students into courses via a batch process.
14. Describe the different forms of course access (administrative, faculty, student, etc.). Is there a limitation to the number of each form of access per course? Can access be defined for each individual? (For example, can a faculty member determine which elements of faculty access will be allowed for a teaching assistant?)
15. Does your system provide web-based conferencing? Does that conferencing support both synchronous chat and asynchronous threaded-discussions? Is that chat logged to an accessible file?
16. Are glossary and references functions available? If so, are they searchable?

17. Can portions of a course be made available to potential students for review? (For example, can the syllabus be made available outside the secured course?)
18. What is your corporate strategy and commitment to staying current with emerging technologies and standards? Please speak specifically to compliance with IMS and SCORM standards.
19. How would you address training and technical support for TeleCampus staff?
20. What type of technical support will be available to faculty and students? If a help desk or other technical support email or phone number is available, what are the days and times of availability?
21. Are faculty and student tutorials available? If so, describe.
22. Describe the communication system and processes that will be put in place to facilitate the working relationship between the company and the TeleCampus.
23. Describe in what ways your system allows for automation of student access to courses. How "open" is your system in terms of integrating back-office processes with our Student Information System?
24. What is the process by which bugs or other technical problems are resolved?
25. What would be the minimum required user configuration (processor, browser and version, etc.) for course access?
26. Will course development be possible on PC and Macintosh computers? Will courses be available to students using Windows, Macintosh and Linux systems?
27. How will you handle modifications/upgrades of the courseware platform? How frequent are modifications/upgrades? If existing courses are to be upgraded, how do you propose that happen?
28. Describe your course hosting options and models (e.g., licensed to end-user, vendor-hosted, etc.). If hosting will be outsourced to another company, please name that company and describe the relationship between the two companies.
29. How will the hosting system handle back-up and recovery? What will be the frequency of back-up?
30. Do you maintain a development environment separate from your production environment? Describe the differences between the management, security and hosting of courses being developed and courses being offered to students.
31. Provide data on server downtime during the most recent 12-month period.
32. How would you handle the issues of course conversion from the current platform (if necessary)?
33. Please address our need for documentation and on-line help regarding the courseware.
34. Please present a general timeframe for implementation of the relationship, including TeleCampus staff training, server set-up and conversion of existing courses.
35. Please provide the names of three to five academic clients. Describe the length of your relationship and the number of courses each client is offering on the platform. Please provide contact information for those clients. Please be sure one of the clients is your most active academic client (i.e., the most courses or annual course offerings).
36. Please provide any additional information that you believe is relevant.

RFO Review

After proposals were eliminated that did not meet the deadline or that were not complete, the proposals were reviewed internally and externally. Internal reviewers were the UTTC management staff. External reviewers represented campuses and included faculty, course production staff, distance education administrators and administrative leadership. All reviewers completed a courseware evaluation matrix that was based on the criteria for selection.

1. Total cost (including start-up and per-student) as derived from information contained within the offer and clarified during negotiations. (35%)
2. The quality of the response to the Vendor Questionnaire. (30%)
3. Past performance of the vendor's system in other, large scale "virtual universities." (15%)
4. Assessment of vendor strength and long-term viability. (10%)
5. Proposed migration methodology of existing courses to vendor platform. (10%)

Narrowing the Candidates

When the initial reviews were complete, the results were tallied and provided to the UTTC management staff and RFO respondents were each offered an opportunity to present their proposal in a two-hour meeting. Copies of the proposals were provided to all interested UTTC staff who were also invited to participate. At the completion of the presentation cycle, the UTTC managers made their first vote to narrow the candidates. Two finalists were selected for additional review.

Selecting a Final Candidate

After the selection of the final candidates, UTTC managers called the institutional contacts listed by the vendors in response to question number 35 of the vendor questionnaire to pose a series of questions.

1. Which product is being used (release and version)?
2. What is the size and mission of your institution (public, private, for-profit)?
3. What is the number of courses developed on this platform (true web based or web-enhanced)?
4. Do you host the product locally; does the vendor do the hosting? Or, third party hosting?
5. What other platforms were considered before selecting this one?
6. What were the reasons for the selection of this product?
7. How long have you had the product in service? How long from contract to production?
8. How has the level of service met your expectations, based on initial plans and promises?
9. Were there any significant additional costs above what was initially contracted?
10. How frequently have you had to call tech support? Are you satisfied with the timeliness and quality of the resolution to the calls?
11. What is your overall service and support satisfaction?
12. Did you integrate the product with your student information system (SIS)? If yes, how successfully?
13. What are best/least desirable features of the platform?
14. All things considered, would you renew your contract with the company?
15. Do you have any advice for us?

In addition, requests were made to the two platform providers for access to the courseware. Blank courses on each of the two platforms were assigned to three staff in the curriculum department who each built all or part of a course on each platform. As a final step, all UTTC staff members met with representatives of each of the courseware platform companies for a half-day. The meetings each wrapped up with a discussion between the company representatives and the UTTC management staff regarding platform pricing. After review of the reference checks, presentations by curriculum staff and meetings with company representatives, a final candidate was selected and contract negotiations were begun.

Summary

In summary, the UTTC learned valuable lessons regarding platform provider selection. It is of primary importance that universities and colleges enter into the RFO process with a clear idea of what they are seeking. They simply must know the products. The less they know, the more likely they are to make a mistake in their selection.

Biographical Sketches

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Multipoint Videoconferencing:
Using Constructivist Strategies to Engage Adult Learners

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Introduction and Background

With the expanding infrastructure for telecommunication in the world today, new applications for communications are emerging. To assure success in the workplace of tomorrow, it will be necessary for students to have collaboration and communication skills that utilize technology tools (CEO Forum, 1997; Schlechty, 1997). Videoconferencing, also referred to as teleconferencing, is a two-way method of communication between two or more groups in separate locations via audio, video, and/or computer systems. As a communicative technology, videoconferencing offers the potential to provide students relevant skills, connect distant or remote learners, and induce change.

These communication elements are central to the mission statement at California State University San Marcos. The faculty is committed to transforming public education and has engaged in research that identifies effective teaching and learning strategies within distance learning environments that include videoconferencing (Hanor, Hollenbeck & Wendling, 1997; Hayden & Hanor, 2002). One simple definition of distance learning is, "learning without the physical presence of the instructor" (Mantyla, 1999, p. 4). As in distance learning, videoconferencing may separate teachers physically from learners. What is lost and what is gained in the process of separation? Teachers and administrators must confront issues such as these while they receive training in the design and application of appropriate uses of videoconferencing to support effective, efficient, and meaningful learning.

As educators are exposed to new methods for instructional delivery, old analogies are often applied. "Educators tend to use new technologies within the context of their perceptions of instructional strategies" (Hayden, 1999). Videoconferencing experiences can be effectively integrated into constructivist learning environments. The results of a videoconferencing study completed in 1999 (Hayden) were used to guide the planning of videoconferencing seminars for a professional development project implemented in Southern California between May 2000 and May 2002.

Improving Learning for All Students through Technology (ILAST) was one of thirty state funded professional development projects to improve K-12 teachers' and administrators' skills for applying technology to teaching and learning. Within the context of the ILAST partnership, a collaborative system for videoconferencing was established in which the San Diego County Office of Education provided a bridge for multi-point connections among four to five locations simultaneously. Using dial-in systems for connectivity, each site had two-way visual and audio access. While technical information can be provided for duplicating this system, the intent of this paper is to share the pedagogical research and discoveries that have been made as a result of these experiences with multi-point videoconferencing.

Research and Philosophical Foundations

A study completed in 1999 (Hayden) used the Delphi process to collect data regarding connections between videoconferencing and instructional strategies that enable constructivist learning. A panel of experts was asked to draw from their experiences with education, technology, and videoconferencing to identify characteristics and critical support strategies necessary for videoconferencing in constructivist K-12 environments. The panel's recommendations have provided a guide for technology trainers and professional development planners in implementing effective teacher training and support.

Twenty characteristics of videoconferencing that support constructivist learning emerged in the study completed by Hayden (1999). These twenty characteristics are categorized into four themes in Table 1: (a) connections, (b) questioning, (c) learning, and (d) interaction. Within this list of twenty characteristics, ten characteristics of videoconferencing were rated higher than the other ten. By organizing the top ten characteristics by theme area, learning experiences using videoconferencing to support constructivist learning can be planned. Table 1 shows how a videoconferencing project can incorporate all ten of the top videoconferencing characteristics.

Table 1. *Planning An Activity Using The Top Ten Characteristics Of Videoconferencing That Support Constructivist Learning Environments* (Hayden, 1999)

Theme	Characteristic	Scenario:
Connections	Synchronous connections between students and primary sources such as experts and remote locations; involving multiple sites in activities.	Students are assigned an authentic task that offers opportunities for planning connections outside the classroom with experts and primary sources such as museums. The students plan, develop and ask questions during a videoconference to collect information and gain an understanding of key concepts. The students use a suite of online tools as follow-up to the initial interaction and then present their findings "live" to remote partners concluding their research.
Questioning	Students develop and ask questions; they are in charge of their learning.	
Learning	Students present to remote partners using audio and video for communication.	
Interaction	Students work in groups on authentic activities with remote sites. This involves videoconferencing with remote sites and use of an online suite of tools to support videoconferencing activities.	

Development of Strategies Based on Research

The format for the ILAST videoconferences was developed using the effective constructivist practices and interactive techniques identified by Hayden (1999) in four categories.

Connections

Participants contributed to the selection of topics and attended videoconferences at one of five locations convenient to their school or home. Experts and/presenters shared ideas, projects, resources, and provided opportunities for participants to raise questions, respond to content and interact with other participants or materials during the seminars. During some seminars, additional sites were invited to connect and participate in order to provide access to primary sources of information located remotely. Sometimes a discussant summarized key issues, suggested connections, identified emerging themes and trends, or pointed out possible areas for future research or collaboration. Participants from all of the sites were invited to contribute to group discussions and ask questions during designated times of each seminar.

Questioning

A key component of each videoconference seminar was question-and-answer periods encouraging participants to clarify and confirm concepts. Participants frequently were divided into groups and worked collaboratively at each site and among sites to raise questions, identify critical issues and reflect on the session with guidance from appointed facilitators. The use of laptops at each site enabled individual or small group inquiry into designated software or online resources appropriate to the topic of study. Each site shared questions, responses, and reflections and continued to build knowledge on the topics following the interactive seminars.

Learning

"When teachers are learning to integrate technology into their classrooms, the most important staff-development features include opportunities to explore, reflect, collaborate with peers, work on authentic learning tasks, and engage in hands-on, active learning" (Sandholtz, Ringstaff, & Dwyer, 1997, p. 142).

Participants were engaged in the process as well as the content of the seminars. Participants contributed to the design, implementation and assessment of videoconferences and practiced methods and strategies that had been modeled at previous videoconferences. This contributed to understanding the videoconferencing components that could be applied to their own classrooms. Presenters were located at different sites and sometimes at more than one site to distribute the expertise and collaboration among the partner locations. Whenever possible participants were invited to share their expertise at future seminars and reflect on their learning experiences with their mentors.

Interaction

"Using real-time interaction through computer text-chat or videoconferencing programs create a "telepresence" between students and other people around the world" (Harris, 1998, p. 8).

After each videoconference, opportunities were structured that enabled participants to contact experts, contribute to discussion threads in an online bulletin board, and visit resources posted on the ILAST web page (http://www.csusm.edu/ilast). While some issues and topics were derived from the competency-based curriculum for ILAST, participants played a critical role in determining topics that they considered valuable. This enabled topics such as "Addressing the Needs of English Language Learners", an issue at many partner schools in Southern California, to be included. A search identified several local experts and examples of best practices that had been implemented by nearby schools, including ILAST partner schools. The experts not only shared their experiences and projects, but also invited participants to visit their schools. They encouraged continued contact through email.

Conclusions

Each of the eleven ILAST videoconference seminars provided an opportunity to reflect and evaluate the effectiveness of the conference formats. Participants completed evaluation forms at the end of each seminar. The ILAST leadership team analyzed and reviewed participant comments and reflections. Lessons were learned regarding selection of format and content to best meet program and learner needs. The leadership team found the following:

In response to technical analysis of connections, participants were fairly accepting of temporary visual "disconnects," but much more limited in their tolerance for auditory problems. Participants appreciated strongly presented content with explicit links to standards and curricula and visuals to support key concepts. ILAST seminars used video, document cameras, presentation software and web projection to broadcast visual images. Each of these media offered support for visual learning but the technology offered challenges through varying bandwidth, and audio/video technical difficulties. When technical difficulties were experienced, the participants were very critical and felt as though their time was not productive. Backup plans, as recommended in the findings by Hayden (1999), were essential so that each site could proceed independently when technical difficulties were experienced. One difficulty was that experts in the content area could not be at all sites and site facilitators lacked confidence in assuming the role of an expert.

Participants identified certain criteria for determining their satisfaction with the ability to raise questions and interact with content as well as people. They questioned the efficiency and effectiveness of videoconferencing in comparison to other learning formats. Although each seminar had scheduled times and activities for interaction with content, experts and other practitioners, the ratings for the evaluation question: "rate the ability with which you were able to participate in the videoconference" ranged from low (47 % rated a 1) to high (57% rated 5) on a five-point Likert scale.

The category of learning was evaluated in the survey by asking several questions related to content, application and satisfaction with the seminar content. Opportunities for questioning and interaction during each conference were thought to provide an opportunity to engage and motivate participants. Evaluation responses to learning were shared through reflections during the conference and through posting and emails to instructors and experts following the conference. The area of content was generally rated high when the technology worked and participants could see and hear the transmission. When participants were asked to identify "the best thing about the videoconference," they always overwhelmingly responded that the presenters were most important, followed by the area of content.

Preparing our presenters for the interactive format of the seminars presented another challenge. Guidelines were prepared and sent to presenters ahead of time to help them prepare for interactive formats, but this issue continued to be a challenge. Most of the experts that were scheduled as presenters, planned to present information in a "lecture" format in their content proposals in spite of the recommendations. Each time this occurred, the participants responded in their evaluations by stating that they needed more interaction and "less lecture." The planning team found it helpful to post pre-seminar information on a web page prior to the videoconference to prepare participants in advance for the seminar. This activity encouraged increased interaction with the content, with the expert and/or materials being presented during the videoconference.

Implications and Future Work

The ILAST leadership team has further investigated the findings from the Delphi Study and has found the characteristics recommended by the study to be valid. As the second year of professional development draws to a close, the evaluations for all videoconferences are being continually analyzed to document the successes and challenges. The leadership team plans to further the study and identification of effective constructivist practices for interactive videoconferencing for professional development. The support strategies for videoconferencing have been distributed to the schools in the ILAST partnership. This study will help inform decisions made by schools and districts planning to acquire videoconferencing equipment and implement this new media in student learning activities.

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Biographical Sketches

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Building a Highly Accessible Web-Based Training Course

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Introduction: Distance Education and Accessibility

In theory, distance education is ideally suited to the needs of people who are not able to attend traditional learning environments. People with disabilities, travelers, or those who live in remote areas can find it difficult to attend traditional classes and are thus perfect candidates to participate in Internet-based distance learning.

Unfortunately, distance education courses are not always accessible to all of the students who wish to take them. Barriers exist for a variety of reasons. To eliminate these barriers, Internet-based distance education courses should be designed with an emphasis on accessibility. Design for accessibility takes into account the abilities of the student, as well as the abilities of the student's computer hardware and software.

Design for accessibility involves a number of different techniques, some of which are quite easy to follow. Two distinct areas of focus are instructional design and web site design. By structuring course content in an appropriate manner, accessibility can be maximized for people having various learning styles, cultural backgrounds and abilities. Appropriate use of technology and careful web site design are the other key factors that enhance accessibility.

While improving accessibility is crucial to the success of distance education courses, it is important to maintain student interest. Graphics, interesting and interactive course content, and creativity can be combined with accessibility techniques to form an engaging and accessible training course.

Understanding Accessibility

Many people experience difficulty using the Internet and computers. Difficulties can arise due to disabilities and limitations of computer hardware and software. Developers of courseware can take steps, some of which are quite simple, that will greatly improve accessibility. The initial, easy steps taken to improve accessibility will result in benefits for all users.

The more difficult and specialized techniques require judgment and compromise. It is possible that in attending to the needs of a particular type of disability, content might become less accessible to people with different disabilities. Maximizing accessibility involves following established guidelines as well as determining the appropriate balance to strike between the needs of the users.

Abilities can vary from person to person. Some people have combinations of disabilities, or disabilities of varying severity. The following is a list of disabilities that affect people's abilities to access computers.

- Blindness: a substantial loss of vision in both eyes
- Low Vision: vision that is not sharp, or is sharp only in portions of the field of vision
- Color Blindness: a lack of sensitivity to some colors

- Deafness: a substantial impairment of hearing in both ears
- Hard of Hearing: mild to moderate hearing impairment
- Motor Disabilities: various conditions that affect the ability to move or to control movement
- Cognitive & Neurological Difficulties: dyslexia, dyscalculia, attention deficit disorder, memory impairments, mental health disabilities
- Seizure disorders

In addition to disabilities, a person might have trouble with accessibility due to the software and/or hardware they're using. It's helpful to understand the various reasons why a person could be unable or unwilling to install a particular type or version of hardware or software on a computer. Some reasons are listed below.

- They do not have the expertise to install it
- They cannot afford to purchase it or have it installed.
- They cannot install it because they use a shared or public computer
- The computer they use may be too old to support it
- They may be using a Web appliance or service that does not allow changes
- They may be using an operating system that will not support it
- They may not be willing to wait through the download
- They may have special needs which restrict their ability to use some browsers or software

Put Yourself in Someone Else's Shoes

Experiencing web pages through the browsers of other people can help in understanding the accessibility needs of others. Many people do not have the latest versions of the Netscape Navigator or Internet Explorer browsers. And for various reasons some people have their browsers configured to not show graphics or to not run JavaScript.

In addition, some people use alternate browsers such as Opera, which has many accessibility features, or the text-only Lynx browser. To further complicate things, some people with disabilities use screen readers or self-voicing browsers, which are software programs that use a speech synthesizer to read aloud the text on a page.

A courseware developer must be aware of this and strive to eliminate barriers that arise due to the differences in browsing setups. Testing your web pages in various browsers and screen readers, along with following established accessibility guidelines will enable you to improve the accessibility of your courseware.

Improving Accessibility Through Instructional Design

Educational content is the cornerstone of a course and its design can have a significant impact on the accessibility of the material. All the fancy spinning graphics in the world will never replace interesting and engaging material delivered in a creative and interactive way. Accessibility can be improved, and web-based learning environments can be made to be more interesting if a few basic considerations are addressed in the context of Instructional Design.

Know Your Students

By knowing the motivations and expectations of your students, you can design a course that best suits them. You can also anticipate barriers and improve accessibility by understanding their needs and abilities

Manage the Subject Matter

Reformat traditional educational text to make it more readable on the Internet by:

- "Bracketing" the material by adding introductions and conclusions
- Using sub-headings to break-up large chunks of text
- Knowing how much information is enough
- Keeping paragraphs brief and using bulleted lists
- Adding internal hyperlinks to emphasize key points

Enhance the Learning Environment for Adult Learners

This is done by:

- Clearly defining learning outcomes.
- Designing assessments to reinforce and assess mastery of objectives.
- Increasing interactivity
  - Build in student feedback, such as quizzes
  - Allow students to have control over their learning experience by offering choices on how to navigate through the course
  - Use multiple interactions

Create an Esthetic Experience That Enhances the Learning Environment

Choose an easy to read font and use plenty of white space to aid in reading ease. Text should be placed on a background that allows for high contrast and is visually appealing. The judicious use of graphics can be an excellent tool in facilitating learning for the visual learner.

Improving Accessibility Through Web Site Design

There are numerous organizations promoting accessibility guidelines for web site design. Foremost is the Web Accessibility Initiative (WAI), a division of the World Wide Web Consortium (W3C). The primary reference resources for developing accessible HTML Web pages are the WAI Web Content Accessibility Guidelines 1.0 (http://www.w3.org/TR/WCAG10/) and Checklist of Checkpoints for Web Content Accessibility Guidelines 1.0 (http://www.w3.org/TR/WCAG10/full-checklist.html). In addition to guidelines, the WAI provides detailed examples and reference materials on web accessibility.

A few highlights of accessibility guidelines are:

- Use clear and consistent navigation menus
- Use alt tags to provide text explanations for graphics
- Use relative rather than absolute sizing for tables and fonts
- Provide for keyboard navigation through use of TABINDEX
- Avoid the use of tables for page layout
- If tables are used for page layout, they should degrade gracefully if the user agent (browser) cannot interpret tables
- Use text-only pages as a last resort
- Use structured HTML for text formatting, rather than outdated commands such as Bold and Italic
- Do not rely on color alone to communicate meaning.

- ❖ Use high contrast colors
- ❖ Test web pages using a number of different browsers and window sizes
- ❖ Validation and testing of web pages must include human review

Note that the guidelines do not prohibit the use of graphics and other visually interesting elements. In fact, by relying too heavily on plain blocks of text, a web page can be made less accessible to visual learners. For this reason, it is important to incorporate graphics and color onto the web page.

Conclusion

By carefully applying instructional design and web design techniques, accessible training courses can be created that benefit all students. A side effect of designing for accessibility is that simple, straightforward software is used, which reduces the cost and eases the process of developing and maintaining the course.

Biographical Sketches

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An In-Depth Look at Strategies for Mentoring Online Adult Learners

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This paper presents results of a qualitative analysis of mentor support for distant adult learners in a web-based learning environment. It combines two sources of data: emails mentors sent to their students and mentors' reflections about mentoring students in a Master of Arts of Learning and Technology program at Western Governors University (WGU). By examining the data from these sources, we gained insights into our mentoring practices and hoped to find useful strategies for helping students progress in a timely and successful manner through our program.

Western Governors University implements a model that separates assessment from instruction, which means that its faculty, the mentors, do not directly deliver instruction. Students take online courses offered by other universities, known as Education Providers. The responsibilities of the WGU mentors are to provide academic guidance, advising, and tutoring to WGU students throughout their programs. Mentoring activities range from designing a preferred path, preparing students for assessments, reviewing portfolio projects, and serving as Chair for students' Capstone Committees. Mentoring is conducted via email, listserv, and telephone. The main communication channel between students and mentors is email.

The MLT program at WGU consists of five domains and 17 assessments. Students' progress is measured by the number of assessments they have passed. Therefore, it is important for a mentor to motivate students to take assessments after the students have completed the recommended learning opportunities. Our experience tells us that the first 4 to 6 months of a student's program are crucial for retention and eventual graduation. However, students enter our program on a monthly basis, while most of our online courses are semester-based. In addition, students begin with different skill levels, necessitating individualized learning. Thus, we were particularly interested in finding out what activities our most rapidly progressing students were engaged in during the first few months of their programs. Emails provided the best window through which we could view those activities.

Mentoring students at a distance in a competency-based online environment is new and there are few models to rely on for support. Mentors employ their own strategies to help students progress. After more than two years' practice, each mentor has accumulated some thoughts and tips for mentoring adult learners at a distance. This reflective part of the paper will identify and share our best practices for helping future students progress. Results may be valuable for educators engaged in research on, or the practice of, mentoring in a distance-learning environment.

Methodology

Participants

There were two types of participants for this analysis: the three researchers/mentors as direct participants and 30 students as indirect participants. The students were included only because they were the email recipients and correspondents of the participating mentors. Each mentor's students were ranked by their speed of progress based on the number of assessments completed and number of months a student had been in the program. The top ten from each group were selected. Two students were removed from the list due to the loss of their first six months' emails. Therefore, only emails sent to 28 students were selected for analysis.

Collection of Data

1. Each of the researchers/mentors collected her/his own emails from Microsoft Outlook Sent Box. Five to six months of emails sent at the beginning of each student's program were chosen for analysis.
2. The researchers wrote separate reflections about their mentoring practices in response to four guiding questions (see Results section below).

Data Analysis

Through a rough check of emails sent to students, a tentative set of categories was developed. The set was further discussed and revised. The initial set of 26 categories was detailed and specific for easy coding and control of reliability. The categories were entered in a spreadsheet for coding. During the coding process, categories were added or deleted as necessary. The initial categories were grouped into 14 major categories in the analysis process. The final set of categories was summarized in Figure 1 below.

The reflections of the researchers/mentors were synthesized and summarized in the Results section, below.

Results

The three coding sheets were merged and summarized in Figure 1.

As Figure 1 shows, mentors sent more emails that were related to assessments and portfolio projects. It seems that early in their programs, these students were already engaged in these activities. Our initial set of categories shows that mentors were either announcing assessment results, providing feedback on portfolio activities, scheduling for competency review, or answering questions regarding assessments or portfolio activities.

The next largest group of emails fell into the categories of resources, encouragement, and phone calls. *Resources* here means mentors were sending students various resources for their domain assessments or domain projects. *Phone calls* here means scheduling phone calls. Mentors always review competencies with students on the phone when they are ready for a domain assessment and scheduling of those phone calls is usually via email. Thus, these categories further point to the fact that the selected students had dived right into the core activities of the Master's program early in their WGU studies.

The comparatively large volume of encouraging emails from mentors indicates that encouragement or praise was a good motivator, as discussed in the following Mentoring Strategies section.

Although it is too early to draw any conclusions from this preliminary email analysis, results seem to suggest that it might make a difference if a mentor encourages students to attempt at least one assessment early in their program. The experience of taking an assessment could reduce testing anxiety and/or increase self-esteem and confidence.

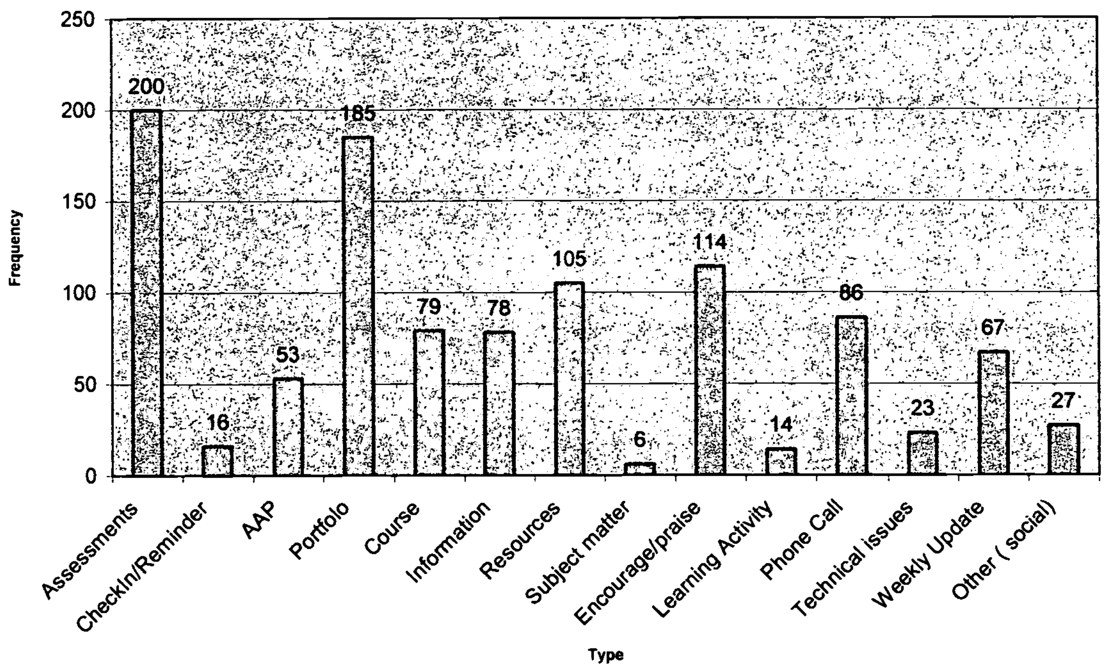

Figure 1. Emails sent to students

Mentoring Strategies

The researchers'/mentors' reflections reveal similarities and differences in mentoring practice. Results are summarized based on four guiding questions, included below.

1. *What challenges have we faced in moving our adult learners through a competency-based, online learning model?*

The first challenge was to help students see the importance of structuring their learning time and setting aside a specific number of hours per week for their studies. An additional challenge was helping students realize their own ability to pass our domain assessments or helping them cope with failure in an assessment.

Another challenge was to help students, who entered the program with inadequate writing and/or technology skills. Unlike traditional universities, WGU hires outside graders to score students' portfolio projects using rubrics for consistent quality control. As a result, the writing requirement is rigorous and daunting, causing some students to tend to procrastinate rather than to revise their portfolio projects and move forward. Occasionally, we find students who desire to learn how to integrate technology into their teaching curriculum, but who come with limited technology skills and understanding. These students may become very frustrated when they encounter technical difficulties in their first online courses. As a result, their frustration easily builds and their progress wanes.

2. *How do we motivate students to progress in this web-based and non-traditional learning environment?*

Students enjoy the freedom of the "any time and any place" feature of online classes, but they tend to get frustrated without face-to-face interaction, as well as examples and models to rely on. They feel online learning is similar to independent study and much harder than learning in a traditional classroom. Mentors try to build strong rapport via email and phone calls with their students so that learning in online courses is less lonely and intimidating, or frustrating. While providing the necessary academic support, mentors also try to psychologically prepare students at the very beginning of their program for failures in assessments or portfolio activities by emphasizing the fact that a competency-based model of learning naturally entails multiple attempts at assessments to reach the competencies. Students soon learn that they can turn to their mentors at any time for academic and emotional support, and for solving problems, thus giving them the courage to progress (Brookfield, 1986).

3. *What strategies do we use to help new students have a good start in the competency-based program?*

Mentors have learned from experience that a good understanding of the program ensures student success. Before a student starts her/his program, a mentor makes a detailed analysis of the student's background knowledge, expectations of the program, and future career interests. Based on the information obtained from the skill survey and the pre-assessment that a new student takes as required items for admission, the mentor gains a good understanding of a student before the first extended phone interview with her/him for structuring the Academic Action Plan. During this phone interview, mentors use the strategy of an advance organizer (Ausubel, 1968) to give the student a good overview of the program, detailing how each domain project can be integrated into the final capstone. Most important of all, the mentor tries to relate the program projects to the student's career interest, and help the student identify some instructional and learning needs in the student's environment as topics on which to build the capstone. This initial discussion of the final project and the possible relation of the capstone to their work environment is so crucial that students immediately see the meaning and the benefit of pursuing the program. This discussion also coincides with many students' expectation that they will be able to work on a project in a competency-based program to solve practical problems using a variety of technologies.

4. *What strategies do we use to keep them progressing smoothly in the program?*

In a distance-learning environment, we found that students really need immediate feedback to motivate them to progress. We tried to provide feedback within 24 hours or at least 48 hours. Praising students is also a great motivator; some students really need that encouragement according to the Learning Orientation Model (discussed below) and androgogical principles (Islam, 2002), which advocate placing learners in situations that promote their positive self esteem and show respect for the individual learner.

Understanding students' learning orientations has made mentoring more effective. According to the Learning Orientation Questionnaire (The Training Place, 2001), learners range through a continuum of transforming, performing, or conforming learners to resistant learners at the far end of the scale. An important role of a WGU mentor is to adjust her/his level of guidance and support to accommodate different learning orientations. We noticed that learners could move in and out of one orientation in response to negative or positive responses, conditions, results, and experiences (The Training Place, 2001). Thus, we tried to create a conducive environment for students at the very beginning of their program in an attempt to help them move more toward the performing or transforming end of the continuum of learning orientations to take more control of their learning.

We also tried to build strong relations with students through flexible availability for phone appointments and demonstrations of caring. A strategy adopted by an individual mentor is to require weekly reports from students in an attempt to make students set their own goals and deadlines. This strategy, which is used in addition to a monthly phone call, has proven effective by the mentor.

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Campus Outreach Efforts:
Moving Beyond Lecture Notes to "Interactive" Online Instruction

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Introduction and Campus Outreach Efforts

Standards, standards and more standards combined with a rapidly changing technological age have provided faculty with new, exciting, and often challenging obstacles to overcome. A $1.5 million dollar U.S. Department of Education, Preparing Tomorrow's Teachers to Use Technology (PT3) grant has provided Southwest Missouri State University (SMSU) faculty with state-of-the-art technology, release time, outside consultants, a full-time in-house consultant, opportunities to work with the St. Louis Science Center, and technology-savvy partners at three technology-rich K-12 public school districts in the State of Missouri. One of the objectives of the grant was not only to provide faculty with state-of-the-art technology that they did not have before but also to change the fact that new teacher graduates at SMSU were not incorporating best-practice uses of technology into their own K-12 teaching strategies due to a lack of "modeling" by faculty. At SMSU, the PT3 grant gives faculty members money to spend on technology of their choice that they will use in their own classroom. To further support the efforts the University has put in place: a Vice President for Information Services, a high speed data backbone with a domain structure; a fiber-based video backbone for Interactive Television; a bridge connecting the two networks; 30 separate servers for various academic needs; a campus-wide email system; an extensive web-based information system; a faculty development computer laboratory; a cadre of computer user support specialists; on-going software training courses for faculty; an instructional designer; a media distribution system in a newly constructed $26 million dollar Library Information-Annex; three campus-wide microcomputer labs and technology-based workshops for faculty/staff. Faculty now are modeling the use of their choice of technology in the classroom and many of them are now using the available online course management system. At SMSU, the course management system, Blackboard CourseInfo. is used on campus either to deliver a course or it is used as a web-supported system. Regardless, this in itself has brought about new problems. The biggest problem is that faculty are using the course management system to merely upload their daily "text-based" lecture notes, students are downloading them and/or printing them and reading the documents. Faculty members and students were/are missing out on the unique characteristics of the web that should be used. As part of the PT3 grant, there is currently an ongoing campus-wide outreach effort via web-based training modules and face-to-face with faculty using blended technologies to try and get faculty to move beyond posting lecture notes to creating interactive online instruction. In an effort to model for faculty how they can utilize the web, the following section will identify the unique characteristics that make teaching via the web different from teaching a face-to-face course.

Unique Characteristics That Make Teaching Via the Web Different From Teaching in a Face-to-Face Course

The Internet and World Wide Web (WWW) are often used interchangeably though quite different. From the very beginning, as a government experiment the Internet was and has provided strong transparent connections between military and research institutions. Today, the Internet links computers together everywhere in the world. The WWW however is not the same. The WWW is accessed through browsers such as Netscape and Internet Explorer. The web uses "hypertext" as a way of interacting with users. Hypertext, can be read, searched, edited and even stored. Its unique features allow connections to be made within the body of the text to other documents, graphics, photos, video clips, audio clips, etc. In

Perelman's (1992) book entitled, *School's Out: Hyperlearning, the New Technology and the End of Education*, Perelman talks about hyperlearning which will allow students to learn through multisensory delivery modes at any time and any location around the world. While the WWW is still limited in its capabilities due to limited search engines, technological standardization, infrastructure, and accessibility faculty members at SMSU have been trained how to utilized blended technologies that incorporate multimedia into their projects that get at the unique characteristics that the WWW provides. As the Internet and the WWW evolves Perelman's vision may not be too far from becoming reality. At SMSU, faculty members across campus have had to confront the unique characteristics that make teaching via the web different than teaching face-to-face. Although each faculty member chose to purchase their own specific technology with PT3 grant money to help them meet their students needs, the following unique characteristics were found necessary to address by those using the WWW that were different from teaching in a face-to-face course. These include acknowledging and addressing:

4 X 3 Aspect Ratio

The computer has an aspect ratio, like that of instructional television. The aspect ratio is the vertical and horizontal ratio of a graphic in any presentation format. In essence, this is how the computer views information, people, graphics, and objects. Consequently, many faculty believed that they could take their overhead transparencies and scan them into the computer and then upload them into Blackboard CourseInfo. so that students would have access to them and could either read and/or download them when they wanted to. Understanding what the aspect ratio is and how it affects course material was important to faculty when they realized that in scanning their material and viewing it on a computer, they had cropped off the top and bottom portion of their material and it couldn't be seen without scrolling up and down. Also, they noticed that they had not used up the complete width of the computer screen that was available, whereby making concepts and ideas less clear when scanned in in the inappropriate format.

Graphic Design Elements for the WWW

There are special graphic design elements that must be considered when creating and placing course material on the WWW for students to access and/or link to. For example, most faculty at SMSU use the Microsoft Office Suite software. PowerPoint is a favorite among faculty. PowerPoint, or even other similar software that is used to create course material for the WWW, cannot do everything for you so that your "slides" portray the use of good graphic design principles. Therefore, many faculty were taught some basic graphic design principles. For example, it is important that on any slide, your slide should contain words that are balanced and any graphic representation of the words on the computer screen should be balanced. In doing so, good graphic design elements also dictate that a lot of white space be left around the graphic and text should not be placed too close to the graphic so it is easier to read. Also, the total number of words on any "slide" should not exceed 20-25 words. Fewer words are preferable. Prompts and cues should be used by <u>underlining</u>, using *italics*, **bold**, color or all CAPITAL LETTERS. However, do not use too many of these at one time or confusion will be created rather than clarity and emphasis. Color is good to use, but limit color should be limited to 2-3 per page. Color should also be checked to make sure that the color rendition is good on various computers. Likewise, limit the number of font styles to three per page to avoid further confusion. Text must be checked for legibility. A good rule of thumb is to use at least a 24 point sans serif font. If possible, all text should be flush left, in upper and lower case letters for easier reading (Cyrs, Conway, 1997).

Visualization

Visualization is the ability to take abstract concepts and ideas and turn them into concrete representations using graphics, pictures, and video clips. Visualization is particularly important because "Well-conceived and rendered visuals help your audience understand and retain information" (Wileman, 1993, p.3). Many faculty in the traditional classroom use overhead transparencies with primarily small-textbook like print; and/or write on the chalk and/or white board using primarily text. Some faculty use the document camera and data projector to project their overhead transparencies directly or print out a copy of their overhead transparency onto copy paper and then use the document camera and data projector simultaneously to project onto the screen. In working with faculty and pointing out the benefits of capitalizing upon the WWW's visual ability (though if overused, download time away from campus T1 lines becomes much slower) most faculty at SMSU began incorporating more graphics, video clips, digital photographs, word pictures, and so forth, into their courses. In addition many faculty required their students' to create visual multimedia presentations, although time consuming. Many faculty used software programs such as Inspiration, Mathematica, Powerpoint, Excel, etc. to create their visuals and then uploaded them into Blackboard, CourseInfo. These visuals were created to represent concrete facts, directions, processes, bits of data, comparative data, data recorded over time, organizational structures, places, chronologies, generalizations, theories, and feelings or attitudes. Although no specific quantative data was collected, most faculty expressed that they did feel that the visuals helped theirs students in learning, thinking and solving problems.

Unlimited Access to Information Anytime/Anywhere

Another unique characteristic of the WWW is the ability to create course material and post it online for students to access anytime and anywhere. In creating online course material, SMSU faculty, like Driscoll (1997) have found that there are two broad categories of online based teaching. The first type includes text only material that may include such things as email, software downloading, and utilizing bulletin boards. Email traditionally allows students to send and receive messages and send and return messages. Software downloading has traditionally meant that students could receive attachments of information and it could be downloaded to their own computer for reading/printing. The second type of online-based teaching utilizes multimedia. Faculty members at SMSU were trained, by modeling, what a self-directed, self-paced learning environment on the web was. For example, in one particular online module, faculty were trained on how to use Blackboard by using multimedia to communicate the content to them. Interactions with the training material were conducted by the trainer and controlled as the faculty member advanced through the training module utilizing the anytime/anywhere concept. Further one-on-one explorations explained how instruction and learning could take place at anytime and anyplace, given that the students had proper access to equipment. As will be shown in the actual presentation during the conference, several faculty are still in the process of redesigning and uploading their course material into this type of virtual classroom to blend hypermedia, hypertext documents, on-line quizzes, modules of multimedia material, email, virtual classroom, discussion board, and group projects via Blackboard CourseInfo. In doing so, the primary role of the instructor shifted to guiding students to resources, assessing learning outcomes and providing constant feedback. Many of the faculty have chosen specific strategies that create an "interactive" learning environment for their students, even at a distance. Some of these include: brainstorming sessions, case studies, character dialogue, threaded discussion, demonstration, scavenger hunts, webquests, virtual field trips, group projects, interviews, learning dyads, interactive lecturettes, modeling, online office hours, questioning wrap-up, reaction panels, role playing, scenarios, and surveying. At SMSU, not all faculty are working within the second type of online-based teaching. In fact, there are several faculty who are still only comfortable with the first type of online based teaching as aforementioned. Likewise, there are several who are in the transition from moving from the first type to the second, as well as many combinations along the continuum.

Conclusion

Regardless, of where one fits on the continuum, many individuals believe that the WWW has the greatest potential for the future that provides educators with a way to organize and present instruction synchronously as well as asynchronously. The WWW is capable of providing educators and students with print, video, audio, graphics, digital photographs, and data in a variety of formats with immediate access to information from sources all over the world. Regardless of the course management system that you are using (Blackboard, Web Course-In-A-Box, etc.) teaching on the WWW requires educators to redesign their courses with some adjustments made in how they prepare and present their course material, teaching pedagogy, and, considering course planning and preparation time; faculty and student hardware and software needs; security issues; costs; and student control.

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Helping Faculty Develop Online Courses at a Distance

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Introduction

Founded in St. Louis, Missouri in 1915, Webster University is a private, multi-campus, international institution offering undergraduate and graduate degrees in the liberal arts, communications, fine arts, education and business and technology. Today, Webster has grown to 100 campuses in the United States, Europe and Asia. Webster's online initiatives started in 1998 with launch of the Online MBA. Three other online programs followed: Master of Arts in Teaching (MAT) (1999), Web Development Certificate (1999), and MS in Business and Organizational Security Management (SECR) (2002). The Academic Distance Learning Center (ADLC) was established in 2001 with a mission to create a quality distance learning experience for Webster University students and faculty by providing leadership, direction, and a range of support services for distance learning initiatives. The Center provides support in five major areas: program development, course development, WebCT administration, student support, and over all leadership and expertise in distance learning. The Distance Learning Center employs a comprehensive support team, including an instructional designer, course developer, course trainer, administrative coordinator, and student assistants.

In the area of course development, the Center's staff assist individual faculty (both full-time and adjunct) in the development and delivery of online courses by offering training, instructional design, course construction, and ongoing technical support. Because of Webster's unique structure, online faculty are located all across the U.S. and working with them collaboratively presents an ongoing challenge to the ADLC staff. The ADLC staff have developed a successful process for working with faculty regardless of their location, using the Internet, email, phone, print materials, and more to bridge the geographic distance without compromising quality. Three general strategies are used to accomplish this goal:

1. *Division of Labor*: The ADLC's instructional designer, course trainer, and course developer divide and share responsibilities in order to meet the individual needs of faculty.
2. *The Course Development Process:* Starting with a comprehensive needs assessment, the ADLC staff guide Webster's online faculty through a step-by-step development process. A unique timeline and training process is customized to match each faculty member's needs and style. In addition, specially developed work guides and online resources help the faculty through each step in the development process.
3. *Maintaining Contact:* The ADLC staff initiating and maintaining frequent communication with faculty to help them stay on track.

Meeting Challenges of Online Instructional Design

Assisting Webster University faculty with the development of quality online courses is complicated by two challenges. The first is to identify an instructional design process that will help faculty move easily from the traditional classroom to the online environment in a timely manner. The second is to work collaboratively with faculty who are located all over the country. From our needs assessment forms (which are filled out by new online instructors), we have identified the following challenges that faculty face when designing an online course: 1) lack of knowledge on how to transition from a traditional course design to an online course design; 2) lack of technical competence and/or experience in using online course management tools (WebCT); and 3) limited time available for designing an online course.

To find an instructional design model that would be appropriate for online courses, we looked at several established instructional design models, specifically the ADDIE model and Dick's ISD model (Figure 1). Both of these models are traditional and systematic models for designing classroom instruction and they can be used for designing online courses. However, we have found that they do not specifically meet our needs. First, these models are time-consuming. In addition, both models do not address the specific need of converting traditional classroom instruction into online instruction.

<u>**ADDIE Model**</u> (Richey & Seels, 1994)	<u>**Dick's Instructional System Design Model**</u>
The ADDIE model represents five stages of course design: 1. Analysis - identify the instructional problems, assess needs of learners, and identify topics of instruction. 2. Design - write course objectives, select instructional strategies, and identify assessment methods. 3. Develop – select course materials and develop instructional materials. 4. Implement - deliver instruction. 5. Evaluate – conduct formative and summative evaluation of the instruction.	Dick's model (Dick, Carey, & Carey, 2001) is a linear model. It encourages a step-by-step process in which instructors are expected to finish processes in prescribed sequence. The output of one step becomes the input for next. This system design model consists of ten steps: 1. Assess need to identify goals. 2. Conduct instructional analysis. 3. Analyze learners and contexts. 4. Write performance objectives. 5. Develop assessment instruments. 6. Develop instructional strategy. 7. Develop and select instructional materials. 8. Design and conduct formative evaluation of instruction. 9. Revise instruction. 10. Design and conduct summative evaluation.

Figure 1: Two Established Instructional Design Models

The second challenge faced by the ADLC team is the location and availability of our online faculty. Because of the Webster's multi-campus structure, faculty teaching in the online programs are located all over the U.S. In addition, many of the online instructors are adjunct instructors. They have full-time jobs that often preclude them from working on course development during regular business hours, and are most likely teaching traditional evening courses at one of the University's remote sites. This means that while they frequently need intensive support, faculty are rarely available to meet with our staff face-to-face.

The ADLC Design and Development Model

To meet these challenges, the ADLC team has developed a process that starts with a needs assessment, takes the faculty through a step-by-step design process, and then supports the faculty on an ongoing basis to ensure success in the online classroom.

General Approach

The course development process begins with a needs assessment form that is filled out by new online instructors. This document is reviewed by the entire ADLC team and helps them assess the level of assistance the faculty may need and what particular challenges he or she might have. After the needs assessment, the instructional designer develops a suggested timeline in which the course will be developed, including target dates for each of the seven steps in the development process. At the same time, the course developer creates a new WebCT course shell based on the program template.

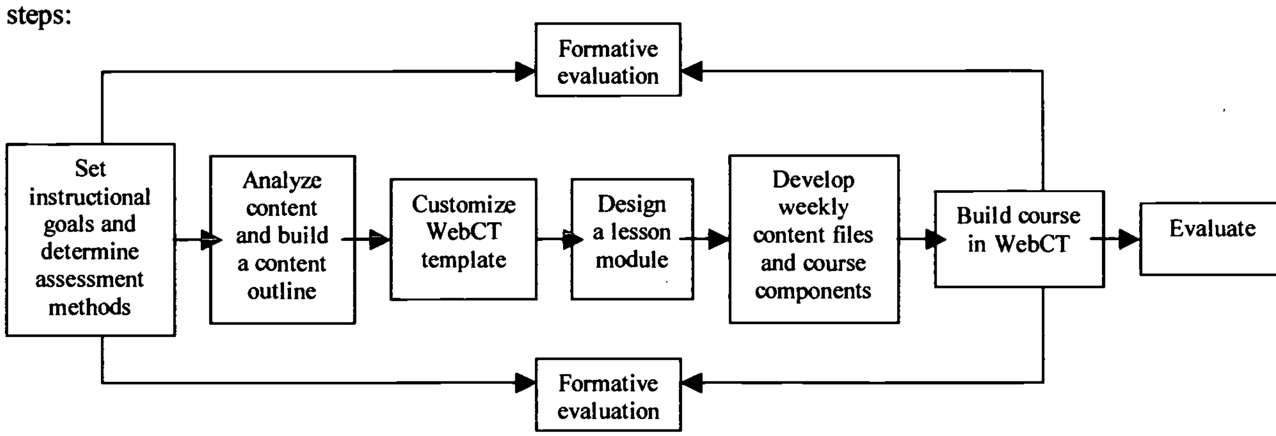
At this stage, several training options are considered as well. On several occasions, groups of faculty have been brought to St. Louis, usually for 1-1½ days on a weekend, for intensive technical training. The structure of the training may change depending on the specific program. On one occasion, the course trainer traveled to a remote site to train a group of instructors at that location. Instructors are also provided with a variety of training materials and a WebCT Handbook. The course trainer is also available to work with faculty one-on-one in person or via phone/email, at any time during and after the course design process. Depending on timing and instructor availability, instructors may be at varying stages in the course development process when they attend training. The course design model, though, is designed in such as way that lack of technical knowledge in how to use WebCT will not stop faculty from starting the design process.

Once the faculty member agrees to the dates and deadlines proposed in the course development timeline, the development process begins. At the start of each new step, the instructional designer emails detailed instructions and examples to the instructor and then maintains weekly (sometime more often) communication with them to offer assistance and encouragement. In addition to documents for each one of the steps, the instructional designer also provides written guidelines for developing content files (HTML pages), managing an asynchronous discussion, and more.

The entire process is designed to be completed in a 15-week time frame that includes the initial needs assessments and final course sign-off. By providing a specific time frame for each step, as well as the design and development process as a whole, we help faculty manage their time and complete the course in a timely manner.

The Design and Development Model

To meet our needs, we have developed a new instructional design model that takes advantage of the ADDIE model and Dick's ISD model, and adapt them to the online learning environment. Our model is a step-by-step process that leads instructors though the design process. This strategy allows for rapid development of online courses and easy project management. The ADLC model also encourages instructors to integrate WebCT tools into their course design in an effective way. The strategy involves 7 steps:



Generally, instructors are encouraged to go through these steps in sequence. For example, they should finish step 4 (Design a lesson module) before they begin Step 5 (Develop weekly content files). However, the strategy is open for instructors to reflectively design their courses. They can always go back and forth between the steps to refine their course design.

Step 1 – Set instructional goals and select assessment methods. In this first step, instructors work with the instructional designer to write a syllabus or adapt their existing traditional course syllabus to the online learning environment. Course objectives, student expectations, course requirements, entry competency, course assessments, and grading information are discussed and reviewed. A page to introduce the instructor to the class is written in this step and a "getting started" activity is designed as the first class assignment to help students get acquainted with each other. In Step 1, faculty are also introduced to our Page Design Guidelines to help them create HTML documents appropriate for WebCT.

Step 2 – Analyze content and build a course content outline. In this step, instructors analyze their course content and generate a detailed outline. The content outline should be aligned with the course objectives identified in Step 1. Instructors work with instructional designer to lay out an instructional plan for the course, including the scope and sequence of course content, instructional activities, and learning assessments. Student learning styles and motivation issues are taken into account as well. This plan may be refined when instructors are designing weekly content later in Step 5. Upon the completion of this step, instructors create a word document that records the content outline and email it to instructional designer.

Step 3 - Customize WebCT template. Each of Webster's online programs has its own WebCT template to ensure that all courses in the program have a similar "look and feel." Step 3 allows instructors to customize the program template further to meet their specific teaching style and content needs. The instructional designer works with instructors to identify and integrate the appropriate WebCT tools (e.g. chat room, discussions, quizzes, and glossary, etc) into the course design. The course developer makes the actual changes in WebCT. Step 3 also helps instructors conceptualize and visualize how the content will be delivered and how the instructional activities will be organized and implemented in WebCT.

Step 4 - Develop a lesson module. In this step, instructors generate a lesson module for week 1. The module may differ by content and discipline, but usually includes lecture note pages, discussion activities, and assignment components. It may also include other components such as PowerPoint presentations. Instructors send these materials to the instructional designer for review. The instructional designer and course developer then work together to take these materials, upload them to WebCT, and make a prototype lesson module. Instructors can review the lesson module at any time and changes are made as needed. When all parties agree on the design and structure of the first lesson module, it becomes an example for the rest of course.

Step 5 - Develop weekly content files and course components. Next, instructors are ready to develop all the remaining content files and course components. At this point, instructors can usually work independently to develop files for each week, following the content outline developed in Step 2 and the lesson module developed in Step 4. In Step 5, the instructional designer may be involved if instructors need assistance in designing or revising instructional activities. The course developer may also be involved to assist in converting files to HTML format or developing PowerPoint presentations. Once instructors finish the files for one week, they send them to the course developer to be loaded into WebCT.

Step 6 - Build course on WebCT. In this step, the course developer uploads the instructors' files into WebCT and builds the course site following the example of first lesson module. Step 5 and Step 6 can be completed in parallel; going back and forth until all files are built into WebCT.

Step 7 – Test and evaluate the course site. Once the course is built, the ADLC staff review the course to ensure that all links are working and all contend is in place. Course instructors receive a checkout list to help them with the final review of the course. Instructors go through all items on the list to make their courses are ready for the semester. At the end of the first semester teaching, the instructional designer will do a follow-up to get feedback from instructors about their experience teaching the course.

Using the ADLC Model: Success and Lessons Learned

Success

Our strategy has been applied successfully so far. Since Fall 2002, we have used this strategy to develop 1 Online MBA and 5 Online Security Management courses. We are currently in the process of developing 4 additional Online SECR courses and 1 Online MAT course. Of the courses already developed or currently in development, all but two of the instructors live outside the St. Louis metropolitan area, including Maryland, New Mexico, North Carolina, Virginia, and other parts of Missouri. All completed courses were built within the 15-week time frame and instructors are satisfied with their final product. In our follow-up email communication with instructors, they are doing well with their online courses. One instructor said that his online courses are "great" and his online teaching "successful."

Lessons Learned

From our experience, we have found that the entire ADLC team, especially the instructional designer and course developer, must work together and be flexible in order to assist instructors in designing their courses. Each instructor has different needs, teaching styles, technical abilities, and experience, and our team has to accommodate these individual needs. Not all faculty will follow the design model step by step. Some instructors, for example, continue to refine their design as they proceed, they may come back to Step 3 to add/remove a certain design when they are developing step 5.

In addition, we found that communication is crucial for the success of this strategy. The instructional designer takes on the responsibility for initiating and maintaining communication with the instructors throughout the process, and beyond. The designer and course developer also need to communicate with each other frequently while building an online course to coordinate their work effectively.

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Instructional Methods in Online High School Courses

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Abstract

This study presents a brief summarization of the history of online high schools as a context for investigating the kinds of instructional methods being used in online high school courses. The framework for the investigation is typology of instructional methods, which is used to compare the methods utilized by three online high school course providers. The results of the study are presented with comments about the findings and suggestions for future research.

Purpose of the Study

This study focuses on instructional methods[3] used in online high school courses. Instructional methods involve relationships between materials/resources, instructors, and learners. We can gain several insights from investigating the methods used in online high school courses:

- Insights about commonly chosen instructional methods.
- Insights about the kinds of higher order thinking skills that are encouraged.
- Insights into the degree to which the strengths of computer technologies are being used to strengthen and support instructional methods.

Methodology

A convenience sample of courses was chosen from three institutions[4] which provide online high school courses (Table 1). Our intent was to observe the types of instructional methods in each of the courses.
Course Providers and Courses Reviewed

[3] Instructional methods are defined as "ways of helping someone to learn" (Reigeluth, 2001). In order to have a standard for comparing online methods we chose a typology of instructional methods developed by Dr. Michael Molenda at Indiana University (2001). The categories in this typology are based primarily on the essential communication pattern entailed in each particular method; that is, the relationships between Teacher (or teaching system), Learner, and Resources.

[4] Apexlearning.com is a for-profit company, which fills the advanced placement (AP) niche of the online high school market. Class.com is a for-profit company that is based in Lincoln, Nebraska enrolling students in all 50 states and serving the international market. Cyberschool courses, unlike those from Class and Apex, are publicly accessible

Table 1.

Apex	Class	Cyberschool
• Literature and Composition • Physics • Statistics • U.S. History • U.S. Government and Politics	• Algebra I • Civics • U.S. History • World Literature	• American History • Classic Literature in the Western World • Economics • General Biology • Statistics

Prior to examining the online courses, a one-hour time limit was established for viewing each course. Both researchers reviewed one of the courses in an effort to establish uniformity in the reviewing process. Each researcher used a data collection instrument to record instances of instructional methods in each course. We were most interested in the variety of methods employed rather than the frequency of their use.

Results

Apex

Apex courses have a consistent pattern in terms of instructional methods (Table 2). The courses have a standard look and feel. The syllabus page consists of hyperlinks to course content, assignments, and activities. The syllabus hyperlinks have titles reflecting the instructional methods employed in each section of the lesson. These instructional methods do not necessarily fit the categories outlined in the typology. For example, the tutorial sections of the Apex lessons fit the description of presentation in Molenda's typology. The purpose of these courses is to prepare students for the Advanced Placement test. The true success of students in these courses is measured by a standardized assessment, the Advanced Placement exam.

Table 2.
Observation of Instructional Methods in Courses.

Instructional Methods	Apex 5 courses	Class 4 courses	Cyberschool 5 courses	Total
Presentation	5	4	5	14
Tutorial	0	0	1	1
Drill	5	2	1	8
Reading	5	4	5	14
Reflection	1	2	4	7
Discussion	5	3	2	10
Game	0	0	1	1
Laboratory	1	0	3	4

Class.com

Unlike Apex, Class courses (Table 2) do not follow a template and so do not have a standard look and feel. The most employed instructional methods in Class courses, according to Molenda's typology, are presentation, reading, and discussion. The presentation of content includes many multimedia items.

Cyberschool Courses

Cyberschool courses (Table 2) vary in their look and feel, as do the assignments and the instructional methods employed. Despite a lack of stylistic conformity, Cyberschool courses employed the most varied instructional methods among all of the courses we reviewed. Laboratory work included simulations, an outside activity, and collaborative partner work. All methods from the typology were observed in Cyberschool courses.

Discussion and Interpretation of Results

Without making any generalizations, we would like to point out a few observations and offer a few reflections based on our examination of the methods used in online high school courses.

- ❖ Presentation plays a key role in almost all courses observed. Teacher centered instruction continues to dominate in the online classroom.
- ❖ Reading enjoys a prominent position in the online course. Copies of readings are available on line. Textbooks continue to be employed. Hyperlinks provide primary and augmenting content for online courses.
- ❖ Few courses capitalized on the strengths of the computer to connect individuals synchronously and asynchronously. Only one organization offered courses with collaborative work on assignments.
- ❖ Few courses implemented reflection, games, or laboratories as instructional methods.
- ❖ Few courses used the drill or tutorial methods as defined by the typology.

What are the reasons for the observations above? Any answer would be incomplete but here are our reflections:

- ❖ Instructional methods are not always chosen for their pedagogical appropriateness. Ideally instructional methods should be thoughtfully matched to objectives and desired learning outcomes, this is not always the case. The high cost of developing online courses, the convenience of transforming the face-to-face materials to online materials, and the high cost of supporting the delivery of online courses can be contributors to poor matches between optimal instructional methods and the course objectives.
- ❖ Some instructional methods are easier to use than others. Presentations are comparatively easy to prepare, implement, and administer in comparison to laboratories. While laboratories may be well matched to instructional content and desired learning outcomes, they may not be leveraged because of the extra work that they entail.

- ❖ Exploiting the strengths of the computer medium is a skill that many educators and course designers have not mastered. Educators have largely designed for print-based media in the past. The strengths of the computer media such as, response tracking, instant feedback, calculating, sorting, and archiving are still being discovered and applied gradually. Mapping the strengths of the traditional classroom and print-based venues onto an online course invites less than satisfactory results.

- ❖ There is no surprise that presentation and reading were prominent features of all online courses that we reviewed. These instructional methods have been used throughout the history of instruction and continue to be appropriate methods in the online delivery medium considering their text-based orientation. The methods that are little used such as games and laboratories deserve a closer look because of their capabilities to support learners in active meaning making.

Conclusions and Suggestions

Moore (1994) says that successful secondary teachers employ a variety of instructional methods. This indicates that successful course design would utilize a variety of instructional methods. The results of our study point toward a need for a greater variety of methods to be implemented in online courses. Online courses can be improved by using a variety of appropriate instructional methods to address learning needs, content, and desired outcomes in varied learning situations.

According to Merrill's First Principles of Instruction (2001), good instruction starts with a problem and includes activation, demonstration, application and integration. Merrill hypothesizes that failure to model the First Principles will result in less effective instruction. The high school courses, which we reviewed, did not reflect problem solving as the central focus of the course design as is evident by the few instances of the laboratory method in our data.

Further research about online high school courses could pursue a number of paths. Investigation of a broader range of courses from a greater variety of companies could yield a more complete picture of instructional methods being employed. Comparisons of student achievement across courses employing a variety of instructional methods could provide insight into the methods most effective. Probes into successful implementation of laboratories, games, discussion, and reflection could provide guidelines for course developers desiring to leverage these high-powered methods in their courses.

The anytime/anywhere promise of online courses brings an important consideration to course design. More people are going to be exposed to a single course design than before. It is very important that these widely distributed designs are of high quality. This quality can be measured in part by the match of instructional objectives and content to the instructional methods used, and the degree to which the strengths of the medium are exploited to accomplish tasks and to support learning in ways not possible without the computer.

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Demonstrating the Scholarship of Teaching Online Using MERLOT

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In recent years the increased attention is being given to teaching activities as part of the promotion and tenure guidelines even at the Doctoral/Research Universities—Extensive Universities (formerly Carnegie Research I category). Our own university is in the midst of rewriting its policies to make teaching activities even more inclusive in the promotion process. My personal experiences are as Faculty Senate President and former chair of the Chemistry Department as well as a member of the MERLOT Co-Leaders team.

However, there is a also a very sizeable group of faculty who express concerns that the new emphasis on teaching is, in some way, diluting the role of research and allowing routine teaching to over counted. Those faculty members have a legitimate concern and one way to prevent the misapplication of the new guidelines is by better-defined criteria for excellence in teaching.

Ernest Boyer and others have argued that to really advance the status of teaching requires us to develop a scholarship of teaching. There is now an extensive Carnegie Academy for the Scholarship of Teaching and Learning, CASTL (http://carnegiefoundation.org/CASTL/index.htm) as well as many other groups such as those at the American Association for Higher Education and the Center for New Designs in Learning and Scholarship, CNDLS, at Georgetown (http://candles.georgetown.edu/index.htm). In order to develop instruction as scholarship we need to apply review criteria to teaching activities of similar exactness to those we use in evaluating our research activities. One reason of the many reasons teaching has been so underemphasized is that quality of teaching is so hard to measure. Most of you have been involved in promotion and tenure decisions where the quality of teaching must be evaluated. At LSU we routinely, and have for about 20 years, include the results of student evaluations of teaching. Our experiences suggest that these have some use and do define the very best and the very worst but in their simplest application do not provide administrators or other faculty much guidance for judging the vast majority of our faculty. In fact, Charles Dziuban of the Center for Research Initiative in Teaching Effectiveness (RITE) at the University of Central Florida, in a very extensive study does find some validity in those ratings. They also found that the entire multiple-choice survey could be done with one question, all questions are strongly correlated; at least that is how the students use them (http://pegasus.cc.ucf.edu/~rite/index.html). Many schools are now using a multitude of measures to try to get a better picture of a person's teaching accomplishments but still that is largely based on their classroom behaviors as measured against local standards.

When we judge a person's research, which most groups tend to say is easier than judging teaching, what we do is something rather different. Sure we judge how that person presents seminars and interacts with her/his peers but the real value of a person is what new discoveries that person has made and how that person has promoted or published that work. In research, if a person does not *publish* the work it is useless to society and we do not reward that faculty member. Furthermore, that research will not be published unless it meets the *standards* of the profession as *judged by his/her peers*.

To judge the quality of instructional materials scholarship, especially when those materials are used in online instruction, we need to be able to judge the scholarship of the teaching as well as we now demonstrate the research activities of our faculty for promotion and tenure decisions. To do this we need a new set of tools and some collectively agreed upon standards of quality. We now consider one aspect of this problem, namely standards and a mechanism for evaluating the quality of online materials.

One aspect that is often downplayed is the amount of work necessary to develop quality materials. That time represents a major commitment of the part of the faculty to the profession and as such needs to be shared extensively. Also since the development requires so much work, one needs to share the workload and make the results public, much as we do routinely with research results. But there are real problems in just sharing one's work. Granted there are some discipline specific databases and web sites as well as some commercial sites that are appropriate for certain disciplines and in some cases, even well advertised, but in most cases the faculty member's work is sought out by word of mouth or a lucky hit from a search engine. Too often the only choice is for the author to give out his material with little recognition in return. In addition while most faculty want their courses to be individualized by being able to pick and choose what items to include, commercial sites, at least most of those currently available, want the user to buy all of the content or none—and at a price.

According to Shulman (1998), "A scholarship of teaching will entail a public account of some or all of the full act of teaching—vision, design, enactment, outcomes, and analysis-in a manner susceptible to critical review by the teacher's professional peers and amenable to productive employment in future work by members of that same community." Notice the key words of public, review, analysis, and community.

One organization that has begun to deal with this issue in a comprehensive way is MERLOT (http://www.merlot.org). The MERLOT organization is a collection of 22 major educational organizations, many being state Boards of Higher Education, which provides a location for the faculty to display its work in instructional technology. It provides a faculty driven database of online educational applets for anyone to use freely (in all senses of the word). It is an attempt to increase the dissemination of learning objects for faculty across many disciplines, improving the instruction for all while developing a real community of online material producers and users, while at the same time recognizing the nature and proper authorship of the material. Thus MERLOT is a large collection of links to online learning objects in 14 disciplines (6894 items with 1422 user comments and 463 reviews as of June 7, 2002). However MERLOT is different from most collections. These items are reviewed and commented on by experts and users of the materials. The reviewers also use well-defined criteria. So what is not fully appreciated by many is that MERLOT is above all a process as much or more so than a searchable database of quality materials. It is that process that is most important to us in the present context.

Let us discuss this process at some length. MERLOT has to be understood at several levels, all of which relate to the scholarship of teaching. There are users, authors, members and nonmembers, reviewers and the editorial boards, all interacting communities. We start with a small educational applet URL submitted to site. It can be submitted by anyone: member, nonmember, or author. It is automatically indexed, the author is notified, and the item is made available to everyone via a very extensive search engine.

Three things happen next. First, users can begin using these applets by going to the author's web site. Those users are also invited to join the MERLOT community (it's free) and submit comments on the use of this item. Secondly, when the review committee (or two people specifically in the case of chemistry) has time they will first triage the item based on their quick review and initial guess as to quality and importance (ranking them from *review immediately* to *remove* on a five-point scale). Thirdly, the editorial board assigns or the reviewers individually decide what items to review. Those reviews are performed according to published standards agreed upon within the discipline and consistent with the MERLOT general criteria. It is very important that there be such discipline specific guidelines.

As an example, the chemistry discipline team drafted its criteria and review process after a very extensive period of discussion. There are three general categories of evaluation standards within MERLOT-Chemistry:

1. Quality of Content.
2. Effectiveness as a Teaching-Learning Tool.
3. Ease of Use.

These three categories are interdependent to some degree, but separate ratings are given for each. Specific evaluation criteria are applied within each category (see details at web site: http://taste.merlot.org/disciplines/eval_criteria/chemcriteria.html). Some criteria are applicable to several categories. While we will not cover all of the details here, it is important to note that the reviewers pay a lot of attention to the learning outcomes and good pedagogy in their reviews. We believe that it is the duty of our reviewers to make sure that the items are rated on their use and interactivity, and their learning potential even more than on the content and the ease of use. Most of those details are not published but form the basis of the two reviewers' final rating. The judgments of the reviewers, especially on effectiveness, are also different depending on the intended use of the materials as indicated by the author (e.g., Lecture/Demo, Tutorial, Homework, Lab - group or individual learning or other use).

The authors are fully informed that a review is underway and at the end of the review process they are notified, just as in the case of a peer reviewed article in any respected journal. There develops an ongoing dialog with the authors about the review. The authors can make further comments to the reviewers just as in the case of a journal article. The reviews are briefly summarized by a star system (5 stars is exceptionally good) but more important are the details in the written comments. Those reviews are posted for all to see. One of the many other advantages of our reviews is that they alert the user to any special issues involved in their use: maybe a plugin is needed, maybe it works only with certain browsers, maybe there some obvious improvements that could be made, etc. We also encourage the authors or any member user to add online learning assignments for each item so that others may see how these items are used in some detail. In some cases entire midterm exams or homework worksheets are available based on some item in the collection. It is a very *public* process.

At the end of the process, authors with items rated as high quality items have the option of having MERLOT inform their superiors of these reviews and in many cases these have played major roles in the promotion of faculty members. So MERLOT is not only of interest to the users (faculty and students) but to administrators who see the value of its reviews as illustrating the quality of the author's activities and thus his scholarship in educational activities. Since it is the collective view of many experts and users in the discipline, it has much more validity than other measures often used. These are also external to the university, which gives it national and even international validity.

So what is MERLOT accomplishing by its actions? First of all, it is making the instructional process more public. It is developing a community of instructors dedicated to the scholarship of teaching, especially those involving technological applications. It is generating a set of defensible discipline specific standards by which items are judged by one's peers. In short, it is trying to model the peer review process so familiar to us in evaluating research activities.

Now clearly, MERLOT or any similar database cannot judge the complete merits of any instructor nor even begin to address how well the learning process occurs in each classroom but it does judge the merits of one of the products of that educational activity.

We also suggest that the well-defined discipline specific peer review process by external experts used by MERLOT could also be adapted to one's own institution and to other collections. While the final reviews which MERLOT posts provide strong supporting evidence in tenure and promotion decisions and for various teaching awards, the process is even more important. It is hoped that institutions and individuals will join with MERLOT and adopt similar standards and processes that can be used in tenure and promotions considerations. Some have even suggested that MERLOT or another agency could provide teams that could review instructional materials for promotion considerations.

Have we made progress? I believe so. We are getting many testimonials from faculty members who use the MERLOT reviews in their P&T packages (see also "Ever So Slowly, Colleges Start to Count Work With Technology in Tenure Decisions," Feb 22, 2002, *Chronicle of Higher Education* article by Jay Young or the Chronicle chat session with Bruce Mason from MERLOT and others in a live colloquy recorded at http://chronicle.com/colloquylive/2002/02/tenure/). Many like the fact that their work is being shared and also that they can use the products of others and not spend time doing everything themselves, the "Lone Ranger" approach. The anonymous reviews by experts are highly rated in many packages. However, the bottom line is that ultimately a tenure decision is made by a group of faculty sitting in a small room. The administration tries to make sure those very private decisions conform to their university policies, which increasingly support the use of technology and newer teaching methods as well as good instructional designs as an integral part of faculty member's promotional requirements. In my own experience I can see this happening and the use of peer reviews for both research and instruction (and instructional materials) is quoted widely in promotion materials today. It was not just a short time ago. I believe MERLOT is on the right track and setting the standards for others to follow.

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Biographical Sketch

Neil R. Kestner is the Charles Barré Professor of Chemistry at Louisiana State University. He has been active in Internet instruction for over ten years, but more importantly has been a departmental chairman and currently is president of the Faculty Senate for a university now revising its promotion and tenure guidelines. As a MERLOT co-leader of the Chemistry discipline for two years, he has been involved in MERLOT policy decisions. In addition he has chaired the university's task forces on Distance Education, Research Computing as well as its Information Technology Master Plan.

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Instructional Strategies for Distance Education: Research Based Examples

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Friedman and Fisher's (1998) *Handbook on Effective Instructional Strategies: Evidence for Decision-Making* made 14 evidenced-based teaching generalizations, built on research in face-to-face settings. This paper looks at "how" these 14 instructional strategies are incorporated into distance learning environments by using benchmarks explored by Friedman and Fisher.

Instructional strategies are those tactics used by the instructor to promote learning. Friedman and Fisher's classroom based findings support the effectiveness of the identified instructional strategies in improving student learning. The 14 strategies are generalizable across "academic disciplines, types of students, and educational settings" (xvii).

Literature reviews (Abrami, 2001; King and Weber, 2001) demonstrated many instructional styles or strategies used in the online environment. However, few studies examine the micro level of instructional strategies as defined by Friedman and Fisher and fewer still that compare their effectiveness when used in the distance classroom, especially the online environment. An observational study was conducted to analyze whether effective instructional strategies found in the face-to-face environment could be identified in the distance learning environment. This study was conducted over two years with data extracted from observations recorded in student papers, coded and aggregated to identify if Friedman and Fisher's strategies could be found and what variations of the strategies might exist. For this paper, we are reporting instructional strategies in the online environment. They are shown in Table 1 with specific tactics and examples following each instructional strategy noted in the text below.

Table 1. *Strategy Categories and 14 Instructional Strategies from M.I. Friedman and S.P. Fisher (1998).*

Process strategies to enhance students' learning and adaptation. Providing:	Reminders Transfer of Learning Instructions Teamwork Instructions
Teaching strategies to increase students' learning. Increase students' learning by:	Taking student readiness into account Defining instructional expectations Providing effective evaluation and remediation Providing contiguity Utilizing repetition effectively Clarifying communication Reducing student/teacher ratio Providing subject matter unifiers
Strategies to manage the classroom by use of appropriate time dimension:	Providing ample learning time Keeping students on task

(Note: some of the tactics and examples below have been condensed and consolidated for space reasons.)

Providing Reminders Strategy-"Achievement of learning objectives is enhanced when reminders are used to cue the recall of information needed to perform assigned tasks" (p. 294). In the online setting:

- ❖ Mnemonic devices used; highlighted words represented terms in glossary or were links to maps or examples. Examples used that illustrated application of learning to the real world.
- ❖ Weekly audiovisual updates with PowerPoint and e-mail.

Providing Transfer of Learning Instruction "Achievement of learning objectives is enhanced when students are taught beforehand the knowledge and skills needed to perform assigned tasks and how to determine when learned knowledge and skills can be used to perform . . .tasks" (p. 295). In online settings:

- ❖ Assignments given in "building block" format. Modules are related to previous modules and drawn from previous knowledge. Directed to additional or previous material to problem solve.
- ❖ Students describe in discussion threads how current learning is relevant in their own lives.
- ❖ Project sheets direct students to learn an objective, and then apply to real world situations.

Providing Teamwork Instruction Strategy- "Achievement of learning objectives is enhanced when students are taught to perform complementary tasks as a team in pursuit of the objective" (p. 295). In the online setting:

- ❖ Encourage collaboration and discussion; refer to responses; synthesize responses; provide information; offer insight; provide additional input and provide opposite perspective from participants and ask them to think about and redirect response.
- ❖ Threaded discussion: Continual collaborative feedback enhances active learning socially, not competitively; prevents isolation of student. Assign person to lead and to start activity.
- ❖ Providing tools for groups to give and receive constructive feedback including instructions to do so and examples of good feedback. Include FAQ that gives students answers to what to do when the group isn't working as a group. Small groups established with 5-10 students as virtual classes within the larger class for discussion and a higher level of participation.
- ❖ Study groups formed in response to student panic after first unit exam (statistics).
- ❖ Groups of 4; points given for introductions in group room; grades for chapters are given as groups not individually; brainstorming within group –one member reports back for group.

Taking Student Readiness into Account- "Achievement of learning objectives is enhanced when students possess the readiness capabilities to achieve learning objectives" (p. 293). In an online setting:

- ❖ Course orientation quiz covering course requirements. First lesson reviewed basic concepts. Students are introduced first to concepts of distance learning as a prelude to course content.
- ❖ From welcome screen students move to syllabus. The acceptance of the syllabus document is an assigned requirement, which confirms students understand expectations.
- ❖ Students wrote a personal history paper that was content related at very beginning of class.
- ❖ Division of material into units with each providing prerequisite skills for subsequent skills.
- ❖ Program has step-by-step approach moving from simplest concepts to most complicated.

Defining Instructional Expectation: "Achievement of learning objectives is enhanced when prior to instruction (1) learning objectives are derived for students, (2) procedures to be used in the performance of tasks to achieve the objectives are identified, and (3) student outcomes designating achievement of the objectives are defined" (p. 293). In an online environment:

- ❖ Initial face-to-face or videoconference meeting. Expectations are restated in e-mail to the student.
- ❖ Syllabus provided grading scale, performance expectations, course outline, and focused toward learning objectives. Define objectives based on ABCD=audience (the students), behavior (learning task/performance), condition (how to learn the objectives), and degree (performance criteria). Detailed explanation of how web course will work.
- ❖ Percentages assigned to group participation, individual participation, and projects helped to define what was required to achieve course goals. Performance criteria are matched with checklists provided throughout the course to ensure students were meeting expectations.
- ❖ Getting-started section to articulate structure of course. Examples of work/lessons as guideline.
- ❖ Classroom profile section provides listing of completed activities. Step-by-step instructions specifying what procedures students were to follow within the course.
- ❖ Discussion is considered a key course requirement; requirement for 350-500 word essay response to instructor's questions.
- ❖ Definition from course catalog and then teacher's definition of course provided...using own words. Prerequisites listed to give student a "sense" of being qualified.

Providing Effective Evaluation and Remediation: "Achievement of learning objectives is enhanced when appropriate remediation is provided: (1) evaluation procedures and remedial tasks are formulated when task sequences are planned, (2) student task performance is frequently evaluated, (3) feedback on evaluation is given to students without delay, and (4) incorrect performance is immediately remediated, based on evaluation results" (p. 293). In an online environment:

- ❖ Grade book is included that may be accessed at anytime.
- ❖ Pre-test, post-test, mid-quarter, and final exam testing on objectives to ensure students learn what they need to learn. Feedback given as students perform exercises and practice sets. Self-tests with immediate feedback. Unit projects email to instructor with 1-3 day turn around for grading.
- ❖ Continual feedback throughout the course reinforces expectations.
- ❖ Teacher marks student responses and student redirected if material not understood. Students allowed to redo notebook and unit projects to improve grades.
- ❖ Positive feedback on well-done assignments and suggestions for improvement on others.
- ❖ After each lesson give quiz of 5-7 questions. May retake quizzes. Immediate feedback with comments on incorrect answers. Students may use threaded discussions to discuss quizzes.
- ❖ Contact instructor-email provided; also participates in threaded discussions.

Providing Contiguity: "Achievement of learning objectives is enhanced when events students are to associate are presented to them close together in time and space" (p. 294). In the online environment:

- ❖ Posting assignments for other students to comment on before submitting to instructor; substantive-useful feedback from instructor before next learning objective.
- ❖ Material is organized according to subject-matter topic and assignments are grouped by subject-matter topic. Course material is structured so that the assignments build upon each other.
- ❖ Lessons presented sequentially utilizing information from previous lessons.
- ❖ Assignments divided into small manageable amounts of material with concepts building on each other; students began by reading or researching about concept followed by activity or assignment.

Utilizing Repetition Effectively: "Achievement of learning objectives is enhanced when there is repetition in instruction and tasks students are assigned to perform" (p. 294). In the online setting:

- ❖ Vary assignments within the same topic to enhance deep learning. No single explanation is clear to all students. Final exams are an accumulation of quiz and test questions.

- Students discussing learning of activities through discussion threads (even though some of the comments may be repetition) helps to provide repetition of information for deeper learning.
- Important information repeated several times and in several locations.
- Varying activities to reinforce learning followed reading; graphics and pictures repeat concepts.
- Test questions on final were from earlier assignments.
- Units are broken down into lessons. Summary ties all together at end of unit.

Clarifying Communication-"Achievement of learning objectives is enhanced when information on objectives, tasks, and evaluations is clearly communicated to students" (p. 294). In the online setting:

- Constant direction to resources. Information provided for technical support.
- Multimedia used provides stimulation to participation and engage different learning styles.
- Syllabus-succinct and directive; expectations-reading studying and writing.
- Format of class including quiz schedule, projects, attendance policy, supplemental material to lecture, video presentations, access to college library, requirements for communications (email and website discussion board); office hours and encouragement to communicate.
- Thorough outline of class schedule; include student names that lead discussions.
- Grouping tasks together for each assignment and specifying how each assignment related to different learning objectives. Familiar items selected to demonstrate concepts.
- Clarified with e-mail, discussion area and on several web pages.
- Videotaped lectures in adjunct to online course; weekly audiovisual updates with PowerPoint and e-mail. Instructor takes an active role in threaded discussions; frequent clarifying questions to eliminate confusion and encourage participation.
- Course orientation quiz covering course requirements and stressing the contact information for the instructor. After quizzes instructor available by phone.
- Study Guide defines procedures step by step and encourages students to contact instructor to verify understanding; information and project sheets are clearly written with precise instructions.
- Re-clarifying assignments and providing resources within the course for additional clarification.
- Journal writing was used to relate content to students' experiences. Numerous graphics and links to illustrate concepts; observations, research, demonstration of concepts.

Reducing Student/Teacher Ratio: "Achievement of learning objectives is enhanced when there is a lower student-to-teacher ratio in teaching situations" (p. 294). In the online environment:

- Ratio for this online course is typically 11:1, however, this evaluation period was 4:1; and still team-taught. Automation of grading quizzes gives instructor more free time.
- Interaction done individually without known numbers in class. Student has no knowledge of how many students in class. Ratio of 6:1 allowed for individuation of instruction.

Providing Subject Matter Unifiers: "Achievement of learning objectives is enhanced when a scheme is used to highlight parts/whole relationships in the subject matter students is assigned to learn" (p. 294). In the online environment:

- Models and diagrams are used and developed by students; problem based/knowledge based environment to create higher level of thinking.
- Rich in research, design and format –related links, metaphors, recommended readings.

Providing Ample Learning Time: "Achievement of learning objectives is enhanced when students are given ample learning time to perform tasks" (p. 295). In the online setting:

- Optional extra credit quizzes are to be done during the assignment that is scheduled for that timeframe. Re-dos on papers were encouraged.
- Course was extended to a 10-month period because it was a writing course.
- Students are given one year from registration date to complete class. Self paced class.

- ❖ A major question is posted on one day of the week and must be answered by noon Mondays.
- ❖ Assignments and tasks were posted at the beginning of the course, as were due dates.

Keeping Students on Task: "Achievement of learning objectives is enhanced when students spend more time attending to tasks formulated to enable them to achieve the learning objective" (p. 295). In the online environment:

- ❖ Clarifying expectations and timelines in advance help students focus; reminders; encouraging students work ahead.
- ❖ Assignments were specifically related to the required reading and goals/outcomes of the course-no "busy work". Weekly agenda with list of assignments, instructional activities, and evaluation; all information is in order and on the web.
- ❖ Hyperlinks to additional resources so time is used efficiently; future lessons not available to prevent working ahead and distraction.
- ❖ Tasks are performed in the field and then reported in to Web site. Teacher is not with them during field tasks. Tasks had to meet a timeline.

Implications and Conclusions

In reviewing over 50 online courses, we determined that all 14 instructional strategies were being used. We feel this reinforces that "good teaching is good teaching" and that online teachers exhibit the ability to use instructional strategies identified as successful in face-to-face teaching. We would also note that our online instructional strategy research appears to link to and reinforce other teaching and learning theories and applications (APA, 1997; Chickering, et al., 1987, 1991, 1996; Sattler-Weber, Hunt & King, 2002). We also note that three strategies identified here, "Defining Instructional Expectations," "Clarifying Communication," and "Evaluation and Remediation," may be the most effective of the 14 strategies, or may be the most easily adapted to online teaching as evidenced by the number of strategies observed.

Instructional strategies may be seen as analogous to what is found in the body that rejuvenates cellular activity, DNA, often referred to as the "essence of life." Like DNA, instructional strategies are responsible for the enormous possibilities for variability at the micro level—the "essence of learning." Used in the online environment, the instructional strategies are energizers of the learning experience while technology is the injection system or carrier. Ways in which specific instructional strategies are utilized and operationalized will differ when the characteristics and capacities of technology in the online environment are analyzed. Principles and practices are the invisible threads of interrelated actions and teaching theory that make up effective strategies. In building an instructional paradigm, teaching in the online environment must be both purposeful and mindful of the interrelatedness of principles and practices. While these 14 strategies are the "DNA" of good teaching, the applications are everyday activities most teachers commonly use. We believe that we can show that these strategies are effective in the distance education environment as well as the face-to-face setting.

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Online Education Investment Strategy: Key Educational and Financial Success Factors

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Introduction

The *Chronicle of Higher Education*, the *Wall Street Journal*, and the *New York Times* contain almost daily announcements of yet another university or business enterprise offering a degree via the World Wide Web (WWW). With almost the same frequency, these newspapers contain stories about online educational programs that have been deliriously successful or have failed miserably to achieve their educational or financial objectives. It would appear that many universities are investing in online education without full knowledge and understanding of what it takes to implement high quality online educational programs. Such "boom or bust" variance clearly demonstrates an escalating need for advanced research targeted at discovering key success factors (KSFs[5]) affecting online education program management. KSFs are the assets and skills that provide the bases for competing successfully. Examples such as state-of-the-art knowledge, technical or management skill acquisition and positive attitudes will surely help all of us improve resource allocation in higher educational investments that ultimately benefits our learners.

It sounds like we need to consider an educational venture perspective in our strategic judgment. Hmmmmmm, that calls for a little bit of educational investment discussion. What is the reality here? Are we going to have to earn our way? Maybe to some extent since online education is still an innovation in education and any educational innovation is usually put to the "does it pay its own way test" on its journey towards a distributed learning portfolio. An educational investment may mean to spend (time, effort, money) with the expectation of some satisfaction (student, faculty or institutional) as opposed to putting only (money) into a business, real estate, stocks or bonds, for the purpose of obtaining an income or profit. So, where does the value of such educational investment research reside?

The value resides in the comprehensive benchmark knowledge that contributes to the distance education field about online programming resource use and management. Educational KSFs such as faculty satisfaction, student satisfaction and learner support for example; and financial KSFs such as revenues, costs and ratio performance measures that have surfaced, serve to inform and answer the original research question asked in this inquiry: what is required to design, develop, implement and evaluate high quality online distance education degree programming investments?

OK, so what are the KSFs? Well there are: I. Performance Measures; II. Revenues and Sources of Funding; III. Costs and IV. Dominant Themes and Patterns. The performance measure KSFs are presented in two groups: educational and financial. Assuming we are educators at heart, we'll look at the educational KSFs first. These fall into four major categories: learner-oriented; faculty-oriented; corporate/industry-oriented; and program-oriented. Each of these categories has numerous subcategories. Some are mentioned in this summary and a complete list of subcategories will be available upon request.

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[5] Source: Aaker, David A. (1995). *Strategic market management.* (4th ed.). New York: John Wiley and Sons. 100-102.

Key Success Factors in Online Education: Performance Measures

Educational Categories

1. *Learner-oriented*: student/customer satisfaction; student performance; learning evaluations; interaction evaluations (learner-instructor, learner-learner, learner-content and learner-context); coursework review/maintenance/revision; quality (expert-opinion, face validity or cadre credentials, G.P.A. as a proxy, online program/course efficacy).

2. *Faculty-oriented*: satisfaction; faculty involvement; and faculty/teaching improvement.

3. *Corporate/industry-oriented*: satisfaction; involvement; and teaching involvement.

4. *Program-oriented*: entry requirement reviews; self-evaluations; annual summary of program issues; annual statistical summary (applicants, admissions, enrollments, cohorts, conditionals, retention rates, graduation rates); annual percentage of tenure-track faculty teaching in the program; annual summary of student credentials; annual comparison with other programs; university measurement and evaluation survey; and post-program surveys at graduation and three–year intervals (graduate success rate in working world, employers, earnings levels and repeatability as students).

Financial Categories

1. *Annual break-even analysis*: with zero-sum requirement, without zero-sum requirement.

2. *Net cash flow management*

3. *Cost/student/course*

4. *Cost per program*

5. *Net profit margin*

6. *Pricing structure*

Revenues and Sources of Funding

Revenue KSFs are presented in four major categories:

1. *Online program development funding sources* (state funds, federal programs and agencies, foundations, in-kind support and corporate/industry sponsorship).

2. *Annual tuition* (program, instructional and in some cases segregated fees) for programs.

3. *Technology fees*.

4. *Services and service agreements* (research updates, mini-talk/seminars, direct billing, credit card fees, in-kind support and service agreements).

Costs

The cost KSFs are presented in seven major categories. The very detailed nature of costs precludes listing all subcategories in this summary due to space restrictions. There will be handouts available during the presentation that will provide these details.

1. *Marketing/market research/public relations/promotion*: (pre-program needs assessment, marketing plan).

2. *Management* (salaries, fringes).

3. *Program Development* (annual loan, funding principal and interest repayment, opportunity cost, overheads, supplies and maintenance, course development)

4. *Program Delivery* (Instructional costs, technology platform, and courseware)

5. *Learner Support* (1-800 number for instructor/TA, 1-800 number for interactive conference bridge, technical, proctoring, library services, and advisor (counselor).

6. *Summative Evaluations*

Dominant Themes and Patterns

1. Universities were distinctively innovative in their educational approaches to online programming implementation. The characterization was predominately entrepreneurial, market-oriented, a business plan approach, although one University was more cost-oriented while maintaining a "business consciousness or awareness".
2. University units were determined to be risk-takers to varying extents.
3. The primary market segment targeted was working alumni. Other segments were added as each University discovered additional educational needs.
4. Faculty involvement and related issues topped the list of online programming barriers. Related issues included: faculty burden when online courses were expected to be added to their existing teaching load; copyright issues; reluctance to change; and the invisibility of online work in the tenure/promotion process. The second barrier was adequate, timely and annual funding. Other barriers discovered were: University-related, i.e. lack of administration commitment, inappropriate/inadequate guidelines/regulations; a lack of understanding of the marketing and competitive issues involved in the educational marketplace; inadequate University accounting systems for distance education program management; a significant dilemma where, for example, a twelve month in-University program approval process ultimately endorses program quality but, severely hinders timely market entry; lack of distance education history and relative newness of the concepts compared to on campus teaching and learning; and legislative control of tuition.
5. The over-riding theme concerning improvements in financial matters was stable funding (or removal of volatility) and financial accountability.
6. Educational application was priority over infrastructure or administration applications.
7. The use of government funding in the development or startup stage of online education to give institutions the risk-taking capability to "test the waters" before traditional funding sources were adjusted or developed to provide standard line items in the annual budgets.

8. Although a zero incorporation of funds was prevalent at the inception of most distance education programs, it is reasonable to deduce that the general trend was toward a growing inclusion of these funds into base-operating budgets over time.
9. The majority of respondents felt senior management already does or should hold back a percentage of general operating funds before the Dean's or heads of departments/units receive their share for operating. In one University operating under institution-wide centralized management, respondents strongly favored this approach for uniform quality control and organizational consistency. For example, historically, one Dean advocated the building of a particular online program. He/she was then replaced by one who didn't. The program was dropped until a third Dean appeared, again an advocate, thus resulting in the entire program having to be rebuilt.

Implications for Practice

This research builds online distance education theory based on the foundational works of Bates (2001); Coldeway and Spencer (1982); Douglas and Harmening (1999); Ehrmann and Milam (1999); Jenny (1996); MacDonald and Gibson (1998); Markowitz (1987); Moore and Kearsley (1996); Morgan (2000); Murgatroyd and Woudstra (1989); Rumble (1988); Smith (1998); Woudstra and Powell (1989); Yin (1994); and others. The inquiry hopefully provides useful tools and a benchmarking database for practitioners.

This study took advantage of wonderful opportunities presented by rapid technological and cultural changes taking place in education. The momentum of the competitive forces at work in the educational marketplace was harnessed for practitioners in online programming, and is just as helpful to those traditional practitioners who face similar and increasingly competitive forces.

We as educators may see the integration of online distance education into a more "distributed" teaching and learning model. We may also see a strong teaching and learning model emerge from the ashes of the struggle between online distance education and traditional education. The result may be a teaching and learning model symbolizing the immortality of education, where each constituent educator can preserve their own identity, yet can draw on and contribute to the synergies gained from the similarities as well as the differences with one another.

Implications for Further Research

This research discovered key success factors in online programming by identifying revenue, cost and performance measures and definitions that contribute to a common language to inform higher education. Systematic inquiries exploring the relationships between these identified variables could further inform the field. For example, research directed at putting actual numbers into the categories. These comparisons would enhance critical funding priority questions that arise such as: should Learner Support Services or Faculty Training be increased to improve program quality? Or where is our best educational return on investment?

Intangibles such as goodwill or public relations are not accounted for in the research results. On the other hand, the value of faculty involvement, goodwill and repeat customers for example, was a point made by most study respondents. Therefore, a gap in organizational returns or revenue exists. How are very evident intangible returns valued by the organization? Are there others?

A study of risk-takers (i.e., "risk seeking" versus "risk-neutral" versus "risk adverse") operating in the University context would be valuable. What are the various organizational contexts that encourage or support creative online programming? Are risk takers rewarded by the organizational structure? If so, in what ways? If not, why not?

What about removal of zero-sum accounting constraints? What is the probability that removal of zero-sum accounting constraints will positively impact the educational mission of the University? Will such a critical turn around be accepted? Is such a move financially feasible? What impact will it have on those units serving a social need not served by a profit motive?

Epilogue

Please recall the original research goal was to determine key success factors (KSFs) by identifying revenue, cost and performance measure categories, subcategories and definitions that need to be considered in designing, developing, implementing and evaluating online distance education program investments to build online distance education theory. The literature revealed contextual issues at work in the University environment lending insights into subjective influences affecting the success of such investments. Therefore, the refined research goal was to answer: What are the revenue, cost and performance measure categories, subcategories and intrinsic definitions that need to be considered in designing, developing, implementing and evaluating online distance education programs to build online distance education theory? What are the institutional contexts and program characteristics influencing those categories and definitions? The benchmark information presented was derived from selected online education programs at four public, Doctoral/Research-Extensive Universities having characteristics that suggested successful programming investment or potential.

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Pedagogy, Multimedia, and Distance Education: Developing Critical Inquiry Through Virtual Communities

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Emerging technologies offer educational possibilities for enhancing the pedagogical development of distance education courses delivered through the Internet. In this paper, I will discuss some ways that *integrated multimedia* has been used to strengthen the teaching and learning of a virtual education course — "Ethnic Arts Online." From the beginning development of the Ethnic Arts Online course, it was important that it meet the same high academic and pedagogical goals of the face-to-face course. Over the past few years, I have collected data from these courses and relationally analyzed them with regards to content robustness and academic rigor. Course data was available from both courses primarily through student writings and interactions. From my research and examination of electronic educational computing courses, I believe that virtual teaching and learning can be academically challenging and the content contextually rich. I support a social constructivist educational position guided by critical inquiry about the complexities of life-centered issues, exploration of meanings and values of social, historical, and cultural contextual conditions, and dialogue about multiple and divergent interpretations. Below I briefly introduce the Ethnic Arts Online course and some pedagogical aspects of integrated multimedia, critical inquiry, intercultural communication spaces, and student self-directed learning. Woven within this review are suggestions for developing and practicing social constructivist educational pedagogy.

Ethnic Arts Online Course

"Ethnic Arts: A Means of Intercultural Communication," (Ethnic Arts) is an undergraduate course offered at The Ohio State University (OSU). Six or more sections of the course are offered each quarter through the Department of Art Education. *Ethnic Arts* satisfies three OSU undergraduate General Education Curriculum requirements: arts and humanities, social and cultural diversity, and second level writing. Course content is thematically organized to examine a comprehensive range of artists, artwork, and critical writing in the art worlds from diverse ethnic cultures in North America. *Ethnic Arts* enrolls approximately 500 students each year from a broad spectrum of the university's student population (e.g., African American, Asian American, Chicano/a, Latino/a, Puerto Rican, Korean, Malaysian, Chinese, Indian American [India], Somalian, Mexican American, Honduran, European American, Native American, etc.). One section of the distance education course (Ethnic Arts Online) has been offered over the Internet each year since the 2000 spring quarter. Ethnic Arts Online combines course management aspects of WebCT within an HTML set of frames, along with animation, and multimedia authoring features of Apple QuickTime, Flash, and RealPlayer. Students enrolled in this online version of the course meet only in a virtual community.

A distinctive feature of the Ethnic Arts course is that students interview local artists from various ethnic groups and within the student's local community. In the face-to-face course, many of the students bring objects, images, and video in to the classroom to share with their classmates. They document the artist's sense of ethnicity and cultural identity in relationship with their art-making processes. So in order to provide a similar rich context for distance education students, it was desirable to have intercultural communication spaces available for students to post visual, audio, and textual information via the Internet.

Social Constructivist Pedagogy

The Ethnic Arts Online Web site's interface was developed with a "pedagogical design" to enhance academic rigor and content robustness. The pedagogical design infused aspects of integrated multimedia, critical inquiry, intercultural communication spaces, and self-directed learning that were strongly influenced by a social constructivist educational philosophy. The aim was to promote a sense of initiative, creativity, collaboration, and responsibility among students and the instructor.

In "Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom," Palloff and Pratt (1999) suggested that the importance of developing and maintaining valuable online learning begins with interactions among students themselves, between faculty and students, and with collaboration in learning that results from these interactions. In describing the evolution of a learner-centered virtual community, these authors suggest that instructors need to find ways to make students feel "embodied" with the course content. Indeed, I have found that one of the most significant ways of involving students with online course content is to establish minimal *levels of participation*. This means students are required to take responsibility for their own learning, conduct inquiry, and make use of the course's intercultural communication spaces. The development of integrated multimedia that supports involvement and interaction is critical to achieving these educational goals of content robustness and academic rigor in an online course.

Integrated Multimedia

The Ethnic Arts Online course incorporates many different forms of emerging technologies including Internet and Web-based computer-mediated communication, WebCT course management software, streaming audio and video, and virtual reality QuickTime movies. Macromedia Flash was used to organize content, multimedia, and course management applications within a set of html frames. In addition, the course interface was visually arranged to guide students in recognizing and reinforcing their critical inquiry processes during their virtual experiences.

The use of emerging technologies in the Ethnic Arts Online course draws from various forms of integrated multimedia, while creating a high expectation level for learning, it also facilitates self-directed inquiry and provides an environment conducive to collaboration among learners and the instructor. These resources have the potential to enable students to participate in a learning environment, inquire and communicate about ideas and issues, and assess their learning performance. The following overviews some of these resources:

1. Course Readings: online articles about course ideas.
2. Contexts: lectures, audio and video materials prepared for students to view online. Audio and video are streamed and can be accessed from this resources link in the weekly assignment section. RealPlayer Basic must be installed in order to access this material.
3. Unit Galleries: examples of past student papers written about selected artists, art forms or conditions of change associated with artistic practice.
4. Student Work: examples of past student work that addresses the concepts being studied at this time in the course.
5. Links: Internet sites that address the ideas, issues, or related course information.
6. Virtual Objects and Environments (QTVR): QuickTime virtual reality files are available for some assignments. The QuickTime plug-in must be installed on the student's Internet browser to access these resources.

Critical Inquiry

Students in the Ethnic Arts Online course are required to critically examine the interconnectedness of everyday representations, aesthetics, and culture. Another pedagogical aspect of the course was to facilitate student research of complex sets of lived events, contextual relationships, and how social issues contribute to the production, divergence, and shared meanings of visual forms of symbolic culture. In the course, inquiry is simply defined as to direct ones immediate thoughts and actions about an idea, issue, or problem so as to increase one's understanding of a particular solution or body of knowledge. However, students are asked to do more than just inquire about the "things" that people make special everyday. "Critical" inquiry is a continual process of identifying and posing problems, asking questions and questioning the validity of the questions asked. It entails the selection of inquiry processes to solve the problem or that are relevant to studying the ideas and issues. Students also learn that there can be multiple processes of educational and ethnographic inquiry.

Inquiry is used to conduct ethnographic research about ethnicity, identity, representation, and visual culture. Course assignments provide ways for students to: share common interests and beliefs; discuss differences of interpretations; work alone and collaboratively on assignments; reflect on and critically think about the ideas and issues in relationship to themselves and within society; and make a long-term commitments to their own, one another's, and/or the group's understanding of the online learning community. Students represent their research through formal and informal dialogue, structured and semi-structured questions generated by the instructor and student group leaders, and though written assignments. They are expected to conduct ethnographic research in their own communities, interviewing people about their "sense of peoplehood" or ethnicity and social alliances. This information is then posted on the course Web site and critically examined through various forms of communication spaces.

Intercultural Communication Spaces

Another goal of the course is to facilitate intercultural communication by building a supportive virtual community of online learning. This is achieved by clearly defining how technology can be used appropriately to complete assignments successfully. Our online course policy indicates a clear code of conduct for student participation in this virtual educational learning community. Technology is also used to create distinctive gathering places for group conversations and to encourage positive student leadership from within. Therefore to support student involvement and interaction, the Ethnic Arts Online course attempts to create a safe and dynamic virtual learning community. These kinds of intercultural communication spaces are becoming much easier with the aid of emerging technologies that allow for the design, production, administration, and maintenance of online messaging systems.

Perhaps an example would be helpful to illustrate some of these points. In the first assignment students introduce themselves to a partner in order to facilitate community building among class members. They share these interviews online (interviews are an important aspect of ethnographic inquiry. Additionally, students are required to conduct an interview with a local artist and use the data in writing their major papers for the course). These introductions serve several purposes for creating an online class community including: building positive social relationships among class members, identifying common interests, and limiting the online group size to only a few people at the beginning of their online process of communication. Group collaboration is used throughout the course. As the quarter progresses, students participate in several varying group sizes of 2-6 members. Each member is scheduled to take an active role as a group leader for several activities, such as posing questions about the course readings, facilitating group schedules and activities, and helping fellow students probe life-centered issues of diversity, difference, ethnicity, representation, and aesthetics, as related to course content. Student involvement and interaction are mediated through the following synchronous and asynchronous computer messaging systems, or as I have referred to them in this paper, intercultural communication spaces (e.g., email, listserv, threaded discussion forum, chat room, and an electronic student portfolio).

1. Chat Rooms: Chat room conversations happen in real time. Therefore, course members are expected to only use the chat rooms in small group assignments. In order to log-on at the same time, group members make prior arrangements for a common time to have their chats.

2. E-mail: There are two different forms of e-mail that we use in this course, individual email and a listserv. Students are enrolled in the listserv and any message they send to the "LIST" automatically goes to all of the class members. They are instructed to use the listserv for general correspondence between themselves, classmates, and the instructor. If they have personal business or are asked to send an individual email, this is achieved by sending the e-mail to the individual's email address. Some assignments are sent directly to the instructor.

3. Discussion Forum: The Discussion Forum is like a listserv with the exception that it is posted and maintained on the World Wide Web. Students use a browser (Navigator or Internet Explorer, not their email application) to access the Discussion Forums. One forum is created for each week of class during the quarter. The discussion forums allow course members to communicate with each other and to organize their conversations in one location on the Internet.

4. ePortfolios: The electronic portfolio is a set of Internet web pages that consist of student papers with supportive images. The administration and forms are generated using Practical Extraction and Report Language (PERL). Students use this communication space to create their own online web pages during week 6, 7, and 8. In addition to text, these pages also contain digital images taken by students using a camera and transferred to a CDROM by a photo-processing store, digital camera, or captured from a scanner. Images are saved in the JPG format, sized no larger than 400 x 400 pixels @ 72 dpi. The images are then sent using the portfolio common gateway interface (CGI) form. The eportfolio Web pages are also used during the final group assignments during week 10 and 11. After capturing information digitally, students post their ethnographic research in this eportfolio area, which is archived to preserve their inquiry for future classes.

The creation of computer-mediated messaging systems is crucial to developing dynamic virtual intercultural communication spaces in distance. The integration of emerging technologies within online virtual education can offer students a less threatening way to become active participants in creating and making sense of visual culture. Virtual education allows students to use their time to explore, examine, reflect, and then write their interpretations through computer-mediated messaging systems. For many students, these virtual communication spaces help them feel more at easy. It provides them greater control over expressing their ideas with peers. Students in face-to-face classroom situations do not always experience this "comfort zone." For example, language differences can create miscommunications and interpretation difficulties for some students. Both domestic and international students expressed that virtual intercultural communication spaces offered them a greater degree of security and confidence. Here I would like to note that the development of online learning communities should be continually examined for issues of conflict and the negotiation of divergent and shared values. The Ethnic Arts Online course is organized to facilitate interactions and collaboration among learners and the instructor. An adage we sometimes adopt in the course is that we should "agree to disagree" about some issues.

Self-Directed Learning

The course is also structured to create a self-directed learning environment for inquiry, communication, experimentation, and problem solving of ideas and issues. Self-directed learning is based on research that learners can actively create knowledge and meaning through direct experiences, reflection, manipulation, and critical inquiry of ideas in everyday life. Students are encouraged and required to participate in course activities and assist others with reflecting on and assessing the accuracy and application of their ideas. Collaboration, shared goals, and group work are powerful forces in this learning process as are group activities, simulations, and the use of open-ended questions.

Criteria for all assignments are clearly represented and available online for students. Criteria are listed in different ways to address the diversity of different learning styles. The instructor reviews and grades all assignments, assesses the student's achievement and performance, as well as, helps students clarify assignment criteria and interacts with them as they pursue their research. The instructor serves as a facilitator to the learning process by setting up: the use of collaborative assignments, forums for active discussions, and multimedia to aid in the development of critical inquiry and research skills. Students are directly responsible for exploring ways to successfully deliberate and engage in this form of educational practice.

After students describe, reflect on, and assess their own learning performances, they are required to analyze the information they produce in relationship to other perspectives associated with the idea or topic. These culminating experiences are represented in their eportfolio presentations. Because students know that they are allowed to rewrite and resubmit assignments, they typically feel comfortable taking risks and their assumptions sometimes lead to incorrect choices. However, these risks more often lead to the generation of greater in-depth information. Student eportfolios and assessment often reflect adjusts to their interpretations learned through self-directed, peer reviewed, and critical inquiry methods.

Summary

Ethnic Arts Online requires students to effectively demonstrate achievement and performance with acquired knowledge in the course content areas. Student are not asked to recall or "plug in" what they learned. Instead, they must apply their knowledge with consideration of contemporary contextual societal conditions acquired through their own inquiry. Students are expected to achieve greater than the required minimal *levels of participation.* They must conduct research, which includes: collaborating with others; writing, revising and discussing papers; engaging in oral analysis of course ideas within the contexts of contemporary society; and discussing intercultural similarities and differences of opinions and interpretations. In conclusion, I believe that critical inquiry and integrated multimedia are some of the ways to strengthen the pedagogy of virtual education. Ultimately, the over-aching premise of the Ethnic Arts Online course has been to develop an online community that can support the needs of many different learning styles, improve student performances and instructional practices. This is a very large task and one that will need to be continually addressed in order to achieve success. Nevertheless, the purpose of this social constructivist approach is to support students not just being respondent to standardized curriculum knowledge or reflective of prior experiences. Virtual education and pedagogy should help students to seek out new knowledge, to empower themselves and others, and to be forward-looking in their life-long learning.

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Biographical Sketch

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Third Generation Online Courseware: Don't Replicate—Innovate

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A majority of colleges and universities in the United States now offer educational programs online. The need to develop these courses quickly but at the same time satisfy academic considerations regarding their quality has produced a simple model for developing and delivering college-level online courseware —replicate the traditional on-campus course as closely as possible. Typically, this is done in one of two ways. The easiest is to use a basic learning management system available at most colleges, and have a faculty member produce an electronic text of the syllabus. Course notes, lectures, assignments, and the textbook of the comparable on-campus section are added, with a "chat" section for discussion or posting assignments. This "first" generation model for online course development is used for the majority of online courses now available. A "second" generation model has been developed for those schools equipped with broadcast or videotaping capability. Taped sessions of live class lectures are streamed on the web, with course notes, on-line discussion groups, and email, creating a video for online delivery.

Both models offer the advantage of using existing course content thereby reducing faculty development time and preserving familiar course structure. Under these standards, distance education departments have been able to quickly and easily increase offerings with a common design approach at relatively low cost to the institution.

But online instruction is no longer new. Universities can no longer be satisfied with what is primarily a low-tech, stagnant course product, housed in a high tech delivery system. As educators, we should provide courseware that *improves* on the traditional face-to-face learning experience. A "third generation" model is not only necessary but required at this stage in online development.

New Assumptions

Improvement means expanding our assumptions about online education:

Online courseware does not have to imitate a traditional course to be an effective learning experience. The web offers the ability to create interactive modules and multimedia demonstrations that can be compelling and innovative without the physical presence of a teacher. The discussions which take place online offer a true "record of debate," not just what might be recalled from a class discussion. We need our online courses to be valuable educational experience, not just the second choice to being in a traditional classroom.

Developing online courseware requires a new model. The web is not the computer equivalent of a television, a delivery system for static programs. We should use the tools that the Internet provides to offer self-directed learning, interaction, and exploration.

We must recognize different learning styles of adult learners and teach to that audience. We can incorporate adult learning into online courses. Adults learn by audio, video, reading, interaction, and testing—all active learning tasks.

Doing is what online courseware can be—instant feedback and problem solving. Approaching course development from the learner's prospective helps to create interaction and a better learning experience.

With these assumptions, Boston University set out to construct a "third" generation course development model. Our goal was to develop fresh courses for the web. While there may be a course delivered on campus with the same title, course number, and description and fulfill the same requirements, the similarity would end there. Faculty would contract with us in a different way and be a member of a team to develop the courseware. As subject matter experts only, they would not be required to worry about loading courseware, creating interactive elements, getting copyright clearances, be experts in instructional design, or anything else. Their most important function would be to think about delivery in a nontraditional manner, to provide content, review for accuracy, and be able to suggest multimedia strategies. The implementation of design and function would be the responsibility of others.

New Goals/Standards

The right development partners were needed to share this vision. Coming to the online world late gave us the advantage of learning from the successes and failures of others. From those lessons, we shaped our goals:

- ❖ Develop new course content beyond that which can be delivered via text or straight video lectures.
- ❖ Identify the unique qualities of the web and use them to support a new course development strategy through a team approach.
- ❖ Build content made up of graphics, animation, print, audio, video and a wide range of published materials in a highly interactive environment.
- ❖ Create high quality, scalable, easily revisable, courseware.
- ❖ Incorporate student assessment and evaluation instruments and adult learning theory in the development process.
- ❖ Measure student performance.
- ❖ Established and meet objectives and goals suitable for the delivery medium.
- ❖ Develop modules within courses that may have multiple uses as supplements in other courses or stand-alone noncredit programs.
- ❖ Build courseware that results in a level of sophistication and high degree of student and faculty satisfaction based on performance outcomes, evaluations, and student interviews.
- ❖ Further test the model by measuring completion and drop-out rates and revising courses based on the feedback from beta testing early courses.

With these goals we knew that rapid production of courseware was not going to be possible. We focused on a team development approach and a few graduate certificates to begin with which met our design standards. We also prepared to commit resources, contract for outside assistance where needed and allow sufficient time for development. The University provided us with seed money to acquire the development time of faculty, as well as partner with outside specialists for instructional design, hosting, and course development. This was not an unlimited amount of money, but enough, if we budgeted right, to produce 6-10 courses the first year which would meet our standards.

We felt that we'd need at least six months if not more to build the first courses. Our development team consisted of a subject matter expert (faculty), a hosting and design company, a cross platform learning management system, and a project manager/director within the university whose sole job it was to oversee the team and development of the course. The hosting and design company played a critical role in our success as providing not only the technical support but much of the design and vision for a course. The University solicited proposals from two separate publishing/instructional design groups with specific experience in on-line course production. The company who won our contract was responsible for getting copyright clearances, live telephone 24x7 technical support (not just email), providing instructional design support and training our university instructional designers, and successfully translating a faculty member's vision into a coherent effective, elearning experience.

We concentrated on graduate certificate courses in order to achieve a higher level of sophistication. The University administration wanted also to limit the early online experience to graduate or noncredit programming. We beta-tested courseware before we released our product for general enrollment.

As with all plans, there were adjustments. We started to develop courses in late spring, with the idea to start to beta-test in the fall. Of the four courses identified, only one was ready for testing with a small number of students in the fall. The remaining three were still in development and postponed for offering until the following spring. We learned that though we were creating distance learning courseware, much of the development needed to be face-to-face with faculty and instructional designers, as well as training of the faculty. We also learned that a good agreement gets partners on board, but constant, consistent communication and project management is what keeps the schedule on track. And of course, the things that you never expect to go wrong, do, while the obstacles you anticipate don't always materialize.

As of spring, 2002 we had seven courses in a beta test phase which included graduate courses in clinical research from our medical school and a courses in instructional technology in education. In the Summer 2002, we began a master's degree program in criminal justice. In fall 2002, we will introduce the first course in a transitional doctorate degree in physical therapy. Our programs are interactive, vigorous, and, we believe, achieve our standards for using the technology as well as possible. They also require constant improvement as we receive feedback from student and faculty. These high-end programs have forced us to broadened our thinking, technical capabilities, our support structure and our vision.

We have not yet achieved what we believe is the best "third generation" course with all the elements we want (and within our budget!) But we are close. We also have laid the groundwork for faculty to think in a different way in preparing to develop and teach on line.

Of course, we've learned important lessons in the process.

General Lessons

Build a team that holds the same priorities and understands the goals of the "third generation" course development model and communicate it often. We were careful in explaining our goals to the teams of faculty members (subject matter expert), instructional designers, a manager from the distance education office, and a project manager from the outside company hosting and assisting the development of the course. After careful review, we found a company who would provide us with the support necessary to create courses that went beyond the two models outlined and had a track record and understanding of where we wanted to go. We "sold" our ideas to colleges and departments within the University. We were honest about the of work required from faculty and that they would be part of a team, not sole contributor/owner of what would eventually end up on line. We also made clear what the University's expectations were for the final product.

Having established all of this, there was slippage in the schedule and members of the team who will misunderstand the commitment and goals. Reiteration of the goals as well as constant communication is required for success of the project. None of this was easy but necessary.

Provide a faculty agreement that is fair and generous. Boston University owns the finished online product in a typical work-for-hire arrangement. The University however has a royalty agreement in place to share revenue once the course makes a certain gross amount as well as money that flows to the faculty member who developed the course if there is a derivative use, for example, sale of a few modules of a course as a stand alone to an outside company, etc. Payment for development of a course is generous. Faculty who feel they are treated fairly respond more positively to a process that requires hard work.

Create certificate programs or common bodies of knowledge. It's easier to sell a whole car, than parts of one, to both the person who will manufacture it or the person buying it. Get the buy-in of a department for an entire certificate or degree before starting the process. A commitment must also be at the dean's level or the equivalent. Without a complete program, marketing individual courses becomes very problematic.

Have one project manager who knows what all the members of the team are doing at any given moment in time. Developing third generation courses means managing lots of people on one product with a clear vision. Everyone thinks they know what a project manager is, but few people know how time consuming and detail driven it is. Having to go to three different people to find out where a course stands in terms of scheduled development, is not project management. Weekly conference calls with the instructional designer, project manager and design company and a weekly updated spread sheet of deliverables is necessary for all team members.

Be prepared for more work and more frustration. Because we require a different type of course, "good enough," isn't good enough. An instructional designer may go back a number of times to a faculty member asking if a new simulation, diagram, or video is appropriate to add in a certain place. This is where creativity and appropriateness comes in. This means more time and effort on everyone's part.

Don't assume money buys commitment or timeliness. Despite fair compensation and agreements all around, schedules still don't get met for good and not so good reasons. Constant vigilance is necessary. Delays beyond a few days require communication and adjustments.

We've learned from the recent demise of some University for-profit online entities, that even breaking even on these programs is a long-term goal. Boston University has accepted a slow growth model with the promise that it will be an excellent learning experience.

We now have programs representing four separate colleges/schools and anticipate expanding to others. We also expect that other universities will continue to develop and improve their online courseware to reflect new technical and pedagogical goals. As we become more comfortable with the model developed and reach the standard we've set, we hope to decrease the development process to 4-5 months.

By building a "third generation" online model, Boston University hopes to contribute to the further improvement of online delivery.

Biographical Sketches

Susan M. Kryczka, is the director of the Office of Distance Education at Boston University. She has over 23 years of experience in distance education. She directed the distance learning programs at Northeastern University in Boston, the Illinois Institute of Technology (Chicago) instructional television system and began her career in distance education at the City Colleges of Chicago. Susan also teaches history at the college level. She holds two graduate degrees, an M.A. in journalism from Northeastern University and M.A. in history from Loyola University of Chicago.

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Christopher Hughes is the manager of online distance education programs at Boston University's Office of Distance Education. Prior to joining Boston University, he held positions with BaseSix, Nitro Communications, the Massachusetts Department of education, and the Massachusetts Telecommunications Council in the areas of policy, strategy, project/account management, and content development. Chris has an M.P.A. degree from Columbia University's School of International and Public Affairs with a focus on technology management and a B.A. in political science from Holy Cross.

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CyberTower:
A Model for Scalable, Sustainable Distributed Learning

Diane Kubarek
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Introduction: What Is CyberTower?

What do gardens, engines, mastodons, and wine have in common? They're all study rooms in CyberTower, a Web-based distance learning opportunity offered through Cornell's Adult University (CAU) and implemented by Cornell Information Technologies (CIT). To allow CyberTower to be accessible to the widest possibly audience, it is non-credit, very low cost, and requires a relatively low-end computer with network connection for participation. CyberTower's primary target audience is Cornell alumni. CAU offers both on-campus and travel study programs, which at full capacity can only reach 2,000-3,000 alumni per year. CyberTower is designed to reach out to the remaining 170,000+ alumni who cannot participate in CAU's synchronous program offerings. In addition, CyberTower is being used as a recruiting tool for prospective students to introduce them to the diversity of subjects and faculty at Cornell, and as a distributed learning resource for incoming freshmen, who are required to begin their academic work during the summer before they arrive on campus.

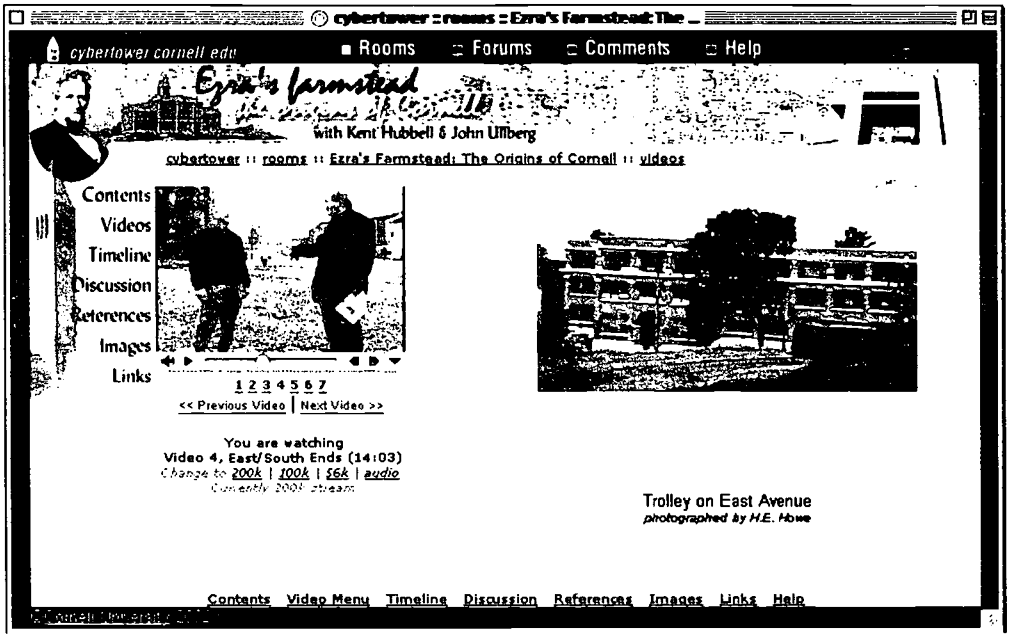
The Instructional Design Model: Making It Scalable

Defining an instructional design model for a collection of course materials can provide flexibility, structure, and consistency, while streamlining the production process and promoting scalability. The instructional design model used for CyberTower provides structure and consistency but is adaptable for virtually any topic faculty may wish to present. In addition, existing rooms give faculty concrete examples of the end product, so they can be more focused during the process.

Subscribers to CyberTower explore topics with Cornell faculty experts through multimedia lectures, presented in a format called a "study room." Each study room is a self-contained mini-course. Faculty present their content via a streaming video lecture that is divided into sections, each a maximum of 12-14 minutes in length. The lecture format is one with which faculty are familiar and comfortable, making entry into this new method of teaching easier. Each video is accompanied by synchronized visuals to the right of the video (see figure). These visuals can be still images, graphics, bullet points, text, or animations that illustrate the content.

Each room has several additional supplementary sections. The Images section allows viewers to explore in more detail the images they saw in the lecture. The References and Links sections provide both print and Web-based resources that have been reviewed and recommended by the faculty, which viewers can use on their own to continue their study of the topic. The Discussion section of the room allows viewers to ask questions of the faculty, make comments, or talk about the topic of the room with other CyberTower participants. The discussion can be a vehicle for building a community of learners who share an interest and have direct access to the faculty. A final open-ended section can be adapted to the needs of the room; this section has been used most commonly as a timeline, a map, or a glossary of terms.

We have also enhanced the original instructional design model with a second lower-investment alternative called "forums." A forum is a videotaped talk-show-style interview, lasting approximately one hour, on the faculty member's area of expertise. The forum is recorded live in a studio, eliminating the need for video post-production. A single Web page presents the content of the forum, including the streaming video interview, a description of the topic, a brief biography of the faculty member, several recommended Web or print references, and a link to a discussion board for questions or comments for the faculty.



The Content Production Process: Making It Scalable

CyberTower content is produced at a very rapid pace. Ten new study rooms and eight new forums are scheduled to launch each year. How do you go about producing new content at a rapid pace while at the same time maintaining an ever-growing body of existing content? For us, the keys to scalability have been the instructional design model that is well defined, a development team that is very small, and a production process that has well-defined stages.

Each CyberTower room is assigned a room producer. All of our room producers are instructional designers and also have extensive experience with project management. The room producer partners with the faculty member from beginning to end, filling the roles of project manager, instructional designer, and video producer. Having one person fill multiple roles has many advantages; room production time is reduced because the person is very familiar with the content, and it also increases the faculty's sense of having a "partner" in the process, someone who is equally invested in the work as they are. Our infrastructure also allows the room producers to build the room using relatively simple Web and QuickTime authoring tools.

One audio/video professional on staff works on all CyberTower study rooms. The video professional must be very flexible in his or her approach to producing video; for example, some faculty will wish to script the lecture word for word, while others will speak comfortably from bullet points. . At Cornell, most faculty have never taught on video and have no experience in front of a camera. We shoot on location and only do productions that can be accomplished with a single camera to make the process less intimidating. We schedule a brief rehearsal with the camera several days before the shoot, and review the resulting footage with the faculty so they can be more comfortable with their on-camera presence.

Other contributors include a graphic designer to develop the room banners and navigation graphics, and student employees who assist with image scanning and preparation, creation of animations and illustrations, and data entry. If the faculty member wishes, they can hire a student who will be paid by the project to help locate supplementary Web and print materials. Librarians are also a valuable resource in this stage. Throughout, it is important to keep the faculty in the content expert role during the development process. The content is their specialty; everything else is likely to be new to them.

Once the faculty member has finished writing the lecture, production of a room takes approximately three months. The first month is focused on recording the video, the second month on editing the video and preparing related materials, and the third month on synchronizing the visuals with the lecture and building the room itself.

It is also important to respect and acknowledge the faculty's other time commitments. We take a realistic look at the faculty's calendar before room production starts and stress the impact of missed deadlines. The room producer needs to be an aggressive project coordinator, putting meetings on the faculty's calendar well in advance, keeping the faculty moving forward, recognizing the faculty's working style early on and taking an active role in shaping the content of the room.

CyberTower is not the only development project our ID&P group must manage, and we had to figure out how to juggle CyberTower with existing and new faculty development projects. .We have made it a goal to maintain a rigorous and regular production schedule so that we can plan this production work in with other projects. This is a goal toward which we are still working. We have learned that we need to recruit faculty far in advance – even years before work will begin. We need to recruit faculty in larger batches, and wherever possible, we need to have more content "in the works" than is on the production schedule, because faculty will delay and gaps in production will result. Toward this end, the CyberTower project leader oversees all room production, assists CAU in recruiting new faculty, develops and monitors the room production schedule, and coordinates room production with the overall ID&P production manager.

Copyright remains a significant challenge to the project. We encourage the faculty to use copyright-free materials or materials they own in their room. Room producers collect source information on all materials from the faculty, and enter the information into a shared database. Staff at CAU work in collaboration with librarians to identify copyright holders and request permission. A newly formed Copyright Advisory Committee comprised of librarians and lawyers from University Counsel's Office make legal recommendations when needed. However, the number and complexity of the copyright issues arising from CyberTower continue to grow, and clearances often take long periods of time to obtain.

The Infrastructure: Making It Sustainable

Long-term sustainability of any distributed learning application depends on having a scalable infrastructure to store and deliver content. CyberTower was originally developed using a combination of static Web pages, Microsoft Access, and Active Server Pages (ASP). However, we knew this infrastructure would not scale to large numbers of users or large numbers of study rooms; maintenance of the content would become increasingly time-intensive, and performance of the application would degrade over time. We therefore redesigned and redeveloped CyberTower's infrastructure from the ground up using Java and Oracle. Again, the use of a consistent instructional design model enabled us to make the site dynamic and almost completely database-driven. Over a period of about nine months, one lead Java developer worked closely with a code review team to design and build the database and code structures. This new cross-organizational collaboration was a valuable professional development opportunity for all involved, from the lead developer still early in his career to the most seasoned Java programmer on staff.

Though the up-front investment was significant, the benefits to building this infrastructure are numerous. The process of building rooms has been greatly streamlined, cutting down greatly on room production time. We knew that in the old infrastructure, maintaining 30, 40, or 50 study rooms would have become very time-consuming. Now, maintenance of the growing body of content is practical since there is no longer duplication of content in static Web pages. The new infrastructure is robust and scalable; it will support far more simultaneous users than we ever expect to have. The application was designed to maximize performance, so the user's Web browsing experience is much faster and much improved. The old infrastructure also represented aging technologies in which our organization had no existing expertise; the cost of developing this expertise for a single application would have been significant.

Content storage is not the only infrastructure required to offer an online distance learning product. Just as critical is providing online registration and account management. Today's distance learning audience expects instant e-commerce access to offerings, and the system will not be scalable if staff have to be involved in this never-ending administrative function. In our case, we were able to tie into CAU's existing online registration system, making CyberTower one "course" in our School of Continuing Educations' offerings. The School's technical staff collaborate with CIT to enhance the registration system as needed.

One notable lesson learned was that there are often multiple acceptable solutions to technical problems. A critical juncture in the infrastructure redesign was choosing between MySQL and Oracle for a database. For us, the choice was more of a resource one than a technical one, since by using Oracle we can purchase database administration services from the group that specializes in this work. Another example of such a choice is the streaming video technology being used. Though CyberTower is currently committed to QuickTime streaming, we must keep abreast of technology developments and periodically re-evaluate that choice. Junctures such as this illustrate the need for an overall project leader who can oversee the process, facilitate collaborations among different groups, develop the infrastructure production schedule, and set criteria by which technical solutions will be chosen.

User Support: Finding an Appropriate Model

CyberTower has a potentially huge audience of users with a very wide range of computer hardware and level of comfort with the technology. Before launching to the general public, we opened the product to about 150 alumni who had volunteered to be beta testers. All participants received a Getting Started packet in the mail with instructions for setting up their computers. We established a dedicated phone line and a special email address, both monitored by talented student employees, similar to our Helpdesk for Cornell's residential students. It quickly became apparent that such dedicated support was not necessary; the bulk of the questions came in the first couple of weeks and reduced to almost none thereafter. The nature of the application was that users needed help when they first subscribed, but not afterwards.

When we launched to the general public in the summer of 2001, we modified our user support model based on our pilot experience. We eliminated phone support but kept the email address, and folded the monitoring of that address into the standard procedures of our residential Helpdesk. From that experience, we learned that case resolution time became extremely lengthy; users would often take many days or weeks to reply that a proposed solution had or had not worked for them. We were unable to help users "in the moment" that they were having the problem, and the product is not of such a pressing nature (i.e. not for credit) that the client is likely to follow through to a solution. These two factors combined to create a client perception that the product does not work.

In response to this experience, we reinstated phone contact, but rather than set up a dedicated line, CyberTower became one of the many products supported through our residential Helpdesk's main phone line. The immediacy of phone support provides better service to those who need it, and perhaps more importantly, *client perception* of better service. We continue to monitor case resolution times and demand for user support as the number of subscriptions rises, and expect to modify the model further to better accommodate user expectations and needs.

After the general launch to the public, we received feedback from potential subscribers that they did not want to pay for a subscription until they knew whether their computer hardware and network connection would deliver the application satisfactorily. In response to this feedback, we implemented an automated sign-up for a free three-day trial subscription. The trial allows users complete access to the application along with access to our user support helpdesk, so they can know their computer will deliver CyberTower before paying the yearly fee.

University-Wide Collaborations: Don't Go It Alone

Very early in the development of CyberTower, we realized that the project's stakeholders represented many organizations across the University. Looking beyond our central IT organization for partners and forging new relationships has brought wide acceptance of CyberTower and a sense of mutual investment in the project. CAU owns and promotes the product, maintains the registration system, and recruits faculty. CIT supports the infrastructure and works directly with faculty to produce the content. Cornell University Libraries assist with content research and copyright concerns. Media Services, a video production service on campus, produces the multi-camera live-switched video for forums. University Counsel provides legal guidance for copyright concerns. And of course, the faculty themselves provide the content for the site. Forging new relationships among so many stakeholders has offered long-term benefits which extend far beyond the CyberTower project. For example, a new committee on copyright concerns at Cornell was formed partly due to the new demand for clearances generated by CyberTower.

Just as challenging was establishing brand new working and financial relationships between different areas within CIT. In order to obtain all the necessary technical expertise, staff were drawn from four separate divisions:

1. Distributed Learning Services (Academic Technology Center): Project management, instructional design, single-camera video production, lead Java developer, content production
2. Integration and Delivery (Administrative Systems): Java code design and review team, Oracle database development and administration, QuickTime streaming server administration
3. Customer Services and Marketing: online and paper documentation, user support
4. Systems and Operations: NT and UNIX systems configuration, hardware specifications and standards

These working relationships continue to evolve and reappear in other instructional technology projects managed by the Academic Technology Center.

Biographical Sketch

Diane Kubarek is a project leader and instructional designer with Cornell Information Technology's Academic Technology Center, the central support organization for faculty using technology in teaching. In addition to leading CyberTower, she consults with faculty on various instructional technology projects. She assists in designing curriculum and teaching hands-on workshops for faculty. Recently she led an evaluation of online testing software products for possible implementation campus-wide.

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Retail Data Mart Online Course: "The First-Best Online Training Experience"

Nancy Laich, USPS
Executive Program Director,
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Gail Breed
Operations Specialist
USPS Field Operations Standardization Implementation

Background

With the introduction of the Retail Data Mart (RDM), the Postal Service can use Point-of-Service One data to track and analyze customer preferences and purchasing trends. Data transfers on a daily basis from the terminals at the post offices to the Retail Data Mart where reports are available for access by managers in these offices.

Prior to November 21, 2001 training on the Retail Data Mart (RDM) was conducted in a classroom setting using contracted instructors. About 30% of those trained in this traditional method used the available reports. Retail Workforce Strategies (RWS) led by Nancy Laich, was tasked to produce an online self-study course so that the costs associated with travel and replacement hours could be saved.

The benefits of online training include:

- ❖ Elimination of travel and employee replacement costs
- ❖ Immediate testing of knowledge
- ❖ Working at one's own pace within a reasonable timeframe
- ❖ Voice Of the Employee (VOE) training hours credit

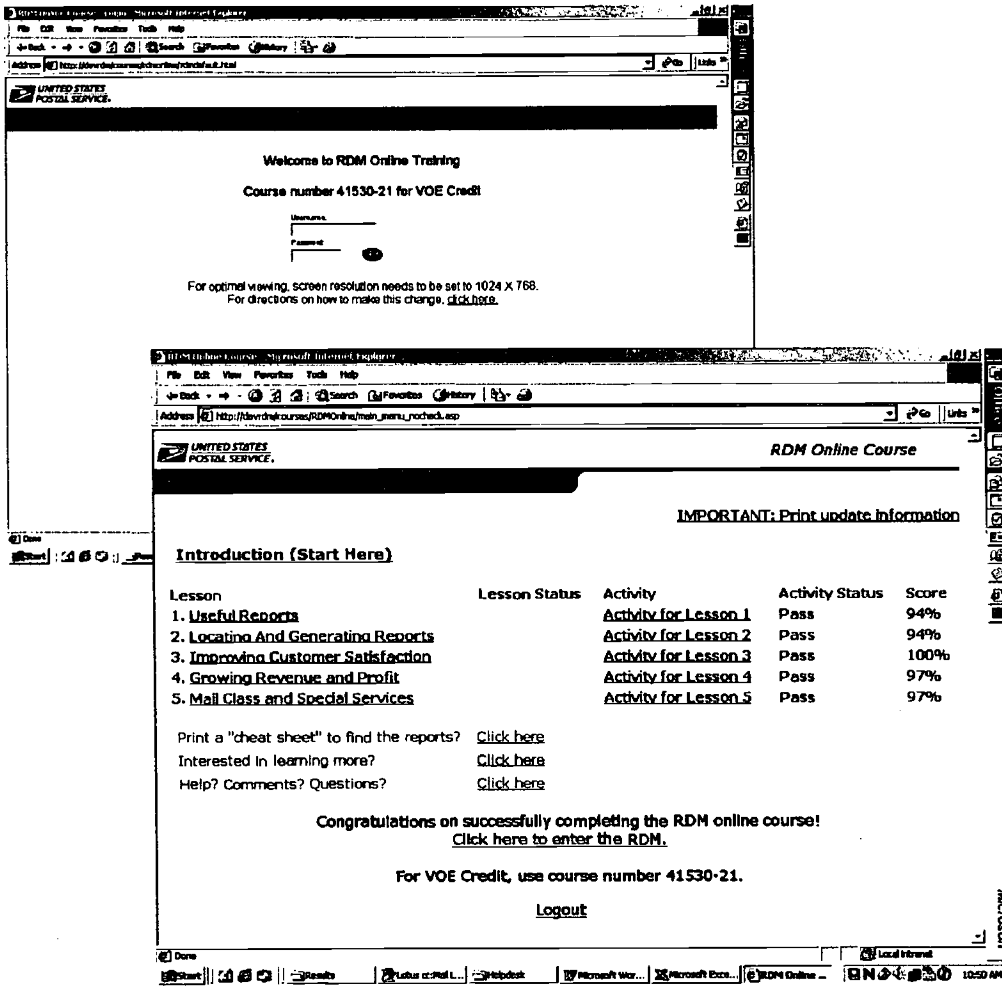
Pilot Results

The Pilot and Goal

The RDM Online Course was piloted beginning November 21,2001 with 263 registrants from six different geographical areas. They were ready to test the effectiveness of the end-to-end development and implementation of online training for the Retail Data Mart (RDM). They were accessing a completely new system for automated registration with course access 24 hours a day-7 days per week that included an automated course scoring and certification. This is a first for USPS. Eight different groups of people coordinated in this work to go from concept to implementation. These included 4 postal groups (RDM Program Office, Retail Workforce Strategies, and Information Technology) and 4 contractor groups (NCR, MicroStrategy, Zerone and Northrop Grumman Information Technology).

The goal of the training was to enable each participant to be ready to generate and use RDM reports in the workplace to address one or more of the following strategic retail goals:

- ❖ Remove low-value transactions from the window (stamps only)
- ❖ Identify revenue opportunities such as value-added sales the manager can influence and
- ❖ Identify how the work budget can be more effectively manipulated against actual workload.



The Results

Delivering this training via the web, as opposed to the classroom has resulted in cost savings estimated at $1.5 million. Reduction over classroom costs exceeded 85%.
The online course templates are re-usable for other Postal courses at less cost than a completely new development

- ❖ The current 103 graduates of the course have tested successful in the techniques and business-related problem solving with an average score of 94%.
- ❖ 70% of the graduates are accessing the RDM.
- ❖ This first best experience with online learning is an enterprise wide change management application for postal operations

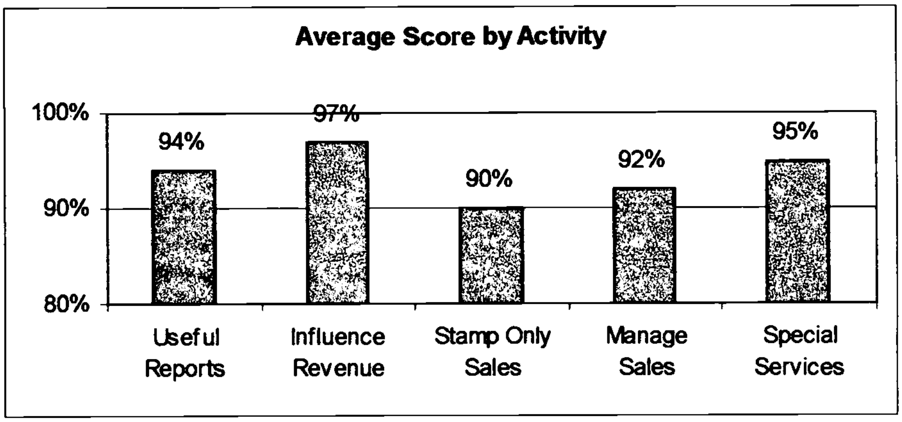
Who's Who: The Population Demographics

One hundred seventy people registered to take the course with 103 completing the course. Of those who completed the course and accessed the RDM, 72% accessed it on the same day they graduated from the course.

While the course was designed with business scenarios for Postmasters and Supervisors, a wide variety of USPS employees took the course to learn the techniques required to access reports from the Retail Data Mart. For example, employees from the Inspection Service, and various groups within Retail and Customer Services requested to participate. Several other groups had a single student, as in the case of an Information Specialist Technician, Manager of Operations Support, secretary and a letter carrier.

Test Scoring

In addition to the lessons, the activities were designed to include a business-related scenario using a particular report. For example, lesson three teaches to the Stamps Only Report and controlling inventory. The corresponding activity tests the user knowledge and skills in the techniques as well as the business application of the reports found in the Retail Data Mart.



These successful scores by the graduates demonstrate a high level of understanding of the use of the reports available within the RDM. No longer is there training for its own sake, but measurable data related to the training can be tracked between on the job performance and the teachings from the course.

You may now be asking if there was any real deviation, the average participants completed well above the passing rate of 75%, as a matter of fact the average score for all activities was 94%. The standard deviation is .035.

Days to Completion

Now that we know who's who and how well they scored, the next question was how quickly they completed the course. The postal inspectors were treated as a group while everyone else was grouped by area location. This distinction was made because the postal inspectors are currently the single greatest users of the Retail Data Mart.

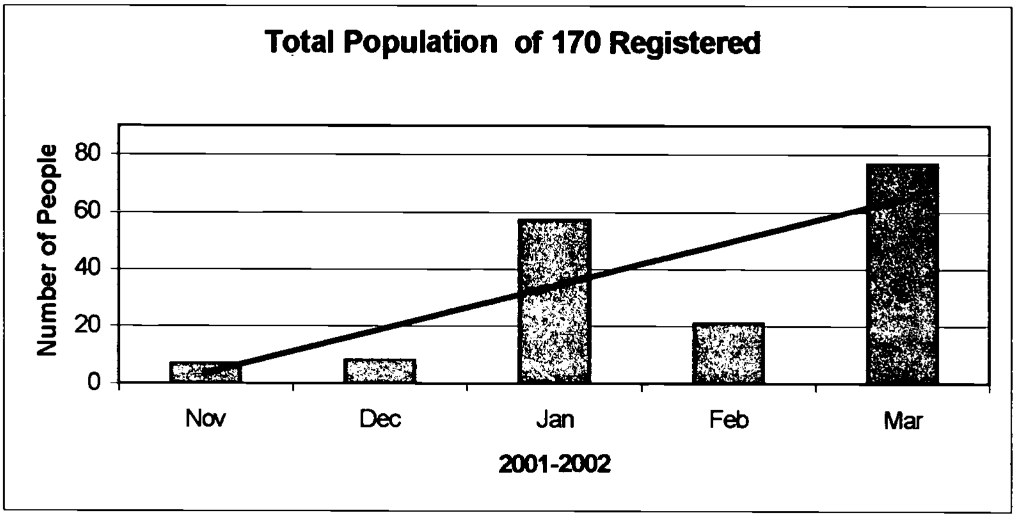
On average, a participant registered and then completed the course over 18 days. However, 19% of the time, these graduates registered and completed the course within one day.
When the data was charted, the trend lines are identical, indicating no difference in the number of days each group spent in the training.

Communications and Registration

Interest in registration was driven by several variables:

1. Timely and regular messaging to each area about status of enrollment
2. Providing certificates of completion to graduates
3. Establishing an end date to registration and completion

Below you will see the big picture of total registration for the pilot.



Several key messages occurred over the course of the pilot. The first was the "Go Message" sent 11/21/01 to the area coordinators notifying them about the process to register via the web site for e1357.

The next key message occurred on 12/10 announcing the first three graduates of the RDM Online Course.

Biweekly status reports began in 1/14/02 and provided details on which people for a given area had registered and completed the course.

Certificates of completion were also sent for the remainder of the pilot, until its conclusion.

The final message on 3/19/02 included the announcement about ending the pilot on 3/22/02 along with the status update.

Testimonials

These are the testimonials from the graduates of the online learning regarding to how this online course positively affected job performance.

- Like, Ed, I think the data is excellent to be used by each PM nearly weekly or at a minimum each AP. For us it is a mother lode vein for finding out days, times and volumes of products sold—such as Express Mail—if I am correct we could even find out the destinations of the pieces.
- The training on-line is very effective—much more so than in a classroom without hands-on training. Because it is self-paced and can be done in your office you learn more. Also, the on-line training is available always—so if you need a refresher you can retake a short module to find the reports you need.

- ❖ Susan took the first training without the on-line course and said she learned more through the on-line course.
- ❖ The course was created with Postmaster input throughout to make it easy to use, quick and continuously available. They even made it easy to figure out which reports would be of more value for Postmasters and be able to store their own canned reports so they can just pull them without setting it up again.
- ❖ The course is very practical. It allows the trainee to learn at his/her pace. I appreciate the consideration built into the program that makes a reasonable allowance for those who have difficulty taking tests.
- ❖ More training and certification should be offered in this web-based format. The program allows the user to open the course at any time that is most convenient.
- ❖ The RDM format allows users to learn how to manage and set up strategies to get the best results out of existing data. No data outlet that I am aware of allows the user this benefit.
- ❖ The RDM course format should be the standard by which all other data outlets are designed, and all should be accessible from one Web location.
- ❖ I am a secretary just pulling reports for the Postmaster, so it hasn't affected me, but I can certainly see how the reports could help managers & supervisors, particularly in defining which sales associates are selling which products better and in seeing how many transactions an SSA handles compared to their peers.
- ❖ I really haven't had a lot of time to search around on the RDM to see how it has helped. I think that it will be good for me to spend some time and play around with it a bit to see exactly what useful information there is.
- ❖ The CBT RDM course was excellent. I really liked the on line cheat sheet. This simple handout gives a good definition of the reports and a drill path. The basic reports are an excellent starting point for field users. Thank you for letting me take this course. I would encourage others to do so.
- ❖ Though I haven't had a lot of time to take advantage of this new (to me anyway) source for useful information, I can see it being a helpful tool to research many different types of retail data.
- ❖ The Online Course provided a refresher on the various reports available in RDM. I believe this is an excellent way to update the field as enhancements are made to RDM. Additionally, when HQs identifies certain reports everyone should be using, they could provide CBT explaining the report and how to access it, the path to use. This is a great tool to use in support of the RDM.
- ❖ There is so much information to be obtained from the Retail Data Mart. I know that this will be an invaluable asset to future retail planning in our office.

Biographical Sketches

Nancy Laich is an executive program director with the United States Postal Service in Employee Resource Management. In her current position she is responsible for the implementation of process redesign and system configuration of and Enterprise Resource Planning system for all human resource functions. This effort will impact almost 1 million career and temporary postal employees. In her former position as Manager, Retail Workforce Strategies, Nancy worked with a team to design a process using distance learning that is covered in this workshop.

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Gail Breed is an operations specialist with the United States Postal Service in Field Operations Standardization Implementation. Ms. Breed is responsible for the design, development and implementation of an online course for processing operations. Ms. Breed has an undergraduate degree from James Madison University and began working in the USPS in 1989. She has demonstrated exceptional organizational and managerial skills which have resulted in increasing levels of responsibility with projects of nationwide scope.

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Learning by "Doing" and "Experiencing": A Success Story

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Learning by "doing" and "experiencing" is a lot more feasible and productive when highly interactive learning technologies are well integrated into the curriculum. This paper describes the background, design and delivery, and outcomes of the Summer Institute of Instructional Technology held last summer (2001) at the University of Minnesota, Crookston. The intent of this paper is to share the rewarding experience in using a constructivist learning approach in conjunction with technology modeling to train selected faculty from Singapore and Minnesota to be certified professionals in instructional technology.

Background

Origin

After giving a keynote address at a national symposium on technology in Singapore in September, 2000, the author was asked to find some technology integration courses to help train some 60 Educational Technology Champions from among 1200 educators at the Institute of Technical Education (ITE) of Singapore. The Institute enrolled about 18,000 students each year. The administration of the Institute was embarking on a 5-year technology master plan to provide web-based learning for on-campus and off-campus students in Singapore. The proposed 60 trained Educational Technology Champions would be the critical core group helping to train the entire faculty to adopt and develop online courseware. Since the administration of the Institute wanted to emulate the philosophy, instructional design, and technology integration model at the University of Minnesota, Crookston (UMC), the author proposed the concept of the Summer Institute of Instructional Technology to be held at UMC. At the end of the training period, the participants who successfully completed the course requirements would receive the Instructional Technology Certification from UMC.

Rationale and Concept

The concept of a Summer Institute of Instructional Technology was conceived to meet the proposed needs and requirements for training selected faculty to become educational technology champions for both Singapore and Minnesota. The main rationale for conducting the summer institute was to train a core group of "trainer" educators who will in turn help train other educators to integrate technology into the teaching curriculum. An onsite hands-on training of 5 weeks during summer on instructional design, development, and technology integration would provide the participants a total "immersion" of industry standard and emerging instructional technologies. Completing all course assignments, projects, and other requirement online and at a distance would provide the participants the authentic experience of learning, managing, troubleshooting, and interacting in a "faceless" environment.

Planning

The process of organizing and preparing for the summer institute took about 6 months. Content analysis was conducted among Singapore and Minnesota participants. The selected course contents were integrated into 6 courses: Introduction to Instructional Technology, Instructional Design & Development, Graphics & Interface Design for Courseware, Courseware Development & Management, Computer-based Instructions & Training, and Curriculum Integration of Technology. A thorough learner analysis was conducted among the participants and their background, experience, motivation, and reading level were taken into considerations in designing and developing the courses. The logistics of providing laptops, software, logins, and WebCT setup took about a week to complete for all participants.

Philosophical Framework

The underlying philosophical framework for the Summer Institute of Instructional Technology was using a constructivist learning environment to help participants apply technology integration and develop authentic and well integrated learning objects. A "guided" constructivist learning environment transformed "the role of the learner from receiver (classic, communications conception of learners) to producer, creator, and sender" (Jonassen, 2000, p. 24). The major learning outcomes of courses were to empower the participants to create technology-based learning products that were authentic and had strong contextual integration.

Modeling of technology integration was a vital component of designing the summer institute courses. The intent of the author was that the participants would emulate the use of highly interactive technologies demonstrated and experienced throughout the duration of the courses. Jonassen (2000) pointed out that when technology is used as a constructivist learning tool, it "can help to transform learning and learners-to help them to become independent, self-regulated, life-long seekers and constructors of knowledge" (p. 25). Participants were expected to be responsible for constructing their own learning experiences and development using the learning opportunities, collaboration with peers, technology resources, facilitation, support provided by the instructor. de Caprariis (2000) noted that "Jonassen's point—that students who take charge of their own education, who are no longer assimilating 'canned' instruction, and are thus able to construct their own version of reality—s worth considering" (p 41).

Design and Delivery

Interactivity: "Doing"

Although this Chinese saying "What I hear, I forget; what I see, I remember; what I do, I understand" has been widely quoted, the concept still challenges most educators in making learning interactive for students. What mesmerizes millions of young people around the world about video games is its high degree of interactivity. When some interactivity is introduced to an absolutely passive lecture, students become more interested in the content presented. The key of making education interactive is providing students with more learner control.

The design of the Summer Institute of Instructional Technology courses followed a formula of 30% passive content and 70% interactive (application) content. The 70% interactive content consisted of interactive simulations, job aids, practice, reviews, and self-assessment. Providing creative feedback in interactive application content was vital in motivating students and reinforcing content retention. The participants found the interactive applications motivating, easy to follow, easy to comprehend, and most importantly, achieving better retention of what they were learning.

Participants at the Summer Institute of Instructional Technology learned by doing interactive practice and reviews (to learn intellectual content), interactive simulations (to learn skills and techniques), handy job aids (to perform specific tasks), interactive learning games (to help retain difficult or complex content), and hands-on creation of learning applications. Presentation content and instructions were presented in small chunks (in HTML and PowerPoint) to guide participants in doing the interactive and hands-on activities. Figure 1 is an example of an interactive practice/review (drag and drop application) to help participants learn the criteria of determining whether to use CBI/'CBT or group instruction. Figure 2 is a

Flash learning game designed for the participants to learn and remember the terms and concepts used in the third course: Graphics and Interface Design for Courseware. Figure 3 is an interactive simulation for prioritizing learning tasks.

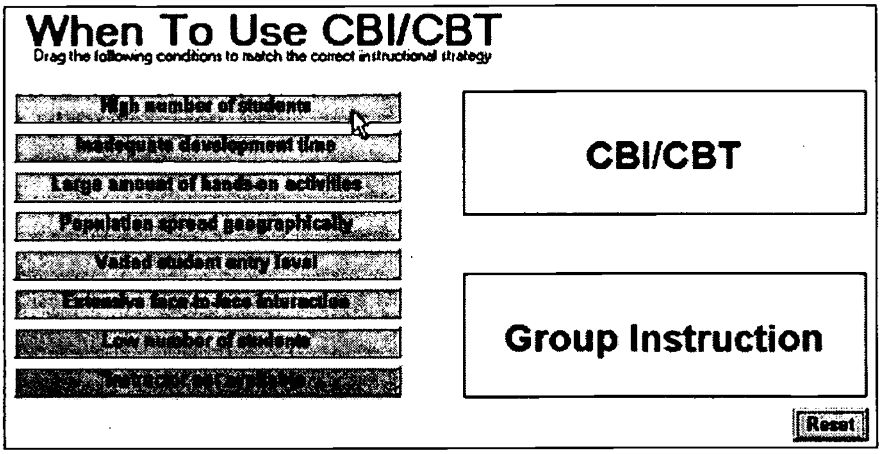

Figure 1

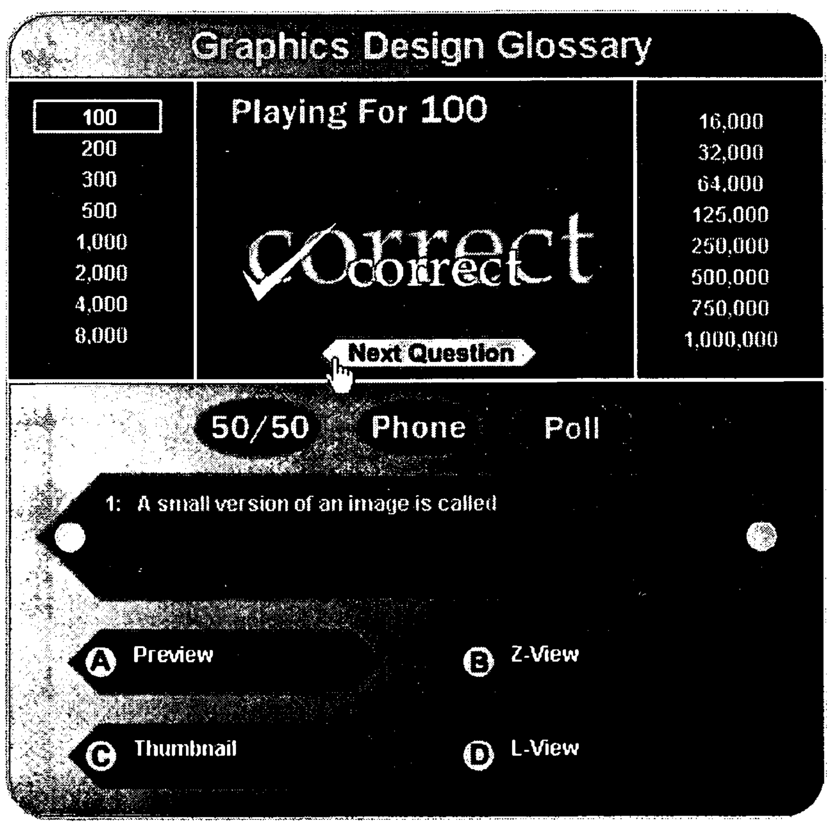

Figure 2

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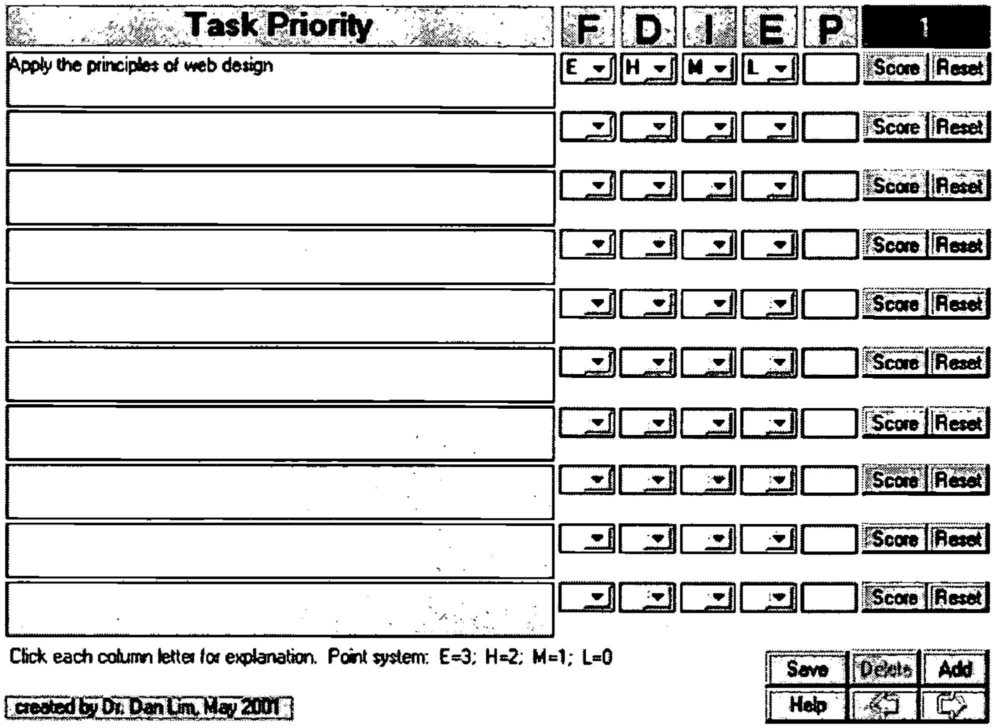

Figure 3

Modeling : "Catching"

There are two important reasons why technology integration should be modeled in teacher technology training courses. Firstly, the nature of the program, which is instructional technology, requires a certain degree of technology integration. It is more effective to convince the participants to integrate technology into their teaching when they see and experience a high degree of technology integration themselves. When they are excited by the high degree of technology integration, they are more likely to use technology when they return to the classroom. Secondly, students tend to teach the way they are taught. Modeling technology in the courses will subtly help them carry it over to their teaching career. Compelling software, highly interactive web-based technologies, and collaborative learning systems were integrated into the courses. Technology modeling was implemented through the use of Toolbook Instructor, Macromedia Flash, Adobe PhotoShop, Adobe Illustrator, Webcrossing, WebCT, and other software. The author used these compelling software to provide participants with compelling visuals and interface, interactive learning objects, and a single convenient interface for all courses.

Constructivism: "Experiencing"

As most learners learn constructively with most hands-on tasks, it makes sense to create a constructivist learning environment for all courses in the Summer Institute of Instructional Technology. During the onsite hands-on classes, participants practiced using various software to create learning applications. Visual tutorials and virtual labs were provided to help participants to self-learn or review. When participants completed all projects and course requirements, they would have had "experienced" technology integration in a constructivist learning environment by being in the program, practice, creating, troubleshooting, and producing interactive learning products for their students. During the 6 months of distance and online learning, participants actively discuss in WebCT bulletin boards answering questions posted by the instructor and exchange views with fellow participants. They posted daily (5 times per week) logs documenting their struggle, progress, troubleshooting, and reflections. It was very rewarding to see fellow participants responding to each other's logs affirming ideas and helping each other out.

Outcomes

Observations

The author observed a great change of attitude towards the constructivist learning approach, especially among the Singaporean participants who claimed that constructivism would never work in Singapore. Throughout the duration of the distance mode of learning, participants became more self-reliant in using and troubleshooting technology. As all course projects were derived from their workplace, all participants had used what they created in at least one class. The most exciting part was evaluating the reusable learning objects they created. Many went beyond the instructor's expectations. Another exhilarating moment was seeing participants emulating the way technology was modeled in their course projects and teaching experience, especially online teaching. There were several downsides: technical support was not adequate for Singapore participants; a variety of examples (for various disciplines) was not available; six months could not do justice to the required course projects. Here are some excerpts from the daily logs of the participants:

Sample Excerpts From Daily Logs

"One of Dr. Lim's assignments was to write a paper on what we had learned as constructivist online educators. My paper was accepted for a national conference."

"The good news is that I have made progress and my progress is documented by my class journaling (a very good thing to use in any class). I smile as I continue to search for that pot of gold at the end of the rainbow. I feel a little like Dorothy, from *The Wizard of Oz*, taking one step at a time on the yellow brick road journeying toward the wizardly wisdom of ITC."

"I did a kind of 'soul searching' after reading Dr. Dan's reply. What struck me most was the phrase 'learning context' mentioned. I had another look at my task analysis and task structure plan and finally managed to come up with not one but six learning frames for my first subtask of my first LO (learning object) … As usual there was an initial struggle. I did not seem to know where I was heading until my wife pointed out that our son was not learning his spelling. It struck me that he was not enjoying the normal practice of rote learning. I devised a simple game of matching, words scrambling, word arrangement and fill-in the blanks of spelling words. They were the same words put in different 'situations.' I began to appreciate the need to 'overteach.' In no time my son was able to learn his spelling well. When I started to work on learning frames for the first subtask, I realized the need for a 'learning context' in my CBI development."

"Browsed the content put up by <deleted> in ITC540. Attempted some of his quizzes and tests. It was interesting and exciting going through the course. <Deleted> has done a good job in ensuring that the students stay on his course. Well done, <deleted>. Hopefully I can create a module as excellent as his."

"Prepared answers for the questions posted in the discussions. Questions in the discussion were very useful for me to recap and reflect on my personal experiences and thoughts while going through the module."

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Biographical Sketch

Dr. Dan Lim is the Assistant Professor of Information Technology Management and the Director of Instructional Technology Center at the University of Minnesota, Crookston. A certified instructional designer, he is a frequent presenter and speaker at national and international technology conferences in North America, Asia, Europe, Australia, and South America. He has published in the areas of paperless learning, constructivist learning, interactive learning games, technology cultural change, and ubiquitous laptop computing. His most recent research and development is the creation of an academic gaming portal where educators from around the world can create Flash learning games. He has taught computer courses at the University of Minnesota, Crookston and instructional design graduate courses at University of North Dakota.

Providing Direct Service Distance Education to Students With Disabilities.

Lori Magnuson, M.A.
Training Specialist
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Western Washington University

Conrad Kuehn, M.A.
Technical Specialist
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Introduction

In October 2000, the Center for Continuing Education in Rehabilitation (CCER) at Western Washington University began a distance-education based program funded through the United States Department of Education Rehabilitation Services Administration to prepare people with disabilities for careers in the human services field as **Direct Service Professionals.** Over the five year period of the Direct Service Professional (DSP) Project, we anticipate an impact at three levels: 1) assisting 100 individuals with disabilities in becoming employed as Direct Service Professionals (DSPs), including self-employment if desired; 2) assisting 400 other individuals with disabilities and other needs to develop and implement employment and/or independent living goals through the efforts of the CCER-trained DSPs; and 3) incorporating the DSP service option into the activities of state and Native American VR agencies, one-stop career centers, and other disability service agencies. The training curriculum, student marketing strategies, and DSP employment approaches will be disseminated nationally.

The disability community is a large part of the total population. According to 2000 data from the U.S. Census Bureau, there are 22.2 million people with disabilities of working age in the U.S. Despite efforts to bring people with disabilities into the mainstream of education with IDEA (Individuals with Disabilities Education Act) and the mainstream of the workforce with the ADA (Americans with Disabilities Act), more than half (51.3 percent) of these individuals are unemployed.

People with disabilities are particularly underrepresented in professional occupations, including human services. This five-year demonstration grant was designed to explore distance education as a method of bringing applied, career-focused education to people with significant disabilities, particularly individuals from communities of color and from rural areas with limited access to training and educational opportunities. The lessons learned from the project are applicable to any distance education program concerned with providing access and support to students with disabilities, and other non-traditional populations.

Several challenges were encountered in the educational design for this project. The content, materials, and approaches had to be designed for students with on-line experience that varied from no experience to expert; and academic experience ranging from high school to the graduate level. All the students have single or multiple disabilities such as quadriplegia, blindness, hearing impairment, mental illness, learning disabilities, and other barriers that challenge major life activities. Through the Internet-based course work, amplified with six days of on-site training; conference calls; and intensive, individualized technological and content support; students learn both the technical and soft skills needed to be successful in a human services career.

Our target population is modeled to be rural and serve communities of color and others without access to instructional facilities, or with other educational access problems. Included in the two cohorts of students to date are 19 females, 14 males, 13 from rural areas, 8 from small towns, 11 from large cities. Five students are Native American. Disabilities include: hypothyroidism, Bipolar disorder; orthopedic impairments; drug and alcohol addiction, degenerative joint disorder; vision impairment, schizophrenia; explosive disorder; generalized anxiety disorder; paranoia, depression, Attention deficit disorder, quadriplegia, brain injury, carpal tunnel, joint degeneration, hard of hearing, Fetal alcohol effect, schizo-affective disorder, Crone's syndrome, fibromyalgia, specific learning disabilities.

The Project

The project crystallized into two main categories. The first was the design of the instructional product. The second is the technology needed to deliver the instructional product. The common denominator in the design of this program was to reach an audience that would run the gamut from skilled and technically experienced to unskilled and a non-technical penchant. Two cohorts have been completed and two more are in the recruiting stages with a total of six cohorts planned.

Instructional Approach

The instructional approach is to find a general methodology that allows the students to fins a way to learn, share their learning and to find a sense of community amongst their fellow students. Two aspects have become the focal points of the program. The first is the face-to-face meeting and the second is the extensive use of the asynchronous discussion group.

Two face-to-face meetings are designed with the first to take place after the students receive their technology and before the first Internet-based courses lessons begin. In this three-day session held in a central location to the area covered by the students (First Oregon-Eugene, Second Alaska-Anchorage) the emphasis is on project overview, technology training, and community building.

The second face-to-face takes place before the two final Internet-based courses. This is held in the same location as the first and the emphasis is on further community building, internship and employment search skills. Panels of employers and human service providers are available for information and discussion. Interview techniques and practice are also provided.

Asynchronous discussion groups are formed and become the main platform for learning. Assignments are posted, and students are required to submit homework assignments as new threads in the discussion board and student comments and replies are required. This discussion process is the main exercise of learning in the online environment.

The curriculum was developed by the project staff and is constantly being updated and modified. The third cohort will be a Native American group, and Native consultants were brought in to review and advise on curriculum modifications. Constant feedback is elicited from the participants to facilitate the curriculum modifications.

In addition to the curriculum materials developed by project staff, we are using the text *Human Services? That Must Be So Rewarding,* by Julia Bernstein. We are also using *Disability Handbook* by the Department of Rehabilitation Education and Research at the University of Arkansas as a text for the course on Disability Information and Resources. A number of elective courses are offered in collaboration with the Continuing Education Center at the University of Wisconsin-Stout.

Original Courses and Order	Current Courses and Order
Month 1: 1. Principles and Practices of Effective Communication 2. Principles and Values of Informed Choice	**Month 1 (includes on-site days):** 1. Developing Relationships (title change - content is the same) 2. On Being a Direct Service Professional (title change from *Self and Client Advocacy*- content is the same; order change from third to first month)
Month 2: 3. Understanding Disability Information and Resources 4. Role of Family and Support Systems in the Rehabilitation Process	**Month 2:** 3. Understanding Disability Information and Resources 4. Principles and Values of Informed Choice
Month 3 5. Self and Client Advocacy 6. Cultural Diversity	**Month 3:** 5. The Role of Families and Support Systems in the Rehabilitation Process 6. Cultural Diversity
Month 4 7. Negotiation and Conflict Resolution 8. Group Facilitation	**Month 4 (includes on-site days):** 7. Negotiation and Problem Solving (title change; content is the same) 8. Group Facilitation
Month 5: 9. Community Resources 10. The Role of the PRC: Working with Professionals and Other Support Personnel in Organizations	**Month 5:** 9. Federal, State, and Community Resources 10. Working with Professionals and Other Support Personnel in Organizations

In addition to completing the ten core courses, students complete 120 hours of work experience as direct service professionals in their local communities.

Technology

This aspect of the project has presented many challenges. Our commitment was to bring Internet training to anyone in the targeted region or state who fit within the criteria of the grant. The only barrier directly related to technology would be the ability to have Internet access in the individual student's home. The technology requirements are a 28k modem or better, a computer with Internet Explorer, and the ability to use the Blackboard course presentation courseware. This eliminated some online services such as AOL, though with version 5 of BlackBoard, compatibility has improved. The last requirement was some type of word processing program for ease of posting to the discussion group. If Microsoft Word was not available, a free text editor such as NoteTab was used.

The students are contacted by the technology specialist to determine their technology status and needs. The project technologist who trains and set up the workstations at the participant's houses visits most of the students who do not have computers. This enables him to determine the skills and need levels of the students in their home contexts. The technologist also supplies ongoing help services throughout the duration of the Internet courses.

The technology survey is given on-line or by phone or in person if necessary. For the initial cohort, nine computers were purchased and eight were delivered. The skill levels for the first cohort were: three students who had never used computers, four who had modest computer skills, and one student with good experience and skills. Some students needed Internet access, while two others needed either partial equipment or upgrades on some of their existing equipment.

Students with no computers or computers with obsolescent technology were supplied with loaned computers and printers for the duration of the coursework and work experience (approximately 8 months). The computers are 700MH Pentiums with10 gig hard drives and 56k modems running Windows 98. Most are desktops but several notebooks were purchased for students with space or other necessities.

One student needed her computer to run the newest version of JAWS for Windows. This entailed a memory upgrade and repairs to the modem. This task was contracted to a local computer expert the technology specialist had previously contacted and researched. Other equipment needs were Dragon Naturally Speaking, and a head pointer for a student with quadriplegia.

Initial technical training is often spearheaded by individual students' state vocational rehabilitation counselors, but is also supplied as online and telephone desk help from the technology specialist. If necessary, locally based tutors are hired to deliver training to the individual. When computers are installed in student homes, intensive training is supplied, and lines of communication are established as barrier free. During the first three-day face-to-face session, more computer training is supplied and the specialist is available before, during and after the sessions for individual tutoring.

Support beyond the three day face-to-face is via e-mail, telephone help-line and the use of PC Anywhere for trouble-shooting the computer itself. The telephone is the main vehicle for support and is often used for needs beyond the technical requirements and questions.

The mode of presentation of the course materials is Courseware version 5 by BlackBoard. Western Washington University uses this as its main vehicle for distance education for undergraduate and graduate classes. The order of presentation and the ability to contain all learning activities within a web-based shell is a definite plus for the pilot program. With the advances in version 5, the accessibility needs of our students have been easily met.

Lastly, focus groups are arranged with each cohort during the second three-day session. The group is randomly divided into two groups, and an independent facilitator conducts a one-hour session with each group. The results are used for feedback and content analysis for further research.

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Biographical Sketches

Lori Magnuson is a Training Specialist at Western Washington University's Center for Continuing Education in Rehabilitation, and is the lead trainer for the Direct Service Professional Project. She holds a Masters' Degree in Counseling from Seattle University, and has had more than 16 years of experience working with people with a variety of disabilities. Ms. Magnuson currently designs, develops, and presents both classroom and Internet-based curricula for human service professionals in Alaska, Oregon, Idaho, and Washington State.

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Internet 2 + Web-Based Instruction = Effective Distance Teaching and Learning

Dr. Dixie Mercer and Ms. Frankie Swift
Project VISION
Stephen F. Austin State University

Background and Need for Training

Facilitating the education of a student who is blind or visually impaired or one who has multiple disabilities including vision loss requires that the practitioner utilize utmost the levels of both the art and the science of teaching. Intensive and highly specialized training on such topics as braille literacy, use of abacus and Nemeth code, modification of learning materials and environments, orientation and mobility, and assessing the needs of students who have multiple impairment is required to equip professionals who work with these children. Without the services of a trained Teacher of Students with Visual Impairments (TVI) and or Certified Orientation and Mobility Specialist (COMS), students who have visual impairments quite often find themselves entering their academic, social, and vocational lives without having had an opportunity to master the skills that are specific to their disability and which are essential to independent living. In order to help students develop into productive, successful adults frequent and intensive service by a TVI and/or COMS is an absolute requirement. Unfortunately, there is a critical need for educational personnel who are trained to meet the needs of blind and visually impaired students ages 0-22. By the mid 1980s, the TVI and COMS shortage was critical enough to draw attention from some of the prominent scholars in the field (Tuttle & Heinze, 1986; Head, 1989). In 2000, the *National Plan for Training Personnel to Serve Children with Blindness and Low Vision (NPTP)* estimated that there was a need for an additional 5,000 TVIs and an additional 10,000 COMS. In 1999, the 33 universities in the United States who have personnel preparation programs in visual impairments produced only 215 TVIs and 78 COMS (Corn & Ferrell, 2000).

The Visually Impaired Preparation Program

Even before the Personnel Preparation Program in Visual Impairment at Stephen F. Austin State University (SFASU) was approached by what would become the Northwestern Consortium (Idaho, Montana, Washington and Wyoming), it had already acquired experience in developing and implementing a distance learning program in collaboration with Texas Tech University. From 1998 to 2000, these two universities worked in conjunction with Texas School for the Blind and Visually Impaired to provide TVI and COMS training across the state. The Visually Impaired Preparation Program (VIPP) program utilized a combination of delivery technologies to provide the classes necessary for completion of a teaching credential in the field of visual impairment in Texas. Essentially, the classes were composed of a once per month meeting over interactive television, followed by independent work on the web, and prescheduled computer chat review sessions. Interactive television (ITV) sessions were provided on Saturdays so that those who were already teachers (a vast majority of the students) would be able to attend. By May of 2000, 194 new prospective VI professionals had registered in the program (Griffin-Shirley, Almon, and Kelley, 2000)

Project VISION—Background

In the fall of 2000, the VI Personnel Preparation Program at SFASU was contacted by a group of vision related professionals in the state of Idaho. This group was interested in getting SFASU to provide distance education classes to a consortium of states in the northwest. It was decided that the SFASU would pursue a personnel preparation grant through the Office of Special Education Programs (OSEP) in Washington, DC. In the summer of 2001, Project VISION was granted $1.5 million over a five-year period, and training actually began in the spring semester of 2002. Twenty-nine students were registered for two classes provided by Project VISION.

Project VISION—Program Characteristics

Philosophy

Based on their three years of experience in utilizing various distance learning methodologies, the faculty at SFASU had become committed to the belief that the curricular content and the learning objective for the student should drive the selection of the distance learning technology. Many instructors have tended to design their programs around the newest or most popular technology of the moment rather than allowing the learning objective to drive the selection of the technological platform (Petrides, 2002; Palloff & Pratt, 1999; Chute, et. al., 1999; Cyrs, 1997). Further, faculty members agreed that the pedagogical techniques for teaching via distance education were (and ought to be) completely different than those which are used in a traditional, face-to-face setting.

Interactive Television (ITV)

Availability of ITV sites. It was determined before Project VISION was begun that some use of ITV would be necessary in order to provide students with an opportunity to participate in class discussions, instruction/student question answer sessions, and group presentations. Preliminary plans assumed that an h.320 compressed video system would be used, but after gathering more precise information, it became obvious that these systems would be prohibitively expensive. Further exploration revealed that SFASU (and many other major universities) had h.323 (Internet II – I2) capability that might be useable at a fraction of the h.320 estimates. In addition to using I2 member sites, it was determined that internet based interactive desktop video could be a viable option. Initially, it was thought that there would be very little difficulty in finding sites to host the ITV sessions since all that was technically required was an interactive video camera and sufficient bandwidth to support video/audio connectivity (presumably a T1 line). Aside from some manageable problems with server gate keeping systems and occasional bandwidth availability, the technology worked very well. The major difficulties with the ITV portion of the Project revolved around the political and manpower issues surrounding site usage. In spite of these problems, however, seven ITV host sites were available by the spring of 2002, and two classes were presented (3 ½ hours of ITV time each on one Saturday per month).

ITV pedagogy. By the time Project VISION began, the faculty at SFASU had determined that only those activities that required synchronous interaction should be undertaken using ITV. Further, an entirely different pedagogy was necessary for facilitating class interaction over ITV. Students had to be made to feel comfortable enough to overcome initial reluctance about participating over a televised system. They also had to be actively drawn into the class activities so that they would concentrate on the curricular content rather than on the technology that was used to deliver it. A light and conversational tone was utilized by the instructor, and she made every effort to engage the students on a personal level, attempting to make the students feel that they were sitting in a "real" (traditional) classroom. ITV was also used for group presentations which utilized Power Point presentations, videotapes, and handouts which were downloaded off of the class website. In two cases, these groups were composed of students from two different states who were able to use a variety of distance technologies to design and present their projects.

ITV backup. Because the ITV component of the classes was relied heavily on the synchronous participation of all students, it was also the delivery mode that produced the highest level of student anxiety when technological problems were encountered.[1] It was critical, therefore, that students be provided with a reliable back up plan.[2] Three systems were put in place to provide more security to students who were almost uniformly new to the distance learning process. First, a live, streamed video option was made available as a link on the class web site. This site would allow students to watch (although not respond or ask questions) the class as it occurred in real time using a Real Media player on their home computer. Secondly, a telephone conference bridge was provided so that students could call in and participate as the class took place. In one class, a group project was presented over the telephone conference bridge. Some students who had a dedicated computer line in their home chose to utilize both the video stream and the telephone conference bridge so they could watch as well as verbally participate in class.[3] Finally, for those who missed the classes altogether, a videotaped version was both available for mailing and archived on the web.

Web Instructional Activities (WIAs)

Since ITV time was limited as much as possible to class interaction activities, some method of conveying basic curricular content to the student had to be devised. The method, Web Instructional Activities (WIAs), was developed by the SFASU faculty during the later stages of the VIPP Program. WIAs are the rough equivalent of classroom lectures in that they provide the instructor's personalized approach to the material covered and give the student the benefit of the instructor's unique perspective. Students worked on these WIAs asynchronously.

Learning Activities (LAs)

In any class, students must be given an opportunity to practically apply the knowledge and skills gained through classroom and independent activities. Students in the distance learning program, needed to have this same opportunity to interact on a pragmatic basis with the curricular content. This opportunity was provided in a set of Learning Activities (LAs) which required the students to apply what they had learned in the WIAs. These LAs were posted on the class website, and specific due dates were identified in the class calendar (also posted on the website). LAs were completed by the students and emailed as attachments to the professor for grading by a student assistant. The LAs were returned to their authors with comments, and grades were factored into the student's semester grade.

Computer Chats

Computer chats were used to provide the students with an opportunity to (1) review material for tests, and (2) review their answers to test questions. Approximately three to four chats were held during the semester in each of the classes. These tended to be very well attended with as many as 17 students joining in. The instructor had very strict rules about how the chats were conducted, including the following:

- The instructor always began the chat with an overview of the agenda for the session.
- Students were then called on to ask a question in the order in which they had entered the chat room.

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[1] The computer chats were also synchronous, but these were easily logged for anyone having trouble with live participation, and, most importantly, they covered no new material.

[2] In point of fact, this happened fairly rarely, although there were two sites (Casper, Wyoming and Helena, Montana) that had chronic access and/or bandwidth issues.

[3] There was a 15-20 second lag between the output via telephone and that from the video stream. While this was definitely annoying, it made full class possible when winter storms had made driving the hour to class impractical.

- ❖ The instructor would answer the question, open the floor for answers, or refer the question to another student. Then she would ask if the questioning student had a follow up. If there was not follow up question, the instructor moved to the next student.
- ❖ Any student could pass their turn, and since two rounds of questions were usually taken, they would typically have another chance to ask questions that had arisen later in the discussion.
- ❖ Any student could ask a question at any time by typing a "?" and waiting for the instructor to call on them.

Program Evaluation

The program was evaluated by the students in a traditional instructional evaluation (dealing with how well the instructor had served the learning needs of the students) and also in a technology evaluation which attempted to assess how well the technology had served as a platform for learning the course content. Students were asked to rate the technological effectiveness in three ways: (1) using a 6 point likert scale to rate the effectiveness of different platforms (e.g. ITV, WIAs, LAs, etc.); (2) to rate each of the platforms as to whether their use should be increased, decreased, or remain the same; and (3) using a 6 point likert scale to rate the overall technological effectiveness of the program. A total of 12 evaluations were received, and not every student responded to every question. However, results indicated that the students were very pleased with the distance education technology and pedagogy used in the class. 72% of the respondents rated the ITV sections of the class either "excellent" or "very good." WIAs and LAs were both rated in the top two categories on 90% of the surveys, and computer chats were rated in the same categories 80% of the time. The use of discussion boards fell into the top two categories on only 66% of the evaluations.

The instructor of both classes also expressed satisfaction with the overall Project performance. In particular, the ITV system produced higher quality results with a greater level of reliability than she had anticipated before the Project began.

Project VISION has made it possible to train TVIs and COMS in areas of the United States where such training was not a possibility a year ago. In addition, it has demonstrated that expertise can be shared by locations that are separated by large geographical distances. It has demonstrated that even very small fields (such as visual impairment) can obtain high quality training in a cost effective manner. Hopefully, it will also have demonstrated how this process can be continued by geographically contiguous state consortia throughout the country which can provide low cost training in working with low incidence populations.

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Designing the Blend for Audiences in Developing Countries

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Background

The International Bank for Reconstruction and Development, frequently called the "World Bank," was established in July 1946. With a goal to reduce poverty and improve living standards by promoting sustainable growth and investment in people, the Bank provides loans, technical assistance and policy guidance to developing-country members. The World Bank Institute (WBI), a department within the World Bank, was established in 1955 to promote development through learning. Its mission is to help increase the capacity of countries to make well-informed judgments and carry out effective development programs. To this end, WBI facilitates a learning dialogue on development through structured exchanges of ideas and experience among people.

From the beginning, the WBI staff delivered courses in a traditional face-to-face manner to audiences, which included high-level government officials and policy makers from developing countries. Course teams gathered their participants together in groups of 20-50 for periods of one to two weeks and led them through the economic, financial and policy issue based content. In 1995, WBI was reorganized with three strategic goals driving the changes: reaching broader audiences, promoting information networks among countries and the Bank, and collaborating within the Bank to increase client responsiveness. In late 1997, WBI began to look at distance learning strategies as a way to achieve these goals.

Clients, Challenges, and Initial Solutions

WBI's clients come from a broad range of social, economic, educational, and cultural backgrounds. Clients (course participants) consist of senior government officials and staff from bilateral and multilateral organizations, as well as managers, journalists, NGOs, business and labor leaders, and others important to building civic consensus. The main difference between our clients and students in universities is that our clients are (often middle age) adults with practical skills in the topics covered by the course in which they are going to participate.

WBI courses are designed to keep pace with its clients' needs as well as the changing needs in economic development. Courses may also be designed for one or more regions with common concerns and may consist of multiple activities that span more than one year. This design provides the opportunity for participants to gain the broadest possible perspective on specific issues, but it also means that course materials are constantly in a state of flux.

In light of this, the challenges faced in re-designing WBI's courses for distance deliver, using modern technologies, were considerable. In addition to the aforementioned design issues of varied audiences and changing needs, the majority of participants had little or no access to computers or the Internet, were globally dispersed, and came from a wide variety of cultural and language backgrounds. Noting this, it was agreed then that courses must always be learner based. Choosing a common, yet flexible, approach to distance education—an approach based upon sound pedagogy and designed to maximize quality learning provided by teams of professional specialists using state-of-the-art technology—was paramount. Ours would be a learner-centered, integrated, multiple media approach which would, as far as possible, replicate the benefits of face-to-face teaching and learning.

Taking into account technological infrastructure already available, including the Bank's worldwide network (which connects its country offices and its headquarters) and networks of partner institutions, all of which provided some access to videoconferencing, satellite TV broadcasting and Internet, it was obvious we could rely on a mix of technologies—depending on the course objectives, audience and local learning sites used. The media mix chosen could be an integrated use of prepared print materials, web pages, CD-ROMs, videoconference and live interactive TV, and computer mediated communication (e-mail, web and Internet chat). However, after reviewing the various synchronous and asynchronous technological tools available, it was decided to rely more heavily on print (for asynchronous activities) and one- or two-way video (for synchronous activities). This decision was made for the following reasons: a) many courses already had a large amount of background and course material in print; b) it was felt that the use of video would provide the "face-to-face" (see and be seen) opportunities that were necessary when dealing with key clients—policy makers and high-level government officials. Synchronous video access would also provide instructors and subject matter experts the feeling of being in a classroom environment, making it somewhat easier for them to accept the distance format. Additionally, it was believed that the use of —and access to—computers was limited in client countries, inhibiting the effectiveness of their use and the applications they provided.

Expanding the Toolset and Incorporating Partners

Today WBI's mission statement ends with the words . . . *investing in people and ideas as the most powerful means of development.* As a result our participant base has become much more diverse. Now, courses must reach people from all walks of life—from farmer to project manager, Minister of Education to teacher, women and children in rural villages to high level government officials in capital cities. And they must be designed in a fashion in which participants learn from each other, as often the participants have as much experience, or more expertise, than do we.

Changes have been made on the technology side too. Prices for computers have decreased, and the wireless technologies are being embraced as a means of quickly "hooking people up." Due to such changes, and the donor community's pledge that the "digital divide" will not widen, large inroads have been made to provide people in developing countries with access to information communications technologies, such as cell phones, computers, email and the Internet.

In the midst of these changes, early in the 2000s, it was conceived that participant reach could be expanded by establishing partnerships with other learning networks. And, where those networks didn't exist, client countries could be encouraged to establish Distance Learning Centers (DLCs) with facilities providing a gathering place as well as access to videoconference and Internet. Thus was born the Global Development Learning Network (GDLN). The mandate of this global network, composed of public, private and non-governmental organizations, is to work together to build an interactive, multi-channel distance learning network for the development goal of fighting to reduce poverty.

The establishment of this network and DLCs was key to expanding the use of tools and methodologies in our course design, particularly in the area of using the newer technologies. When participants can come together in a DLC for the learning activities, it is guaranteed that they will have access to high speed Internet connection and access to videoconferencing facilities, VCRs, overhead projectors, etc. Additionally, the Centers can provide the kinds of logistical, administrative, and technical support that are necessary elements of a good learning environment. And by using local facilitators (or facilitating institutions) at each location, we have been able to more closely simulate the social aspects of classroom learning.

Designing the Blend

As our instructors and subject matter experts move away from being the "sages on the stage" and instead become the "guides on the side" and as access to technology increases, designing the blend of tools and methodologies for effective learning within our diverse audiences remains a large challenge. Presenting course teams with a choice of synchronous and asynchronous technologies including everything – from print to videoconference (CD-ROM, videotape, audiotape, Internet, email, videoconference, audio conference, TV) gives them flexibility. But assisting them in understanding how (and when) to use these tools for effective learning has been the key.

While there appears to be no typical course (as there is no typical audience and needs continue to change) and thus no typical blend, there are some basic elements we have summarized from our more successful courses. These include:

- ❖ A course can be, on average, 4-8 weeks in length and can reach 20-40 participants in 4-5 countries.
- ❖ A course includes face-to-face discussions (live and virtual), self-paced study (print or web-based), group exercises (live and virtual), and both synchronous and asynchronous networking opportunities.
- ❖ Each site has one or more local facilitators, used much like teaching assistants.
- ❖ While this last element was originally designed to provide the instructor with his/her "eyes and ears on the ground," it has had the unexpected outcome of helping to build in-country capacity.

Following is a brief summary of courses containing these elements.

Course A

Audience: High school teachers. Timing challenge: Participants had a full time teaching schedule and were only available for synchronous activities during school vacations. Tools: videoconference, videotapes, CD-ROMS, Internet, email, print.
Format: Session 1 – Three eight-hour days together in DLCs with facilitators. Each day consisted of five hours local work (including videotaped lectures, group exercises, Internet searches use of videotape, group exercises) and three hours group/regional work during which participants in each DLCs were connected with each other and the lead instructors in Washington, DC via videoconference. At the end of the three days, each participant left with an project and the names and email addresses in his/her assigned group. Each group was comprised of six participants and one facilitator.
Session 2 – Six weeks, during which participants worked on their assignment both individually and in their group via email.
Session 3 – Two eight-hour days together in DLCs with facilitators during which each individual presented their project; and for 3 hours each day, each group presented, via vc, one selected project in the group.

Course B

Audience: Senior government officials, staff from bilateral and multilateral organizations, members of research organizations and academia, journalists. Timing challenge: Participants had full work schedules, limiting the amount of time for synchronous activities. Tools: videoconference, Internet, print.
Format: Six sessions over three weeks. Each session, held in DLCs, consisted of one hour of facilitated local group work and three hours of videoconference. Videoconference time was used for input from subject matter experts, interactive discussion, and sharing of experiences among the sites. All background materials, presentations, participant information, and links to relevant materials were made available on the course website.

Course C

Audience: Government officials, private executives, financiers, and academicians. Timing challenge: Evening professional development course. Tools: Videoconferences, videotapes, Internet, e-mail, print. **Format:** A ten week program consisting of six videoconference sessions with a variety of subject matter experts, and four videotaped sessions shown locally to instigate facilitated group discussion. Participants met in the DLCs for each session. Interaction with subject matter experts, following videoconferences, was available by email. Course material was made available on the course website.

Building Communities

One of the other important things is democracy is not just about voting for your leaders, it's about intelligent conversation among citizens. And we've lost a lot of that communication in the mass media. So . . . will we see intelligent political discourse continue online and will that have an affect?

(Howard Rheingold)

We are still struggling with the building and nurturing communities of practice – an objective of the majority of our courses. Many of our designs include a threaded discussion space on the course website, where this tool is intended to be used to continue the discussions begun by participants and subject matter experts during the course. We are finding that some teams do have better results than others with using this tool. And it appears that the most critical factor to success is dedicated human resources—moderators with the ability to draw participants into the discussion, summarize, and show the appropriate online netiquette and personality.

This may be our biggest challenge yet.

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A New Typology of Instructional Methods

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Gagne's Original Construct

In the very last section of his book, *Conditions of Learning*, Gagne referred to the different types of instructional environments as "modes" of instruction:

> "Environments for learning consist of the various communication media arranged so as to perform their several functions by interaction with the student. The particular *arrangements* these media may have in relation to the student are usually called the *modes of instruction.*" (Gagne, 1965, p. 285)

He outlined six different modes of instruction being commonly used (Gagne, pp.285-294):

1. Tutoring: "interchange between a student and his tutor"
2. Lecture: "oral communication on the part of the teacher"
3. Recitation: "teacher 'heard' the students perform"
4. Discussion: "oral communication...between teacher and student...[and] interactions between students"
5. Laboratory: "a stimulus situation that brings the student into contact with actual objects and events"
6. Homework
    - ❖ self-instruction: "as [reading] a chapter in a textbook"
    - ❖ practice: "examples of previously learned principles"
    - ❖ projects: "organize a variety of activities for himself in such a way as to lead to the development of a product"

This construct of "modes" was repeated verbatim in the second edition of *Conditions of Learning* (Gagne, 1970), but it disappeared from all subsequent editions.

Molenda's Adaptation of Gagne

It seemed to me that Gagne was onto an important idea here—that you could classify the various instructional arrangements according to the interaction pattern that characterized it. Gagne did not pursue this idea, but I took it one step further, trying to be quite explicit about establishing categories and defining the communication patterns among Teacher, Learner, and Resources (Molenda, 1972):

1. Tutorial: two-way interchange between tutor (Teacher) and tutee (Learner)
2. Lecture: one-way information flow from source (Teacher) to many receivers (Learners)
3. Discussion: two-way interchange among Learners
4. Laboratory: Learner acts on raw materials (Resources)
5. Independent study: Learner acts on encoded, instructional materials (Resources)
6. Practice: Learner uses new skill repeatedly (may be guided by Teacher)

This seemed to be a handy classification system—small and simple—that was fairly successful in providing "baskets" into which you could place many of the instructional formats that one encounters in everyday teaching (See Table 1).

Table 1. *Modes and Formats*

Modes	Formats
tutorial	apprenticeship coaching: music lessons mentoring Socratic dialog programmed tutoring branching programmed instruction adaptive computer-assisted instruction
lecture	oral presentation overhead transparency presentation PowerPoint presentation film presentation radio program television program telelecture
discussion	seminar T-group buzz group debate panel discussion role-play
laboratory	science experiment social simulation instructional game field work: archeology, anthropology case study project
independent study	reading textbooks, modules, handouts reading Web pages reading Web "tutorials" programmed instruction linear computer-assisted instruction watching video
practice	memorization drill language lab athletic practice drama rehearsal end-of-chapter exercises recitation

A theory that accompanies this typology is that what is important is the communication pattern; it provides certain possibilities and imposes certain limits. Once you've chose the mode of instruction, the formats are pretty much interchangeable. The particular manifestation of that communication pattern, the format, may bring logistical advantages or disadvantages—textbooks might be more readily available than Web pages for some audiences—but it's communication pattern that carries the pedagogical power…and limitations. We had learned this with a vengeance in the hundreds of media studies comparing film and video presentations to live lectures. A given message will have essentially the same learning effect whether it is delivered live, over television, or over 3-D holographs. Choices made for logistical considerations—time and money—can be crucial decisions, but they don't directly affect the pedagogy.

Another theory associated with this typology is that certain modes lend themselves to different phases of the learning process. For example, a laboratory activity might serve well to stimulate interest and provoke questions about a new topic. A lecture would be an efficient way to present new information to an audience whose curiosity is aroused. A discussion can help learners digest new principles and apply them to their daily lives. Practice activities are often assigned as homework in order to develop confidence and speed in application.

A Transitional Typology

Over the years, as new technologies and new instructional theories entered the stage the typology grew. In 1995, my colleague, Charles Reigeluth, asked permission to put it into print in his book on instructional design theory (Reigeluth, 1999, p. 23). See Table 2.

The New Typology

Then came Distance Education. When my students and I began to study the pedagogical strategies of Web-based distance courses, we quickly found that the 1999 version of the typology did not provide very adequate "baskets" for holding the various activities that were most common in Web-based courses. This opened our eyes to the realization that "virtual" courses employ lots and lots of *learning* strategies, but very few teaching strategies. So, in order to capture the teaching *and* learning methods being employed, the typology must be expanded to include both the methods that the Teacher controls and those that the Learner controls. This leads to the "new typology." (See Table 3)

This typology is intended to portray the somewhat disorderly, asymmetrical picture of reality. The categories are not neatly mutually exclusive; there are overlaps. Some constructs could be portrayed as separate methods or as subsets of other methods. So, this is today's view. The next step is to test these categories by attempting to apply them to real-world observation of face-to-face and distance education courses. Will these "baskets" prove to be comprehensive, distinguishable from each other, and practical? That's the test ahead.

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Reigeluth, C. R. (1999) *Instructional-design theories and models (Vol. II)*. Mahwah, NJ: Lawrence Erlbaum.

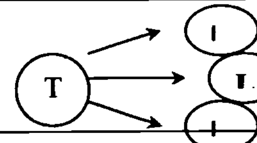
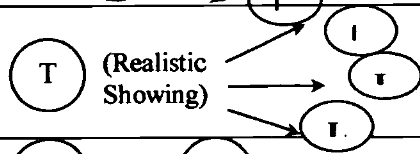
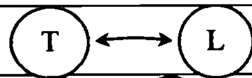
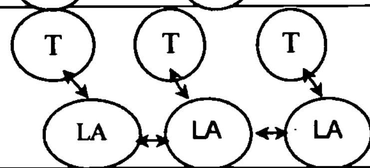
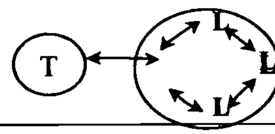
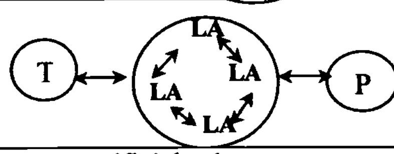
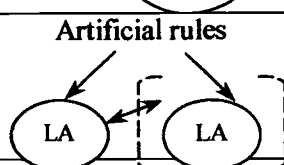
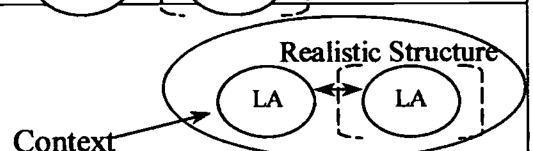
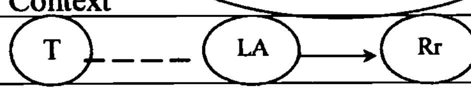
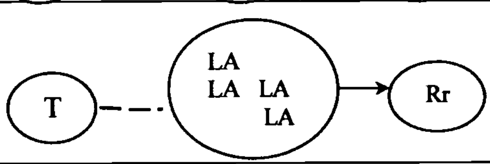
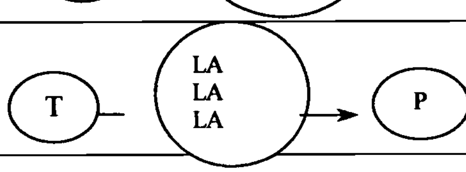
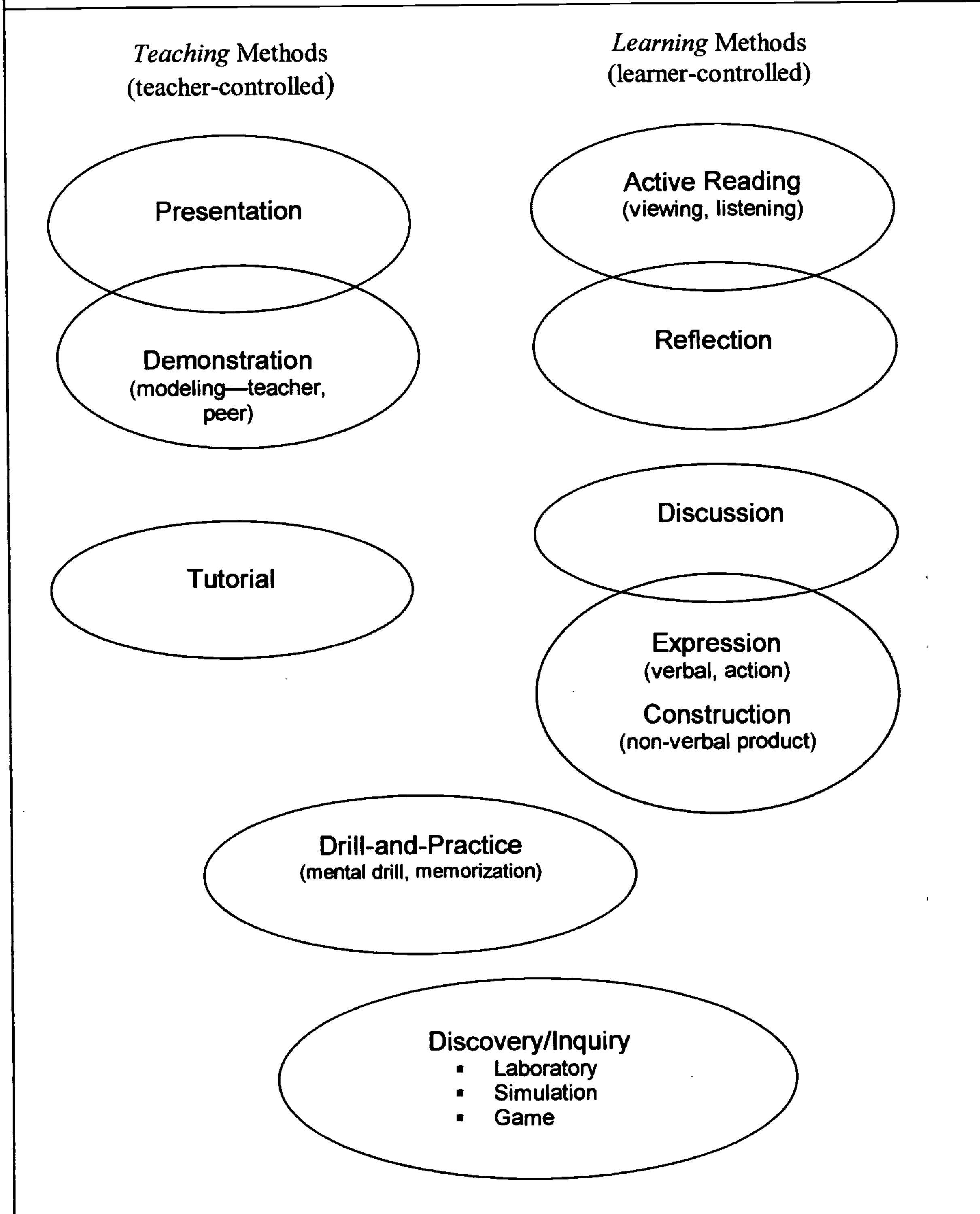
Table 2. Typology of Instructional Methods (1999)		
Method	**Visualization**	**Strengths**
Lecture/Presentation		Efficient Standardized Structured
Demonstration/Modeling		Eases comprehension, application
Tutorial		Customized Learner Responsible
Drill & Practice		Automatized Mastery
Independent/Learner Control		Flexible implementation
Discussion, Seminar		Meaningful, realism, owned, customized to learner
Cooperative Group Learning		Ownership Team-building
Games		High Transfer High Motivation
Simulations		
Discovery • Individual		
• Group		
Problem Solving/Lab		High Level Thinking in ill-structured problems

Table 3. Molenda's Typology of Instructional Methods (2002)



Biographical Sketch

Michael Molenda is an associate professor, Instructional Systems Technology (IST), Indiana University since 1972. Coauthor of *Instructional Media and Technologies for Learning*, 7th ed. (Prentice-Hall, 2002) and of the chapter on "Trends and Issues in Instructional Technology" for *Educational Media and Technology Yearbook*, 1998 through 2002 editions. He teaches in the areas of instructional design, instructional technology foundations, and distance education. Received PhD in Instructional Technology from Syracuse University, 1971

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How Do Faculty Use Course Management Systems?
A Modular Approach

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Introduction and Background

Course management systems (CMS) have become both the panacea and the bane of distributed, Internet based learning just the past few years. It is the purpose of this presentation to outline three concurrent research projects we are undertaking related to course management systems, and provide an update on our current activities and proposed directions.

Distributed learning can be thought of as learning that can be enhanced or accomplished by the delivery of learning resources anytime and anywhere. In just a few years the educational community has made huge financial and pedagogical commitments into distributed learning. Moreover, there has been a sea change in attitudes in academia towards the acceptance of Web-based instruction and the use of distributed technologies in teaching and learning. The experiment in the use of the World Wide Web that began in higher education in the early 1990's is now seen at every level of education as a potentially important pedagogical tool. It has become mission-critical to the educational enterprise.

Like many of our peers, we in the University of Wisconsin System (UWS) have made an extensive investment in time, expertise and resources in the enhancement of instruction using these distributed learning technologies. The most important among these is the course management system (CMS). Early on it became clear that the support and delivery of CMS's was going to be a substantial commitment. Beginning in the fall of 1999 the UWS made a strategic decision, at the behest of its 15 institutional CIO's, to support the hosting and delivery of course management systems as a "utility." Central funding was identified, institutions with appropriate technical and support infrastructure agreed to act as "service providers" and the earliest version of our CMS "utility" *ITS@Wiscsonsin.edu* was born. Two short years later the UWS has over 100,000 of its 150,000 students using these resources each semester and something over 3000 active courses.

Given the rapid growth and critical nature of CMS's, providing for them in a cost-effective and reliable way has become an increasing challenge for the UWS as it has for many other higher education institutions. An important part of this challenge lies in understanding the e-learning marketplace within which CMS's are developed and provided. Within the UWS the initial strategy was to provide something of a research environment as well as to provide diversity and choice among tools. If we look back to the beginning of our utility just two and a half years ago, the names of our CMS tools were Web Course in a Box (WCB), Learning Space, and WebCT. Of these only WebCT remains. We had barely gotten the enterprise underway when Blackboard and purchased WCB. Our most recent attempt at diversification was to provide Prometheus, recently purchased by Bb. Clearly change is going to continue to be a constant in the marketplace for CMS tools and we need to develop further strategies to deal with it.

A further challenge lies in finding sufficient funding for course management systems. CMS's are really "academic systems" and increasingly require technical, financial and other academic-specific support a scale previously reserved for large administrative systems like PeopleSoft and Oracle. The central funding mechanism is an important strategic choice allowing adoption of these tools independently of strapped and already allocated current departmental and college S&E budgets. However, with the CMS becoming much more costly we have been forced to rethink our model of how we as support them. We have, in fact, questioned whether or not CMS's are the only way of providing the kinds of support and services that faculty and students require.

As a result, the UWS has undertaken three research projects relating to course management systems. The three research projects are as follows:

1. First, we undertook a Request for Information (RFI) process in an effort to identify the most robust e-Learning system.
2. Second we undertook an in-depth project researching just how we use our current CMS tools in the UWS.
3. Finally, we undertook a series of eight research projects examining modularity, interoperability and interchangeability of CMS functionality.

The RFI Process

The *RFI document* itself was issued as a result of the work of a UWS task force in May of 2002 with the stated purpose of gathering "information about software/services that will meet the Web-based learning needs of UWS. The information gathered from this RFI will inform the development of a Request for Proposal leading to the acquisition of software/services or set of interoperable software/services to support a range of learning needs from blended courses combining online with traditional learning styles to fully web-based asynchronous courses. ... UWS encourages responses that address all or part of the e-Learning system."

"The e-Learning system may be a "best of breed" approach addressing the various functions outlined in this RFI. The UWS encourages responses to the RFI from all sectors of the marketplace. Responders who cannot provide software/services for the entire spectrum should address the parts that they can provide. Responders may offer collaborative responses to address all or parts of the e-Learning system. The results reported on here were *summarized* by the task force and will be used to generate and *RFP* for the next generation UWS e-learning system.

Research on CMS Use

A second aspect to our research into course management systems consists of an in-depth study of how faculty actually use course management systems. Too often it seems that what we know about CMS's is provided either by the vendor or takes the form of a comparison of functionalities of different course management systems. We wanted to gain insight into how faculty use course management systems in order to get a more nuanced understanding of the following sorts of issues:

- How extensive is faculty use of course management systems? Early findings suggest significant under-usage of the tools and our research project will explore in more detail the extent to which this is actually the case.
- What features of course management systems do faculty use the most and for what purposes. What factors are driving the use of these features?
- Are there differences (beyond a simple difference in degree) in the use of course management systems in completely online courses compared to their use in hybrid or blended courses? Is the same course management system appropriate for both kinds of courses?
- What are the primary advantages and disadvantages to using a course management system?

- ❖ How adept are faculty and how willing are they to use course management systems in conjunction with other tools?

The insights gained will provide us with the information we need to make decisions about how best to provide CMS's in the future. In order to study the issue we designed a mix of quantitative and qualitative research methods. By means of a process of triangulation we were able to capture the multiple aspects of faculty use of course management systems. Most of the studies of technology use in teaching and learning have tended to be limited to perceptions of the technology or its impacts. In our research project we sought to go beyond this. Using a variety of methods we are able to explore not only perceptions of the technology and its uses, but also track actual usage within high-end, low and middle of the road users. The three parts of the triangulation process consisted of:

Interviews With Faculty

Using semi-structured interviews with individual faculty we explored faculty use of course management systems by asking
i. How they came to use the technology,
ii. How this usage changed over time,
iii. What features of course management systems they routinely use, for what purpose and with what degrees of success,
iv. Faculty perceptions of the major advantages and disadvantages of course management systems and
v. what other kinds of programs faculty regularly use in conjunction with course management systems.
These interviews were supplemented with larger focus groups made up of faculty members.

To get an accurate picture of faculty use of course management systems across different platforms (such as WebCT, Blackboard, Prometheus, Lotus learning Space) we interviewed faculty from a range of different disciplines and different kinds of institutions (large research institutions, both large and small four year comprehensive institutions and two year colleges).

Survey

We are carrying out an online survey of University of Wisconsin faculty who use course management systems. This survey focused on what features of course management systems they use, for what purposes and with what degrees of satisfaction. By means of the survey we hope will get a larger picture of the use of the technologies. Surveys will be administered to all faculty currently using a course management system within the University of Wisconsin. The site administrator at each institution will be asked to forward an online survey url to each faculty member with whom they are currently working.

Longitudinal Analysis of Usage Logs

By exploring usage logs of course management system usage over time we are able to get a different perspective on their usage by faculty and how this changes. On a number of campuses we have analyzed up to four semesters worth of usage logs. By this means we can see how usage changes over time as well as getting a broad overview of levels and kinds of usage. This part of the study has needed to be done with careful consideration being given to privacy, to ensure that student and faculty privacy are not compromised and that data at the level of the individual is not released.

Exploring a Modular Approach to CMS Use

A final part of our research strategy consists of exploring a more modular approach to course management use. In this part of our project we are interested in exploring the feasibility of using a range of different products alongside and in conjunction with a CMS. From our research into faculty use of CMS's we found that faculty are especially interested in particular functions that CMS's provide, for example, assessment tools, discussion forums and gradebooks however at the same time they are frequently disappointed by the performance of these tools within the CMS that they currently use. Thus we have sought to explore how it might work for faculty to use third-party tools, such as an assessment tool, in conjunction with a CMS. We are especially interested in seeing what issues faculty face in using third-party tools and how well these will interact with the CMS. To this end we have undertaken a series of pilots to explore faculty use of tools. We have pilot studies underway in which we are exploring faculty use of third-party:

- Testing and assessment tools
- Discussion and collaboration tools
- Rapid content development tools.

In addition we hope to add pilots exploring the use of third-party grade books in the near future.

Conclusion

By means of these three research undertakings we hope to develop a comprehensive understanding of the course management system universe. They have clearly become mission critical tools yet the growth in their usage combined with frequent changes in the market and ever-increasing costs mean that steady-state is not an option for us. As those responsible within higher education for providing distributed learning infrastructure we need to be prepared to meet these challenges and the kind of knowledge that our research undertaking are producing is a critical aspect of such preparation.

Biographical Sketches

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Games to Teach By

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Introduction

Believe it or not, the use of games that teach can be traced back many thousands of years. For example, China used board games and war games over 5000 years ago. Fast-forward a few years ... business games starting surfacing in the late 1950s/early 1960s. Even with these examples, the use of games as a learning tool has still not gained widespread acceptance. Despite its history, the use of "games" as an instructional tool is often viewed with suspicion by *serious educators,* who wonder, "How can games teach?" "Is this just being used for filler, so the teacher doesn't have to teach?" "We're not offering coursework to teach people how to play games ... we're running a business here!"

Times, however, are starting to change. According to Ruben (1999), in the 1970s and early 80s some educators embraced games and simulations as "an attractive and novel alternative to traditional classroom lectures and other one-way information-dispensing methods" (p. 3). Part of the reason for this, the author suggests, is that experience-based (experiential) models have a greater potential to "address many of the limitations of the traditional paradigm." Specifically, they "accommodated more complex and diverse approaches to the learning processes and outcomes; allowed for interactivity; promoted collaboration and peer learning; allowed for addressing cognitive as well as affective learning issues; and, perhaps most important, fostered active learning" (Ruben, 1999, p. 3).

A 1995 Training and Development survey indicated that 100% of training professionals surveyed indicated that they used some type(s) of training games and seventy-six percent indicated they used them in all or most of their programs (Salopek, 1999). The figures are higher today. Educators in the public sector have long used games to enhance the learning process and engage learners, but if our experiences are any guide, gaming was typically used in the lower grades—elementary school. All that has changed, as well.

In a business context, a recent *USA Today* article discussed the increase in the use of games and toys with executive groups as they conduct strategic visioning, creativity and planning sessions (Horovitz, 2002). In the article, entitled "Toys Bring Out Kid in Corporate America," the author suggests that one of the reasons for the rise in popularity of toys and games is based on the belief that "Most executives are basically kids in adult clothing" (Horovitz, 2002, p.1). The value proposition for many organizations that use gaming and toys and that realize the value of "play" is that such things allow us to anchor back to a time when we were most creative and open to new ideas—something business and educational environments say they value.

It is not the purpose of this article to have the final say on the efficacy of gaming in learning. Rather, it is our goal to discuss:

- the theoretical foundations behind the use of games in teaching and training in both college and corporate settings.
- various uses of games in learning.

- tools and techniques that help bridge the gap between experiencing the game and tying it to the learning objectives.
- the value of games as tools that support different learning styles.

We have been very encouraged by the learner feedback we have received as a result of our use of games to support learning. There is certainly an abundance of literature to support the use of games as tools that help learners, among other things, to reflect on new information, reinforce what they already know, enhance knowledge transfer, and as a tool for both formative and summative evaluation to support key learning.

Fundamentals of Games

What Is a Game?

There are a number of different terms and definitions used to describe "games"—such as experiential learning (Salopek, 1999), instructional simulations, and group learning (Mantyla, 1999). Carolyn Nilson, author of *More Team Games for Trainers*, defines a game as a "structured activity with learning at the end" (Salopek, 1999, p. 29). Steve Sugar, President of The Game Group and author of a book entitled *Games that Teach*, defines games simply as "fun with a purpose" (Salopek, 1999, p. 30). The key phrase in this definition, in our minds, is *with a purpose*. At times, we can get more caught up with the "bells and whistles" than with the actual content we are trying to transfer to the learner. Fetro and David (2000) are even more pointed when they emphasize the importance of course and student objectives when determining how (or if) to incorporate educational games into the classroom instruction.

Why Use Games?

We consider several factors when deciding whether to use games or not to support learning.

From a *course design standpoint*, effective instructional design in both traditional and distance environments is driven by how learners are connected to the content, the instructor, and each other. Given this, one of the greatest strengths of using games for learning is that they are excellent tools for connecting learners to knowledge, key concepts, facts, and processes in a way that is fun *and* purposeful. Because they are often fun, games also help learners construct meaning and to discover things about a subject area in a more personal way and in a safe environment.

In addition to helping learners to "reinforce and review course information by allowing learners to apply what they have learned" (Mantyla, 1999, p. 91), "conceptualizing education as a game restores enjoyment, healthy competition, cooperation, and discipline to teaching and learning" (Schwartzman, 1997, p. 1). Depending on their design, games can also improve teamwork (Sugar, 2002; Nemerow, 1996).

From a *practical standpoint*, the profile of learners has changed (Prensky, 2001). Consider this—today's children (who are quickly becoming tomorrow's college students and adult learners):

- spend over 10,000 hours playing video games.
- receive and send over 200,000 emails and instant messages
- spend over 10,000 hours talking on digital cell phones and over 20,000 hours watching TV (a high percentage fast speed MTV).

According to Prensky, (2001), they do all of this before they ever even leave for college! As a result, he suggests, "learning via digital games is one good way to reach *Digital Natives* in their 'native language' " (Prensky, 2001, p.1).

From a *technology standpoint*, there is a proliferation of new and emerging computer capabilities that enable greater collaboration and interactivity across time zones and geography (Berson, 1996). This is not to suggest that the traditional barriers to entry relative to technology-enhanced learning do not still surface—issues such as access, comfort with technology, support infrastructures, etc. It is to say, however, that the ability to engage with learners through the use of computers is increasingly attractive, based on learner profiles, *and* possible, based on current technology capabilities. Prensky (2001) is quick to caution "if some games don't produce learning it is not because they are games, or because the concept of 'game-based learning' is faulty. It is because those particular games are badly designed" (Prensky, 2001, p. 4).

From a *learner-centered standpoint*, games can be intrinsically motivating and can adapt to different styles of learners, as well as different learning styles. This is a theme that emerges in much of the literature on games (Nemerow, 1997). Adult learning theory suggests that learners like to be in charge of their own learning—and they like to experience it. Experience-based learning can foster greater diversity in approaches to learning, opportunities for interactivity, collaboration and peer-to-peer learning. If it is true, as some suggest, that all learning is social, this is a particularly compelling argument for more active levels of learning —something that learning games can satisfy. As well, to be meaningful, the learning venue must link to real world problems, ideas, concepts, etc. Games can be constructed to bridge to real-world relevance.

When constructed with different learning styles in mind, games can often accelerate the learning process. For example, because games involve 'doing,' they provide the kinesthetic learner with opportunities to engage in his or her own learning in a physically interactive way. In an article by Berson (1996), the author, a high school social studies teacher, used interactive games with technology as the enabling tool in his class. He found that more visual learners were not only able to enhance their critical thinking skills, but they also increased their ability to interpret visual cues such as maps and graphs.

One of the foremost experts in the use of games that teach, Sivasailiam Thiagarajan—"Thiagi"—instructs trainers and educators that "an awareness of your participants and an understanding of their needs and learning styles are vital to using training games effectively" (Salopek, 1999, p. 30). This perspective includes not only the learning style of the individual, but also the cultural orientation. For example, some cultures are less comfortable with games and activities that require high degrees participation in teams or self-disclosure.

Games can also provide useful tools for generating feedback for the learner as to how well he or she has internalized the learning (Sugar, 2002). This feedback loop extends to the instructor, as well. The opportunity for both formative and summative evaluation is relevant in both an academic setting, in which evaluation is a huge component, and corporate settings, where the link to business outcomes is of primary concern throughout the instructional design process.

The Value of Play in the Context of Games

"The commonsense tendency is for people to define *play* as the opposite of work" (Rieber, 1996, p. 2).

We have found this statement to be true in many academic and business settings. The mantras, "we don't pay you to play!" and "You're here to learn, not to have fun!" resonate through the halls of corporate America and universities, alike. Why this is so remains one of the ultimate ironies if you consider the positive impact of play on things such as stress levels, problem-solving, and creativity.

Literature on the subject of play (Rieber, 1998, p. 2) usually revolves around four themes:

- ❖ Play as progress—engaging in play leads to other outcomes, such as learning. Play, in this context, provides the backdrop for this article.

- Play as fantasy—where play is intended to unleash creativity, which is why things like LEGOs, Silly Putty, and Etch-a-Sketch are popping up in corporate America! (Horovitz, 2002).
- Play as self acknowledges that play itself is to be valued without regard to secondary outcomes—that is, play for its own sake, to enhance one's quality of life.
- Play as power involves our traditional competitive view of play where there are winners and losers. In the context of play for learning, however, some authors (Hark, 1997; Nemerow 1996) believe that games used to foster learning work best when competitive elements are minimized and emphasis is placed on the value of the experience and learning itself.

Elements of Games That Teach

According to Thiagi (1998), well-constructed games share the following characteristics:

- Conflict—Players must have a goal to achieve, as well as various obstacles that must be overcome to achieve the goal.
- Control—The game must have a clear set of rules that indicate how to play the game (making moves, taking turns, etc.).
- Closure—It must be clear how and under what conditions the game ends (e.g., when a certain point total is achieved, after a specific time limit, when players are eliminated, etc.)
- Contrivance—Those things that allow learners to say, "After all, it's only a game!"
- Competency—Refers to the specific skill or knowledge areas that the game is designed to improve.

Games and Learning Strategies

There are several important factors to consider in the instructional design phase of course development—where and when to incorporate a game into your lesson. Questions to ask yourself may include:

- Is it important to reinforce specific learning points immediately after a single lesson or should a learning game be incorporated at the end of a unit as a summative evaluation tool?
- Can the game be placed in the beginning of the lesson as a way to create the context for learning about a specific topic?
- Is the subject matter highly sensitive (e.g., sexual harassment) and, therefore, requires selecting a game that engages the learner but in no way trivializes the subject matter?
- Where can I incorporate my game where it is the most seamless to the learner (doesn't disrupt the flow or instruction or seems as if it was just dumped into the lesson)?
- Are there any logistical considerations that would limit the type of games that are feasible (do I have support for any technology-delivered games or must I rely more on a less-sophisticated approach when devising and/or selecting a learning game)?

Other useful questions to consider are offered by Madelyn Callahan (cited in Salopek, 1999):

- What should the game communicate to the group?
- How large is the group?
- What is the audience profile (demographics, culture, and previous knowledge of the subject matter)?
- Is the game most appropriate for introducing, reinforcing, or demonstrating learning points?
- Is the game "playable"?
- Is a game the best method for achieving my learning objectives?

Conclusions

Some of the lessons we have learned in our journey into educational games are that:

- ❖ The use of games as a learning strategy has added great value to the variety and quality of the learning experience for our respective audiences.
- ❖ Regardless of whether you are in an academic or a corporate setting, games can enhance the learning process.
- ❖ Every forward-thinking teacher/facilitator needs a techie and every forward-thinking techie needs a teacher to partner with when creating games that teach.

Lastly, we encourage you to visit our web site for gaming ideas and templates: *http://facstaff.uww.edu/jonesd/games/*

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Development of a Software Tool for Multi-institutional Faculty with Minimal Computer Experience

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Background

In the agronomic and horticultural science areas, emerging research technologies are providing opportunities our clientele (adult learners) can utilize to advance their individual careers and businesses. This has been especially true with crop genetics and agriculture biotechnology. Often times a challenge lies in bridging the gap between the university and its applications beyond the research field or laboratory. Our learner backgrounds are diverse, some requiring introductory materials while others needing advanced curriculum. Furthermore, their educational goals vary: some earn graduate academic credit, some require continued education credits for professional certification, and others want no credit because they are participating for their own interests.

At the same time, advances have also been made in distance education technologies, which have the potential to provide an infrastructure for readily meeting these education and training needs to a larger audience. Even though university instructors and extension educators are highly qualified and motivated to meet these educational needs, they lack the time and financial resources to also become distance education experts or develop complex distance materials. The learning curve for developing distance delivered programs can be daunting, especially for already stretched faculty. If a working model for content authoring could be established and supported by an electronic environment that was truly user friendly, we believed distance delivery of educational materials could effectively bridge the information gap between cutting edge agricultural research and its uses by our clientele.

Objective

An overall goal of this project was to create both a software program infrastructure and a content authoring model for faculty to develop materials within their resource constraints to meet these educational needs efficiently. Long term sustainability of both the software and working model was a crucial requirement.

Project Description

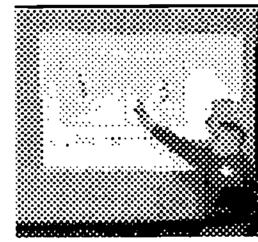
Figure 1 Dr. Alex Martin using an animation for an extension program.

Land grant universities have a mission to provide unbiased agricultural research, college education and public outreach of research information discovered. The model of developing entire courses which are password protected was not a satisfactory option because this would limit the potential audience, hindering our overall mission, as well as place unrealistic expectations upon a single instructor. Instead, an idea of an electronic library of lesson materials with free public access for educational use was envisioned. With this in mind, a group of faculty could individually develop a short lesson and illustrating animation movie addressing a specific content topic in their field of expertise. Collectively these lesson materials would form a resource library which public educators worldwide could go to and pull out those particular materials to support their specific resident course, distance course, extension program or workshop (Figure 1). These materials could also be subjected to a peer review process to insure the learner of accurate up-to-date information and provide the authors with a venue for scholarly development and creativity. The electronic learning environment would have to be expandable in many aspects: number of lessons per topic, number of topic areas addressed, number of content authors who were geographically dispersed, and number of world-wide students accessing the site.

Collaboration Between Information Technologists and Agriculture Scientists

With this vision in mind, experts at the Distributive Environments for Active Learning Lab (DEAL) at the University of Nebraska were consulted. Was there a way to develop a truly user-friendly environment to provide the necessary infrastructure? Once fully developed could it essentially stand alone with minimal technical maintenance required? What we discovered along the way was the challenge and yet importance of clear communication between experts in two very different disciplines of crop science and information technology. We found brainstorming sessions effective in which the content authors explained what their dream internet library characteristics would be, without considering if the technology was available. It was then up to the information technology experts to go back to their labs and see if they could produce such a product. It was also helpful for the content authors to look at other case examples to begin developing their own ideas. Finally, it became imperative for all involved to keep the larger picture in mind and not merely focus on the immediate needs. This was important in order to create an expandable software system and authoring model.

System Description

The following discussion sections will introduce the features of the developed system in terms of interaction of learners with the system and interaction of authors/instructors with the system. We then discuss the architecture of the developed system where we briefly describe the tools and technologies that were selected; why they were selected and how the developed system allows authors to share resources such as images, glossary etc. The content itself remains copyright protected through UNL and the individual author's institution.

Learner Interactions

The audiences who wish to view the information maintained in this system access the web address http://croptechnology.unl.edu (Figure 2). The html page at http://croptechnology.unl.edu has a *menu bar* on the left side of the browser window. This menu bar contains hyperlinks/buttons that allow a user to make selections and browse through the system. For the learners the information appears to be organized according to individual lessons. A user can select the appropriate lesson from either a *subject area menu* or a *list of lessons* from the left menu bar. Once a lesson is selected the user views the first topic of the selected lesson. This topic is in form of a HTML page and has a *next* button at the bottom of the page to go to the

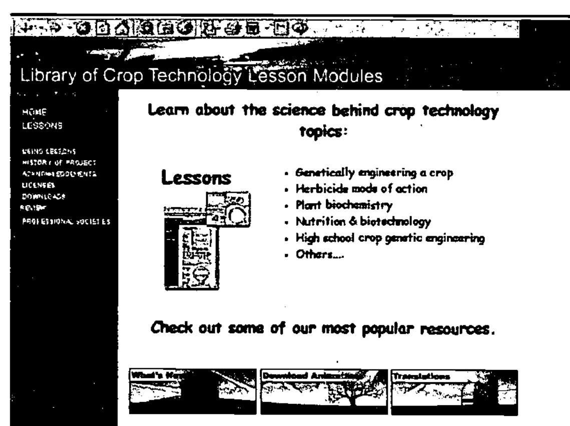

Figure 2 Screen capture of home page for the crop technology lesson library.

next topic in this lesson; depending on the topic, a page may also have a *previous* button at the bottom of it. Together, the two buttons allow a user to go forward or backward while reading the lesson content.

Apart from containing text and graphics, the topic pages have hyperlinked glossary elements. These elements can be clicked with the mouse and the glossary word is then displayed to the user in a small pop up window. A lesson may also have one or more associated animations, movie clips and/or PowerPoint presentations associated with it. The users can access these by clicking on a button on the left menu bar or when prompted within the lesson's text. Besides these features, the users who are registered and approved can also take a quiz at the end of each lesson. The system maintains the records of each user with information on each of the quizzes taken by her/him. A user who prefers to read a printed lesson can click on the *Get Printer Friendly Version* button. This presents the contents of the complete lesson in a printer-friendly format.

Author/Instructor Interactions

According to selected design strategy, the content objects of the system were decided and these included topics, glossary, lessons, images, animations etc. with a unique ID identifying each object. These objects are stored and managed in a database; when requested by a user these objects are written out in an html page format with the help of display managers.

In order to insert or maintain their content objects, the authors login into their account on the maintenance portion of the system. The application program performs the functions of authentication and then provides access to the author's objects. Once logged in, the authors have the capability to add, delete or modify their previously maintained objects. The maintenance interface has easy-to-use forms that an author uses to insert/edit different types of content objects. The forms interact with their server-side components that in turn update the appropriate database tables. Because all the information, including the images and animations, are maintained in a relational database and these objects are identifiable by their ID, all these resources (including resources from other authors) can be searched and then reused by an author by referencing to them through their respective display managers using the object ID.

System architecture. The complete system operates using Open Source Technologies, namely Apache Web Server, MySQL database and application program written in Perl programming language hosted on Linux environment. The design and implementation of the developed software is done in a modular way in order to provide high flexibility and ease of maintenance.

A multi-stage approach was taken to analyze and design the infrastructure of the system. The development process involved determining the information requirements of the learners and authors. System needs were analyzed and structured decisions were made. These decisions included the conditions, alternatives, actions, and rules under which the tools will be selected and the software will be developed. Based on the evaluated requirements and decisions made, the complete system was emulated with process and data flow diagrams. These preliminary models were developed to help make the development process modular and manageable. These models formed the skeleton for the system development and implementation cycle. Although the models were changed as the system evolved, they provided an indispensable aid throughout the development process.

The decision for opting for the open source technologies was based on the previous experience of the development group with the open source tools. The tools that were selected for this system are highly flexible, stable, have a wide developer community around the world and are freely distributed. The selection decisions were supported by our assessment of the belief such as the Apache being the most popular web server; Perl being the most popular web programming language with its excellent capability of text manipulation and rapid development cycle; MySQL being one of the most popular Open Source Databases; and the reliability of Linux. Selection of such an operating environment gave us the capability to develop a system that is easy to distribute to communities across the world. This could have been difficult if proprietary software were used because of the licensing and royalty issues. As a result, the content developed for distribution is also free of restrictive licensing.

Figure 3 illustrates the components of our system that reside on two different servers. The implementation is essentially a "fat" server and "thin" client (web browser in our case), where most of the processing is performed at the server. The first server is the application server, which holds and executes the application code. The second server is the MySQL database server that provides the database management services for the information. All the user interaction takes place with the application server which then makes connections to the database server for the data management/retrieval services.

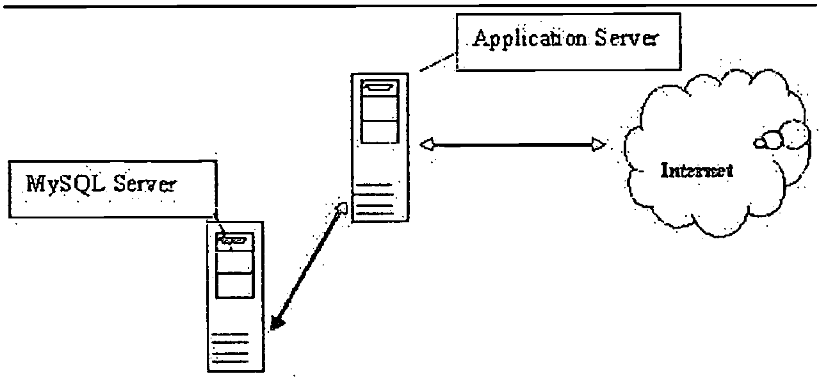

Figure 3 System design illustration.

The Content Authoring Model

This electronic lesson library was coupled with a content authoring model established at the faculty departmental level. In this model, both faculty with teaching appointments and those with extension appointments are able to develop distance delivered course modules without being in an overload assignment. The idea is that in both cases (teaching and extension), faculty create electronic materials in stepwise increments to enhance their current resident teaching or extension programming assignments. Not only does this improve the quality of their current activities, but it provides an environment for testing and refining the materials, which over time then can be packaged for distance students, as well.

Further maximizing our resources, we have created what we call dual-purpose modules. These are compact, intense, one-credit courses which can be taken for graduate academic credit or professional continuing education credit (CEU's). This shorter length is preferred by the full-time working learners, as well as the faculty. In a single offering there will be non-credit learners attending just to gain new knowledge, some for CEU credit and some for academic credit. What differs among them is the particular assignments and depth of knowledge application required for each group of learners. Currently, this library of on-line lessons provides a significant portion of activities students undergo for three of these dual-purpose modules.

Impacts

What began with one instructor, one graduate student and six crop genetic engineering lesson texts in October 1999 has grown to 20 instructors from six universities, three graduate students, two high school teachers, seven graphic artists, one programmer, two educational experts, one Spanish translator, one professional society and three industry partners to produce a library of 40 lessons covering topics in agronomy, weed science, crop genetics, animal science and nutrition and dietetics. More lessons are under development, some in new topic areas, some being modified for a high school audience and others being translated for Spanish-speaking learners.

This library has been utilized in four UNL courses (three distance/grad level; one resident/undergrad) and two NMSU (one resident/undergrad; one distance/grad), where in all cases instructors linked to the site within other University courseware programs. Animations have been used in several programs at CSU. There are many other uses of the library materials, but these mentioned are part of a research study underway. More globally, between August 2001 and May 2002 the library has received 260 download requests for 5479 flash animation files worldwide to teach a minimum of 5400 learners. Between July 2001 to March 2002, the site received 809,427 hits from 85 different countries.

A mirrored site is currently being piloted with the Western Society of Weed Science. This second site will host traffic from weed science educators and learners, while periodically being updated with the latest content developed at the parent server in Nebraska.

The advantages of this project we have identified include flexibility of design and layout, ease of sharability among authors with varying needs and resources and downloadability of materials for public educators worldwide.

Acknowledgments

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Building Effective Virtual Teams
Using Selection Interviews and Peer Assessment

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This paper describes a learning activity that can be used to demonstrate effective selection principles. It can also be used to guide students to an understanding of the factors involved in constructing and enhancing the performance of a virtual team.

The paper begins by describing the general principles involved in building an effective team. Various task-facilitating roles and relationship-building roles within teams will be described. In addition, blocking roles, i.e. behaviors that limit team performance will also be discussed. Differences between virtual teams and co-located teams (face-to-face) will be explored

A multi-stage online exercise is then described. In the first stage, identification of the KSAs (knowledge, skills and abilities) of an effective virtual team member is stimulated by a set of suggested discussion questions. In the second stage, students are given an opportunity to gain experience in selection by developing interview questions related to the KSAs identified in stage one. The third stage of the exercise leads students through a process during which they develop performance standards and rules of conduct for their virtual team. During the final stage, students generate performance evaluations for each of their virtual team mates.

Introduction

Qualities of Effective Teams

The benefits of teams for collaborative learning in the classroom has long been recognized (Bouton & Garth, 1983; Jalajas & Sutton, 1984, Johnson & Johnson, 1984; Vella, 1994. Unfortunately, many of us have had the unfortunate experience of being on a team that performs poorly or leaves us unsatisfied with the quality of interpersonal interaction. Hopefully, most of us have also had the experience of being a part of an effective team. What is the behavior that distinguishes these two experiences?

In describing effective team performance within the workplace, Ancona et. al (1999) suggests that there are four components: 1) performance - how well do team members produce output in terms such as quality, quantity, timeliness, efficiency and innovation; 2) member satisfaction – how well do team members create a positive experience through commitment, trust and meeting individual needs; 3) team learning - how well do team members acquire new skills, perspectives and behaviors as needed by changing circumstances; and 4) outsider satisfaction - how well do team members meet the needs of outside constituencies such as customers and suppliers?

These measures of effectiveness can also be applied to teams in a classroom setting. An effective class team will work efficiently to provide a product (e.g., research paper, presentation, etc.) that means appropriate standards of quality, quantity and timeliness. The team will also be a positive experience for its members. Teams members will learn from each other and acquire new skills together and they will effectively satisfy the demands of the instructor and peers.

Roles Within Teams

For teams to function effectively, team members must engage in both task and maintenance functions (Ancona et al., 1999; Gabarro & Harlan, 1983; Schein, 1988.) Task functions help team members to organize and focus on getting the work done. Examples include planning agendas for team meetings, setting team objectives and prioritizing tasks. Maintenance functions focus on holding the team together. Examples include encouraging all members to participate or mediating conflict between team members. Table 1 (extracted from Ancona et al., 1999, M-5, p. 8) provides a list of functions required for effective group functioning:

Table 1. *Processes required for effective group functioning*

	Process	Description
Processes that build task accomplishment	Initiating	Stating the goal or problem, making proposals about how to work on it, setting time limits.
	Seeking information and opinions	Asking team members for specific factual information related to the task or problem or for their opinions about it.
	Providing information and opinions	Sharing information or opinions related to the task or problems.
	Clarifying	Helping one another understand ideas and suggestions that come up in the team.
	Elaborating	Building on one another's ideas and suggestions
	Summarizing	Reviewing the points covered by the group and the different ideas states so that decisions can be based on full information.
	Consensus Testing	Periodic testing about whether the group is nearing a decision or needs to continue discussion.
Processes that build and maintain a group	Harmonizing	Mediating conflict between other members, reconciling disagreements, relieving tensions.
	Compromising	Admitting error at times of group conflict.
	Gatekeeping	Making sure all members have a chance to express their ideas and feelings and preventing members from being interrupted.
	Encouraging	Helping a group member make his or her point. Establish a climate of acceptance in the group.

The Virtual Team

A virtual team shares many characteristics of a co-located team. Like a co-located team, a virtual team is a group of people who interact to achieve a common purpose. Unlike a co-located team, however, a virtual team does not meet face to face but rather works across space and time to achieve its purpose and relies on communication technologies to achieve the interaction they need. In today's organizations, working together in virtual teams has become quite common.

Virtual teams, particularly those in the distance education classroom, face some unique challenges in their efforts to attain effectiveness. Team interactions frequently occur asynchronously. Thus, the amount of time required to thoroughly discuss an issue or reach a group decision is often greatly increased. Perhaps an even greater challenge is that there is no opportunity for non-verbal communication. A smile, a blush, a look of frustration can provide important clues to team members about the meaning of messages exchanged within a co-located team. Virtual team members are deprived of these clues to their teammates opinions, attitudes and emotions (Benson-Armer and Tsun-Yan Hsieh, 1997).

Thus, while the same types of task and maintenance functions that lead to effective co-located teams also need to occur in virtual teams, accomplishment of these functions can be more difficult to achieve. The first stage of the exercise described below encourages students to consider the material presented thus far and identify KSAs that are particularly important for virtual team members.

An Online Exercise

In the paragraphs below, I will describe a multi-stage exercise that I have used in a web based human resource management class. This class has no face-to-face meetings. The objectives for this exercise are to:

1. provide students with an introduction to the principles of effective selection.
2. lead students to an understanding of the KSAs that are desirable in an effective team member.
3. demonstrate the unique challenges inherent in working within a virtual team.
4. provide students with the experience of working with members of a virtual team to accomplish a common goal and develop a product.
5. expose students to the steps involved in developing performance standards and operating procedures.
6. provide students with peer evaluation feedback of their performance within the virtual team.

Stage One: Identify the KSAs of an Effective Virtual Team Member

Identifying the specific knowledge, skills and abilities required to fill a position is a critical step in the selection of human resources (Gatewood & Field, 1994.) Stage one of this exercise leads students through a discussion designed to identify the KSA's important for a virtual team member. Students review an online lecture that summarizes the discussion provided in the first part of this paper with respect to qualities and processes of effective teams and the challenges faced by virtual teams, Using a web based bulletin board, students are then required to reply to the following discussion questions:

1. Describe the best experience you ever had working in a team. This could be a team you were part of in class, a team you were assigned to at work or a team you were involved with during a recreational or volunteer activity. What made this team experience so successful from your perspective?
2. Describe your worst team experience. Why do you believe this team was not effective or enjoyable?
3. What qualities are the most desirable for a team member to have? Think in terms of KSAs, i.e. specific knowledge, skills or abilities you would like the team member to have.
4. Consider working with a team in an online environment. How might that experience differ from a face-to-face environment? What KSAs would be particularly important for a virtual team member to have? (try to list KSAs that haven't already been identified by another class member so that we can generate as broad a list as possible.

The discussion of KSAs for an effective virtual team member led to identification of the qualities presented in table 2 The items with an * were considered particularly important for a virtual team setting.

Table 2. *KSAs of Effective Virtual Team Members*

• listens effectively	• well organized*	• objective
• communicates often	• provides feedback	• respects others
• shows initiative	• flexible	• positive attitude
• trustworthy/ dependable	• dedicated to doing a good job	• self-motivated
• willing to do their fair share	• open to the views of others	• provides work in a timely fashion
• reads and understands the material	• works well without supervision*	• able to compromise/ reach consensus
• communicates effectively through writing*		

Stage Two: Develop the Interview Question

In stage two, students were instructed to choose one of the KSAs listed and write 2 interview questions that they believed would help them discern if the person answering possessed the quality they were seeking. Students were asked to post each interview question as a separate thread on the discussion board.

Once all interview questions had been posted, students were instructed to return to the discussion forum and post their responses to at least 3 of the interview questions posted by another classmate. Answers were to be posted as a reply to the thread started by the question.

After the deadline for posting interview questions had passed, students were instructed to submit a list of preferred team mates. The instructor assigned virtual teams in keeping with the preferences stated by students as much as possible.

A general discussion about the effectiveness of the interview questions in measuring relevant KSAs was held after stage two was complete. During this discussion, a significant level of instructor interaction took place in order to guide student understanding of the value of various questions and to provide suggestions for ways to better target desired KSAs.

Stage Three: Develop Performance Standards and Team Policies

During stage three of the exercise, teams were asked to discuss their expectations for performance. In particular, expectations were to be expressed in behavioral terms. Students were also required to develop procedures for use if a team member's performance fell outside of agreed upon expectations. For example, extremely high performance might merit an email to the instructor commending the student's performance. Low performance may result in a email to the student warning that there peer evaluation was at risk if there performance did not improve. Finally, students were instructed to develop a peer evaluation form that would be used to provide feedback to the instructor about that student's performance. In addition, each student would receive a summary compiled by the instructor of the comments provided by their peers (without any name attribution.

Stage Four: Perform as a Team and Complete Evaluation of Peers

During stage four, the virtual team completes a project together. The most recent project I have assigned is a case analysis and web-based presentation of the analysis to the other class teams. Each team receives a private discussion space to work together on their project. At the conclusion of the project, the team posts a power point presentation, that provides the key points in their analysis for review by the other teams.

Team members are then responsible for completing the performance evaluation form developed during stage three. Both quantitative ratings and comments about each peer team member are required. Upon receipt of the evaluations, the instructor compiles an anonymous summary of the written comments received to each team member. In addition, the instructor averages the quantitative component of the evaluation to determine 10% of the student's grade in the course (This procedure is clearly announced in the syllabus at the beginning of the semester.)

Conclusion

This paper describes an online class virtual team exercise grounded in the literature on team effectiveness. This exercise provides students with an interactive experience in two key human resource management activities, selection and evaluation. It also provides them with an opportunity to experience working together in a virtual team, a skill highly valued in today's workplace. In addition, the virtual team exercise provides sufficient structure and incentives to engage students and motivate performance.

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Biographical Sketch

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Delivering Interdisciplinary, Competency-Based Professional Education On-Line: A Case Example

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Interdisciplinary, Coordinated Care of the Child with Chronic Illness (IC4I) is a graduate-level course offered at the University of Wisconsin –Madison to students in pediatrics, nursing, nutrition, social work, pharmacy, and child and family studies. Class size ranges from six to fifteen students. Historically, the course has been taught in a traditional on-campus format. The faculty have used lecture, group discussion, written in-class exercises, role playing, and case simulations to teach students how to function as part of an interdisciplinary health care team.

In the spring of 2000, a decision was made to offer the course in a web-based format in order to reach a larger population of health professions students. Implementing this decision posed a number of significant challenges:

- The course is taught by as many as 10 faculty members representing multiple disciplines and perspectives on professional education.
- The course would need to be redesigned "from the ground up" to make it suitable for delivery via the web.
- A new consensus and shared vision about the purpose, content, and instructional activities of the course would have to be forged.
- Given the centrality of teaching students in the course how to function more effectively as part of an interdisciplinary team, creative strategies would have to be found to promote and facilitate teamwork among students enrolled in the on-line version of the course.

The purpose of this paper is to describe how the course design team dealt with these issues through the use of a competency-based approach to instructional design.

Course Design Strategy

The most powerful question that can be asked during the design of any educational program is "What are we trying to accomplish?" Or perhaps more to the point in professional education, what is it that we want students to be able to do in the realm of applied practice? Clear statements of desired outcomes serve as guides to subsequent steps in the instructional design process and communicate to learners what they are expected to accomplish. To the extent that outcomes describe observable clinical performances, they can also help students see the relevance of what they are learning to clinical practice and suggest more authentic strategies for evaluating learning.

For the purpose of developing an on-line version of the IC4I course, a decision was made to use a competency-based design strategy. Competency-based approaches to instructional design are based on explicit behavioral specification of both the desired learner outcomes and evaluative procedures for all learning activities. Desired outcomes are expressed in the form of competency statements, which describe the performances expected of learners if they are to be considered to have successfully completed the requirements of the course.

To build consensus among the members of the faculty and give direction to the instructional design process, we began by developing a detailed set of competency descriptions. In developing competency statements, we made a distinction between *clinical competencies* and *course competencies*. **Clinical competencies** describe the actual work performance of the professional in a real work setting and constitute the ultimate outcome sought by course faculty. Instructional design decisions must be guided by this vision of clinical performance to ensure the relevance and effectiveness of the course. However, clinical competencies can rarely be observed and assessed directly in the context of an on-line course. While they constitute the ultimate desired outcome, they cannot directly serve to guide instructional design decisions, hence, the need to define desired outcomes at a second level. **Course competencies** are derived from clinical competencies and describe the performances required of students for successful completion of the course. They serve as the basis for decisions about specific learning objectives, the course content, learning activities, and evaluation of student learning. While a time-consuming and for most faculty, unfamiliar exercise, the process of defining clinical and course competencies is critically important, especially in light of the expense of developing on-line courses and society's (and increasingly, accrediting agencies') demand that professional training programs be able to certify that its learners have demonstrated that they are able to perform their professional duties to acceptable standards.

Example: The Team Function Lesson

In this section we provide an example of a clinical and course competency drawn from the course's Team Function lesson (one of eleven lessons), describe the process by which they were developed, and summarize how they were used to inform choices about course content, structure, learning activities, learning resources, and evaluation strategies.

Competency statements for the IC4I course were developed in a group setting with all faculty participating. Faculty met with one of the authors (CO) who served as group facilitator. Working from a list of general topics to be covered in the course (i.e., death and dying, team function, teams in health care delivery, public policy, advocacy, family perspective, transitions, adherence, cultural competence), the group discussed what were the clinical competencies needed for effective practice in each area. Clinical competencies were framed without regard to the fact that the course would be taught on-line. Discussions typically began with a review of how each topic was currently being taught—what content was covered and the types of learning activities used. Discussants were encouraged to relate this information to clinical practice, primarily in response to two questions:

> Why is it important for students to know/be able to do this?
> How is it useful to them as practicing professionals?

A total of sixteen clinical competencies were identified for the course using this process.

The clinical competencies for the Team Function lesson were as follows:

> *The clinician will function effectively as a member of an interdisciplinary team, be able to monitor the functioning of a team in terms of leadership and process, and initiate appropriate interventions to maintain or improve team functioning when needed.*
>
> *Given a specific case, the clinician will decide on an appropriate approach to health care delivery (i.e., interdisciplinary, multidisciplinary, trans-disciplinary, or single primary care provider) and choose to use an interdisciplinary approach when indicated.*

In identifying these competencies, the presumption was not that the course would provide all that was needed for the student be able to perform them, but instead that they mark out the ultimate goal, and that the course would move the student along a continuum in the direction of performance of that goal. Just how far along the continuum to that goal students would be expected to progress was an issue that was addressed in the next step of the process, when the course competency was defined.

After developing the clinical competency statements, the faculty were asked to describe what behaviors the student would be expected to demonstrate in the context of the course.
The course competency developed by the faculty for the Team Function lesson was:

Given a case scenario, the student will be able to interact as part of an interdisciplinary team, demonstrating the ability to work collaboratively, communicate effectively, and facilitate reaching a consensus.

The course competency guides the process of formulating more specific learning objectives. The critical question is what does the student need to know or be able to do in order to adequately demonstrate mastery of the course competency? At this level, much more attention was given to the constraints of an on-line method for delivering the course. For the Team Function lesson, the faculty established the following learning objectives:

Describe the characteristics and dynamics of effective teams and barriers to team function
Describe, analyze, and evaluate the group process of an interdisciplinary team.
Recognize behaviors of team members that promote or impede team function.
Use communication skills to enhance team process (e.g., giving feedback, clarifying issues, summarizing discussion, testing for consensus).
Identify and implement appropriate interventions (e.g., agenda setting, conflict management, goal setting, negotiation) to maintain or improve group functioning.

In the faculty's view, if students successfully attained these objectives they would have the many of the requisite skills and knowledge to perform the activities described in the course competency.

The next task was to identify learning activities that would create the conditions needed for students to realize the learning objectives. Students would also need opportunities to integrate their new knowledge and skills and practice the performance required by the course competency statements. Learning activities used in the current course and potential on-line activities were listed for consideration.

The general template for each lesson consisted of an overview page introducing the lessonfaculty and describing the topics and learning outcomes (objectives) for the lesson, a learning activities page with assigned readings, a lecture (on CD-ROM), a discussion topic, individual and group assignments, and a clinical case that required students to apply what they had learned to patient care.

The learning activities chosen as part of the Team Function lesson were designed around the template and included readings on team dynamics and communication; a lecture about different types of teams; threaded discussions in which students discussed their personal experience on professional teams; a brief paper critiquing the team function of two videotaped examples of case conferences, In addition, students were assigned to teams and asked to complete a group project in which they were to determine the ground rules and process that their team would use for future assignments. *Three additional group assignments during the remainder of the course allowed the students to form their own teams, practice teamwork skills, and receive feedback from peers and faculty.*

Finally, consideration was given to how students' learning would be assessed. For the Team Function course competency and learning objectives, students were evaluated in five ways. First, the faculty assessed students' ability to employ concepts of team functioning presented in lectures and readings to reflect on their personal experiences working in teams. Second, they were evaluated on their analyses and critiques of videos of pulmonary team meetings. Third, they were evaluated on their ability to function as a team member in completing their group assignments. (The course instructor (RT) and faculty were able to "eavesdrop" in on the student's chat and threaded discussions used to complete the group assignments throughout the semester.) Lastly, students to provide a self-assessment of the degree to which they had accomplished the learning objectives. In the next iteration of the course, additional methods such as skills checklists will be used to assess student performance.

Outcomes

Through the process described above, the faculty for the IC4I course was able to build consensus on the purpose and general architecture of the on-line course. This process also allowed faculty to describe in detail the performances expected of students, identify learning activities that were directly linked to the desired outcomes, specify evaluation strategies that would give both the student and faculty feedback on course effectiveness, and provide clear guidance to the team that was responsible for developing web resources for the course. Piloted in spring of 2002, the course has been highly rated by students, recognized on campus as an exemplary on-line course, and shown to be an effective means for accomplishing its intended goals.

Biographical Sketches

Curtis Olson is the Director of Curriculum Development and Evaluation in the Department of Pediatrics at the University of Wisconsin-Madison, a position he has held since 1995. His responsibilities include providing consultation to faculty on distance education and directing the department's distance education program for practicing physicians. He received his doctorate in adult education from the Department of Continuing and Vocational Education (CAVE) at the University of Wisconsin-Madison, with an emphasis on curriculum development and facilitating change in educational organizations. He has taught graduate-level courses for the CAVE department on topics ranging from research methods to the philosophy of adult education.

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Are We Constructing Sterilized and Disembodied Universities? Academic Freedom and Distance Education

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Abstract

Faculty and staff at online universities are encountering many of the same political and social concerns as faculty in brick-and-mortar environments, but new problems are emerging as well. Online classroom activity can be monitored externally in manners not often found in traditional classroom contexts, presenting potentials for new forms of academic freedom and intellectual property violations. Participants should be vigilant for these violations as they materialize and share relevant accounts with colleagues worldwide.

Introduction

In past decades, one of the underpinnings of the higher education systems of the US and many Western nations has been the notion of "academic freedom" (Hofstader, 1955; Metzger, 1955). Many longstanding academic and professional groups have worked to support academic freedom, and new organizations that focus on these issues (such as Europe's Observatory of Fundamental University Values and Rights) are also being instituted (*Academe*, 2002). However, attacks on academic freedom by public officials and institutional administrators have grown in recent years, apparently linked to such concerns as international security (*Lancet*, 2002), organizational efficiency (Koch & Fisher, 1998), and campus speech codes (Cox, 1995), as well as various political pressures. In the advent of the widespread diffusion of online learning systems in higher education institutions, new dimensions of academic freedom issues are emerging. These encroachments are related to such matters as the control and evaluation of course content and structure. As information technology allows the recording and analysis of details of course activities, the classroom (like many other workplaces in the information age) can become a "fishbowl" (Clement, 1992). Distortions of various aspects of classroom interaction can be used to harass and intimidate faculty members as well as students, providing a chilling effect and leading to diminished innovation and creativity.

This presentation provides an assortment of scenarios of how distance education is currently influencing academic freedom issues in university contexts and how it may affect them in the future. It also outlines some of the rhetorical and political battles that are taking place as proponents of distance education counter those in academic life who less enthusiastic about information technology advances. The plausibility of these scenarios will be supported by details of incidents already reported along with related secondary source material. The scenarios reflect themes including the following:

Online Course Monitoring and Surveillance

Monitoring of classroom activity may provide frightening restrictions upon freedom of speech and a subsequent stifling of intellectual expression. The technology that provides the convenient delivery of academic content via computer also affords the surveillance and subsequent analysis of what is conveyed in everyday online coursework. Teachers as well as students could fear retribution in years to come if and when controversial comments are taken out-of-context. Already, the monitoring of e-mail correspondence between teachers and students is causing concern (Alger, 1999).

Inability to Reflect Local University Conditions in Course Content

Many of the nuances of academic life and the various issues of campus may be excluded from consideration in course design, thus creating "sterilized and disembodied" institutions delivering whitewashed content. Local events in a university context (such as those associated with academic politics) often provide a microcosm of the larger issues facing academia and society as a whole, although sometimes reflecting conflict as well as collegiality. However, these events may be eliminated from most course materials and activities by program administrators eager to produce a "standard" and "safe" academic product. The textbook industry in the US (as described in Altbach, Kelly, Petrie, & Weis, 1991) may provide a model of the overall academic classroom of the future, as many institutions will focus on delivering carefully-scripted educational content that is devoid of most reflections of institutional or individual personality.

"Quality Control" as Mechanism for Control of Content

Mechanisms for the development and evaluation of online courses may effectively eliminate many varieties of academic expression. Quality control (as implemented in "total quality" systems or other methodologies) is becoming a growing aspect of universities (Widrick, 2002). Creative nuances in course design or implementation that deviate from standard course models may be construed by program administrators as technical errors or problems rather than as innovations. For example, faculty members who are frustrated by the course development tools that are sponsored by their universities and who seek different channels for course content delivery may be stymied in their efforts. Experimental approaches may be eschewed in favor of less creative teaching techniques that are more in keeping with a mass audience.

Restriction of the Use of Certain Sources of Material

The kinds of sources that are utilized in coursework may be controlled by external bodies, making many forms of investigation in classroom contexts impossible or infeasible (Oravec, forthcoming). If certain sources cannot be utilized because of economic or political factors then academic freedom can be violated in certain contexts. A campus may not be able to afford the intellectual property expenses associated with certain materials; this is not enough in itself to claim an academic freedom violation. However, if a faculty member's requests for support are turned down for political reasons, or if access to materials is otherwise blocked in a discriminatory manner, a kind of violation of academic freedom occurs.

Publishing Versus Speech

The consideration of much of online classroom activity as "publishing" instead of "speech" may remove some of the legal and social protections associated with classroom speech. Only a small amount of case law on these matters has emerged as of yet in academic contexts.

In general, the trends that the scenarios (along with their theoretical support) reflect show how control of the content and modes of delivery of classroom material is being removed from faculty and placed in the hands of program administrators. The freedom that individuals have in classroom contexts to speak openly as well as to exchange materials may thus be diminished, and university life reduced in quality as a result.

Rhetorics of Distance Education and Academic Freedom

As discussed in the presentation, the impetus toward the integration of online or distance education into higher education institutions has spawned a rhetoric that champions technology as reflecting "progress" and diminishes other aspects of university life (Noble, 2002). This rhetoric includes the following recent statement, in which faculty and their philosophical and political stances have been construed as a barrier to the development of online learning:

It's not about budgets. It's not even about network overload. When it comes to applying digital technology in the classroom, the biggest obstacle for higher education has nothing to do with resources or wiring. It's about faculty members (Lynch, Altschuler, & McClure, 2002, p. B15).

Yet another commentator on these issues in *The Guardian* declares that "the online university has little need of faculty in the traditional sense" (Alderman, 2002). With faculty themselves labeled as being superfluous to the higher education institution of the future, academic freedom issues are being recast as inessential aspects of higher education rather than the very essence of university life; they are the "noise" rather than the "signal" of university functioning.

Some Conclusions and Reflections

Defending Academic Freedom in Online Contexts

Rather than being a vestige of the past, academic freedom is becoming even more essential to support open inquiry and exchange in an "information age." Faculty, staff, and students require protection for their expressions, especially as the varieties and forms of their inquiry expand with the advanced technologies for simulation and discovery at their disposal. However, rhetoric that combines respect for academic freedom along with regard for the positive significance of technology is apparently less common than confrontational rhetoric that places distance education and academic freedom in opposition. Cases in which individual students and faculty members face severe pressures to conform to values of efficiency in course delivery rather than more traditional academic values are also emerging.

In order to ensure that academic freedom survives in online university contexts, participants must be vigilant for academic freedom violations and share their reflections about these matters with each other. Unfortunately, with faculty members and students often dispersed across the globe, defense of academic freedom cases could suffer. Many of the part-time instructors of distance education courses are professionals from non-academic environments and may not be well versed in academic freedom issues.

Other concerns relate to the lack of cohesion among faculty or even awareness of others' situations. In electronic contexts, casual encounters and exchange of information about university life are indeed possible in hallways and coffee room, and allegiances form over committee assignments and golf outings. However, if individuals are not aware of the total picture involving the fate of particular faculty members they may be less interested in defending those involved. Metzger (1955) described academic institutions in the Western ideal as drawing participants into "working together in the vineyards of knowledge"; as these vineyards spread in electronic form across the globe, defense of academic freedom becomes even more important.

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Concentric Model for Evaluating Internet-Based Distance Learning Programs

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Evaluation in Distance Learning

With distance learning becoming more prevalent as an option for obtaining an education, many schools are rushing to get their courses online and available to students (Institute for Higher Education Policy, 2000). However, is anyone stopping to ask if what is in place is a quality program? If so, what is the definition of quality and what aspects of the program are being evaluated?

According to the current literature, the majority of articles on the assessment and evaluation of distance learning programs focus on single elements and fail to take into consideration the complex environment necessary for a quality program. Even titles that convey a holistic approach to evaluation only address a specific issue. For example, Benigno & Trentin's (2000) article, "The Evaluation of Online Courses" focuses on assessing student participation through analyzing the students' messages; Gunawardena, Lowe and Carabajal's (2000) article, "Evaluating Online Learning: Models and Methods" focuses on methods for evaluating discussion groups, and Robson's (2000) article "Evaluating Online Teaching" focuses only on the issue of human computer interface.

Moreover, only a few articles actually provide insight into the complexity involved in evaluating an entire distance-learning program. One of the best reports, in regards to explaining the breadth of the issue is "Quality on the Line: Benchmarks for Success in Internet-Based Distance Education" by the Institute for Higher Education Policy (2000). This report did a thorough review of the literature, selected six institutions that had reputations as leaders in distance education, and conducted interviews and surveys of students, faculty, and administrators at each of the schools. Other articles that provide insight into the realm of a holistic program evaluation are Benke, Brigham, Jarmon and Paist (2000) article, "Rethinking Quality Assurance: Examining Established Practices, Exploring New Strategies," which offers valuable insight into four of the major elements—faculty, course development, student support, and technology considerations—and Dasher-Alston's (1999) article, "Evaluation Criteria for Distance Learning," which focuses on academic planning yet provides additional information on other aspects relating to quality.

While each of these articles present valuable information into the aspects required in a quality distance learning program, none provide all the aspects we, as researchers, feel should be addressed and none provide a visual model that illustrated how the elements in question related to one another. Therefore, the Concentric Model for the evaluation of quality distance learning programs was created to meet this need and is now in the process of being validated.

Defining a Quality Distance Learning Program

In order to develop an evaluation model for distance learning programs, a clear definition of what was meant by a "quality distance-learning program" had to be established. A survey of people interested in the field of distance learning (as determined by membership of listservs dealing with distance learning issues) was conducted to define a quality distance learning program and list the key elements a quality program would contain.

After compiling the results and incorporating elements deemed as critical from the researchers' point of view the following definition was created and used as the foundation of the model:

> *A quality distance-learning program focuses on and supports the needs of the people it is intended to serve. Therefore, it has at its core the interaction between faculty and students, surrounded by pedagogically appropriate content presented through a stable technology platform that is supported, both technically and programmatically, to provide knowledge and/or training that is accepted and desired by the larger community.*

When reviewing the various definitions of a quality distance learning program as provided by the participants of the survey, it was interesting to note that the most frequently listed components focused on the needs required by the faculty and students of a specific course. Within the various definitions, the support needs required to sustain a program were frequently absent. The reason for this can only be hypothesized at this point. Was it because the respondents were primarily faculty and were not aware or choose not to emphasize the larger picture of supporting an entire program? Is it a weakness in the data collection process, in that technical support and administrators did not comprise a large portion of the sample? Could it be that the elements outside the everyday classroom are not important in the assessment of quality in a distance-learning program? Only further analysis and validation of this definition will tell.

Development of a Model for Evaluation of Distance Learning Programs

Using the above definition as the foundation for a model that will assess and evaluate distance learning programs, the researchers wanted to capture and build upon their opinion, and that of the participants they surveyed, that for a distance learning program to be successful it had to focus and revolve around the people it intended to serve - primarily the students who are learning but also the faculty who are teaching. In addition, the model needed to position the other elements critical to the success of the program around the core of people.

The model (see figure 1) begins with a core symbolizing the student and faculty member. Each half of this core is equally important, as the success of the student learning depends on the success of the teacher in providing instruction. Supporting the core is a ring indicating the interaction of the students and teachers with the content of the course. The content is surrounded by a course management system, which enables the content to be managed by the instructor and served up to the students. We are not trying to presuppose that a quality distance learning program needs to have one of the large commercial course management systems; we are only suggesting that the content needs to be managed through a system for consistency and security of the information. The content, faculty, and students need to be supported by a team of technical staff, who are available to assist in troubleshooting problems, providing training and instruction, and attending to the server and other technology. This enables individual courses and students to be successful, at least in terms of technical expertise.

This is where the majority of the research ends, in terms of evaluation. However, we suggest that there are two additional levels that need to be considered. First, a quality program will need programmatic support for the faculty and students. This means that clear support from the executive leadership needs to be in place, which will help enable and support faculty needs (e.g. release time for development, importance of distance learning to promotion and tenure, etc.) and the needs of the students (e.g. online services such as registration and payment, research resources, etc.). Finally, there has to be community support for the program. Questions such as is the degree accepted by industry as a valid from of education, can students receive financial aid, and what is the general opinion of the public for online education need to be addressed.

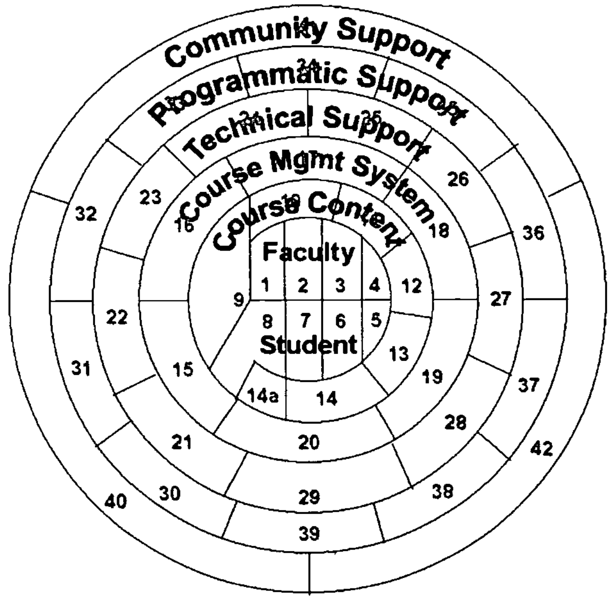

Figure 1: Concentric Model for evaluating distance-learning programs

Required Elements for Evaluation of a Distance Learning Program

After the various "rings of support" were established, the researchers reviewed the literature and pulled from their own experience to determine the various aspects within each area that should be evaluated. This initial analysis yielded 42 critical elements (see Appendix A). These elements were initially validated by comparing them to the results provided by the survey participants. Upon review, we noticed a large omission from our initial list in that we failed to indicate the importance of addressing ADA compliance when developing content. Thus, category 14a was created to address this critical issue.

Use of the Model

The model is intended to help involved parties analyze the quality of their program by indicating whether each element is something in which they excel, need more work, or are lacking. This will provide an indication as to where effort should be placed for improvement, by starting from the inside of the rings and working out. Additionally, the model can be used to help establish a distance-learning program by using the critical elements to assess the feasibility of success, starting at the outer most rings and working their way in.

Future Plans and Directions

The next phase in the development process will revolve around the validation of the model through the use of expert reviewers and further review of the literature. During the validation process we will be looking to make sure that all the required "rings" of support are indicated and all critical elements are defined. If you are interested in participating as an expert reviewer, please contact Elizabeth Osika.

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Appendix A: Listing of Critical Components in the Concentric Model

Faculty

1. Technical Competency
2. Knowledge of online pedagogy
3. Behavioral skill set/motivation
4. Technology available

Student

5. Technical competency
6. Behavioral skill set / motivation
7. Technology available

Content

8. Interaction between students and students
9. Interaction built in the class between faculty and students
10. Design criteria (look, navigation)
11. Clear objectives and goals (good instructional design)
12. Assessment / evaluation is consistent with objectives and goals
13. Learner centered vs. content centered (active classroom)
14. Does the content make use of the online capabilities

14a. Adherence to ADA standards for accessibility

Course Management System

15. Easy to use for faculty and students
16. Feature set available
17. Allows for interactivity
18. Administrative overhead that is required (money, people, time)
19. Consistent format
20. Visually appealing

Technical Support

Student

21. Software support (training on Word, PPT, email, etc.)
22. Problem resolution - online and in person

Faculty

23. Multimedia development assistance
24. Copyright assistance/policy
25. Training on course management system and pedagogy
26. Individual consulting
27. Problem resolution - online and in person

Infrastructure

28. System administration support
29. Stable, robust infrastructure to support technology

Programmatic Support

Faculty

30. Commitment from executive leadership/clear direction
31. Release time for faculty development
32. Important to promotion and tenure
33. Peer assistance and mentoring
34. Policy on Intellectual property issues

Student

35. Online registration
36. Online payment
37. Online support services (advising, etc.)
38. All courses (pre-reqs and required) online or transferable
39. Research resources (library services)

Community Support

40. Acceptance of degree by industry (recruitment, job placement)
41. Financial aid for program
42. Public opinion / impression of the validity of online services

Learning Online: A Collaborative Approach

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Building and sustaining interactivity are key skills that online instructors need to develop. Although many instructors would like to include collaborative learning activities in their online courses, they are unsure of how to do so. This is particularly true for those working in the hard sciences and mathematical areas. In this paper and in our session, we will provide ideas for including collaborative activity in online courses, regardless of the content area being taught. The issue of working with varying learning styles will also be addressed.

The Importance of Collaboration in an Online Course

Collaboration has often been defined as the "heart and soul" of an online course and that which distinguishes online teaching from face-to-face teaching. Collaboration online accomplishes the following:

- **Assists with deeper levels of knowledge generation** – When online classes are developed from a constructivist frame, the central theme is the co-construction of knowledge and meaning. When working in small groups, teams, or even on the discussion board of an online course, the ability to create knowledge and meaning is enhanced.
- **Promotes initiative, creativity, and critical thinking** – Stephen Brookfield (1987), in his discussion of critical thinking notes, "Critical thinking is complex and frequently perplexing since it requires the suspension of belief and the jettisoning of assumptions previously accepted without question. As people strive for clarity in self-understanding, and as they try to change aspects of their lives, the opportunity to discuss these activities is enormously helpful (p.10)." Thus, the ability to collaborate enables the development of the ability to think critically, a skill that is more difficult to master individually.
- **Allows students to create a shared goal for learning and forms the foundation of a learning community** – In our previous work, we have noted that a learning community is the vehicle through which learning occurs in the online course (Palloff and Pratt, 1999; Palloff and Pratt, 2001). Beginning an online course with a discussion of learning objectives and working toward a common goal creates not only the foundation of that learning community, but also is the first step toward collaboration. If students are clear from the beginning of the course that "we're all in this together," then incorporating collaborative activity into the course happens much more easily.
- **Addresses all learning styles** – When an online course is developed using *learning cycles*, which are a systematic set of activities that tap into all learning styles, *collaborative projects*, or *complex activities*, which demand that students approach learning through the use of multiple skills, all learning styles are tapped. Consequently, in using collaborative approaches to learning, the instructor can be assured that the various learning preferences in the group will be utilized and that the less preferred styles may be further developed.
- **Addresses issues of culture** – Collaborative activity enables the capability of students to construct their own knowledge and apply prior experience and their own culturally preferred ways of knowing to the task. Consequently, through collaboration, it is likely that a more culturally sensitive online classroom can be created.

Collaboration, then, assists the instructor and all students in successfully achieving learning objectives more easily. Although collaboration takes more time, the outcome is actually a more efficient and complete learning process.

Incorporating Collaborative Activity into an Online Course

There are numerous ways in which an instructor can create collaboration online, regardless of the content area being studied. Some suggestions are:

- Collaborative small group assignments
- Research assignments which ask students to seek out and present additional resource material to their peers
- Group work on case studies
- Simulations
- Shared facilitation
- Homework forums
- Asynchronous discussion of the reading and discussion questions
- Papers posted to the course site with mutual feedback provided

Regardless of how collaborative activity is used online, the instructor is responsible for creating the container through which it can happen effectively. Consequently, the instructor needs to set the stage for collaborative activity by:

- Focusing on the development of a learning community
- Creating the environment for collaboration by encouraging collaborative activity from the first day of the course
- Modeling the process of collaboration through interaction with the group
- Guiding the participants as they engage in collaborative activity, without dominating the process

Additionally, the questions an instructor poses on the discussion board can assist with and promote collaboration. Brookfield and Preskill (1999), note that there are several categories of questions that promote discussion. They state, "An important focus of democratic discussion should be on getting as many people as possible deeply engaged in the conversation. Whatever the teacher says and does should facilitate and promote this level of engagement (p.87)." The following are the types of questions they delineate that can begin and sustain discussion (pp. 87-92):

- **Questions That Ask for More Evidence** – These questions are asked when participants state an opinion that seems unconnected to what's already been said or that someone else in the group thinks is erroneous, unsupported, or unjustified. The question should be asked as a simple request for more information, not as a challenge to the speaker's intelligence.
- **Questions That Ask for Clarification** – Clarifying questions give speakers the chance to expand on their ideas so that others understand them in the group. They should be an invitation to convey one's meaning in the most complete sense possible.
- **Open Questions** – Questions that are open-ended, particularly those beginning with how and why, are more likely to provoke the students' thinking and problem-solving abilities and make the fullest use of discussion's potential for expanding intellectual and emotional horizons.
- **Linking or Extension Questions** – An effective discussion leader tries to create a dialogical community in which new insights emerge from prior contributions of group members. Linking

or extension questions actively engage students in building on one another's responses to questions.

- **Hypothetical Questions** – Hypothetical questions ask students to consider how changing the circumstances of a case might alter the outcome. They require students to draw on their knowledge and experience to come up with plausible scenarios.
- **Cause-and-Effect Questions** – Questions that provoke students to explore cause-and-effect linkages are fundamental to developing critical thought.
- **Summary and Synthesis Questions** – One of the most valuable types of questions that teachers can ask invites students to summarize or synthesize what has been thought and said. These questions call on participants to identify important ideas and think about them in ways that will aid recall.

How Comfortable Are You in Working With Collaboration? An Exercise in Letting Go

Collaborative activity requires that instructors empower students to take charge of the learning process. Consequently, it is important for an instructor, before incorporating collaborative learning into an online course to do a self-assessment to determine just how comfortable he or she is with letting go of the control. Self-assessment questions for reflection include:

- How do I teach now? What types of learning activities do I include in a face-to-face class?
- How much do I know about small group dynamics? Do I know enough to be able to intervene in a group if the process is not going well?
- How will I need to shift or change my teaching style or approach to enable collaboration to happen?
- How comfortable do I feel letting go of the control and allowing learners to take charge of the process?

The responses to these questions can determine whether collaborative activity will succeed or fail in an online course. The instructor must act as a facilitator or guide, allowing students to create their own learning process. It is the outcome of that process that is most critical – how the students get there should be of minimal interest to the instructor.

Evaluating Collaborative Assignments and Collaborative Work

A major concern expressed by instructors as they embark on collaborative activity online is how to evaluate the outcome of that work. Is giving a group grade fair? If not, how does the individual student earn a grade? We do use group grading for some of our collaborative projects online. However, we do so by asking students to send us a private e-mail giving themselves a grade and evaluating and grading each member of the group. We incorporate this into our assessment of their process and outcome. We will also use this same process in providing individual grades for a group project. Often, giving a group grade for the final product and an individual grade for each group member's work within the activity provides the most equitable means by which collaborative work can be evaluated.

We also feel that it is critical for students to evaluate the process they went through, which can be done publicly on the course site. Finally, regardless of how evaluation occurs, veto power remains with the instructor. If we feel that students are being too harsh in their evaluation of themselves and others, we will intervene. Concern about how to evaluate collaborative activity should not hinder the inclusion of this powerful tool in an online course as it is the most effective means by which to maximize the learning process and create a quality learning outcome for all involved.

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Lessons Learned Through Online Study of Indicators of Constructivism in Online Courses

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Introduction

Many online course developers and instructors are committed to providing quality online courses that are not only accessible and convenient, but also well prepare learners for the 21st century as critical thinkers and collaborators. Increasingly, constructivism (or the active construction of knowledge by the learner as opposed to the passive reception of knowledge from the instructor) is becoming the learning theory of choice of course developers and instructors alike to achieve this learning goal. However, available research is still limited in terms of providing validated indicators of constructivist principles in online courses.

The purpose of this paper is twofold. First, it describes a study that identified indicators of constructivist principles applied to the development of Internet-based courses; and second, it addresses this study as an example of online research—an approach to research that is becoming increasing popular—highlighting the advantages and disadvantages of the approach taken in this study.

Indicators of Constructivist Principles in Internet-Based Courses

This study aimed to assist educators and course developers in providing greater assurance of quality in Internet-based courses by identifying indicators that reflect the application of the principles of constructivist learning theory to course development. If it can be assumed that online learning is amenable to constructivist learning principles and such courses can be markedly improved by adherence to this construct, then defining related indicators is important.

The study used a Delphi survey research method and a panel of experts with identified interests and expertise in constructivist learning theory and instructional technology. The panel identified and validated important indicators of constructivist principles for use with Internet-based courses. Anonymously panelists completed an online Web survey over three rounds of questioning during a one-month period. The Web survey automatically updated response frequencies and commentary. In doing so, it permitted asynchronous electronic communication between panelists and the researchers. Panelists also corresponded with the researchers though e-mail.

Expert panelists proposed and rated categories and indicators of constructivist-compatible principles, which the researchers complied and organized. Over the three rounds, the survey yielded 10 categories and a total of 110 indicators in 10 categories. Panelists rated 53% of the 110 indicators as $\underline{M} = 3.51$ or higher (on a 5-point scale). A selection of the revised list, with indicators receiving a mean rating of 4.50 or higher, is presented in Table 1. The categories and associated indicators provide an initial framework that may help educators apply constructivist principles to the development of Internet-based courses. However, the researchers caution readers because the category and indicator list does not represent a definitive compilation. Additional research is needed to further identify indicators and validate the categories and indicators compiled in this study.

Table 1. *Indicators Rated 4.50 or Higher*

#	Category	Indicators identified by expert panel	Rnd-1	Rnd-2	Ave.
1	AOL	Opportunities to revise or modify work.	4.50	5.00	4.75
2	PBL	Students explore nontrivial problem areas and ask questions, debate ideas, make predictions, and draw conclusions while creating relevant artifacts.	4.60	4.80	4.70
3	COLL	Examples of collaborative and cooperative small group work would include: threaded discussions (internal); discussions with outside experts; synchronous chats; small-group exercises; projects and papers with multiple authors.	4.60	4.80	4.70
4	PBL	Projects are shared with peers during development and completion, thus supporting knowledge construction in social learning settings.	4.60	4.75	4.68
5	COG	Students construct, build, or enact something that is representative of an abstract theory or idea.	4.40	4.80	4.60
6	AUT	Example methods of authentic practices include: making or building things; analyzing problems; designing solutions; trying out solutions; testing and evaluating solutions.	4.60	4.60	4.60
7	SAFE	Instructors avoid public humiliation or unneeded social comparison of students.	4.50	4.60	4.55
8	SAFE	High levels of trust and support (which in turn will allow greater levels of public criticism) are maintained.	4.50	4.60	4.55
9	PBL	Project "assignments" are purposefully under-designed to allow a large degree of flexibility in interpretation, which is in keeping with the construction of new knowledge.	4.40	4.60	4.50
10	COG	Sample types of tasks or methods include: reflective journal entries; threaded discussions; rationales and reflections on projects; projects requiring high levels of self-directed work and organization; evaluation of others' work.	4.20	4.80	4.50
11	COG	Students critically evaluate own (and others') work.	4.60	4.40	4.50
12	AUT	Reported or perceived relevance/utility of the tasks.	4.40	4.60	4.50
13	AUT	Assessments are performance-based or related to real work settings.	4.60	4.40	4.50

Category Code descriptions:
PBL - Project-based learning tasks
COLL - Collaborative and cooperative small group work
COG - Tasks that require higher order cognitive skills
AUT - Tasks that are authentic, relevant, and meaningful
SAFE - Safe environment
AOL - Assessment of learning

Web Survey Method

A second aim of the paper is to discuss the use of the Web for data collection and expert panel discussions. As mentioned, the study employed a Delphi research method to reach consensus of participant opinion through three rounds of questioning. The researchers constructed Web survey forms containing tags that interacted with FileMaker Pro database files. From the Web, participants could submit data to and extract them from the database. Interfacing with database files through Web documents afforded participants the opportunity to see a compilation of other participants' submissions, and to respond to them in an interactive manner. A database was also useful for data sorting and analysis.

In all three rounds of questioning, participants submitted their responses through the Web. The first round presented four general categories of constructivist-compatible instructional practices obtained from the researchers' review of literature. Using a five-point rating scale, participants rated the importance of each category as it related to Internet-based courses. For each category, participants typed at least five relevant indicators or statements that describe observable and measurable elements, methods, and/or procedures whose presence indicated the use of constructivist principles in an Internet-based course. Participants could also type new categories, indicators, and general comments.

The second round presented the categories of constructivist-compatible instructional practices and several indicators (obtained from participants) intended to reflect the application of constructivist learning theory to the development of Internet-based courses. For all categories, participants rated the importance of each indicator from 1 (Not Important) to 5 (Very Important). The survey also presented the average rating each category received in Round 1. The Web survey tallied responses and compiled comments from the previous round. This allowed respondents to consider their responses in relation to those of all other participants.

The third round again presented the categories of constructivist-compatible instructional practices and associated indicators. Participants rated the importance of each indicator. To assist participants, the survey presented comments about the categories and indicators and the average rating of each indicator from Round 2 (see Figure 1).

Advantage and Disadvantages of the Web Survey Method

The researchers note three primary advantages about the Web-based survey and online expert panel discussions. First, from their perspective, the Web proved to be a viable alternative to expert panels when panelists could not meet face-to-face. Web surveys provide unique access to geographically dispersed individuals and their interactive capabilities offer much potential for conducting online panel discussions. In this case, the Web and database facilities allowed discussants to deliberate about topic categories and indicators and to refine them.

Second, the Web survey was easily accessible to anyone with email and a Web browser. Once the researchers created the survey, HTML documents, and database files, they notified potential participants through an email that included the site URL. Participants could click the URL and conveniently gain access to the survey. The process eliminated the need for a print survey and it having to be distributed and returned through the postal system. In addition, the researchers did not need to transfer print copy information to digital form and data became immediately available for analysis as soon as respondents submitted them.

Third, compared to print, the Web surveys, as used in this study, enabled interactivity among participants and allowed data to be collected dynamically. For example, participants read other participants' comments and saw the mean ratings of categories and indicators, which assisted them in rating and refining items. Once participants submitted their responses to the database, their data became instantly available for analysis and display.

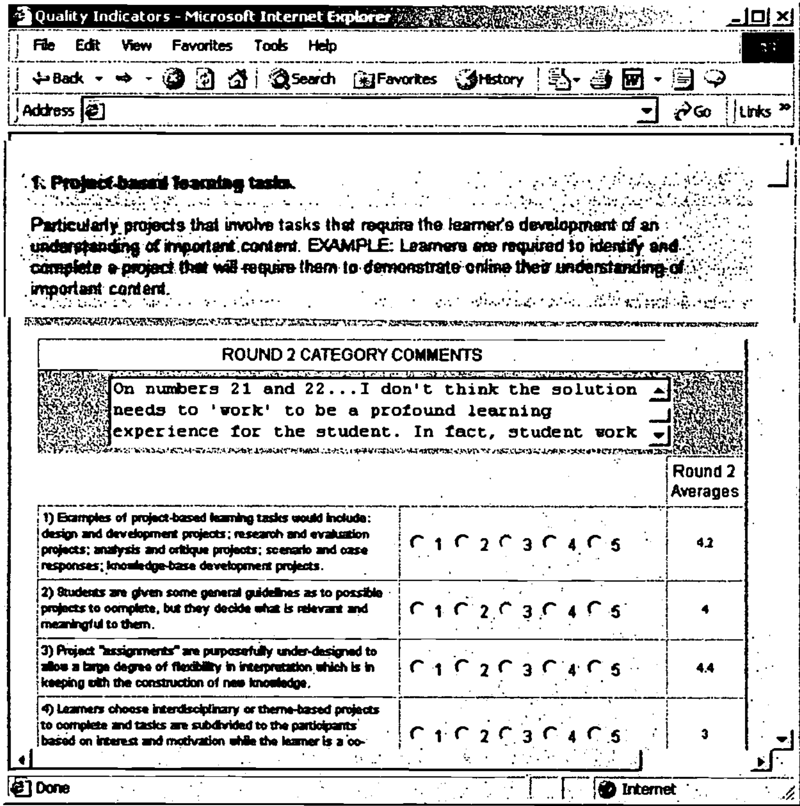

Figure 1: Screen sample of Survey Round 3

A significant disadvantage of conducting panel discussions in this manner is the limited amount of dialogue that took place. The researchers approximate that compared to face-to-face panel discussions, limited commentary occurred online. Depending on a survey's purpose, the utility of the Web for expert panel discussions and data access and collection diminishes when participants are disinclined to communicate. The amount of commentary that participants contributed across rounds did not exceed much more than a thousand words. One may safely assume that if a panel of 5 or more persons met face-to-face, the quantity of comments would far exceed this total. The researchers encouraged panelists to respond to the comments of others across the survey rounds but limited interaction occurred. From the study, it is impossible to ascertain whether the restricted commentary resulted from time constraints (each round lasted one week), the researchers not facilitating communications effectively through the Web survey interface, or if the panelists simply opted not to respond to others. It is also plausible that since computer-mediated (online) groups are task orientated and disinclined to exchange social-emotional information relative to face-to-face groups meetings (Chidambaram, 1996; Jonassen & Kwon, 2001) that less commentary occurred. The online panelists may have stated their point concisely without engaging in extraneous conversations, which may not have been the case if they met in-person. In addition, for many individuals, typing text messages into a Web page is more labor intensive and time consuming than communicating verbally. Text messages also lack the non-verbal cues that often engage discussants more fully in conversation.

Facilitating Web-base panel discussions online is an area that needs further research. In this study, the Web was a useful medium for data collection, analysis, and dissemination. In the researchers' view, it seems reasonable that it can also be as effective medium for panel discussions when interfaces are optimally designed and when the panels are appropriately moderated. The researchers did not attempt to moderate the panel. They served only to observe and answer questions when needed. It would be useful to understand the degree and type of moderation that fosters increased quality dialogue among participants.

Summary

In general, the panelists provided much insight about the topic categories and indicators. While their dialogue was limited, the researches considered it informative and valuable to the study objectives. The results of this work offer a preliminary set of categories with indicators of constructivist-compatible principles that may help educators in their Internet-based course development and evaluation efforts. The identification of constructivist-compatible principles as they related to Internet-based courses is an important area that requires further research and the proliferation of online courses and programs in education today emphasizes the need for continued research.

The Web survey proved useful as an alternative to face-to-face panel discussions. As used in this study, it was conveniently accessible to individuals with email and a Web browser. The Web-based survey had several advantages over print surveys. Since the data were stored in a database they could be compiled and analyzed instantly as participants submitted responses. In the study, there was limited dialogue among participants, which may have resulted from the Web interface, among other things. Additional study is needed to explore methods that more actively engage participants in discussion.

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Aggression in the Online Classroom: Unintended Consequence of Computer Mediated Communication

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Introduction

This was an exploratory qualitative research project to examine the existence of aggression in the online classroom. This particular project was an outgrowth of an earlier focus group with online instructors at Columbia College where the issue of online aggression had been unexpectedly encountered during an enthusiastic discussion of the otherwise positive virtues of online discourse. Almost as an afterthought, two instructors in that earlier focus group had this to say:

> *Yeah, but there is another side. Students also feel more empowered to attack you online and feel safe doing it.*

and

> *It is safer for students to be negative toward you online because there is not that personal relationship.*

Similar results were obtained at SUNY where Smith, Ferguson, and Caris (2001) found that the "asynchronous learning environment gives students and teachers time to consider responses to postings, but also produces a sense of anonymity and political differences" (para. 1), and that "students are sometimes aggressive and questioning of authority in ways not seen face-to-face" (para. 20). A follow-up exploratory project to investigate the issue of aggression in the online classroom was initiated.

On February 4, 2002, all of the current online instructors at Columbia College (N = 88) were emailed a questionnaire asking if they had experienced aggression from students during the course of their duties in facilitating an asynchronous course. The instructors were currently involved in teaching an online class (a factor which probably limited the response rate), and their experience ranged from teaching their first online class, to veteran online instructors who had been teaching online since the first course offerings at the institution. Respondents included individuals who were fulltime instructors at the college as well as adjuncts. Twenty-five instructors responded (a response rate of 29.5%). A definition of aggression was deliberately omitted to allow the response data to operationalize online student aggression rather than imposing an arbitrary definition. The general results are summarized in the Table 1.

Responses confirmed that aggression in the online classroom was a reality, but an exception rather than the rule although three instructors mentioned more than one incident. When it did occur it was particularly disconcerting for the instructors, and unprecedented when compared to instructor expectations, experience, and training. In their responses most instructors voiced uncertainty about how to respond as well as shock that the incidents had occurred in the first place. There seemed to be particular surprise that their authority had been so actively, and boldly, challenged.

> It is an ironic, or unexpected, outcome of asynchronous online learning that a minority of students seems to feel empowered to act in a negative or aggressive manner. Ironic outcomes occur when emerging technologies have unforeseen effects (Scott, Quinn, Timmerman, & Garrett, 1998).

Venues of Online Aggression

Online aggression was displayed through one or more computer-mediated venues:

1. Email to the instructor and/or other students.
2. Conference postings.

Most of the aggression was directed toward the instructor, but one instructor noted an incident between two students. With email the communication tended to be private, but conferences were used for a more public forum of expression. Three of the instructors indicated that students had "shouted" (used all capital letters as the cyber version of face-to-face shouting/yelling) during disagreements when it was not their typical practice. In descending order of occurrence, the reported instances of aggression were related to grade disputes, class expectations/assignments, strong disagreement over controversial topics, or some combination.

Besides shouting, reports included insulting the abilities and intelligence of the instructor (both in conferences and email), attempting to take control of conference discussions, and flooding the instructor with emails. One instructor noted that the student they were having trouble with would send seven or more emails asking the same question within an eight-hour period during the day, and each new email would be more hostile than the last. One instructor reported receiving a computer virus attached to an email that they believed was connected to a dispute over course assignments. By far the most common method of aggressive expression was email or conference communication that included insults, insinuation, profanity, demands, threats, etc. Overall the incidents could be characterized as acts of disrespect and insubordination.

Two other areas deserve mention even though they technically occurred outside of the classroom. Two instructors discussed how they had received telephone calls at their home at night from argumentative, and aggressive, students who were disputing grades. One believed that their caller was intoxicated. The other issue is instructor evaluations. Like many other institutions Columbia College uses anonymous instructor evaluations for assessment purposes, and has continued the practice within the online environment. Instructors believed they could identify the evaluations of students that had been aggressive, and that the aggressive students gave particularly negative and vicious evaluations.

From our findings, including the previous focus group with instructors, it is clear that the perception of the online instructors at Columbia College is that the relative anonymity of the asynchronous classroom reduces inhibitions, but in some instances results in aggressive behavior beyond anything experienced in the face-to-face classroom.

Theoretical Perspectives

The data gathered in this study indicated that a single student nearly always instigated aggression alone with only one reported instance of two students acting in concert (both were displeased with their grade on an assignment). Any theory that successfully predicts/explains the aggressive behavior experienced by instructors would have to account for the fact that this is an individual rather than group phenomena.

The asynchronous online classroom relies exclusively on Computer-Mediated -Communication (CMC). CMC provides a starting point for understanding the dynamics of the online classroom, CMC has been a subject of research for over 20 years, and the field has produced four major theoretical paradigms "to understand which media characteristics of CMC influence users' interaction patterns" (Kim, para. 1). The cues-filtered-out theory is perhaps the most prominent. According to Kim (2000):

> Its basic argument is that text-based computed-mediated communication lacks physical and social cues, which fosters anti-normative and uninhibited behaviors. Bodiless cyberspace has an essential shortcoming in which users cannot use gestures, voice tone and facial expressions. In a similar vein, CMC lacks shared social norms and standards. It can lead users to be more aggressive and impulsive. (para. 3)

According to this theory CMC filters out the aural and physical cues available in face-to-face communication, and increases the likelihood of misunderstandings. The cues-filtered-out theory explains and predicts the aggressive behavior of some students.

Joseph Walther (1996) offered an alternative to the cues-filtered-out theory that "asserts that in CMC message senders portray themselves in a socially favorable manner in order to draw the attention of message receivers and foster anticipation of future interaction" (Kim, para. 6). Walther's perspective, sometimes referred to as the hyperpersonal interaction model, views the time lag between interaction as conducive to thoughtful, and reflective, responses that are superior to face-to-face communication because interaction is in essence a "planned discourse" (para. 61). Unfortunately, this perspective does little to explain individual behavior that seems to run against group norms.

The social identity model of deindividuation effects (SIDE) model is perhaps the second most prominent model of CMC after the cues-filtered-out approach. "The SIDE model predicts conformity to norms associated with the specific social identity of the group, rather than conformity to any general norms" (Postmes, Spears, & Lea, 1998). The SIDE model is heavily influenced by "related ... theories of the crowd and of mass communication" (Postmes, et al., 1998). The SIDE model emphasizes group conformity, and asserts that rather than filtering cues they "can be even stronger in CMC compared to face to face, and similarly that power differential, rather than being diluted can be magnified" (Spears, Postmes, Lea, & Wolbert, 2002, para. 14). Although the SIDE model does emphasis conformity rather than individual deviation from the norm it does raise the interesting question of power differential, and the possibility that aggression in CMC might be rooted in issues of power and control.

Perhaps the most sophisticated theory of CMC is Adaptive Structuration Theory:

> Expanding on the work of Anthony Giddens (1984), Poole, Seibold, and McPhee (1985; 1986) formulated a dialectical theory of micro-level social structures..... This adaptation of structuration theory views micro-level structures as being constructed by agents who monitor and control their behavior with reference to rules, schemata, logics of actions, and other forms of conventions (Donaldson, Scribner, & Perkins, 2001, p. 3).

"The theory allows for group members to intentionally adapt rules and resources to accomplish goals" (Donaldson, et al. p. 3). While the other theories concentrate exclusively on group dynamics to explain CMC behavior adaptive structuration theory looks at the complex matrix of individual, social, and group behavior in a contextual sense (both group and individual). In the terms of adaptive structuration theory aggression by a single student could be explained as that person's reflective adaptation to the situation in an effort to get their needs met. Unfortunately, adapted structuration theory provides little predictive power, and might best be described as a meta-theory.

Adapted structuration theory and cues-filtered-out theory account for aggressive behavior by a lone student. They are also complimentary. Although there are elements of interest, and merit, in the other theories adapted structuration theory and cues-filtered-out theory currently offer the best theoretical heuristic for understanding aggression in the online classroom.

Discussion

Using computers to communicate is not a new concept. In 1971 Roy Tomlinson invented a way to move email across distributed networks (Zakon, 2002), and in the same year Murray Turoff developed a prototype of the computer conferencing system (Rapaport, 1991). Misusing computers, and misusing CMC, is not a new concept either. "No matter how technologically advanced or 'civilized' we become, aggression changes its form but is unlikely to disappear" (Garbasz, 1997). That concept was validated in the controversial case of the first cyber rape consummated entirely with CMC in the early nineties (Dibbell, 1993), and continues with the prospect of anonymity heightening the intensity of classroom aggression when it occurs within the asynchronous classroom. Further complicating the issue of aggression in CMC is that communication over the Internet has historically been rather anarchistic, irreverent, and confrontational (Shea, 1994).

This was a modest exploratory study, and it did not investigate the student perspective. It is quite reasonable to assume that, at least in some instances, the instructor's behavior either instigated or exacerbated a situation. However, it does provide some additional evidence that aggression in the online learning environment is indeed an unintended consequence of CMC. With the explosive growth of the asynchronous learning environment there is a real need for more investigation on what is actually happening in the online classrooms, and a need to develop research based policies as well as best practice guidelines for instructors.

One last issue to consider is that online aggression may have little to do with CMC, but may instead be related to current trends in higher education. Instead of aggressive students what we might be seeing is aggressive consumers who view higher education as just another market commodity. Worley (2000) notes that:

> As learning moves off campus to the home and to the workplace, students will become sophisticated consumers in the educational marketplace, expecting the same "services, customization, and responsiveness" (Boettcher, 1999, p. 4) that they demand from other consumer products. (para. 23)

Recommendations

Tentative recommendations that might reduce the instances and duration of aggressive episodes:

1. Clear written guidelines by the institution and the instructor regarding behavior. A written code for online behavior that is enforced.
2. Policies for withdrawing disruptive students.
3. Insisting on civility, and staying on topic (issues not personalities).
4. Dealing quickly with problems, and consulting with other faculty and staff.
5. Instructors answering email within 24 hours.
6. Instructors should not publish home telephone numbers.
7. Avoidance, or cautious use, of jokes or humor.
8. Cooling off period. Do not use CMC to respond when upset or angry.
9. Avoid escalation of the aggression, and realize that aggressive, or seemingly aggressive behavior, may be in response to a legitimate student concern.
10. Actively engage students regarding course expectations, the syllabus, etiquette, and policies using online quizzes or some other interactive medium.

Table 1. *Instances of Aggression Experienced by Instructors at Columbia College*

	Experienced Online Aggression	No Experience of Aggression	Totals
Number	19	7	26
Percentage	73%	27%	100%

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A Strategic Planning Process Model for the Implementing Distance Education in Higher Education

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Distance education—the ability to reach out beyond the campus to serve the learners at a place and time of their choosing—has displayed tremendous growth in the 1990s. In 1997-98, almost 44 percent of all higher education institutions offered distance-education courses, representing a one-third increase over three years (NCES, 1999). Over the same period, these 2-year and 4-year higher education institutions also increased their course offerings at a distance by 212% to 54,470 courses (NCES, 1999).

While the trend toward distance education in adult learning is undeniable, the forces driving this transition vary. Many institutions face the dilemma of infrastructure funding constraints while desiring to draw a larger market share of the potential student population. Davies (1997) points out that about half of the states have projected increased post-secondary education enrollments, but do not have the funding that was available to accommodate past generations. Even if this funding was available, Hudspeth and Brey (1986, p. 5) poignantly ask one to "imagine the mood of our faculty and students if several thousand more tried to find a place to park each week?"

Distance education offers a potential answer to this dilemma by enabling institutions to be more competitive without necessarily requiring a brick-and-mortar commitment. However, distance education is a dual-edged sword. While it enables higher education institutions to compete in new arenas, such as corporate training, it also adds the burden of increased competition for students from other institutions—all while attempting to keep pace with rapid changes in demographics and technology (NCES, 1999; Zimmerman, 1995).

Adult learning institutions are coming to rely more and more on distance education to meet the challenges posed by constrained funding, increased competition, and rapid advances in technology. The leaders of these institutions are making decisions to move in this direction. However, to be effective, these cannot be simple decisions to implement distance education programs. Just as distance education should not be considered a panacea or a quick fix, its inception and implementation should not be taken lightly; it requires vision, analysis, and coordination to be effective. These same elements are the keys to strategic planning. Keller (1983, p. 75) writes that "to have a strategy is to put your own intelligence, foresight, and will in charge instead of outside forces or disordered concerns." Conversely, without a strategy, implementation of a distance education program can be reactive; a constant string of incremental changes in response to pressure without a clear vision to anchor the process. Such a poorly implemented distance education program is not an answer—it is more likely a potential failure and a drain on the **institution.** The key to successful implementation is effective strategic planning.

Research

A study designed to develop, refine, and validate a model of the strategic planning process for distance education was performed in 2000-2001. To achieve this end, the informed opinion from a population of peer-nominated experts was solicited over three rounds of iterative Delphi questionnaires administered via electronic mail. In developing this model, the study answered specific questions about the following:

1. The impact of volatile technological change on a strategic distance-education plan.
2. The optimum size and composition of a strategic planning body for distance education.
3. The use of planning assumptions.

4. Internal and external factors that are part of the strategic assessment (scan) and analysis for distance education.
5. The development and selection of courses of action in the planning process.

A straw model, representing a synthesis of the literature on the strategic planning process served as the framework for this research. The Delphi panel of experts was asked to identify the issues and questions that they believe should be addressed in each of the phases of the straw model. The Delphi questionnaires were employed in a sequence that effectively developed, refined, and validated a model of the strategic planning process for distance education.

Impact of Technological Volatility

The study determined that the volatility of technological change does in fact limit the number of years that a strategic plan can project forward; however, comments from the expert panel emphasized that technology does not drive strategic planning. It is the planning process that allows the institution to adapt to a dynamic environment by employing an annual review cycle as the proper response to technological volatility. Even with annual review, there was strong agreement that projecting 3 to 4 years was the optimal target for distance education strategic planning.

Optimum Size and Composition of a Strategic Planning Body

Responses from the expert panel indicated that the optimum size and composition of a strategic planning body is variable. Ideally, there is a core of 2 to 4 members who jointly design and lead the planning process and do all critical writing. This core is joined by a second group, with broad representation of the various functional areas and key stakeholders, at key points in the planning process. The panel identified 17 functional areas that should be considered for inclusion in this second planning group.

Internal and external factors for strategic assessment

The study identified 216 possible internal and external factors that are part of the strategic assessment (scan) and analysis for distance education. After eliminating redundancies, a comprehensive list of 33 internal and 33 external factors remained. The internal strengths and weaknesses fell into seven areas: Institutional Assessment, Leadership, Mission, Stakeholders, Infrastructure, Academic Programs, and Funding. External opportunities and threats encompassed eight areas: Market, Competition, Customers/Learners, Politics, Funding, Partnerships, Stakeholders, and Technology.

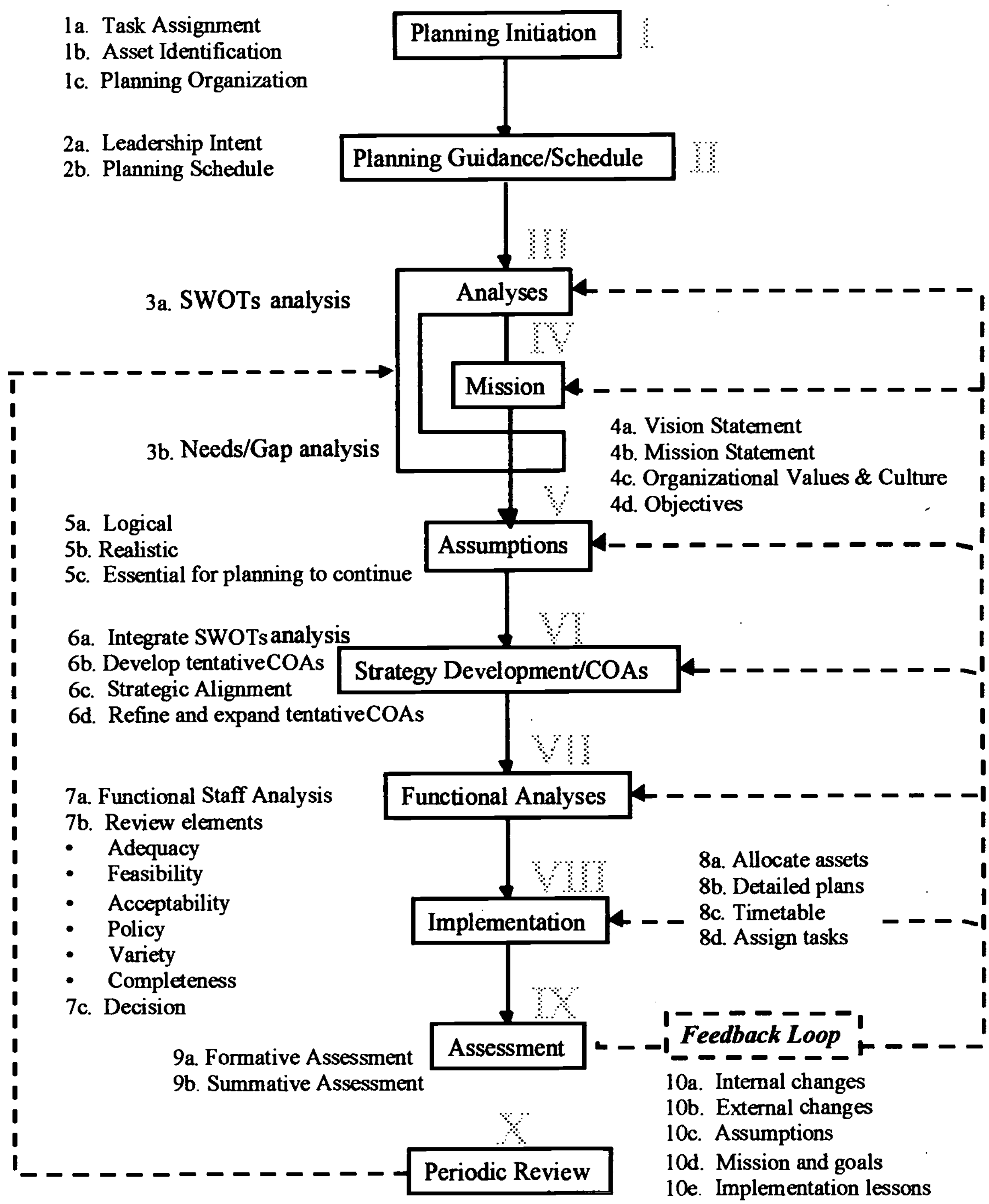
Planning Assumptions

The expert panel confirmed the role and significance of assumptions in strategic planning. Specifically, 92% of the panel agreed that all planning assumptions should be documented to ensure that everyone involved—even those who come on board later—has a common frame of reference. Similarly, over 83% of the panel held that planning assumptions are an essential part of a periodic review process.

Courses of Action

There was broad agreement (91.3%) within the expert panel that multiple courses of action (COAs) or strategic directions should be developed, analyzed, and presented for a decision. Those who did not agree had concerns in two fronts: (1) multiple COAs would only reflect variations in technology, which should not drive strategic planning; and (2) leadership intent, time, or infrastructure would in practice limit the proposal to a single COA.

Strategic Planning Process Model



The Strategic Planning Process Model includes 202 planning elements and 10 planning phases presented in a hypertext format to enable nonlinear navigation.

The findings of this study provided a detailed model of the strategic planning process for distance education designed to empower higher-education planners to be proactive in the highly dynamic distance education environment. An outline of this model is presented in Figure 1.

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Designing a Blended-Delivery Course for Higher-Order Cognitive and Affective Learning

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Program Foundations

In 1986, Congress mandated joint training for the active components. Title 10, USC (Chapter 38) reads:

"The Secretary of Defense shall establish personnel policies emphasizing education and experience in joint matters for reserve officers not on the active-duty list. Such policies shall, to the extent practicable for reserve component, be similar to the policies provided by this [section]" (Section 666, specifics for reserve components).

The FY 99 Defense Authorization Act clarified this guidance:

"In order to prepare reserve component field grade officers for joint duty assignments, the committee directs that a course similar in content to, but not identical to, the in-residence Armed Forces Staff College [AFSC] course for field grade active component officers be developed as soon as possible...periods of in residence training, as well as distance learning, present the best combination of academic rigor, cohort development, and cross-service acculturation."

In May 2000, the Staff College was tasked to develop a strategy for RC JPME. The requirements included achieving learning outcomes comparable to in-residence courses while tailoring the curriculum and war-gaming simulations to serve the requirements of 10 separate major commands. In September, the final implementation plan went submitted and rejected because of its cost..

Planning

The challenge was to develop a program that achieved learning outcomes in the higher levels of the cognitive domain as well as affective learning at a cost that was acceptable. Compounding the problem were the facts that the program had marginal support outside of Congress and the faculty team was a team of four reserve officers with little education background. The near-term solution was to develop and implement a Beta Test to generate support and interest, validate delivery of joint education to reserve personnel using advanced distance learning tools, and help to develop the faculty team before a full program was attempted.

Defining the Requirement

In order to develop a full blended-learning program similar to the in-residence program, the decision was made to test two areas: the ability to deliver joint education at a distance (as described above), and the ability to achieve both higher order cognitive learning and affective objectives in this way. Since no such course in joint education existed, one needed to be developed. The faculty at JFSC identified a two-day, 12-lesson course known as the Joint Planning Orientation Course (JPOC) that was similar in content to the full course but not as robust. Since the JPOC existed only in the form of PowerPoint presentations, instructors were videotaped delivering the lessons to facilitate their translation into an online format. In October 2000, Modern Technologies Corporation (MTC) was contracted to turn this material into an online course to serve as the Beta Test. This development proceeded through the fall and into the spring.

Faculty Development

By April 2001 three of the four initial permanent faculty members had reported to JFSC, with the fourth reporting in June. From April through June, three of the faculty members participated in faculty training. Joint Forces Staff College takes a holistic approach to faculty and course development within each resident school or course offered by the college. All faculty members arrive with a baseline of knowledge, skills and competencies. New faculty members are highly successful field grade officers, service school graduates (Joint Professional Military Education level 1), and hold advanced degrees; most of the current faculty members are graduates of the course they will teach. Faculty training and lesson development are continuous processes, accomplished through formal training, workshops, individual research, a guest lecture program, and visits to the Unified and Specified Commands, Service Component Headquarters and Service Staffs, and other governmental and non-governmental agencies.

Lesson Review

After establishing the procedures outlined above, only one step remained prior to beginning lesson review. The instructors developed a rigorous timeline for course development, identifying the date on which each lesson would be delivered to the contractor; the date the lesson would be returned to the instructor; the final delivery date of the lesson into the LMS; and the date on which each lesson would go "live." Review of each lesson took place in the following manner:

1. Review of the slides online
2. Correction of spelling, grammar, and format
3. Reconcile all lessons to existing joint doctrine (to ensure that what was referenced in the lesson was the same as what was stated in existing doctrine)
4. Correction of graphics or identification of new, additional, and replacement graphics
5. Delivery of corrections/changes to MTC
6. Receipt of notification from MTC that corrections had been made
7. Review of corrections by primary instructor and at least one other instructor
8. Additional corrections delivered to MTC
9. Finalization of each lesson

As instructors, the two primary concerns during this review were that each lesson followed the same format (Introduction, Content, and Objectives, followed by the course material) and that the lesson objectives were written to the appropriate cognitive level. Using Bloom's Taxonomy for the cognitive domain and Krathwohl's affective domain, the lessons were reviewed to ensure the lesson objectives were properly written and that the content matched the objectives.

Program Execution

Test Group Composition

From July-September, 104 students in four groups (known as cohorts) accomplished the 13 online lessons. The initial target student base for the Beta Test was officers of all Services in the grades of O-4 (Majors or Lieutenant Commanders) to O-5 (Lieutenant Colonels or Commanders). Furthermore, the desire was to incorporate a balance of job specialties into each of the cohorts to facilitate cross-service and cross-specialty acculturation. Although the students who participated in the Beta Test did primarily fall into the desired rank categories, there were some who were more junior or more senior. One cohort was particularly senior with a majority of officers in the grade of O-6 (Colonels or Navy Captains.) In another cohort, the job specialty balance was skewed. A majority of officers were in the intelligence career field and very few who had operational (field) experience.

Course Delivery

These factors notwithstanding, the majority of the student participants were interested and motivated, providing valuable input and feedback throughout the course of the Beta Test. Accomplishing two lessons every three weeks, participants took part in periodic asynchronous threaded discussions intended to build on key concepts and ideas contained in the lessons. Finally, the students participated in a two-day face-to-face exercise, intended to reinforce these key concepts and ideas and to allow students to work together to solve problems, thus promoting acculturation.

Program Lessons Learned

Cognitive

As discussed in the course development section, significant attention was paid to the lesson objectives. Writing objectives at the knowledge and comprehension levels was quite easy; the challenge came when trying to elevate the level of learning beyond that. Early on, the instructors realized that for the purposes of the Beta Test it was unreasonable to attempt learning at the synthesis and evaluation level, but application and analysis should be achievable. The only question that remained was, "how?"

The first answer came in the form of the asynchronous threaded discussions. Because the interaction level of the lessons themselves was low, the ability to achieve application- or analysis-level learning within the lesson was curtailed. However, the instructor team realized that by developing complex and thoughtful threaded discussion questions these levels could be achieved. This worked for the following reasons:

1. Students were allowed a relatively limited time period (72 hours) to respond
2. Students were directed to respond a total of three times, either to the instructor's primary question or to a subsequent student response
3. Instructors performed aggressive redirects or follow-on questions as necessary, to control to the extent feasible the threaded discussion objectives

The instructors found that topics that on the surface appeared simple could be delved for greater depth of understanding and deeper levels of cognitive learning.

The second answer to the question of "how" came in the form of the weekend face-to-face portion. During this exercise, students were presented with a scenario designed to allow them to solve problems using tools learned during the online lessons. Information originally presented in the knowledge and comprehension levels quickly melded to raise levels of learning to application and, in some cases, analysis.

Affective

The challenges associated with affective objectives are many, not the least of which is successfully measuring them. During the Beta Test, affective objectives were achieved primarily during asynchronous threaded discussions and the face-to-face sessions, with the face-to-face sessions allowing for the culmination of ideas learned and discussed throughout the course of the Beta Test. It is important to not here that the affective objectives in this course were most impacted by the blended-learning delivery method, because had the course been online only any affective learning would have remained at the lower levels. Having the two-day face-to-face portion enabled the deepening and broadening of affective learning.

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Case-Based Problem Solving: Blending Face-to-Face and Online Discussion

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Background

The final year of the Doctor of Pharmacy program at the University of Nebraska Medical Center (UNMC) College of Pharmacy (COP) consists of experiential training in a variety of health-care settings. This experiential training is organized in 4 week blocks, called clerkships; students complete 10 clerkships in their final year of the Pharm.D. program. During the clerkships, students are precepted by full-time faculty members of the COP and by adjunct faculty (on-site pharmacists).

In the Geriatric Pharmacy Clerkship, students work with pharmacists in long-term care nursing facilities and short-term care rehabilitation facilities. This on-site clerkship training is supplemented with learning activities and face-to-face weekly conferences conducted by a full-time faculty member. The weekly conferences involve student analyses of a series of patient case scenarios having medication-related problems. Students develop and present patient-specific treatment plans that are discussed in conference, and they act as peer-reviewers. The faculty member facilitates discussion, probes the students' decision-making processes, seeks clarification and elaboration of the students' recommendations and rationale, and asks students to respond to variations of in the patient case scenarios. Student performance in the weekly conferences is evaluated.

In Spring 2001 the COP faculty member precepting the Geriatric Pharmacy Clerkship started a process of shifting the face-to-face weekly conferences to an online asynchronous group discussion using Blackboard courseware. Currently, approximately 25 percent of the group learning activities in the Geriatric Pharmacy Clerkship are conducted online. This clerkship has become an example of a blended course (clerkship) in which online case-based learning activities link to curricular and institutional goals.

Rationale for a Blended Course

Distance education methods are used in the Geriatric Pharmacy Clerkship for several reasons. Typically there are 5-10 students in the clerkship at the same time. Student performance in the weekly discussions of patient case scenarios is evaluated. Given the size of the groups and the complexity of the discussions, it has been a challenge to complete a consistent and rigorous evaluation of each student. The permanent written record created by an asynchronous online discussion provides a format for more deliberate assessments of student performance in a discussion and decreases the difficulty encountered when trying to evaluate student performance "on the fly."

The on-site training in the Geriatric Pharmacy Clerkship occurs in a variety of geriatrics-related health care settings in the Omaha, Lincoln, and Fremont, Nebraska area. All sites are within an hour's drive from the College of Pharmacy, located in Omaha on the UNMC campus, where are the face-to-face weekly discussions are held. Most students have Internet access at their clerkship sites or at home in addition to access from computer clusters at UNMC. The online discussion format has the potential to allow students to spend more time with their on-site pharmacist preceptors and spend less time traveling between their clerkship sites and UNMC. In addition, and perhaps more significantly, the online discussion venue facilitates the development of distant clerkship training sites, sites that previously would not have been considered because of the long driving distance to UNMC to attend the face-to-face weekly discussions.

Incremental Migration to the Online Format

An incremental migration to the online format was chosen because most students beginning their Geriatric Pharmacy Clerkship limited experience with online asynchronous discussions. In addition, it was important to model the format of and expectations for the patient case discussions in a face-to-face conference prior to starting an online discussion. Lastly, an incremental approach was chosen in order to generate experience with asynchronous discussions in this clerkship setting and incorporate student feedback before shifting a larger portion of the patient case discussions to the online format.

Curricular Goals and Strategic Outcomes

Educational outcomes for the UNMC Doctor of Pharmacy program include general ability outcomes and professional practice ability outcomes. There are several general ability outcomes supported by online asynchronous active learning. Some of these outcomes pertain to student use of appropriate technologies in critical thinking processes, communication abilities, and self-learning abilities. Several of the professional practice ability outcomes enhanced by online active learning activities in the Geriatrics Pharmacy Clerkship. These outcomes pertain to student abilities in the use of technology to appropriately research and develop patient-specific treatment recommendations and to respond to questions about the effects and appropriate use of medications.

Part of the mission of the UNMC COP is to train pharmacy practitioners who meet the pharmaceutical care needs of the people of Nebraska, including those in under-served areas of the state. Educational models for experiential training in rural and underserved areas of Nebraska may be enhanced by the ability of faculty members to engage distant students in discussion of patient cases and medication-related problems.

Evaluation Components

Evaluation of Student Performance

The implementation of online learning activities in the Geriatric Pharmacy Clerkship has led to a reexamination of the assessment methods used to evaluate student performance in the discussion and analyses of patient case scenarios. A criterion-referenced assessment tool for use in this setting has been developed to assess the appropriateness and clarity of student recommendations and student peer review. The standards for performance are discussed with students during the orientation to the clerkship. These standards, along with an explanation, are delineated below.

1. **Recommendations for treatment and monitoring must be specific.** Each recommendation for treatment and monitoring (i.e., evaluation of treatment outcome) must be specific enough so that the appropriate health care professional could complete and implement the recommendations as they were intended.

2. **Recommendations for treatment and monitoring must be complete.** All essential treatments and monitoring parameters must be addressed. All essential elements for each recommendation must be present.

3. **Recommendations for treatment and monitoring must be appropriate.** Each recommendation for treatment and monitoring must be consistent with current standards of practice and must be tailored to the specific health needs of the patient.

4. **Recommendations for treatment and monitoring must be appropriately justified.** The rationale must include a defense of the treatments that were recommended and an explanation of why the major alternative treatments were not recommended. The rationale must include an explanation of how each recommendation is tailored to the specific health needs of the patient.

Student Evaluation of Face-to-Face and Online Conferences

Since Spring 2001, a total of 40 students have completed the Geriatric Pharmacy Clerkship over the span of 7 four-week clerkships. These students were debriefed following the completion of the online learning activities. A consistent set of questions was used during the debriefing sessions.

Students frequently reported several positive aspects about the online discussion. (1) They could reflect on the discussion, consult resources (including online resources), and thoughtfully prepare their responses. (2) They could manage their schedules and participate in the online discussion at their convenience (within constraints set by the instructor). Also, some students said that the online discussion was "more open," that it was easier for them to state their disagreement with some of their peers' recommendations in the online discussion compared to the face-to-face setting.

Students disliked several aspects of the online discussion. (1) In comparison with the face-to-face discussions, students were dissatisfied with the lack of immediate feedback to messages they posted online. The typical comment in this regard was "I did not know if the discussion was going in the right direction." (2) Students disliked having to take the time to reread messages in order to review the context for new messages posted to the online discussion.

When asked how the online discussion could be improved, students related their lack of experience with online threaded discussions to their challenges in navigating through an online discussion of multiple treatment issues. They identified the importance of appropriately posting related messages in a threaded discussion and the value of using the message subject line to give the clear indication about the content of a message. In response to this, a practice online discussion was implemented, prior to the beginning of the online patient case discussion, using an exercise appropriately named "Two Truths and a Lie." In this exercise each student started a new thread by posted a message containing three statements about him or herself; two of the statements were true, and one was a lie. Then each student would post a reply in the threads started by other students and attempt to identify the lie about that student. This activity, which turned out to be a fun and, at times, entertaining activity for students, helped students improve their ability to organize messages in a threaded discussion and to navigate through the messages.

Students were asked if they felt that they learned more in a face-to-face discussion or in an online discussion. The majority of students indicated that they felt they learned more in a face-to-face discussion. Some students said that they learned more by listening to a discussion than reading online message. Others indicated that nonverbal cues from the instructor and peers were important to their learning. Yet, when asked if they felt that the quality of their responses was better in a face-to-face discussion or in an online discussion, many students felt that the quality of their online responses was better (because they could take time to consult resources and draft responses). In trying to clarify this, some students said that they prepared more broadly in advance of face-to-face meetings while their learning was more in-depth, or focused, in the online discussion. Perhaps 1 in 5 students related their better quality of online responses to a perception that they learned more in the online discussion than a face-to-face discussion.

Lessons Learned

1. The use of an online discussion "icebreaker" helped students develop skills using the asynchronous discussion technology and helped build community.
2. Many students felt that they learned more broadly in the face-to-face discussions compared to the online discussion. They felt that their learning was more in-depth during the online discussion compared to the face-to-face discussions.
3. A criterion-referenced assessment tool was a practical and efficient means of assessing student recommendations in face-to-face and online discussions.

Next Steps

1. The criterion-referenced assessment tool will be refined. The use of this tool will be evaluated in the face-to-face and online patient case discussions as a means for consistent and rigorous assessment of student performance and as a basis for providing formative and summative feedback.
2. It may be possible to examine the relationship between student learning preferences and the discussion modality (face-to-face vs. online).

Biographical Sketches

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Developing Interactive Applications for Handheld Devices: Factors in Design and Development

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Introduction

Handheld computing technologies promise educators the enabling of distributed cognition, with its potential of high level computations, immediate access to data, interpretive tools, based on a user responsive interface (Multisilta, Henno, Lipiainen and Hamalainen, 2001). In medical education this translates to access to clinical information at point of care, scaffolding of the medical decision making process, interaction with Web resources and the ability to engineer a dynamic, self directed, learning process based on immediate feedback. Examples of applications being utilized in medical education environments include, but are not limited to electronic pharmacopoeias (prescription, database type programs), e-textbooks, medical calculators (medical formula-clinical computational type programs), resident tracking of procedures, patient information and prescription writing. A recent study indicates that handheld computers are being used in two thirds of the US Family Practice programs, of which 30% require these devices (Cresswell and Parachmn, 2002).

Several medical schools have developed their own mobile applications, intended to deliver essential clinical and basic science information, and monitor learning experiences while students are on clinical rotations (Bower and Bertling, 2000; Hammond and Sweeney, 2000; Rosenberg, 2001). The latter has been of particular interest as medical practice has increasingly moved to outpatient settings, where students are dispersed over large geographical areas in designated clinics (Ruane and Blake, 1990; Maulitz, Ohles, Schnuth, Lipsky, and Grealish, 1996; Withy, 2001; Witzek, Koff, McGeagh, Skinner, 1990). Our experiences in a leading medical school indicate that clinical faculty have specific demands for the integration of handheld devices, and have expressed a keenness to use them in idiosyncratic ways. Examples include the facilitation of data collection by students, creating portable interactive applications for purposes of evaluation and providing context sensitive clinical guidelines during students' ambulatory experiences.

Objectives

The purpose of this paper is to reflect on selected aspects of the instructional design process critical for the design of mobile applications. In our experience, the success of designing and implementing handheld applications in an academic environment is dependent on an iterative process that continuously assesses, documents, analyses and responds to the needs of all the constituencies involved, including users (medical students), content experts (clinical faculty), critical clinical staff, designers, developers and administrators. The context of implementation, the physical and cultural environment of the institution must be analyzed in conjunction. We use Smith and Ragan's (1993) model to guide analysis of user characteristics. Tessmer and Richey (1997) guides the analysis of the context required for design, development and implementation.

We examine these questions in the context of a variety of mobile learning applications developed in the medical school, which requires that students purchase handheld devices:

A PDA Patient Log: This form based patient tracking system is unique for each specialty. Six versions have been developed, which allow students to enter essential patient data as they encounter patients. The data is uploaded to a central database using AvantGo technology which bridges the Web to handheld devices. The data is available for analysis in a variety of ways using a web interface.

Course information: All the course information, including schedules, faculty contact, course assignments, evaluation guidelines and meetings is provided via AvantGo.

Clinical Guidelines: Disease specific clinical guidelines are delivered by faculty who are interested in students' involvement and learning in particular problems.

Clinical resources: Resources such as Bioterrorism guidelines, physical exam checklists are available for download on a voluntary basis.

Cases, quizzes, sample exams: Students can view cases, quizzes and sample exams in an interactive format on the PDA.

Evaluation instruments: Several evaluation instruments have been designed should faculty want to employ these- single encounter note, one time lecture evaluation, self assessment tools.

An Iterative Needs Assessment

While the user and contextual needs of mobile computing founded on the laptop model have been addressed in the literature, similar analyses for handheld computing are missing. In the following analysis, we present critical questions which must be examined prior to, during and after the design and implementation of handheld applications.

Analysis of Users

A. Medical Students

1. Prior knowledge: What is the students' level of expertise in using handhelds?
2. What are students' perceptions of handhelds for their present and future learning?
3. What are students' perceptions on the friendliness of handheld devices?
4. What kinds of experiences have students had with technology in the past?
5. What are some particular applications that students are already familiar with and find them useful?
6. What is the students' lifestyle concerning their clinical rotation? Do they feel connected with the faculty and peers during their clinical experiences?
7. Is access to clinical information readily available?
8. Are faculty or residents available when students have questions?
9. What are students inclined to do about technical support?
10. What kinds of learning styles do students have?
11. What are the specific factors which impede students' learning?

B. Clinical Faculty

1. What are the perceptions of clinical faculty regarding handheld computing?
2. How do faculty perceive their knowledge of handhelds and their benefits in medical education?
3. Do faculty think of handhelds as friendly devices which adapts to their needs?
4. Have faculty embraced technologies in the past?
5. Have faculty had prior satisfactory experiences with technology?

6. What are the specific concerns of handheld computing expressed by faculty?
7. What are the training and technical needs expressed by faculty?
8. What are the staff needs expressed by faculty?
9. Is there a relationship of trust between faculty and administration?
10. Are faculty open to restructuring the teaching as necessitated by the use of handhelds?
11. Do faculty perceive handheld technology as efficient and time saving?

C. Administration

1. What are the goals of the administration in implementing the handheld requirement?
2. What kind of support- financial, infrastructure, technical, moral, and incentives is the administration willing to provide to faculty and students?
3. Is the administration concerted in its effort to implement the technology?
4. What is the administration's overall vision in how the technology will be integrated?
5. What kind of leadership is available at the administrative level to guide the implementation?
6. What is the mix of expertise at the administrative levels?
7. Is the administration willing to restructure education as handhelds become entrenched?
8. Does the administration have a long term plan and support for integration of handheld technologies in education?

Support staff (clinical)

1. What are the perceptions and knowledge of handheld devices among the critical staff for faculty?
2. What kind of support would the staff need to assist faculty and students in implementation?
3. Can handhelds be used to make staff time more efficient?
4. Do the staff feel capable to respond to changes fomented by the handheld technology?

Analysis of Context

Tessmer and Richey (1997) consider context as "complex, multifarious and enveloping" (p. 87), but also containing resources that can be exploited. According to the authors, context is a multilevel body of factors in which learning and performance are embedded. Indeed this is true of implementing technologies which have the potential of not only vastly benefiting patient care, reducing the number of medical errors, but those which can potentially question traditions of teaching and learning during clinical apprenticeships. With this preface we identify the following social, political, physica and cultural contextual factors as significant in the implementation of handheld technologies.

1. Are users provided physical support to use their handhelds? This includes network stability and access, equipment to sync their PDA's and wireless access if necessary.
2. Are there formal of informal support structures to enable effective use of the handheld technology, to accommodate all levels of knowledge and motivation among students? For example, do students have access to role models in residents or faculty? Are faculty supportive of PDA's? Does the system ensure an instructional model which includes positive reinforcement, feedback to students?
3. What kind of technical support is available to students? Has the staff been expanded to provide scaffolding during heaviest implementation times?
4. What is the culture of the use of technology in the institution and its affiliates? Is the technology being embedded in a culture of change and successful past implementations?
5. What is the nature of institutional framework within which the innovation is entrenched? Is it decentralized, or centralized? Is there adequate communication among the various groups and entities regarding the implementation?

Discussion

Affordability, combined with the vast number of freely available tools to enhance clinical reasoning, make the handheld an attractive technology for medical education. However, as evidenced by prior tales of technology advancement, successful implementation lies in a cognitively rooted examination of the potential of technology, an involvement of all the constituencies involved in the teaching and learning process and an ongoing assessment which responds to the changes that are inevitably fomented by innovation. The needs and context analysis provided above illustrate the complexity of implementing handheld devices with the intention of accomplishing measurable behavior changes during clinical apprenticeships, while also pointing towards resources which can be exploited to enhance implementation effects.

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Designing Web-Based Case Simulations for Medical Students: Case Studies in Instructional Design

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Introduction

The use of cases in medical education is as old as the field itself, with a rich diversity of case methods available for adoption. From clinical experiences to virtual reality representations (Grundman, Wigton & Nickol, 2000), case-based teaching accomplishes a variety of objectives: students gain familiarity with common medical illnesses, are able to construct an adequate differential diagnosis, learn to think like an expert, acquire professional attitudes and behaviors and enrich their knowledge structures about the pathophysiology of disease. With the advent of on-line instruction, clinical faculty have begun to experiment with on-line cases, each with its unique set of instructional strategies. The purpose of this paper is to present the design process used to generate interactive web based case presentations in a leading medical school.

The Need for Effective Case-Based Education

In 1995, Irby conducted a thematic review of literature, based on 101 research articles in undergraduate and graduate medical education in ambulatory care settings. Based on the findings, he characterized education in ambulatory care settings as symptomatic of variability, unpredictability, immediacy and lack of continuity. Students saw a narrow range of problems in a single clinic, and experience limited continuity of care. Few cases were discussed and examined with attending physicians. Case discussions were short, with little teaching and virtually no feedback. The studies included in the review suggested that some students lacked interviewing and physical exam skills and management of psychosocial issues. In a separate qualitative study, Irby (1994) identified five principles of experiential learning in clinical settings derived from exemplary strategies used in teaching rounds: anchoring instruction in cases, actively involving learners, modeling professional thinking and action, providing direction and feedback and creating a collaborative learning environment. Thomas (1992) identified key concerns of students who had interacted with cases in a family medicine course: students felt most confident about skills acquired in relation to diseases with a limited number of key symptoms, signs and treatments, and less confident about diseases with many symptoms and treatments. The level of complexity in cases was thus a key issue for clinical faculty. The tutors emphasized that cases must be based on real patients, include most of the signs and symptoms of the disease, contain one or two foci, have nodal decision making points, emphasize clinical reasoning, reinforce prior knowledge and permit transfer to other cases.

Novice to expert research in medical education has yielded a body of findings that can be extensively utilized in the design of cases. Gruppen (1997) proposes a framework for ambulatory clinical education based on empirically drawn guidelines from cognitive psychology research. The author emphasizes the importance of context, students' need for transferable knowledge, the importance of balancing depth and breadth of knowledge, and the role of prior knowledge in problem solving. Research on computer based and on-line cases has demonstrated the effectiveness of such cases in promoting performance and learning efficiency. Lyon, et al. (1991) report on PlanAlyzer—a computer-based, self-paced, cased-based system for anemia and chest pain diagnosis. The longitudinal study over three years demonstrated time savings resulting from the computer based versus text based cases while accomplishing the same level of mastery.

It is clear from a sample of research that in spite of the rigorous training that medical students receive during undergraduate years, the nature of the field defies grasp by novices- there are gaps in knowledge and intellectual skills which could be addressed with improved instruction. Case based education delivered via technology could fill gaps, lapses and enhance the development of clinical expertise among medical students. Indeed, such efforts in various medical schools have added to the body of knowledge on approaches to case based education (Bergeron, Sato, Bbeid, & Rouse, 1995; Sutyak, Lebeau, Spotnitz, O'Donnell, & Mehne, 1996).

Empirically Grounded Case-Based Development

Over the last three years, we have developed web based cases in the following specialties: Pathophysiology of Disease (Respiratory and Hematopathology), Pediatric Genetics and Emergency Medicine. In addition a case authoring tool has been created to allow clinical faculty to create cases with diagnostic reasoning in Family Medicine as a model. All cases can be viewed at http://www.medsch.ucla.edu/idtu/projects/frstprojects.html. In designing these cases, we briefly present criteria that guided the instruction.

Objectives: What do the cases intend to accomplish? These may consist of diagnostic reasoning skills, solving single complex cases, knowledge acquisition via cases and pattern recognition. Objectives might pertain to standardizing the clinical experience of dispersed students, provide cases infrequently seen during training, and those which need to be finely discriminated.

Learner Characteristics: Who is the primary audience? Beginning medical students, third and fourth year students or residents? How would the program adapt at some basic level to prior knowledge, motivation, technology access, and preference for learning modalities?

Fidelity: What is the level of realism that is desired in the cases? What is the range of imaging from virtual immersive reality to still images which would accomplish the objectives? What kind of multimedia options—audio, video, synchronized multimedia are feasible? Are standardized patients satisfactory, or real patients should be identified?

Scaffolding: Several studies have pointed to strategies for successful scaffolding (Hmelo & Day, 1999; Jonassen, 1996). What kind of support would expand students' knowledge networks? How can prior knowledge be integrated in the scaffolding? How can it be presented in a transparent, well aligned, unobtrusive way? Should this be optional, under learner control, or required?

Communication: Theoretical considerations might dictate the structure of communication. Problem based learning which dominates medical education requires and embedded intervention, where students are required to post their hypotheses on diagnoses. Other communication strategies may be external to the program, and voluntary. The available technology may dictate what shape or form is assumed by the communication.

Interactivity: What is the depth of information processing that is required of learners? Diagnostic reasoning can be considered the highest form of problem solving—at a micro level, however, students need to make decisions which allow them to encode knowledge required for problem solving. Input mechanisms include recall, recognition, hypothesis generation and differential diagnosis. Input devices such as speech recognition software would be a consideration how student thought processes are elicited.

Case Structure: Much debate has occurred over learner versus program control over the last decade. Since we have high ability adult learners as the primary audience, we have largely self-paced, learner controlled case designs. The sequencing of information is another consideration—is this simple—offering a more linear approach, or complex with many options?

Instructional Strategies: Is the overall presentation a didactic, expository, or more discovery oriented? Are the strategies used supplanted or generative? What kind of cueing strategies are available as scaffolding assistance? How does the program adapt to various motivational levels? Is feedback rich or minimal? What is the modality of the feedback? Does the feedback offer modeling of appropriate clinical decision making skills?

Metacognition: Finally, what kinds of options optimize students' self monitoring of performance and interaction? Are there explicit metacognitive tools which can be placed to make the case more meaningful?

Conclusion

In spite of pervasive use of cases in medical education, several studies have identified inadequacies in the required skills and knowledge of medical students. While some may be addressed within a larger framework of curriculum restructuring, the potential of online cases must also be examined in conjunction. This paper is an attempt to comprehend ways of acquiring medical expertise and use this knowledge to generate experiential instruction via web based case simulations. Initial evaluations have already indicated the positive perceptions of students using this learning modality. Whether the cases have also generated learning gains needs further evaluation.

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Biographical Sketch

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Administrative Strategies for the Online Classroom: Support Services for Faculty and Students That Produce Success

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The success of the distance learning program at the University of Toledo has been built on a foundation provided by its administrative strategies, and by its adherence to a structure that produces quality course offerings and student services. Distance Learning at the University of Toledo operates as a centralized entity to coordinate and facilitate all distance learning courses and degree programs. It provides faculty with comprehensive technical support and training allowing them to concentrate on course content as opposed to acquiring high tech skills. Student support provides information and technical support services rather than faculty needing to respond to students' technical questions. That is, UT has structured its DL environment to support faculty so that they may focus on providing an enriching learning experience. Students may focus on their studies and their learning outcomes because their technical concerns are addressed.

Distance Learning began in 1997 with no start up funding and with no courses in place. The enrollment number for the 2001-2002 was almost 8000. For the upcoming academic year enrollment already stands at 6600 with a projection that enrollment will exceed 9800. The anytime, anywhere environment of UT's online courses allows students who are remote from campus and also those students who cannot easily fit work and family responsibilities into a traditional academic schedule to take advantage of a college education. Students may enroll in a large variety of courses ranging from philosophy to computer science to business management technology. Course offerings are available from seven colleges with online degree programs as follows:

- Certificate and Associate degree in Business Management Technology
- Associate degree in Marketing and Sales Technology
- Associate degree in Technical Studies
- Computer Science and Engineering Technology partnered with 11 community colleges
- B.A. in Liberal Studies
- Master's in Liberal Studies
- M.S. in Engineering

The effective administration of an increasing number of course and degree program offerings to an increasingly greater number of students from an increasingly larger geographic area requires a systemized process of operation. Verduin and Clark (1991) emphasize the need for a specific model for success in distance learning programs and Scollin and Tello (1999) point to the framework for understanding the administrative and academic issues in distance learning necessary for success in distance learning. Drawing on that paradigm, success in Distance Learning is structured by means of an institutional philosophy that integrates comprehensive technical support and training for faculty and student services into an effective entity. In fact, the North Central Association notes this integration is critical to the "best practices for electronically offered degree and certificate programs" (p. 52).

Concentration on this integration promotes good teaching, effective learning and the broadening of students' intellectual horizons. The focus is on strategies that produce quality courses and student services rather than on technology alone. This is the reason that Distance Learning is set up to work with faculty in the development of online courses. An instructional designer and an assistant are assigned to each faculty member so that the faculty member's course content and research may become adapted to the online arena. Professors' teaching proficiency and knowledge base is brought to the Web based medium as they learn to employ technology to deliver their course content and communicate with their students electronically.

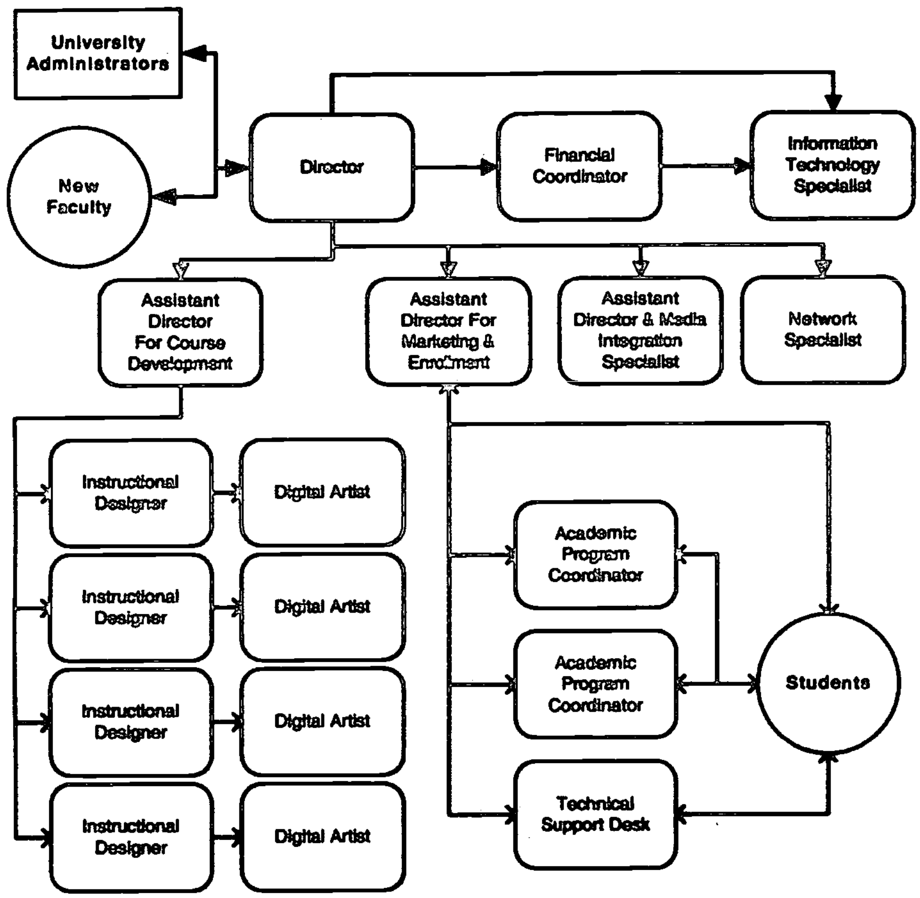
Distance Learning encourages UT's faculty to respond to the adaptation of course content to the online arena in several ways. First, DL Faculty Fellowships opportunities are posted during the spring semester requesting the submission of proposals for the development of one or more online courses. Successful proposals delineate how a course will be adapted to an online teaching endeavor and what population of students will be interested in registering for the course offering(s). Chair and dean's letters of support granting approval for the online course endeavors must accompany proposals. A DL Faculty Fellowship Committee assesses the submissions determining the awardees and the DL Director notifies the recipients. For 2002, seven faculty members received $6000 each for their successful Fellowship proposals. Also, Distance Learning supports conference and research endeavors related to distance learning for UT faculty. That is, faculty are reimbursed for conference expenses up to $1000 each by Distance Learning because of the vital importance of their professional involvement as we move forward institutionally in this arena.

It is the tenured faculty whose dedication we admire as they bring their years of experience in teaching and research to developing and teaching online courses. They are serious about delivering an enriching educational experience to their students. We rely on their communication with us to determine the positives about their online development and teaching ventures and also the elements that should be changed.

Second, Mark Fink, Assistant Director for Course Development, leads the DL Design Team adhering to NCA's accreditation standard for the provision of "an ongoing program of appropriate technical design, and production support for participating faculty members" (p. 56). The strategy is to produce courses in which learning is dynamic and interactive and that "are organized around substantive and coherent curricula which define expected learning outcomes" (p. 52). In assisting faculty in course development, the Design Team creates a complete course for the faculty member including the design elements, web-based content pages, photography, graphical imaging, original artwork, animation, video, audio, and other related services for the course.

Third, Janet Green, Assistant Director for Marketing and Enrollment leads DL student services. The philosophy herein is that of promoting a feeling of affinity with the University for students wherever they may be. This affinity is built "by giving students a single point of contact for everything from advising and registration to technical support" (Rhoda as quoted by Lozenzetti, p. 1). Students who develop a sense of affiliation are more likely to stay the course.

Distance Learning is systemized in the processes that develop a course for online delivery and in the provision of student services. This figure provides a graphical display of the process by which Distance Learning facilitates and coordinates DL courses for UT:



Support Elements for Faculty: The DL Design Team

Within the Design Team, several considerations were made in determining how to structure faculty support. As Distance Learning is responsible for providing distance education opportunities for all colleges, dividing instructional design work by college appeared logical at first glance. After investigating this possibility, it was determined that there could be a transfer of knowledge across disciplines. For example, if an Instructional Designer working with a faculty member in the physical sciences designed a problem based learning (PBL) instrument, the instrument -- or a component of that instrument -- might prove beneficial in a social science course. But this cross-disciplinary approach to design still had to be managed. Due to faculty constraints on time, it was necessary that the Design Team be organized so that faculty know that they could contact one individual in DL to have any issue resolved. While individual Instructional Designers may not be responsible nor have the answer, they are responsible for seeing that the person responsible for the issue within the division is informed. This approach to the organization of Distance Learning has formed the team approach to management, and in fact, we call ourselves the DL Team.

While it appears that the Design Team requires a larger staff, the staffing is comparatively less than many institutions with fewer courses. DL has not had the luxury of easily adding to the team. When a faculty member is confirmed as teaching a distance learning course, the Director of Distance Learning notifies the DL Leadership Team. This initiates faculty support services. The Assistant Director for Course Development assigns an Instructional Designer and assistant to each faculty member. The Instructional Designer is required to have formal knowledge in learning theories and works in partnership with a

Visual/Digital Artist. Next, the Instructional Designer schedules an orientation meeting with the faculty member explaining the services that are provided by Distance Learning. Always, the faculty member is treated as the content expert, the mentor, the instructor, and the director of the course. The orientation includes training on the course portal used (WebCT) and "homework." Homework can include such items as asking the faculty member to consider new possibilities for delivery media that will facilitate course interaction and presentation, or discover what will not transfer well from the traditional classroom. While printed materials are given to all faculty at this orientation, each meeting varies based on the characteristics of the faculty member, the course, and the objectives of the instructional materials. Meetings with the faculty member continue on a regular basis to provide continuous quality improvements.

Unloading faculty from the burden of acquiring high tech skills has been imperative to the success of Distance Learning. While faculty are certainly free to "do it all" if they choose to do so, they have overwhelmingly appreciated the DL Team's services and technical knowledge level. Some of the services eliminated entire tasks that faculty do not time to learn or effectuate, while other services provided more efficient methods of completing the same tasks. Faculty do not have to load students into each course they instruct. Rather, the DL Network Team loads students for the faculty member. Rather than enter each question of an assessment instrument into a question databank, faculty can either ftp an entire quiz to the portal or send their quiz (in Word, email, fax) to their Instructional Designer for entry. Nor do faculty have to know how to build all content within including the portal of their course. Rather, faculty meet with their Design Team, explain what they need, and review high tech courses created through a unique partnership between the Design Team and faculty member. Too, Distance Learning provides a web-based faculty forum with a chat room, bulletin board, a showcase, and a series of content areas providing the latest research in teaching via distance. This forum became particularly useful for faculty who teach courses from locations from China, Ghana, and Hawaii.

The Design Team will meet with faculty in the faculty member's office providing the advantage that utilizing "the equipment the learners are actually going to use when doing their real projects" and that in the privacy of their own office the faculty member "may make as many mistakes as s/he wants without that lack of sophistication being widely known" (p. 44). Faculty members also have the DL Faculty Training Lab available for their use. This is the DL computer facility that provides both PC and Macintosh computers, scanners, high-speed Internet connections, graphics tablets as well as a training server for faculty to be able to test course material so that an ongoing class site is not disrupted.

Support Elements for Students: DL Student Services

While it may appear that student support has nothing to do with faculty development, the reality is that students are imperative to success. A student who is under prepared to engage in a distance learning course impacts the quality of instruction the faculty is able to provide other students in the virtual classroom. Because Distance Learning provides technical support and prerequisite skills to students, faculty spend less time teaching non-content skills, and more time interacting with students. Thus, faculty are able to concentrate on delivering positive learning outcomes to their students.

The phenomenal growth of Distance Learning has occurred as a direct result of the outgrowth of comprehensive student support services. The Assistant Director of Marketing and Enrollment coordinates student services so that Distance Learning provides immediate responses to students' questions, problems and concerns from the coordination of admission and registration to technical questions and problems. An informative letter that includes ID and password directions is mailed to each DL student before the start of each new term. Students are provided with: a web-based "help" and support area, a DL email address, a toll-free telephone number, a video tape that will be mailed to them at no charge, a tech help desk operated evenings and weekends, and software is shipped to their homes. Complete information is posted to the web based "help" site that includes frequently asked questions. Library services are online for DL students with provision of journal articles that are emailed to students and books that are shipped with the label affixed for their return shipment at no charge. Textbooks may be ordered on the University's bookstore web site and are shipped directly to the student's home. In addition, the Distance Learning is developing a knowledge database for the web, a support chat room, a web cam support area, and a complete course for students providing study strategies academic success for any course taken at a distance.

Quality services to faculty in the effective production of online courses and quality services to students can be accessed in the results of student retention in online courses. For Spring 2001 the drop-out rate for the same on campus courses versus online courses in three colleges was similar: 14.64% for the on campus courses and 12.50% for the online courses. Too, course assessments from Spring 2002 report student satisfaction with the DL tech help support desk.

Summary

The essential ingredient to the ongoing success of any distance learning program is the recognition in the university's administrative ranks that quality services for faculty and students are a critical factor. This recognition brings integrity to the components of assembling a distance learning program that not only builds the institution's enrollment but also produces a productive teaching experience for faculty and a quality learning experience for students. The University of Toledo's Distance Learning program is committed to this principle.

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The Ever-Changing Courseware Landscape: Migration Strategies and Lessons Learned

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The University of Texas System TeleCampus and RLO's

In 1998 the University of Texas System TeleCampus began delivering fully online Web-based courses using a Courseware Management System (CMS) developed by UOL Publishing (now called VCampus Corporation). In 2001, after a lengthy RFP process, the TeleCampus selected Prometheus for its next generation CMS. Less than six months later, Prometheus was acquired by yet another CMS vendor, Blackboard. This experience brought home the reality that the courseware management market is characterized by consolidation, acquisition, and rapidly changing technology.

Higher Education Drivers for RLO's

The Web offers a fundamental shift in the way instruction is delivered. When contrasted with face-to-face instruction, Web-based instruction is differentiated by asynchronous delivery and a focus on mass-customization versus mass communication of content. In the real world of budgets, Web-based instruction requires a higher initial investment in dollars and time; these costs are offset by a lower delivery cost that is more scalable than a physical setting. In order to protect these large investments; in order to avoid building a course over and over again, with large construction costs at every iteration; in order to access courses that can be quickly repurposed for changing audiences, the TeleCampus decided in 1997 to build content in a modular fashion. Although the term was not in widespread use at the time, the TeleCampus selected Reusable Learning Objects, or RLO's, as its primary instructional template.

RLO's and Standards

RLO's are intimately involved with standards. A learning object that cannot be reused in a different delivery system (as well as in different content) is worthless. However, while "standards" is a hot topic and hyped by vendor marketing, it is important to distinguish between standards, which are universal definitions agreed upon by accrediting standards bodies such as IEEE or ANSI or ISO, and specifications, which are suggested implementations which may develop into accredited standards. AICC, IMS, and SCORM are specifications for RLO's. There are no real or *de facto* standards for RLO's at this point in the same way that pure technical standards such as XML, J2EE, and RDF already exist.

Major Specifications

AICC was the first specification for the reuse of learning content. AICC evolved out of the aviation training industry and CD-ROMs where aviation training (which was enormously expensive to develop) needed to be repurposed (as Boeing brought out the 737 and then the 747 and then the 757) and as training delivery mediums evolved (from video-discs to CD-ROMs to Web-based training).

IMS (Instructional Management Systems) is a global consortium focused on developing and promoting open specifications for facilitating online distributed learning activities such as locating and using educational content, tracking learner progress, reporting learner performance, and exchanging student records between administrative systems. IMS has published XML bindings and schema for functions like question & test interoperability, content packaging, and the systematic categorization and tagging of learning objects via metadata.

SCORM, the Sharable Content Object Reference Model, is the most recent specification, and it attempts to unify AICC's work in architecture, IEEE's Learning Object Model, and IMS's work in metadata. SCORM is a project of the Advanced Distributed Learning Network, part of the Department of Defense, and has already sponsored several "plug-fests" whereby vendors can demonstrate their claims of "plug and play" interoperability. SCORM provides a reference model that defines a Web-based learning "content model" and offers a practical bridge from emerging technologies to commercial implementations

These efforts do not represent standards, but rather they are the groundwork for future standards. The LTSC (or P1484.12) committee of IEEE will likely adopt SCORM or a SCORM-derivative specification as the RLO standard to provide modular, interoperable content that can respond to the various and changing needs of institutions and students.

Impact of RLO's on a CMS

A CMS is merely one component of a web-based instructional system that takes content (usually from faculty, but increasingly from publishers offering online alternatives to their print products), hosts and delivers that content on hardware (from a campus Web server—or an outside Application Service Provider) in a system that provides structured access (which can be as simple as the ASP technology bundled into Microsoft's Internet Information Server or as complex as a full CMS) and is augmented by additional services such as e-commerce, discussion and chat applications, and tutoring services.

The UT TeleCampus purchases outside services in all of these areas. In three areas—content, hardware, and services—local alternatives are available. However, in one key area—content management software—an outside vendor provides sole-source functionality. Given the recent experiences in CMS vendor change and acquisition, the early decision to use RLO's appears fortuitous, even though it was not necessarily far-sighted.

Background of RLO's

RLO's offer a method for the reuse of content. Wiley has pointed out that Gerard anticipated the development of RLO's in 1969 when he stated that "curricular units can be made smaller and combined." The current use of the term originated in the corporate training arena toward the end of CD-ROM domination as the primary delivery mode and is generally credited to Wayne Hodgins in a 1994 paper delivered to the Computer Education Management Association (CedMA, a group of engineers from major software companies like Microsoft, Autodesk, and Adobe who were trying to design help systems for their software products). As database vendors positioned their products to be appropriate vehicles for the delivery of dynamic content over networks, and as object-oriented databases developed the capacity to deliver multimedia files natively (rather than as the typical relational database field type of BLOB: Binary Large Object), and as software companies saw their product life cycles accelerate, IT training organizations such as CEdMA began to espouse the concept of developing specific, modular learning "chunks" to teach a specific concept. These modules could be used over and over in software training courseware (for example, the File/Save command may remain stable over several lifecycles, eliminating the need to develop a training module for this particular command with every software iteration).

A Theoretical Model for RLO's

After the introduction of the term, cognitive psychologists and instructional designers began to define specific characteristics of RLO's based primarily on concepts from object-oriented programming research.

RLO's Are Self-Contained

RLO's do not draw on outside resources. For this reason, a learning object must not be dependent upon a content management system—although it must be able to communicate with all standards-compliant management systems. In software terms, learning objects are encapsulated, modular and discrete—all communication to an object it is done via messages, and everything an object can do is represented by its message interface.

RLO's Are Internally Consistent

They are abstract in that they contain both data and operations on that data. In software terms, learning objects are persistent—they can be moved around and used in different ways—but they do not change: RLO's are interoperable.

RLO's Are Externally Referenceable

This is the promise of learning objects as exemplified by MERLOT—that a common library of learning objects can be developed and shared. The software term for this is "discoverable," and the use of metadata is the implementation.

RLO's Provide an Instructional Event

Gibson adds this requirement to the definition as a feedback mechanism which provides delineation between "data" and "learning" and which serves as a major component of the Cisco RLO model.

An Applied Model for RLO's

Drawing on Clark's work in outcome-based learning, Barritt (formerly with Oracle and now with Cisco) has proposed a model where smaller objects are aggregated, bracketed with an overview and a summary, and verified by an assessment. The smaller objects may be information objects that generally mirror Bloom's taxonomy: concepts, facts, procedures, processes, and principles; or they may be practice objects: reinforcement activities that give the learner the opportunity to apply skills or knowledge and often provides feedback, remediation, coaching, guidance, and mentoring. Practice objects are not the same as but must map to assessment objects; both practice and assessment objects must match cognitive level and learning objective.

The overview provides a single learning objective, an outline, and may include an outcome (performance) scenario. The overview typically starts with an introduction that relates the importance of the RLO, includes prerequisite knowledge, and is organized by a system-generated outline of information objects contained in the RLO. The summary includes a review (that is tied to the scenario, assuming one was used) and may include additional resources and a "next steps" statement that provides the transition to the assessment. The pre- and post-assessments includes consideration of factors such as pass/fail thresholds and partial credit, retries, and the relative weight of assessment items.

In this model, based on Merrill's Component Display Theory, assessment objects must test an individual concept. In order to test an integrated, real world performance, the assessment must be tied to the summary; however, that architecture is not supported in the model. Wiley, though, has pointed out that if scenarios are used in both the overview and summary, and if assessments are associated with them via these scenarios, learners can pre-test on the integrated performance instead of taking the assessments associated with each individual concept.

A Practical Implementation of RLO's

RLO's are more than theoretical models. The University of Texas System TeleCampus recently tested its RLO strategy when courses were migrated from VCampus to Prometheus. And the strategy will be tested once again when we migrate content from Prometheus to Blackboard. The first step— a correlation of specific functions between the two platforms—produced a trivial one-to-one mapping. The specific movement of course content, originally developed as connected HTML pages in the proprietary VCampus database, required the extraction of those pages and assets, repackaging the individual pages into self-contained lessons, and then the addition of code to provide internal navigation. The end product was RLO's that can be quickly implemented and reused in any courseware delivery platform.

What Is (Is Not) an RLO?

An HTML page—or even a series of pages—is not necessarily a learning object if no event takes place, no feedback occurs. However, a single HTML page could be a learning object, in the case of a Java applet with a self-contained simulation. This typifies the current debate on RLO granularity: how big (or how small) should an RLO be? By using the software concept of inheritance, object classes can de defined that share some or all of the characteristics of related classes. In instructional terms, learning objects are grouped so that they are independent of but build on previous objects. In the Cisco model, granularity is addressed by fixing the number of information objects at 5 +/- 2; rather than being simply an arbitrary number, this figure is tied to research into the upper limits of short-term memory (7-9 "chunks"). In RLO's, size doesn't matter as much so long as we use the hierarchical property of objects.

The Future of RLO's

Most of the efficiency interest in RLO's has focused on their ability to be assembled in an automated fashion. However, in Cisco's model, students cannot self-assemble RLO's because they don't know what they need to know in order to construct the learning object; that is, students do not have the analysis knowledge required to evaluate the RLO's, nor the synthesis knowledge to assemble the information. Instead, information objects must be paired with knowledge objects that identify the instructional function played by an information object in order to automate the creation of RLO's. Faculty will play the pivotal role in creating these knowledge objects for useful instructional sequencing.

Faculty already play the pivotal role in manually assembling RLO's into meaningful instruction through metadata searches. A third approach suggests that subjective metadata, provided by communities of practice and working from research in online self-organizing social systems may provide a third and more efficient method for assembly of RLO's; learners who share key chacteristics (learning style, educational experience, desired outcome objectives) recommend the "XYZ" RLO, thereby forming communities of learning recommendation.

A critical characteristic of objects is polymorphism: the relevance and meaning of the object is defined by the context of its use. The central tenet of software object design is a specialized form called runtime polymorphism: the existence of an object is determined at the instant a learner needs it based on the learner's previous actions with other objects. In simplest terms, an RLO will determine that a student needs not just a remedial lesson (based on a failed assessment) but that the learner needs a video instead of a textual explanation. This requires the development of equivalent objects that teach the same concept but differ in language or media type (for example, audio files versus transcripts). This Holy Grail of adaptable RLO's requires continuous improvement practices in RLO development.

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Much Ado About Usability

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Introduction

Web site usability testing throughout the course development cycle saves time, reduces development costs, and ultimately results in a better learning experience for students. During 2001, a team of instructional designers, technologists, media specialists, and administrators at the Penn State World Campus created a new course design template for online courses and then conducted a web site usability study to assess its new features. This paper describes the usability testing process and provides recommendations for enhancing the usability of online courses.

Methodology

Usability studies can be conducted without great expense or expenditure of time since the majority of usability problems can be uncovered by a group of five or fewer participants. In fact, testing with more than five participants results in diminishing returns (Nielsen, 2000), and small tests that are conducted throughout the development process can reveal significantly more problems than a single test involving a large group of users (Krug, 2000). In our usability study, six of the 12 participants were assigned the role of prospective student while the other six participants acted as enrolled students. This division of roles and assigned tasks was necessary since the course template was originally designed to serve both audiences.

Different usability test methodologies yield information about different aspects of a site, and tests using multiple methodologies provide more information than those incorporating only one (Pearrow, 2000). Questionnaires provide background information about test participants—representative target users—but do not uncover specific task-related problems with a site. Similarly, card sorts elicit valuable data on site organization and labeling, but results can be as varied as the individuals participating in the test. To find specific task-related usability problems, users should be observed as they interact with the site. Typically, participants are assigned a set of tasks to complete while observers note the time on task, the number of mouse clicks involved, and whether the task was successfully completed. Additional qualitative information can be gathered by adding a "cognitive walkthrough" component, where participants are asked to speak their thoughts while completing the assigned tasks.

We utilized four methodologies in this study: a background questionnaire, a card sort, a cognitive walkthrough, and an exit interview. Participants proceeded individually through the usability tests. The background questionnaire was designed to help us gauge the computer skills of the participants. In the card sort, participants were asked to define and categorize the menu items that we had chosen for our course template. The enrolled group was given our chosen menu categories to work with, while the prospective group was asked to create their own categories. The menu items and categories were written on index cards for easy organization, hence the name card sort. In the cognitive walkthrough, prospective students were asked to perform four tasks and enrolled students were asked to perform 10 separate tasks within the course web site. For example, the prospective group was asked to find the date of the first exam, while the enrolled group was asked to navigate to the first page of Module 1. Participants expressed their thoughts aloud while their comments and actions were videotaped and noted by the observers. The data gathering for each participant was completed with an exit interview, which consisted of five questions about the site and its ease-of-use. We also requested general feedback and suggestions for improvement at this stage.

Results and Recommendations

The background questionnaire indicated that the participants had roughly similar computer backgrounds, with most identifying themselves as being comfortable with computers. We found the exit interviews particularly helpful in generating solutions to usability problems uncovered in the cognitive walkthrough. The card sort and the cognitive walkthrough generated a large amount of information on the usability of our course template and were central to improvement of our site design. Due to page constraints, only the most significant and generalizable results from these two methodologies will be described here.

Card Sort Results

Result 1: Some menu item wording was unclear. Participants were confused about the meaning of some of the menu items. For example, our menu included an item titled "directions," which was a list of directions for using course tools such as e-mail and the bulletin board. When asked to describe what they thought this item was referring to, answers ranged from "how to do something" to "concrete contents" with a number of participants simply saying the title was too vague to accurately describe. In other cases, we were using distance education jargon that was clear to us, but not to those unfamiliar with the field. One example was the menu item "IL Student Guide." Out of all the participants, only one knew that this was a student guide of general policies for independent learning students; everyone else simply stated that they didn't know what this item was. Furthermore, no participants correctly described the menu item name "Online Diversions." Even menu items that seemed clear to most students were still confusing to some participants. For example, while most knew that "lessons" was a link to the course content, one individual thought "lessons" would link to a syllabus or schedule.

Recommendation 1. Be as clear as possible when referring to course components in menus or other site navigation. From this study we discovered that names for menu items must be chosen carefully in order to provide clear direction. Catchy phrasing (like "Online Diversions," in our case) and distance education jargon should be avoided. However, we do recognize that in certain cases, creative wording is necessary to reinforce the metaphor behind the organization of the site (such as the "classroom" metaphor or the "personal organizer" metaphor); in these cases, we suggest that a description of each course component be easily accessible from within the site.

Result 2: There was little consistency between participant-generated categories. The enrolled group was asked to classify 30 menu items using the categories we provided. "E-mail" and "bulletin board" were the only two items that all participants assigned to the same category—"Communications." There were nine other items that the majority of participants categorized consistently. Most participants did not classify the remaining 19 items according to any one model. When the prospective group of participants defined their own categories, there was even less consistency. For instance, there were only 8 items that more than 50 percent of the participants placed in similar groups. At best, only two-thirds of the participants agreed at any one time. This result led us to question the value of grouping similar items under headings in the course menu.

Recommendation 2. Although collapsible menu categories and nested menu items conserve space and are visually appealing, we recommend that such features be avoided in course Web sites. Based on the results of this study, we chose to limit the number of items in the main menu so that the menu could be skimmed easily. A shortened menu eliminates the need for students to search through our predetermined categories to find a specific course component; it also avoids the use of pop-up menus or other dynamic HTML that might not be accessible to students with disabilities. To shorten our course menu, we decided to include only those links that would be used repeatedly throughout the course. We then created a space for links to course components used less frequently (such as orientation materials, viewing tips, and instructor biographies) on the course home page.

Result 3: Certain menu items could be interpreted differently based on user expectations. Our course menu contained an item named "sample content," which linked to an example lesson from the course. In the card sort, some participants wrote similar definitions for this item, such as "example of a lesson," showing that they had a similar conceptualization of the site. On the other hand, some had a completely different outlook, instead describing the item as a "sample/example of a report/presentation" or "example of works like those student is supposed to create." While these responses could not be strictly attributed to the participants' roles of prospective versus enrolled students (i.e., not all prospective students thought this item would be an example of a lesson, and not all the enrolled students thought it was an example of student work), we were struck by the fact the results still fell into two different perspectives. Similar findings from other menu item definitions caused us to consider the different ways prospective students and enrolled students would use the site.

Recommendation 3. One site should serve only one function. Single-function sites are easier to design, maintain, and most importantly, use. We ultimately chose to create two separate Web sites for each course, one for the prospective students and one for the enrolled students. Certain items, such as sample materials, a full course syllabus with assignments, instructor information, FAQs, and orientation materials were relocated to the new prospective student site.

Cognitive Walkthrough Results

Result 4: Participants did not always realize that they had completed a task successfully. In several tasks, both prospective and enrolled students had actually navigated to the correct web page but did not see the information they needed—and so did not think they had completed the task. This happened, for example, when the prospective students were asked to find enrollment information and also when enrolled students were asked to find help downloading software for the course. These results prompted us to find ways to reorganize and streamline auxiliary web pages for quick and easy information retrieval.

Recommendation 4. We recommend that all pages in a course Web site be clearly labeled so that the student knows where they are within the course at all times. This labeling must also be consistent throughout the course in terms of appearance and terminology. In addition, course Web pages should be constructed so that the most important information is written concisely and prominently positioned near the top of the page. Extra information should be removed, or if necessary, relocated to the bottom of the page or to linked files. In doing so, you might even find that some additional descriptive material is not necessary at all!

Result 5: Students did not understand directions on the course Web site or preferred to operate through trial and error. No students were able to successfully retrieve assigned readings from an electronic reserve reading system at the Penn State library. This task involved multiple steps, where students were first asked to determine what readings were required for a particular module, and then to access one of these readings from the library. Completion of this task would require participants to interface both with our site and the library database. We provided step-by-step directions for using the library site, but most students did not use these instructions, even after they became hopelessly lost. As a result, we needed to find a way to provide directions so that students used them.

Recommendation 5. Directions must be included up front in order for students to use them. As in Recommendation 4, we realized that we needed to remove all extraneous information within and surrounding the directions for our course tools. We then placed all directions in a central "Getting Help" location. In addition, we realized that adding multiple access paths to the directions would help students retrieve the information as needed.

Conclusions

While instructional designers and Web developers endeavor to "think like their audience" when creating an online course, they are so familiar with the information and terminologies used in the field that stepping outside of their roles is not easy. Web site usability testing led our instructional design unit to see our courses through student eyes, and the data acquired through this study fed an iterative template design process. Although distance education providers rarely have additional staff and resources to dedicate to projects outside the normal scope of activities, questionnaires, card sort activities, observations, and interviews require nothing more than participants, office space, a computer, and traditional office supplies. Even these "quick and dirty" usability tests will improve the learning experience as well as add to the collective knowledge of the design staff.

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Assessment in Online Courses:
Practical Examples

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One question from faculty members teaching an online course for the first time is, "How do you do online exams?" The basis for this question lies in the notion that online assessment must follow the typical assessment methods of campus classes. But this is not necessarily true. In an online environment, as the role of the course instructor changes radically from being the deliverer of content to one of mentor to the students, the function of assessment, and its corresponding techniques, must also change.

Online assessment needs to be viewed as an interactive mentoring opportunity that can be employed in online courses. This perspective provides instructors with the opportunity to move beyond the rhetoric that assessment should be utilized as a teaching tool and not as an evaluation mechanism. To achieve this, assessment must now take on a new role. The assessment techniques employed in an online course should be based on desired learning outcomes. Then these can be used by the students to evaluate their own progress through the course materials while also providing the instructor with evidence of the effectiveness of the course materials or indications of content areas that need further enhancement and/or development.

These online assessment techniques should be used to assist in developing an overall assessment strategy for the online course. This assessment strategy aids in forming student assessment profiles, which offer the instructor a snapshot of student understanding. In order to provide an effective student assessment profile, the foundation for drafting this profile must first be constructed by building learning outcomes which are based on critical course content and applicable assessment methods for determining a student's conceptual framework of these learning outcomes. How does an instructor and the student know that there is an understanding of the learning outcomes?

Learning outcomes should be measurable through an applicable assessment of that outcome and provide evidence of mastery of the learning outcome through student performance. When writing the learning outcomes for the course, consideration should be given to five areas of focus. First, critical course content should be determined. What must the student know in order to function in authentic situations? Second, discern what the students should know or accomplish based on the critical course content. Third, decide what evidence is acceptable as proof of knowledge or accomplishment of the learning outcome. Fourth, write these learning outcomes in such a way that they reflect the appropriate level of cognition. And lastly, determine what student performance will provide this evidence. The selected student performance will furnish the method of assessment for both course and modular critical content.

Assessment should assist the student in changing a behavior and provide guidance to further develop their conceptual framework for a particular area of content. In order to accomplish this goal, assessment should be a continuous process and should guide the student to mastery of the learning outcomes. An assessment strategy thus becomes the foundation for developing the instructional design of the online course. The overall assessment strategy includes four basic levels of development. Level one would be to deliver pre-assessment to understand an individual student's conceptual framework of a learning outcome, which can provide guidance in the development of appropriate learning activities for continued learning growth. These activities are part of the learning strategy of an online course, which is the next level in developing an assessment strategy. The learning strategy would include the presentation of the critical content through interactive, instructional concepts and activities. Level three would be to incorporate short assessment opportunities that should punctuate a course to provide the student with performance feedback on these learning concepts and activities. Learning styles should be taken into consideration by providing a diverse array of assessment methods to reflect student understanding of the learning outcomes. This provides the opportunity to fill in the gaps discovered during the pre-assessment. Opportunities for relearning and reassessment should be available to students. Finally, a post-assessment provides evaluation of the overall student performance and indicates ultimate mastery of the critical content and the ability to authentically incorporate the content into appropriate situations.

Assessment is not only the device through which the student gains feedback on their learning progress and identifies achievement through mastery, but it also provides feedback to the instructor regarding successful course content delivery methods and techniques. By monitoring the evolvement of the student assessment profile, instructors can redesign assessment methods and strategies to meet the needs of students and provide an accurate account of a student's conceptual framework.

Online course delivery provides an organized and systematic approach to assessment. A variety of traditional testing methods are available through the use of digital exam building features. Assessment options are available in a medley of traditional formats with the options to pool questions and control the delivery of the material. These traditional methods should only be a small component of the overall assessment strategy for the online course. Keeping in mind that the learning outcome should be assessed using an applicable assessment technique, online delivery also provides an environment, which is conducive to incorporating a diverse array of assessment techniques. A wide range of instructional technology features and tools are available in the online setting to deliver assessment. This flexibility of delivery allows for a more student-centered approach to assessment and feedback.

As part of Northwest Missouri State University's effort to assist faculty in the development and enhancement of their online courses, the Center for Information Technology in Education has been working closely with faculty as they discuss and develop new perspectives as to how assessment may be conducted in an online environment. The Center has been working closely with faculty to integrate new assessment techniques and develop an overall assessment strategy for their online courses. Additionally methods for addressing the issues of academic dishonesty and conduct in an online course are being examined as faculty design and develop online assessment strategies. This presentation will provide participants with concrete, practical examples of a broad range of useful and diverse assessment techniques and strategies that may be employed across a variety of online course subject areas. These include reflective summaries, projects, papers, presentations, concept maps, peer evaluations, chat interviews, and a variety of other techniques.

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Managing Your Personal Knowledge of Distance Education: Sources, Reliability, Tools and Techniques

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Purpose of the Session

This session will review the sources of knowledge and information in distance education, and will present a matrix, and several criteria for critically analyzing and evaluating them. Furthermore, the audience will receive instruction on how to use specific tools for managing their personal knowledge-base about distance education.

Information Explosion in Distance Education

In recent years, there has been an explosion of information about distance education. Many new academic journals, trade magazines, websites, and books have been added to the knowledge base of the field. These new sources of information have been a boon for academicians, practitioners, and students in the field. A few years ago, there was a dearth of knowledge about the field. Today, the sheer number of sources, variety of modes of knowledge representation, and media used has created a challenge for those who want to keep current about the field, and remain up-to-date.

What's more the information about the field is now presented in a variety of sources ranging from in-flight magazines to exclusive professional and academic journals in specific fields of studies other than distance education and educational technology. Articles about effective means of communicating with distance learners, or creating more accessible instructional websites are in journals targeted to chemists, nurses, engineers, and many others.

Newspapers throughout the country have discovered distance education and e-Learning. Since 1997 an increasing number of newspapers are publishing stories about new programs offered by colleges and universities, faculty involved in distance teaching and students engaged in online learning.

Technology companies, such as, Cisco Systems, Hewlett Packard, Apple, IBM and Microsoft have developed websites with information about teaching and learning at a distance. Furthermore, in the past six years the number of companies specializing in distance and electronic learning has dramatically increased. These companies have not only survived the extremely unfavorable market conditions for the dot.coms in 2001, they are growing and thriving. Their frequent announcements, upgrades to their products, mergers and acquisitions, or in a few cases, demise add to the avalanche of information created every day. In addition, the increasing number of conferences, online seminars, webcasts, videoconferences, and CD-ROM databases make the scene indeed crowded.

Drowning in a Sea of Information

According to senior researchers Peter Lyman and Hal Varian at the University of California, Berkeley: "The world's total yearly production of print, film, optical, and magnetic content would require roughly 1.5 billion gigabytes of storage. This is the equivalent of 250 megabytes per person for each man, woman, and child on earth."

The challenge for the professional and the practitioner is not only keeping track of these sources, but assessing the reliability and validity of the knowledge and information put forward. What is the base of the information presented? Is the narrative based on research, is it opinion based on years of practice, or opinion based on conjecture in the spare of the moment? As we are bombarded with new information, how do we know how good, solid, reliable, and useful it is?

At Distance-Educator.com we constantly receive, review, and assess information for presenting on the website and the Daily News. Our experience shows that contrary to common wisdom there is an inverse relationship between the amount of information available and the knowledge to be had. In other words, information must be analyzed, assessed, and categorized in a specific context to be useful to the end-user. At this standpoint, knowledge is useful information. Information that is not rated and is out of context is almost of no use, as its validity and reliability is subject to question.

Quality of Literature in Distance Education

In years of sorting out information, we have come to the conclusion that there are 5 categories of information available to all of us. Those are presented in the y axis of the following table.

Table 1. *Categories and Sources of Available Information About Distance Education.*

	Refereed Publications	Reviewed Publications	Professional Magazines	Newspapers	Newsletters	Listservs, News Groups
Uninformed Opinion						
Informed Opinion						
Theoretical analysis						
Data-based research articles						
Theory driven data-based research						

Roughly, the shades of grey in this table indicate that, for example, refereed publications at the top left side of the table have a low amount of uniformed opinion, while listserv readers are often challenged by a high amount of uninformed opinion. Conversely, there is a high density of theory driven, and data-based articles in refereed publications, while such items may appear only as bibliographies, or references on listervs, newsletters, newspaper articles or even some professional magazines. This, in part, represents the dramatic growth of the field in the past 7 years, and a need for articles reflecting the creative thoughts of their authors about how the field is developing now, or should be developing in the future.

Nevertheless, simplistic accounts of projects have inundated various publications too. In recent years, there has been a dramatic increase in the number of articles that are not data-based, or theory driven. Gradually, the literature of distance education has become primarily descriptive. Although, there are numerous questions about how the new digital environment could be used for instruction and training, hard data to respond to these questions are hard to find.

New terms, such as blended learning, asynchronous distance education, and e-Learning have emerged without conceptual justification, theoretical grounding, or practical validation. Very often, these terms are coined by those who are new to the field and are not aware of its history and conceptual development. They observe a certain phenomenon, describe it in an article or two, and others take their word as fact, or knowledge.

Criteria for Quality

The literature has become confusing, misleading, and frustrating. In presenting information on Distance-Educator.com, and choosing source materials for our print publications, we do our best to comply with certain standards. You might find these standards useful to manage your knowledge of the field. In our practice, source materials that offer a positive response to the following questions are given priority:

1. Importance: Given the framework of the field, to what extent is the information important to our readers?
2. Relevancy to practice: To what extent the source material is relevant and useful to practitioners in the field?
3. Contribution to the field: To what extent the material contributes to the development of the field?
4. Author's credibility: What is the professional or academic standing of the author?
5. Publisher's credibility: To what extent the publisher or distributor of the information is credible?
6. Factual information: To what extent the source material provides factual information and is devoid of hype and propaganda?
7. Editorials and opinions: To what extent the opinion presented in a source material, is informed by theory, research and practice in the field.
8. Origin and validity: What are the origins and valid grounds for the opinion presented?
9. Theoretical framework: Is the source material grounded in, or oriented toward a known theoretical framework of the field?
10. Literature review: Does the source material refer to the known literature of the subject matter?
11. Grounding on data: Is the source material grounded on data collected from the field?
12. Accuracy and Validity: Are the reported results accurate and valid?
13. Internal Consistency: To what extent the theoretical framework, literature review, and interpretation of the collected data relate to each other?
14. External consistency: To what extent the material is supported by other sources?
15. Display and representation: Is the display and representation of information accurate?

Managing Your Personal Knowledge

We all have heard and read about how corporations and large organizations manage their knowledge. But good knowledge management begins with each individual. Fortunately, as knowledge in the field has increased so has the number of tools, and techniques for managing such knowledge and information. We have offered the 15 criterion above for your use when you select a source material to study about the field of distance education. We use these in addition to many years of experience to select news, research articles, policy papers, resources, and hundreds of other items, which we think you would find interesting and useful.

In addition, we are making the Distance-Educator.com website increasingly personalized so you can interact with the site, and create your own knowledge base. At this point, we will demonstrate the features of the website to you, and will respond to any questions or comments.

Reference

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Biographical Sketches

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Becoming a Learning Community: A Blended Approach for Adult Education

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Introduction

This paper focuses on the blended learning approach used to instruct a cohort of working teachers in South Dakota seeking a masters degree in technology. During a distance course on change management a virtual learning community developed among the students, in which they discussed issues and offered solutions to one another without being prompted to do so by the instructor. This paper describes the technologies involved, nature of the coursework, and learner characteristics. It is my hope that distance learning programs for adults in other settings can use a blended approach to bring about similar results.

Literature Review

Learning communities are an essential part of education, whether in the classroom or by distance. Paloff and Pratt (1999) wrote what is possibly the definitive source on online learning communities. The characteristics of such a community are excitement and passion for learning, the creation of knowledge, and seeing issues from different perspectives. The result is more knowledge being gained than if students had learned alone. Meaning is socially constructed by asking questions, sharing resources, and supporting other students. The "keys to success" include honesty and trust, responsiveness, relevance, respect, and empowerment. The authors suggest looking at the frequency, relevance, and quality of participation to determine if a learning community has been achieved. For example, one indicator would be whether most comments are directed student to student, rather than student to instructor.

Murphy and Cifuentes (2001) see development of a community as a key element for online courses. Members must want to improve their collective knowledge and be able to share what is learned. Instructors can help students to become members of a community by providing structure and support at the beginning of the course and gradually allowing more learner control. Using a collaborative workspace and activities such as getting to know one another helped their students to succeed online.

Clark (online) gives three principles derived from research on virtual communities that can be applied to courses: 1) online learning communities that are grown by the members (i.e.., students), not built by the instructor; 2) having a leader who welcomes and reinforces learners; and 3) using personal stories to build community. According to Clark, one of the "hardest things to do in any online community is to get people to give information. One reason is that people just don't naturally think their way of doing things has value…." Instructor strategies include "letting lurkers lurk," asking questions to get conversations going, leading by example, reading every post, controlling the environment (e.g., by naming the forums and including short introductory posts), encouraging stories (which help build a sense of identity), and caring about the learners in the community.

Youngblood et al. (2001) grouped the tasks of online instructors into four categories:

1. Setting the scene (e.g., making students welcome, giving expectations)
2. Monitoring participation (e.g., keeping online discussion on track)
3. Facilitating critical thinking (e.g., asking questions)
4. Promoting student collaboration (e.g., encouraging students to build on each other's comments).

Bauman (1997) offered these guidelines for creating a learning community in an online course:

- Communicate frequently with the class
- Make as much interaction public as possible
- Create a space for informal interaction
- Understand the limitations/strengths of technology for interaction
- Ask questions often and interact with students

Blended learning, which combines traditional and online instruction, is becoming increasingly popular. Zenge and Uehlein (2001) see blended learning as including integrated instructional design (with each delivery method used to do what it does best), variety, and a consistent framework, values, and concepts. Although the authors believe that this approach can lead to huge gains, they caution that "a full understanding of the benefits of combining both approaches is likely only over a long period of time with further research." Traditional instruction may be better at social situations, casual interaction, getting feedback from others, and discussing emotions. Online learning may be better for information and cognitive skills, as well as being more convenient and less expensive.

Hocutt (2001) identified four criteria for "strategically blended learning": 1) the components should be developed with an awareness of each other; 2) they must be consistent in language and style; 3) there should be some redundancy; and 4) there must be a smooth transition from one component to another. Haythornthwaite et al. (2000) have found that students who fail to make use of connections such as e-mail and chat feel isolated and experience more stress than students who participate in virtual communication. Beginning a course on-campus can help in the bonding experience so that students continue to maintain these connections online.

Approach Used in My Course

This section describes the blended learning approach used by the University of South Dakota (USD) during spring 2002 to instruct a cohort of working K-12 teachers throughout the state who were seeking a masters degree in technology and training. The delivery systems used were videoconferencing and WebCT. During the videoconferencing sessions, students broadcasted from multiple sites through the Digital Distance Network (DDN), a statewide telecommunications network. WebCT is used for all distance courses at USD.

During the preceding fall, students were given an opportunity to travel to Mitchell (at the center of the state) to meet each other and the instructors in person during a special introductory session and dinner. This was part of our strategy to build community. However, when I began teaching a course on organization development, I found that these students required considerable encouragement to participate actively at a distance. In the spring, these same students took my course on Personal/Organizational Transition and Change Management. This time their interaction and intent transformed from simply meeting the degree requirements to the enthusiasm and excitement characteristic of a true learning community. They began to comment on each other's ideas and suggest solutions to one another without my prompting them. What had changed?

I followed several strategies for this new course in an attempt to build online community.

First, I put up the WebCT site for this course over the winter break and gave students access. I posted handouts for each topic, a syllabus, and list of readings. Several students began to post online and to share their experiences and thoughts regarding the topic and the textbooks before the course had even officially started. This set the stage for what was to follow.

At each DDN session, which simulated face-to-face interaction without students having to be at the same location, I began by greeting each site and finding out who was there. I always allowed time for a little informal talk so that we could get comfortable before the real work began. I gave students the opportunity to discuss any problems they were having. Time was also provided before class for students who wanted to talk with me privately.

I asked students to keep all e-mail correspondence to me or other students within WebCT. This eliminated some confusion I had had last semester when e-mails were arriving from different accounts.

Students were asked to keep a personal journal on their Palm Pilots (provided by USD) on change issues in their lives. They used the free software Freewrite. Excerpts of these journals were then loaded onto their PC and e-mailed to me. I took care to comment on each students' journal and on their papers. Although students did not see each other's journals, I found that much of what had been written fueled the discussions on WebCT. We began by discussing issues related to personal change. Students were stunned to find that their reactions toward change were normal and they were not alone in facing many difficult personal changes throughout their lives. Once they understood the basic concepts about change (covered by the textbooks and the handouts), they were able to apply them. Students grew increasingly excited as they realized the real-life application that could apply to them *right now.*

During the DDN sessions I relied much less heavily on showing PowerPoint presentations and more on class discussion. One issue I faced was having seven sites active during the DDN videoconferencing sessions. The technology was voice-activated, meaning that I could only see the site where a student was speaking (or had most recently spoken). This made it difficult to monitor students' level of comprehension. I noticed that certain sites were more likely to dominate the conversation, thus discouraging quieter, more introverted students at other sites. I began to call on less active sites and to ask them for comments and questions. As soon as they spoke, the camera would switch to them. I also encouraged students during these sessions to address comments and questions to each other and not necessarily to me. Sometimes my keeping silent was all that was necessary to get students to do this. Rather than calling on each site, I let students respond more informally.

For group activities, in cases where there were enough students at a site, they worked in the activity together and muted their site so that others could not hear. In cases where there were only one or two students at a site, I had these students continuing to use the DDN link to work together. I turned the volume down and muted my own site so that they had the privacy to work. I then brought everyone back together by turning off my mute and waving my arms at the screen!

In encouraging online discussions about change, I realized that trust was a major issue. Students could only communicate freely if they trusted me as well as each other. I helped to develop that trust by revealing certain things about my own life and how I had reacted to major change. I answered students' questions about myself. For example, I had moved to South Dakota from Virginia and was facing a cultural as well as geographical change. Modeling what I wanted from them seemed to encourage students to share with each other and to come up with useful suggestions for helping each other to get through a difficult change. Because WebCT provided a relatively private area (i.e., only students that I had logged into the course had access), students felt that our discussions were safe.

By midway through the course, perhaps the biggest problem I faced was that students were posting too much! There were days when I had a tough time keeping up with them. Instructors need to keep in mind the enormous amount of time involved in monitoring and encouraging such communities.

During the last DDN session, students presented on the plans they had developed for change management at their school districts. (I deliberately placed the most dominant site last on the agenda, ensuring that the quieter students had a chance to speak). Students were also asked to post handouts on WebCT giving their top strategies for a successful change. This enabled students to gain the benefit of each other's work twice and comment on it. In addition, students were asked whether their views on change had altered during the semester, which led to a fascinating discussion (they had).

The amount of change going on in my adult students' lives undoubtedly influenced their enthusiasm about this course. School districts in rural South Dakota are having to face a dwindling population and make tough choices. Cutbacks, downsizing, and combining have meant that no one's job is safe. In addition, many of my students were undergoing major personal changes that semester. The fact that we had now known each other for a longer period of time – two semesters instead of one – helped also. Learning communities take time to build.

Another group of cohort students taking this course during summer 2002 are attending one session at the USD campus in Vermillion. We will be using an activity to develop a change journey map of a major change taking place in their lives or their organizations. It is my hope that this in-person activity will encourage the bonds already developing among the students. I am also using group projects by having students use the Student Presentations feature on WebCT. This allows students to work in small groups through private discussions, e-mails, chats, and by creating and downloading a shared html document into WebCT. Once students have finished their projects, I plan to put a hyperlink to each project so that students can view and comment on each others' projects.

In conclusion, here is a list of strategies that may be helpful to you in encouraging online communities in your distance courses:

- Let students into the online site before the course begins. Have a face-to-face session or two, if you can, at some mid-point location, and build in some informal networking time.

- Be active in online discussions. This doesn't mean you should dominate the discussions, but students need to know that you're there and are paying attention. Don't just post some questions and then disappear. Comment on students' posts and praise outstanding posts.

- Require students to make a certain number of online responses to other students. I asked students to respond to at least two other students for each discussion topic on WebCT. Some students made many more comments than that. (One particularly empathetic individual wrote a response to every single student's comment!)

- If possible, limit the number of videoconferencing sites. Two to four sites would be ideal. With seven, it gets difficult. Make sure there are at least two students per site (preferably more).

- Connect what students are learning to real life. Students become more involved when they are able to see the benefit immediately.

- Have students post some assignments so that others can view them and make comments. This can be either required or optional. (I used both approaches, depending on the assignment. Students could post their work as an attachment in the Discussion board on WebCT.)

- Have a contingency plan. There were times when the technology didn't work and students were unable to connect to the videoconferencing sessions. We dealt with this by mailing them a videotape of what they missed. Another possibility would be to connect them to a chat room.

- ❖ At the end of the course, encourage students to think about what they have learned and how they related to each other. Ask how they will use this in the future in their lives. Encourage them to keep in contact with one another. (I left the Discussion board up for several weeks afterwards.)

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Co-operative Design Fostering Diversity and Interactivity: International Organizational Behavior for a Distributed Community

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What happens when three institutions attempt to improve understanding and foster deeper insight into cultural differences? In an attempt to accelerate Mexico and U.S. team building through educational projects, interactive problem solving and online learning exercises designed from a multicultural case study perspective: Rensselaer Polytechnic Institute in New York State, Tec de Monterrey in Mexico and General Motors worldwide Technical Education Program, jointly redesigned and presently cooperatively teach a newly created course in International Organizational Behavior.

When multiple institutions work to widen a global perspective through international academic offerings, we begin to address key questions related to diversity and interactivity. How, for example, do our ideas about *difference* affect our actions? How do those ideas and actions affect our communications? If ideas, actions, communications, and binary oppositions or the simple dichotomies that shape our language, all work to contour our reality—what can we do to change our own perspective and promote change within our communities of practice?

Gaviel Salomon (1998) wrote:

> Typically school settings do not offer nearly the opportunities they might for the development of self-regulated, high-road learning. If anything, the problem is even more acute for the learning of large collective entities like corporations, which characteristically have hardly any "metacognitive" awareness of their own learning. The collective that worries about mediating its own learning and the learning of individuals within it is far more likely to learn better and foster individual learning. (p. 19 of 25)

Salomon distinguished between programs designed to mediate individual relations and educational program designed to mediate change between collectives (Salomon, 2001). In the spring of 2002, nineteen students (N=19) enrolled in our pilot course, an intervention determined in its attempt to untangle narratives of both personal and group conflict. This course, offered or distributed through what we are calling *online web-based conferencing* was designed to support group and individual metacognition.

Students were grouped by (a) work location in Mexico and the United States, (b) gender, and (c) known characteristics, and were then randomly assigned to one of four teams for the semester. Over the term, teams communicated and collaborated—building a course-related, problem-based project—using a private asynchronous electronic bulletin board, a synchronous text chat and email.

Several measures were used to analyze course communications and group differences. One measure was created to determine student attitudes towards *Diversity*. *Success,* in this case, is measured as final semester grade—scored for each group by the RPI and TEC professors based on projects, participation and peer reviews. *Activity* is an average of each participant's "hits," readings, and postings in the online environment. *Interactivity* as engagement is measured here as message or communication complexity in the pattern of *posing to,* then *responding to* and *sustaining with* others in a group (Sarlin, 2002)—in this case—within a computer-mediated environment. Reliability for the *interactivity* measure is strong at Cronbach alpha = .87. Reliability for the *diversity* scale is high at Cronbach alpha = .96

Table number one shows differences in *diversity* scores for each of the four student work groups as significantly different from one another. Differences in the *activity* level of each group are also apparent. Differences in *grades* is not significant and additionally grades are not normally distributed.

Table 1.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SCORE	Between Groups	288.392	3	96.131	5.150	.015
	Within Groups	242.667	13	18.667		
	Total	531.059	16			
ACTIVITY	Between Groups	77975.169	3	25991.723	2.603	.096
	Within Groups	129830.4	13	9986.954		
	Total	207805.6	16			
GRADE	Between Groups	1.451	3	.484	1.347	.302
	Within Groups	4.667	13	.359		
	Total	6.118	16			

Figure one reveals differences in each group's feelings about *diversity*. Work ahead will determine how differences in *activity*, *interactivity* and *success* "look" in relationship to these values.

Figure 1

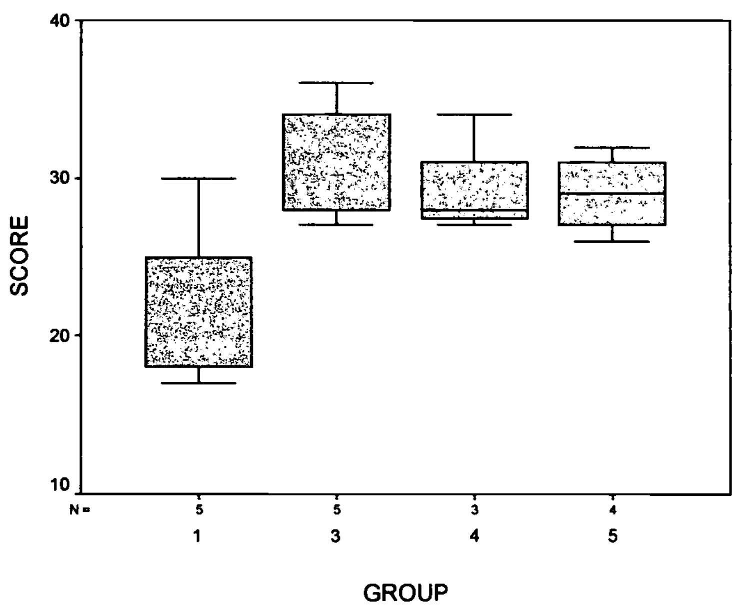
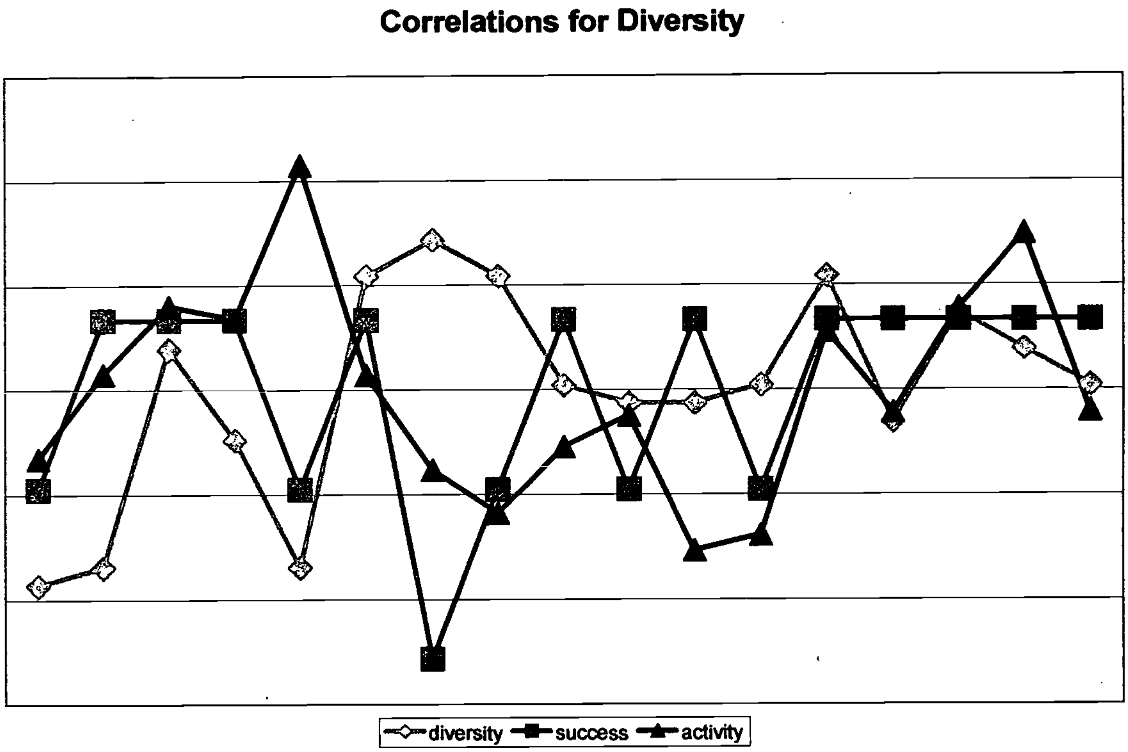


Figure two shows the relationship between individual *diversity* scores, *success* and *activity* as standardized values. There appears to be a relationship between individual feelings about human *diversity* and individual course *success* with some interesting outliers.

Figure 2



This pilot work moves towards determining the relationship between interactivity and conceptions of diversity in computer-mediated learning spaces. Building learning environments designed to foster metacognition and support social relationships online—as well as off in the widening world—seems a supportable vision for the work ahead.

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Overview of the Partnership

Rensselaer Polytechnic Institute is the oldest technological university in America. RPI's award-winning Professional and Distance Education Program has existed since 1987. This distributed educational program, focused on working professionals, has been built on a valued relationships with many leading corporations including GM's MOT program (which includes five sites in Mexico), IBM, Ford, and UTC.

Tec de Monterrey is the leading technological university in Latin America. With more than 90,000 students at 30 campuses, their Virtual University transmits courses and programs throughout Mexico and Latin America using Satellite, Videoconferencing, Internet to over 1,000 sites in Mexico and Latin America. Annually Tec's enrollments are Over 50,000.

General Motors Technical Education Program (TEP) was founded in 1984 as resource for their Engineering division. Currently TEP is part of "General Motors University" a corporate-wide educational service group. Initially its focus was North America, that focus is now global. The TEP Mission is: "*To provide General Motors with a competitive advantage by offering to the technical community education in current and emerging technologies core to our business in partnership with leading universities world-wide.*"

The Rensselaer Plan focuses on global reach or impact—enhancing, extending and strengthening partnership activity with other institutions or agencies. Professional and Distance Education at RPI had successfully worked with General Motors providing educational experiences for working engineers, designers and managers in North America and Mexico. As Tec de Monterrey and Rensselaer share, lcommon values—the possibilities for a developing a GM, TEC, RPI collaborative working alliance seemed evident and exciting.

Our redesign of an existing, successful course in *Organizational Behavior*, holds essential content constant yet clearly focuses on the important dimensions of cross-cultural communication, internationalization and the impact of technology on organizations. To include the perspectives of the three partner groups, we worked to develop an instructional design that would function internationally—across time zones and culture, which would be "comfortable" for our corporate partner.

The course design includes interactive elements, cross-cultural team building exercises and a structure for collaborative group projects. Our hopes are to expand this partnership in a variety of ways: an RPI/TEC joint degree program for Latin America; faculty exchanges; offering or running "parallel" courses; locating funding from US/Mexico government sources to pursue joint research and course development activity. Additionally, we look forward to seeking and forming new partnerships based on this emerging model.

Distance Delivery: Courses, Programs or Both

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Abstract

This paper discusses the methods and strategies in implementing a viable distance-learning program. The main focus will be on the advantages and disadvantages of delivering stand-alone courses versus degree programs, based on the experiences of the Communications, Education, and Training Department at the University of Wisconsin-Stout.

Introduction

There is much potential for growth in distance learning, but the road to success may not be as easy as some proclaim. The Communications, Education, and Training Department has a long history in distance learning, beginning with offering courses for certification in the Wisconsin Technical College System and teacher enhancement. These were originally offered through paper based correspondence and off-campus face-to-face offerings. In 1986, the Department began moving into electronic systems, starting with Computer-Based-Learning and Interactive Video. Since that time, the Department has added teleconferencing, videoconferencing, on-line, and web-based strategies to its delivery methods. The vast majority of the distance courses offered by the Department have to be self-funded. This requires that each course have enough students to pay the instructor, plus any additional overhead. As many have learned, when trying to attract adult learners the market is there, but so is the competition. The competition is not just from other institutions, but the competition created for the need for time for work, family, recreation, and civic responsibility (Peterman, 2000).

Delivery

The Department has used a variety of delivery strategies. A short discussion of each follows.

Self-paced paper based correspondence courses were the Department's first venture into distance learning. They provided flexibility and did not require the learner to have any special technology. They have been phased out and replaced with on-line courses. Surface mail is not used very much anymore. The exceptions are mailing textbooks and other materials that cannot be distributed electronically.

Teaching face-to-face courses on Friday evening and all day Saturday at off-campus sites is a long time mainstay and still used extensively. The advantages are that it still has the personal connection, travel is eliminated for students, and it does not interfere with most learners work schedules. The disadvantages are travel time and expenses for the instructor and it is time and location dependent.

Video tapes are distributed as part of some courses. One particular example is a photography course where a set of tapes was developed to supplement the on-line portion of the course.

Interactive television is used to teach some courses and as a supplement to others. It provides a better level of interaction than on-line, it is easier to demonstrate some items and it can reach multiple sites. It is still time and place dependent and is not the same as being there.

On-line courses offer great flexibility and yet have interactivity. They are time and place independent, although the user needs to have internet access. The technology has some limitations and requires greater bandwidth than many learners have access to.

The future of hybrid systems has great potential. This is the mixing and matching of appropriate technologies. Just as the use of one method of instruction in the classroom is not the most effective, the same is true of the use of one technology.

Offerings

The only stand-alone courses that the Department offers are those that are part of degree sequences or have been requested by someone to meet the needs of a specific audience. Occasionally, the Department may offer a non-credit workshop and attach a credit option to it.

The offering of professional certificates is a step between offering a stand-alone course and a complete degree program. As the department has developed certificate programs, they have been designed to make sure the courses fit within a degree program.

Degrees in Vocational, Technical, and Adult Education B.S, Vocational, Technical, and Adult Education M.S, and Training and Human Resource Development M.S. are offered through off-campus cohort groups using a combination of delivery strategies. A Graphic Communications Management B.S. degree completion program is offered at one technical college site. In addition, the Department offers courses as part of a PhD consortium with Indiana State University.

Strategies

The offering of an individual course or professional certificate is sometimes used in areas where there may not be enough demand to start a cohort group or test the water to see what the demand is. Due to meeting multiple needs, some of the courses in a sequence will have more of a demand than others and these may be offered first. As some courses are used to meet the requirements of more than one degree program, several of these have been converted to an on-line format. The courses typically follow an eight-week format, allowing the courses to be offered Fall, Spring and Summer. Students thus have an opportunity to build some flexibility into their program.

The goal of the Department is to offer programs on campus, as well as offering cohort groups at two other locations with staggered start dates. Students in a specific cohort have preference in enrolling in courses. After those students are enrolled, other students may enroll if there are additional seats.

Conclusions

Based on existing research and the prior experience of the Communications, Education, and Training Department at the University of Wisconsin-Stout, the author concludes that:

- Using a cohort group for delivering a degree program is the most effective way to have successful distance education programs. Delivering individual courses and certificate programs are successful if they can be used in a degree program.
- Although in-depth needs assessments are required in developing new programs, a more informal approach can be taken to convert an existing program to a distance program. It is important to know who else is offering similar programs.
- Forming partnerships with technical colleges, military bases, professional organizations, and businesses has been the most effective marketing tool. These partners need to be involved up-

front because they are the ones who can give the best insight to the viability of a program in a particular geographic area. In addition, direct mail and limited newspaper advertisements are used when starting a new cohort.

- ❖ Since the Department has focused its course delivery within the State of Wisconsin, it has allowed for the use of an array of delivery technology. The use of face-to-face instruction is still prevalent, as all the cohort groups are located within the State. In addition to face-to-face weekend classes, classes are conducted on-line, via teleconferencing, and over interactive TV. The use of hybrid courses has been used over the past few years. All courses taught at a distance have some type of web enhancement and students are encouraged to keep in contact with their professors and classmates, via e-mail, phone, and fax. The course, *Learning Technology*, is now being taught one weekend face-to-face, a four-week session on-line, and wrapping up with an interactive television session. The key is to fit the technology to the learners needs, not the learner to the technology.
- ❖ The Department has moved away from a heavy reliance on adjunct faculty to teach off-campus courses for degree programs. Although adjunct faculty typically have excellent teaching skills and great content expertise, it is important for students to have contact with professors that have knowledge of the programs and working with campus.
- ❖ Support to the students is the key element to success. In addition to relying heavily on the University's continuing education unit, the Department has a person who, as part of their duties, works as a liaison for the students. This person has a master's degree in one of the programs offered at a distance and has taught both on-line and face-to-face courses to off- campus students. This allows the individual to provide support and answer a wider range of questions than provided by many support people.

These conclusions may not be transferable to all situations, as the offerings by The Communications, Education, and Training Department are presently limited to several degree programs that serve specific niches within a restricted geographic area, but the author believes that they will serve as a meaningful foundation as the Department expands into new markets.

"By utilizing the best of both traditional and Internet educational delivery methods, universities can provide an amazingly versatile system stabilized by tradition and anchored by quality" (Bothel, 1999, p.6).

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Biographical Sketch

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Effectively Using Self-Assessments in Online Learning

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Introduction

The use of online learning and computer-based training has been steadily increasing in recent years, and so too, has the quality and level of adult learner satisfaction with these mediums. Using self-assessments in an online learning environment is a strategy that allows learners to test new knowledge, receive meaningful feedback, focus learning, and assist in transferring knowledge for use outside of the online environment. Instructional designers (or designers) and instructors need to be aware that self-assessments are an important tool that can be used to both assess and aid learning.

The Value of Self-Assessments

Assessments, commonly called tests or exams, have been used in traditional classrooms for a variety of reasons. Self-assessments, when designed properly, can be extremely valuable for learners in online learning environments as well.

Online self-assessments can be designed to:

- Measure the degree to which content is meeting learning objectives
- Provide an opportunity for immediate application of content
- Test learners on new knowledge
- Provide meaningful feedback to learners
- Track learner progress
- Focus learning
- Make learning fun, interactive, or flexible
- Assist in limiting or providing access to new information

For all of these reasons, online self-assessments can be part of an effective learning strategy. However, it's important to be aware that the mere mention of the word 'assessment', 'exam', 'test', or even the appearance of an online self-assessment can generate 'learning nightmares' for some because of previous testing experiences. Negative views of tests often stem from test-taking anxiety, fear of how the results will be used, or from unpleasant experiences with poorly designed assessments. On the other hand, some learners may approach an assessment as a challenge, and they may try to 'cheat' their way through the assessment. In other words, get every question correct without ever reading or learning anything. For all of these reasons, it is invaluable to use well-designed self-assessments.

Types of Self-Assessments

There are a variety of effective self-assessments currently being used in online learning environments. Some of those online self-assessments include exercises and activities such as multiple-choice and matching, pre-tests, post-tests, decision makers, and simulations.

Exercises and Activities

Multiple-choice, true and false, fill in the blank, and exercises such as matching, or drag and drop, are all examples of effective online self-assessments. Though simple in design, these assessments are used to test knowledge, add interactivity, and provide immediate feedback to learners.

Pretests and Posttests

These tests are often composed of the exercises and activities listed previously. Pre and post-tests are valuable when used to measure learning gain, focus learning, provide a customized path, or limit and provide access to course materials and resources.

Decision Makers or Decision Trees

Similar to "choose your own adventure" or "if, then" statements, decision makers provide an opportunity to apply concepts or strategies in a situation such as a typical business setting. Decision makers allow learners to evaluate their knowledge of specific content based on how effective their decisions are. For example, if the content is based on teaching mangers to retain valuable employees, a decision maker activity may present an employee retention problem to the learner. The learner then makes a series of decisions attempting to address the employee problem. The subsequent decisions may be different based on the outcomes of the initial decisions the learner makes. By the end of the assessment the learner may have successfully retained the employee, lost the employee, or retained the employee through a less than optimal approach. These types of self-assessments can be extremely effective when meaningful feedback is presented after every decision the learner makes.

Simulations

The goal of an online simulation is to provide a simulated environment that allows learners to make decisions based on situations they would face in real-world environments. The consequences for making a poor choice or wrong decision in a simulation should be the same as in the real world environment. Therefore, if learners can perform well in a simulated environment, then in theory they should be able to perform the same behaviors in a real situation. One common simulation is that of a flight simulator. Learners need to be able to successfully take-off, fly, and land a plane in a simulated environment before attempting to do these same activities in a real airplane. Well-designed simulations can provide safe environments to learn challenging skills, yet it's important to remember that simple multiple-choice questions may in some instances provide similar learning without the time and cost commitment of building a simulation. However, if designed to be re-used, or for a large number of learners, simulations can be worth the cost and effort.

These online self-assessments differ from traditional tests in several ways. Online environments provide the convenience of anytime learning, and designers have the opportunity to provide more customized learning experiences. For example, a pre-test can provide immediate feedback as to where a learner needs to focus, and it can direct a learner to specific content or resources in areas where more knowledge is needed. If a learner already has an acceptable level of mastery with other concepts, there may be no reason for the learner to complete all materials. Online learning environments also allow designers to create materials that are more stimulating and interesting to the individual than less interactive learning environments. A learner working in the manufacturing industry could be provided the option of selecting activities, examples, and assessments that use settings, problems, and scenarios appropriate to manufacturing, as opposed to less relevant scenarios. In addition, online learning environments allow designers to provide tips and hints at times when a learner may be struggling with questions or decisions that deal with a specific content domain. In addition, with a large repository of questions to choose from, designers can test learners at appropriate levels, as opposed to taking a "one-size fits all" self-assessment approach.

Best Practices and Tips for Designing and Implementing Self-Assessments

There are several components to consider when designing and implementing self-assessments. Three of those components are feedback, instructions, and placement.

Feedback

Feedback is one of the most critical parts of a self-assessment because this is often when learning takes place or is confirmed. Learners can complete numerous activities, but it's the feedback that informs learners if they are correct, incorrect, headed in the wrong, or right direction. Feedback can also provide hints and tips, point to resources needed, reinforce the learning of concepts, and provide information on next steps. Before providing feedback, designers should consider when learners will need feedback, how much feedback to provide, and what kind of feedback is needed. For example, consider if all, some, or none of an activity needs to be completed before feedback is given. There can also be different levels of feedback, a feedback strategy often used in simulations. Feedback levels are used when learners attempt part of an activity once and get overall feedback that they are not quite correct and should keep working. As the learner spends more time in a simulation, and perhaps continues to make the same mistakes, feedback would need to get more and more specific until the learner is told clearly what the problem is and how to correct it in order to move on.

In simulations, learners may not need to be told the correct strategy on a first attempt; however, in other activities this may not be the case. In simpler activities such as multiple-choice, learners benefit more from detailed feedback that tells them if they are right or wrong and the rationale behind the answer at every attempt. In this case, feedback should be clear and concise the first time.

In terms of where to place feedback, designers should determine where the learner will struggle or need assistance, where the critical content chunks are, and then provide feedback in those places.

In terms of when to give feedback, consider if feedback should immediately follow an assessment or be provided throughout an assessment. Nothing is more frustrating than completing a long activity only to find out at the end everything was done incorrectly. However, some assessments may be short enough to have all feedback come at the end. In these instances, designers can create meaningful feedback statements without fear of giving away answers to other questions.

Appropriate use of color can be a successful strategy in providing feedback. Learners can associate certain colors with specific assessment outcomes. For example, many students associate the color red with "stop" or "incorrect" and associate the color green with "go" or "correct." Designers may choose toprovide feedback in colored text in order to visually convey correct and incorrect feedback along with detailed text. It is important to note that some learners may have difficulty seeing colored text, are colorblind, or may find the color red offensive because it sends a strong message the learner is wrong.

Feedback may also contain graphics to signify correct and incorrect answers. For example, in a simulation that deals with increasing revenue, there may be a constant chart displaying dollars. When the learner makes correct decisions, the dollars increase on the chart, when the learner makes poor decisions, the dollars decrease. Unfortunately, it can be difficult to find symbols or graphics that represent one thing to all learners. For example, checkmarks can be interpreted as incorrect, or mean that something has been completed. It is important to set learner expectations at the beginning of assessments when using symbols or graphics as feedback. Learners usually appreciate graphics because they are more likely to remember the lesson learned.

Instructions

Another important part of online self-assessments is the instructions. Instructions must be clear and concise because there is no instructor present to provide clarification of directions or ask to clarify any content. Well-written instructions will address both how to use the self-assessment as well as what content is contained within the assessment. Instructions should set the learner's expectations for what will take place during the assessment, approximately how long the assessment will take, and explain how and when the learner will receive feedback. Instructions should be easily accessible at all times during the assessment in case the learner needs to refer to them.

Placement

When implementing online self-assessments, they should be placed to test knowledge domains at the appropriate time in the learning process. If designers place a self-assessment within the content prematurely, this can result in a poor assessment and can be de-motivating to learners. A risk for online learning is that learners who aren't motivated will rarely complete an online course. When a learner is well prepared for a self-assessment, the experience may be fun and motivating.

Additional Tips

Remember to design for learners who are trying to "cheat" their way through an assessment. In true and false assessments, these learners think "true" is most likely the correct choice, for multiple-choice assessments the answer choice "C" is the most common correct response, or the longest answer choice is often correct. Be sure to test and re-test assessments on many different types of learners in order to make it difficult to "guess" correct answers.

In multiple-choice use consistent patterns such as four answer choices for every question. Make sure all answer choices are approximately the same length, and that all answers deal with the same content, and test learning objectives. Never offer learners seven different answer choices for one question because they will get frustrated.

Don't try to make assessments too fun or cute. Adult learners are motivated for different reasons than children. If assessments are well designed and the content is applicable, learners will enjoy the learning experience and have fun because of their own motivation.

Don't try to "trap" learners. All answer choices should seem like valid responses to the leaner, and never test on small details.

Conclusion

If designed correctly, on-line self-assessments can provide many benefits to learners, and can be valuable tools for designers who want assurance that learners are achieving learning objectives. However, if designed or implemented incorrectly, online self-assessments can be extremely frustrating for learners, and serve no use for designers. Learners have strong opinions about what makes a quality online self-assessment, that's why it's critical to continue testing self-assessments and incorporating learner feedback.

Biographical Sketches

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Keys to Success in Project Managing E-Course Development

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On-Time and Within Budget: The Project Manager's Credo

Project management involves the application of tools and techniques designed to meet a set of objectives within a stated time-frame using a given number of resources and dollars. Course developers who have been in the business of managing the delivery of instructor-lead training for years now are redirecting those skills and principles to the realm of e-learning. This article introduces some additional points for consideration—some drawn from lessons learned in IT project management and some drawn from the latest developments in the area of learning objects.

Learning From Failure

In his book *Virtual Learning*, Roger Schank says that "Real thinking never starts until the learner fails." A review of some of the major reasons for e-learning project failure may help identify some lessons for the course developer about to launch a new e-learning project. *Project Managing E-Learning* cites 18 reasons why e-learning projects fail. The most common reasons centered around 4 major areas:

1. Failure maintain customers and project sponsor commitment and involvement
2. Failure to plan for modularity and reusability in e-learning courses.
3. Failure to adequately manage project scope, risks, and evolving requirements throughout the e-learning project.
4. Failure to perform meaningful reviews to ensure an environment of continuous process improvement.

Bullet-proofing an e-learning course development project requires the developer to put best practices in place to avoid these pitfalls. Below are some of the ways of ensuring e-learning project success.

Keys to E-Learning Project Success

E-Learning project success comes from a wide variety of factors, requiring a heady mix of creativity, management prowess, and the application of tools and techniques drawn from best practices in the areas of course development, project management, and information technology. These practices can help the e-learning course developer sidestep the 4 failure scenarios described above.

1. **Keep e-learning customers involved from project launch through final review.** Far too often customer involvement begins to wane shortly after the initial project launch. Successful projects need customers intensely interested throughout the entire project. Some of the techniques used to maintain customer involvement include:

    ❖ Help them create a vision of the completed e-learning course during the project launch. Even going so far as to have them mock up a "box" for the course, complete with logo, name and primary selling points on the front of the box and a list of key features and objectives on the back will go far to create a sense of ownership and excitement about the project.

- ❖ Produce the e-learning course in a series of time-boxed delivery cycles using live or virtual focus groups that include the customer and major stakeholders. Use real e-learning product—not throwaway prototypes.

- ❖ Have at least one member of the customer area included in the ongoing development of the course—either as an official member of the project team or as an ex officio member. Set up a virtual project office for collaborative work on the course, review and collection of course assets, and storing documentation about the project. Whenever possible, have this customer demonstrate the evolving course product at the focus group sessions.

- ❖ Include the customer in project Post-Mortems and interim project reviews and provide ongoing feedback. Summarize Post-Mortems from previous projects at project launches to raise awareness of best practices and alert current project participants to potential risks based on past unexpected events.

2. **Begin thinking in terms of learning objects, templates, and reusability early in the e-learning initiative.** Learning assets are too valuable not to organize and utilize to their fullest potential. Managing these assets effectively is the secret of successful e-learning course delivery. Here are some recommended practices to build reusability and adaptability into the e-learning course development process.

   - ❖ Plan for the future by staying current on e-learning standards. Every piece of learning content should be organized and categorized for ease of reuse and retrieval. Learn about e-learning metadata and how it can help make reuse and sharing of content simpler.

   - ❖ Define a set of templates to be used for most e-learning course pages. Having a relatively small number of these not only simplifies and expedites course delivery but gives e-learning content a consistent look and feel. Eventually, it will become relatively simple to estimate the effort required to deliver a course based on your experience with your repertory of templates.

   - ❖ Categorize various learning objects and templates by degree of interactivity and complexity to make projected estimating more accurate. Each type of asset carries a cost of time and effort to develop. Static text-only pages take little time but may be ineffective as teaching tools. Highly interactive pages with audio and video components often provide powerful learning experiences but can take days or weeks of development time and carry exorbitant production costs. Since most courses involve a broad mix of interactivity, having templates and cost estimates established in advance can help the course developer come up with better project estimates—estimates that can be fine-tuned with ongoing experience in subsequent e-learning projects. (The presentation illustrates various levels of interactivity by demonstrating segments of e-learning courses, ranging from a rather static "page-turner" to an excerpt from a highly sophisticated simulation.)

   - ❖ Explore the potential of using databases to generate course pages. Organizing content as described above can ultimately allow for creation of course pages "on the fly," based on learner preferences or interaction. It can also allow the same course content to be delivered with custom "branding" for e-learning customer site.

3. **Manage scope, risks, and changing requirements using clear-cut statements of work, role definitions, and adaptive iterative e-learning product delivery processes.** The first two items may seem almost too obvious, but short-changing either can lead to e-learning project disaster. Using an iterative product delivery process serves to keep the customer involved as well as provide tangible proof of progress toward completing a successful e-learning product.

- ❖ Create detailed statements of work, defined in terms of templates, learning assets. Map each item to learner objectives and determine appropriate tradeoffs to balance overall course effectiveness to development costs. The customer can assist in this selection process and make decisions based on learning needs and budgetary constraints. At this stage, educate the customer in concept of tradeoffs as the project progresses and changing requirements are identified.

- ❖ Use simple tools such as context diagrams (Figure 1) to define roles and responsibilities during the life of the e-learning course development project.

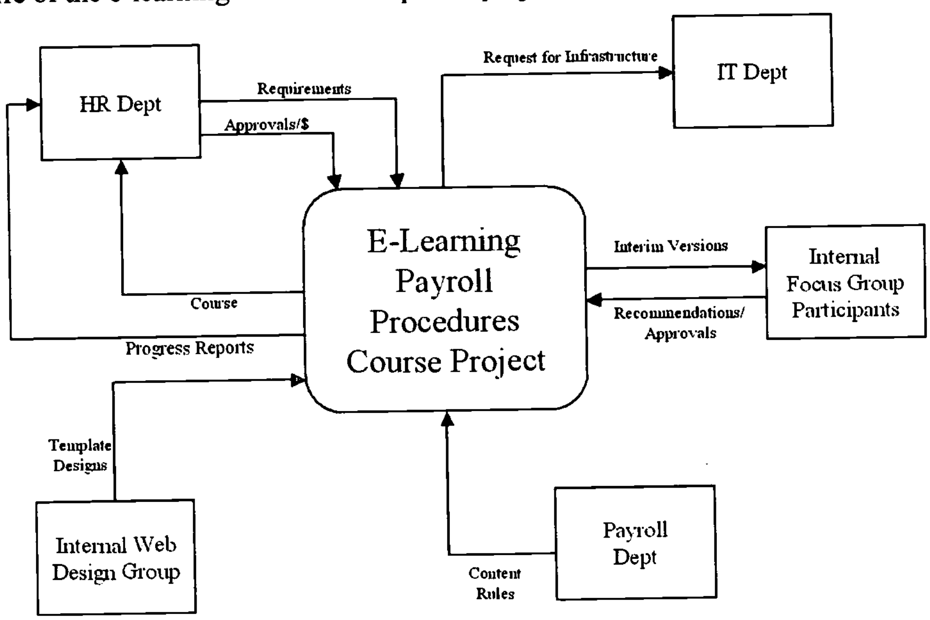

Figure 1 – Sample Context Diagram

- ❖ Use a priority matrix (Figure 2) to show the relative priority of time, cost, and scope/quality.

Target	**1**	**2**	**3**	**Measurement**
Time				
Cost				
Quality/Scope				

Figure 2 – Priority Matrix

- ❖ Perform risk assessments for every project; quantify them based on likelihood, severity of impact, and degree of control; and take appropriate action to avoid or handle the most threatening. Keep these "top 10 risks" visible to all project stakeholders by reporting them in regular weekly progress reports.

- In today's world, changing requirements are often not only inevitable but desirable. The key is to minimize their impact through an iterative delivery process. Break every project into 3 cycles, with each cycle culminating in the delivery of working e-learning course product. Customers working in this environment soon learn about the trade-offs required to deliver the course on time and on budget while at the same time delivering the best possible e-learning product.

4. **Make the project review process an integral part of every e-learning effort.** The key to continuous process improvement is continuous process evaluation. The lessons learned from an e-learning project should inform the next project to reinforce successful practices, to prevent the repetition of inefficient or erroneous ones, and to anticipate risks based on problems encountered in previous projects. Some simple but effective techniques include:

   - Schedule formal post project review sessions at the end of every e-learning project. Survey team members and stakeholders in advance to prepare preliminary findings, but plan to use these surveys as springboards for discussion at the review session. Capture and summarize the results of these sessions and make them part of your virtual project office.

   - Build a risk database to draw upon for future projects. Similarly, build a database of best practices. (A wise e-learning project manager might even view these pieces of data as learning assets for ongoing e-learning and knowledge management activities!)

Build a Pattern of Success

The four areas outlined here can help ensure e-learning success. Sharing of best practices is the obvious first step to a successful ongoing e-learning initiative. Customer involvement, capitalizing on the potential of learning objects, sound project management control coupled with adaptive iterative processes, and a commitment to continuous process improvement will provide a solid basis for current and future e-learning projects.

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Shackelford, B. (2002). *Project managing e-learning.* Alexandria, VA. ASTD.

Biographical Sketches

Jon Aleckson established Madison Productions, Inc. in 1978 for motion picture and video projects, and eventually integrated new media production services for interactive CBT and Web-based e-learning projects. His passion for interactive learning led to the creation of Web Courseworks in 2000. This division of Madison Productions uses database driven authoring to deliver large-scale e-learning deployments and is committed to continuous process improvement through innovative project-management techniques to ensure on-time and on-budget course delivery. Clients include Credit Union National Association, Culinary Institute of America, ABS Global, Ecolab, University of Wisconsin Systems, and the Academy of Financial Services Studies.

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Writing for the Web Using "Just-in-Time" and Performance Support Strategies

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Introduction

One question that all designers of Web-based instruction ask themselves is, "Do our online materials meet our learners' needs?" Answering this question requires careful consideration of three factors: (1) who the learners are; (2) what their needs might be; and (3) how to design online instructional materials to best meet these needs. At the UW-Madison Writing Center, our primary mission is to provide academic support for undergraduates who need assistance with writing tasks assigned by their instructors. A major component of this academic support is our Online Writing Center, which consists of hundreds of Web pages offering writing advice available whenever students need it. Although the Online Writing Center has been in existence for several years and has been quite popular, to better serve the needs of our learners we were motivated to reevaluate and improve its design. In this paper, we will present and advocate an approach to designing task- and learner-centered Web-based instruction that employs principles of structured writing to meet the demands of "just-in-time" instruction and performance support. We have recently applied this approach in redesigning the Online Writing Center's Web site (http://www.wisc.edu/writing), from which we will show examples that will demonstrate their improved pedagogical effectiveness. The concepts and methods involved in our redesign are straightforward yet powerful, and will help all designers of Web-based instruction better meet their learners' needs.

The Importance of Identifying Learners and Their Tasks in Web-Based Instruction

In any pedagogical situation, properly identifying the target audience can help educators tailor their instruction to best convey material to a particular demographic group, and especially so on the Web. In our case, the UW-Madison Online Writing Center Web site aims to provide a wealth of writing instruction available whenever learners need it; our audience primarily consists of undergraduates responding to writing tasks or assignments in their courses, much as in the brick-and-mortar Writing Center on campus. Yet in reevaluating our Web-based instructional materials, we felt that they were not adequately designed to meet the needs of our target audience.

Web usability studies can provide educators with valuable insights for improving the design of their instructional Web sites. The more we understand how users interact with information on the Web, the better we become at designing effective content for online learning. On the whole, usability studies reveal one main user tendency particularly relevant for the design of online instructional materials: people tend to use the Web in a "purposeful" way that is task-driven and focused on getting answers to specific questions, or on obtaining information needed to perform specific tasks and accomplish specific goals. For example, users visit our Online Writing Center Web site *not* because they want to learn everything there is to know about citing sources using the American Psychological Association documentation system; they come there at 3:00 a.m. the morning before their paper is due, wanting to know how to create an entry in a reference list for a particular kind of source—nothing more, nothing less. Whether it be obtaining information for writing an academic paper, gathering data to make a financial decision, researching restaurants or movies for evening entertainment, or researching laptop computers for purchase, the impetus for going to specific Web sites is largely task-driven. Given the reasons why people actually use the Web, the most effective Web sites are those that enable users to get the information they need quickly and easily.

Meeting Users' Needs with the Just-in-Time / Performance Support Paradigm

Knowing how users interact with Web-based information can help educators design and write Web content better suited to how students use the Web medium. If we look outside academia to corporate education and training, one trend is a shift away from content-driven instruction toward task-driven "just-in-time" instruction and electronic performance support. Capitalizing on the fact that people are highly motivated to acquire new knowledge or skills at they time they need them, a just-in-time instructional strategy provides instruction *just before* the learner needs to apply new knowledge or skills. In contrast, traditional content-driven instruction tends to use a "just-in-case" strategy, often providing abundant and extraneous content not immediately relevant to the task at hand. The concept of performance support goes hand-in-hand with such a just-in-time strategy: a performance support application can replace live coaches and is extremely task-centered, providing users with *just enough* guidance they need to perform a task at the very time they need it. Unlike in traditional instruction, where the learner gains knowledge decontextualized from the actual "doing" of the task for which such training was intended, in a performance support environment the learner acquires necessary knowledge while performing the task. A well-designed performance support application strives to make the structure of a task explicit such that even novices will be able to perform it. Because of people's task-driven approach to using the Web, a just-in-time instructional delivery approach using performance support principles—providing *just enough* information *just before* users need to apply it—would be well-suited to a Web environment.

One way we have redesigned the Online Writing Center's Web site to accommodate a more task-driven, performance support format is to rewrite our navigational menus to cater more directly to our learners' tasks. Our online "Writer's Handbook" consists of Web pages containing a great deal of information about writing, yet we felt that this information was not as accessible as it could be. Currently, our Writer's Handbook pages are structured around the content they convey, much as an instructor might present a linear series of lessons. However, we felt that to best serve the needs of our target audience, our pages should above all respond to the writing tasks that they are asked to perform in their coursework. In other words, our pages currently address the "What" of writing, while the needs of our users center more around the "How" of writing. For example, note the changes we have made in our APA Parenthetical Citations menu (Table 1):

• Placement	• Where to place parenthetical citations
• Two or more authors	• Cite source with one or two authors
• No author	• Cite source with three or more authors
• Multiple references	• Cite source with no author
• Punctuation	• Cite multiple sources in one reference
• Electronic sources	• Cite an electronic source

Table 1: Content-driven menu (left) vs. Task-driven menu (right)

The content of the menu links is still self-evident, but now students can better match their tasks with the tasks presented in the menus.

In educational contexts dealing with relatively stable subject matter, Web designers may be asked to create online learning materials that provide just-in-time instruction with just enough information to help learners accomplish their necessary tasks. To meet these needs, we feel that Web designers should employ design strategies that incorporate elements of just-in-time instruction and performance support. These concepts' emphasis on users' tasks underlies a more general shift from content-centered to user-centered instruction. Instead of focusing on what they know themselves, Web designers could first focus on FAQs (what their users *need* and *want* to know) and use them as the basis for their content outlines. A user-centered designer ideally would discuss a prototype content outline for a Web site with several potential users, listen closely to their questions and suggestions, and then incorporate user feedback directly into their site design. In this manner, Web designers would be starting from a rigorous user-centered perspective—perhaps the first and most fundamental change Web designers can make to improve their Web writing.

Using Structured Writing to Design User-Centered, Just-in-Time Performance Support

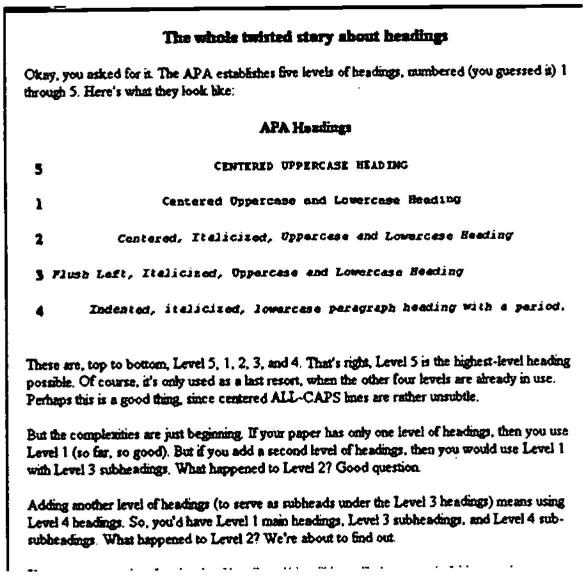
Shifting toward a user-centered perspective allows Web designers better to understand *why* learners use the Web, but one also needs understand *how* users actually read online material, and to design it accordingly. Through numerous usability studies, Jakob Nielsen and others have shown that users tend to read Web pages differently than they would a printed text. They consistently:

1. **Scan page(s):** Users look quickly at main titles, headings, menu labels, and headlines to determine whether to spend more time there.
2. **Skim content:** Users selectively search for information they want and ignore the rest.
3. **Read and retrieve:** Users start to read only after locating the information they want. If documents are more than a few pages in length, most users will print them out.
4. **Leave:** Users move on quickly after locating the information they want. If the site contains interesting information, they may bookmark it for future use.

We need not look further than our own online behaviors to confirm the above. As the Web is largely used for purposeful, task-driven problem-solving and information retrieval, naturally users would read online text much differently than they would printed documents. For maximum pedagogical effectiveness, designers of online instruction should be aware of Web reading practices when writing for the Web.

Much as the just-in-time / performance support paradigm has helped us address learners' task-driven needs, Robert Horn's principles of **structured writing** has helped us learn to write for the Web in accordance with how learners actually read online. Structured writing is a user-centered design model that best allows us to meet the task-driven requirements of just-in-time instruction and performance support, and in turn best meet the instructional needs of our learners. As Horn insists, structured writing is *not* simply a way of formatting text; it is a way of analyzing a communication and teaching situation. Two major components of structured writing involve the concept of "information blocks" and the "systematic integration of graphics" into documents. In structured writing, information blocks replace paragraphs in terms of content organization and presentation, and consist only of essential, factual information readers need to know to perform a certain task; clearly-labeled graphics, such as tables, aid information blocks in presenting material quickly and efficiently.

Below are two examples of how we redesigned existing material using these structured writing principles. In the first example (Figure 1), the old page for "APA Headings" consisted primarily of text in a narrative format with extraneous information, while the new page employs information blocks and graphics to explain efficiently and visually the complex heading structure the APA system requires.



The whole twisted story about headings

Okay, you asked for it. The APA establishes five levels of headings, numbered (you guessed it) 1 through 5. Here's what they look like:

APA Headings

5 CENTERED UPPERCASE HEADING

1 Centered Uppercase and Lowercase Heading

2 *Centered, Italicized, Uppercase and Lowercase Heading*

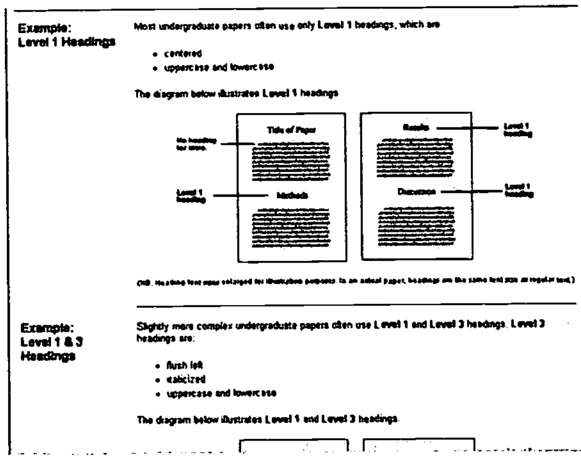
3 *Flush Left, Italicized, Uppercase and Lowercase Heading*

4 *Indented, italicized, lowercase paragraph heading with a period.*

These are, top to bottom, Level 5, 1, 2, 3, and 4. That's right, Level 5 is the highest-level heading possible. Of course, it's only used as a last resort, when the other four levels are already in use. Perhaps this is a good thing, since centered ALL-CAPS lines are rather unsubtle.

But the complexities are just beginning. If your paper has only one level of headings, then you use Level 1 (so far, so good). But if you add a second level of headings, then you would use Level 1 with Level 3 subheadings. What happened to Level 2? Good question.

Adding another level of headings (to serve as subheads under the Level 3 headings) means using Level 4 headings. So, you'd have Level 1 main headings, Level 3 subheadings, and Level 4 subheadings. What happened to Level 2? We're about to find out.



Example: Level 1 Headings

Most undergraduate papers often use only Level 1 headings, which are

- centered
- uppercase and lowercase

The diagram below illustrates Level 1 headings

Example: Level 1 & 3 Headings

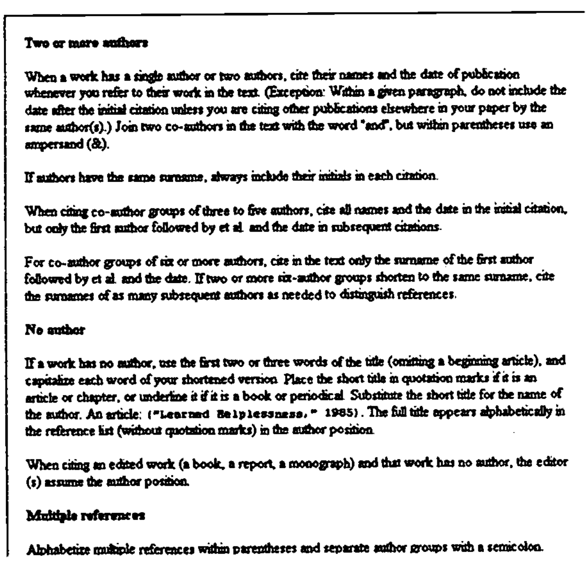
Slightly more complex undergraduate papers often use Level 1 and Level 3 headings. Level 3 headings are:

- flush left
- italicized
- uppercase and lowercase

The diagram below illustrates Level 1 and Level 3 headings.

Figure 1: Old APA Headings Page vs. APA Headings Page with Structured Writing

In the second example (Figure 2), tables with column and row headings immediately indicate the type of content presented, while the visual format allows the user to quickly scan to find the necessary information. In their existing format, our examples of how to create parenthetical citations using the APA system are displayed on a single, long scrolling page, which makes locating a needed example more complicated than necessary.



Two or more authors

When a work has a single author or two authors, cite their names and the date of publication whenever you refer to their work in the text. (Exception: Within a given paragraph, do not include the date after the initial citation unless you are citing other publications elsewhere in your paper by the same author(s).) Join two co-authors in the text with the word "and", but within parentheses use an ampersand (&).

If authors have the same surname, always include their initials in each citation.

When citing co-author groups of three to five authors, cite all names and the date in the initial citation, but only the first author followed by et al. and the date in subsequent citations.

For co-author groups of six or more authors, cite in the text only the surname of the first author followed by et al. and the date. If two or more six-author groups shorten to the same surname, cite the surnames of as many subsequent authors as needed to distinguish references.

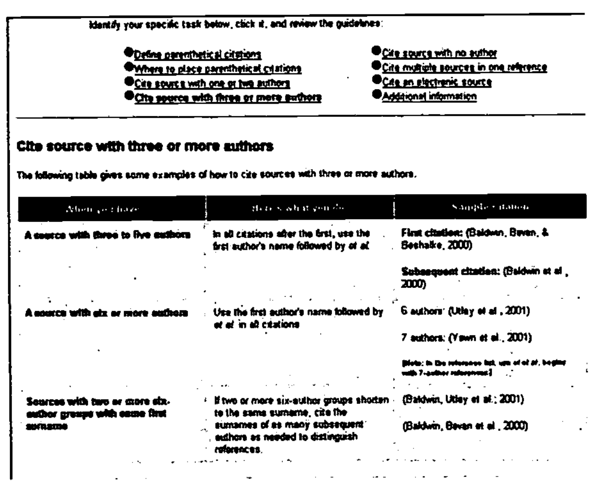
No author

If a work has no author, use the first two or three words of the title (omitting a beginning article), and capitalize each word of your shortened version. Place the short title in quotation marks if it is an article or chapter, or underline it if it is a book or periodical. Substitute the short title for the name of the author. An article: ("Learned Helplessness," 1985). The full title appears alphabetically in the reference list (without quotation marks) in the author position.

When citing an edited work (a book, a report, a monograph) and that work has no author, the editor (s) assume the author position.

Multiple references

Alphabetize multiple references within parentheses and separate author groups with a semicolon.



Identify your specific task below, click it, and review the guidelines:

- Define parenthetical citations
- Where to place parenthetical citations
- Cite source with one or two authors
- Cite source with three or more authors
- Cite source with no author
- Cite multiple sources in one reference
- Cite an electronic source
- Additional information

Cite source with three or more authors

The following table gives some examples of how to cite sources with three or more authors.

[illegible]	[illegible]	Sample citation
A source with three to five authors	In all citations after the first, use the first author's name followed by *et al.*	**First citation:** (Baldwin, Beven, & Beshalke, 2000)
		Subsequent citation: (Baldwin et al., 2000)
A source with six or more authors	Use the first author's name followed by *et al.* in all citations	6 authors: (Utley et al., 2001)
		7 authors: (Yawn et al., 2001)
		[illegible]
Sources with two or more six-author groups with same first surname	If two or more six-author groups shorten to the same surname, cite the surnames of as many subsequent authors as needed to distinguish references.	(Baldwin, Utley et al., 2001)
		(Baldwin, Beven et al., 2000)

Figure 2: Old APA Parenthetical Citations Page vs. APA Parenthetical Citations Page with Tables

Conclusion

We recognize that performance support and structured writing are *not* suitable for all written teaching and training materials. For example, if we were trying to persuade users or students of a particular argument or point of view, the conventions of standard prose may be much better suited. The same may be true when we are introducing a complex new topic, or when simple, discrete instructions are too reductive for a given task.

Yet when there are learning activities in an online environment that involve mastering a process, and when the context is just-in-time, where users arrive at a Web site needing to learn how to do something right away, these methods of designing instructional material seem ideal—and our extensive user testing confirms that. We would urge everyone developing online learning materials to reexamine their online content for parts that match the just-in-time learning situation, and to follow these principles to better serve their learners' actual, task-driven needs.

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Increasing the Quality and Efficiency of Web-Based Course Production

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Introduction

In February of 2002 Utah Valley State College's (UVSC) Distance Education development team began to formulate solutions to certain problems that had amassed since the department had taken on the responsibility of directing and producing web-based distance education courses: high demand with an emphasis on timeliness from academic departments and college administration, and our slow, inconsistent, and often sub-par production.

The aim of this paper is to summarize the development of the template-based web production procedure currently used by UVSC's department of Distance Education in an effort to streamline production, establish consistency, and improve quality. Besides relating the problems and ideas that sparked the development process, I will present an overview of the current process in which our student programmers bring a web-based course from edited content to final review, which is now being used in the production of more than 150 distance education courses.

The Problems

Distance Education at UVSC has experienced a tremendous growth over the past two years. Aside from producing new television broadcast courses each year and broadcasting numerous live interactive courses each semester over fiber optic lines throughout the state of Utah, Distance Education has begun to produce completely and partially online synchronous and asynchronous web-based courses. In 2001 our department's small staff projected we could produce four new web-based courses per semester; we were in fact called on to produce an average of 20 new web-based courses each semester with no significant increase in staff.

Because the demand for courses per semester exceeded department expectations and because no standards, specifications, guidelines, or rigid procedures existed for web-based course production at UVSC, the quality of the courses produced and the efficiency of production was not at the level we had hoped for. From the beginning we worked with a small team of student programmers under the direction of a full-time developer and designer. These often inexperienced programmers were entrusted with course content, the responsibility to turn electronic or hard copy text into web pages, and to provide individualized interactive or multimedia components.

The original "process" consisted of importing a course's textual content into Macromedia Dreamweaver to be coded. In the early stages the programming team found themselves so pressed for time that they would encourage professors to save their content in Word or WordPerfect as HTML documents, eliminating a step in the process. Even the programmers themselves got into the practice of simply saving original word processor documents as HTML. This solved some of the time problems but increased the variability of course appearance, structural design, and coding. These annoyances could be overcome with strict procedure and guidelines, but the other major problem with creating web pages through a word processor is the resulting bloated, inconsistent, unstable, and virtually unnavigable code. Web pages that are manually coded, or that use advanced web design software (we use Macromedia Dreamweaver or HomeSite) are much cleaner and use HTML more efficiently. This makes revising, editing, and extracting simpler, and gives the HTML designer more control.

It would be unrealistic to expect our student programmers to plan out and hand code all the web pages that need to be prepared in a single semester and have them done on time. Creating web pages in Word was fast enough to let us produce 20+ courses a semester, which helped us overlook Word's other shortcomings for the time being. But these bothersome aspects of Word-produced HTML documents reappeared as we found ourselves trying to revise and edit courses from previous semesters. Additionally, because no standards of file naming or folder structure were in place at the time of production, courses were often disorganized and counterintuitive. This made finding and identifying files unnecessarily time consuming. We quickly decided that a set of file naming conventions and folder structure standards were needed so that any programmer in our department could work on one course as easily as another without consulting the original programmer.

Another problem that we confronted was the inconsistency of course appearances. Since most of the documents came straight from the faculty to our staff of technical editors to the programmers there was little in the way of aesthetic or instructional design. Any design that was in practice came usually as an afterthought, or as an independent urge from a faculty or department member. We decided that, in order to better represent Distance Education and UVSC through our web-based courses, certain standards of appearance must be implemented across all web sites. A consistent design would connect course pages to all other pages within a course, would connect courses to all other courses within a department, and would connect departments to all other departments offering web-based courses through Distance Education.

To solve these problems we focused on the following questions: 1) How can we move away from using automatic web page conversion tools (e.g., Word) and yet meet our quotas and deadlines? 2) How can we maintain a standard of design and a consistency of appearance across courses without impeding production? 3) How can we facilitate future revising and editing of web-based course content? We answered these questions with a combination of a stable HTML template, a simple, flexible CSS, and set of guidelines and procedures for graphic design, file and folder structure creation, and overall course production.

Developing a Template, Creating a Process

It became immediately apparent that to streamline our production of web-based courses we needed a fairly rigid procedure supplemented by guidelines for our student programmers to follow. The procedure followed from our experience with programming courses, attending to the need for more precise directions and structural specifications. The guidelines and visual specifications began with meetings between the departments instructional designers, who initiated a list of formatting and design components that should be consistent across courses. Knowing that much of a web site's appearance could be controlled by cascading style sheets, we separated our specifications into elements that could be maintained and controlled in the CSS and those that had to be attended to by the student programmer. As we experimented with a master style sheet for our burgeoning prototype template, the list of elements that would have been controlled by the students grew shorter, eliminating consumptive editing and design steps in the programming process while producing the same visual effect across courses. We also listed items in the style sheet (and in what would be the template) that would need to be changed from course to course or from department to department.

Once we had determined what our formatting and design standards for the course were, I sat down with the senior developer to establish file and folder structures and naming conventions that would be generally consistent. We determined which pages and files were required in all courses and which pages and files were optional or variable. With this master list I produced the first version of our HTML template, a simple framework designed in accordance to our instructional design standards and following our file and folder naming conventions and structures.

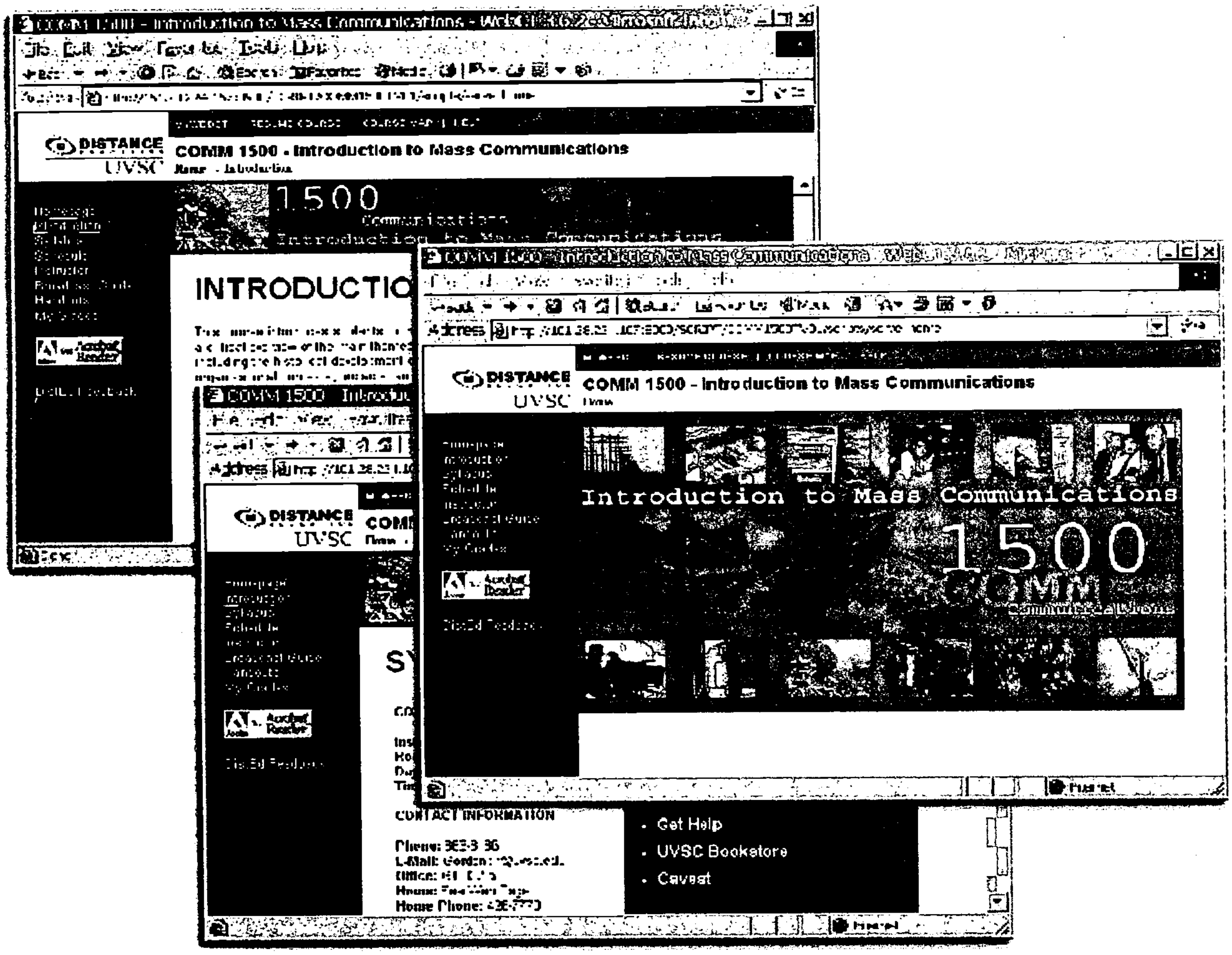
The idea behind the template was that a few basic pages could be copied, renamed, and then modified to preserve design and common elements. Our prototype template, based on this idea, was designed so that common elements that would appear on every page throughout a course could be changed in one step using Dreamweaver's or HomeSite's extended find and replace commands. The body of the web page was designed to hold content without a lot of code to allow our student programmers to copy and paste text content from a word processor, add a few formatting tags (e.g., adding paragraph tags or line breaks, bolding or italicizing text), and save the new page. All other major formatting and design would be contained above or below the content, inherent in the template or style sheet.

With a file and folder structure reference sheet and a HTML specifications and standards reference sheet we brought the prototype template to our programmers and incorporated the web production procedure into our overall course production process.

Results of Our Move to Template-Based Production

Currently we are tracking student programmer production of web-based courses using our new template, style sheet, and procedure guidelines. Most obvious is the overall improvement of web-based course layout and design quality, though the most significant element may be the underlying consistency and stability of the template-based HTML and CSS that runs through all of our courses. Efficiency too has been increased, as new course production programming time fell from an average of 30 hours per course in Summer 2001 to a preliminary projected average of 20 hours per course in Summer 2002. We will continue monitoring and tracking programming times for content portions of our web-based courses throughout the Summer and Fall of 2002.

Additionally, we will attend to the possibilities of further automatizing and streamlining the process to bring greater production efficiency and design quality. One unforseen positive of our template process and the establishment of a stable production procedure is the increase in portability of our web content. No longer is our content stuck within WebCT; since our textual content pages are produced completely outside of the WebCT we are able to preserve our content in a form that is easily adaptable to other web course platforms. The future of our Internet course development will likely include the use of XML and XSL templates for complete portability across web course development platforms, SCORM compliance, and greater integration with college network databases.



An example of a finished template-based course, COMM 1500, as it appears within WebCT.

Biographical Sketch

Jared Stein's background is in commercial and educational web development with 5+ years of experience in the design and delivery of distance education over the Internet. His work for the departments of Distance Education at both Utah Valley State College and Utah State University has taught him to conquer problems and tame unruly hardware, software, and design elements for more effective distance learning. Mr. Stein is also an educator who recently returned from the People's Republic of China where he utilized his MSLT teaching students and lecturing faculty at Jingdezhen Ceramic Institute.

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Creating Course Evaluations for E-Learning

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Introduction

E-Learning, Online Learning, Distance Education, Web-based Training, Computer-based Training, the list goes on and on. Companies today are taking a hard look at alternative methods of delivering training to their employees. TDS TELECOM is no exception. With an employee base of close to 3500 spread across 29 states throughout the US, the TDS TELECOM Training Team is continually challenged to provide quality training, just in time, in the right amount, targeted to the audience -- all without breaking the bank.

TDS TELECOM has embraced this challenge enthusiastically by exploring many alternative delivery methods including:

- Audio teleconference
- Web conferencing
- Video conferencing
- Computer-based training (CBT)
- Web-based training (WBT)

The current focus is on developing WBT in-house, which is the focus of this paper. From anecdotal comments, initial participant reaction to the WBT programs was favorable, however, the Training Team wanted to better quantify the effectiveness of their e-learning. The drivers behind this desire to evaluate their e-learning are listed below.

Driver: Improve Instructional Design

The Instructional Design team consists of experienced classroom trainers and designers and multimedia designers. Even so, web-based training is still too new to have tried and true methods of instructional design. Over the past 3 years, the team had made significant improvement in the design of their WBT programs. Evaluation data would help this team understand, from the participants' point of view, what was helpful, what was annoying and what was unnecessary.

Driver: Justify Development Costs

TDS TELECOM made the decision to develop the skills and knowledge to develop WBT in-house. Costs associated with this decision included instructional developers time, software development tools, outside consultant fees and IT resources. In order to continue down this path, the Training Team needed to assure themselves and upper management that e-learning was delivering effective training.

Driver: Gain Support for Continued Exploration

In addition to justifying the costs to date, the Training Team wanted the support to continue to look for creative solutions and build their skills. They knew that in order to gain that future support, they needed evaluation data to back up their investments.

Driver: Ensure Training Effectiveness

The most important driver of this project was the on-going need to ensure training effectiveness. The Training Team prides itself on focusing on improved performance and needed the proof that their efforts were making an impact.

Evaluation Research

Once deciding to invest the time and effort into evaluating their programs, the Training Team had to come to consensus on an evaluation methodology. Numerous members of the team had past experience with Kirkpatrick's Four Levels of Evaluation and after comparing this model with the team evaluation objectives, they decided to use this as the base of their process. A brief overview of the Four Levels of Evaluation as developed by Kirkpatrick follows.

Level One: Evaluating Reaction

Reaction is measured immediately after the completion of the training session and is designed to measure how the participants felt about the program. This data can communicate how well the audience liked the training, the instructor, the delivery methods or other factors. It is designed to provide the trainer and instructional developer with feedback on the course itself, which can then be used to improve the program.

Level Two: Evaluating Learning

Learning is measured immediately before and immediately after (or during) the training session. The pre-assessment is designed to capture what the participants know going into the program. The post-assessment can then show what they've learned as a result of the training. It is designed to provide the trainer and instructional developer with data regarding the effectiveness of the instructional method and activities.

Level Three: Evaluating Behavior

Behavior is measured after a determined amount of time after the session. The purpose of this evaluation is to measure whether the behavior has changed back on the job. This could include a pre and post assessment, use a control group, or relay on operational measures to make the comparison. Analyzing this data requires looking at Level Two results and the work environment.

Level Four: Evaluating Results

Results refer to the impact the training has had on the organization as a whole. Did Sales increase? Customer Service ratings? Efficiencies? This is the most challenging level to evaluate because increased results are typically not solely the result of effective training. Most often, a number of organizational factors contribute to the successful results.

Developing the Evaluation

The Training Team had been using Level One and Level Three evaluations for their Instructor-led face to face classes for a couple of years. The initial idea then was to simply modify the existing evaluations and call it a day. As the team took a closer look, however, they realized they would need to think a bit more about their objectives for the evaluations before simply converting the existing form. That became the starting question, "What is it we want to know?"

After a great deal of discussion on this question, however, the team realized the root question was, "What will we do with the data?" Answering the use question then pointed them in the right direction for evaluation questions and content.

The result of these discussions was to focus on Level One evaluation first for two reasons; 1) it would be the easiest to create, distribute, collate and analyze, and 2) it would give immediate feedback on the instructional design. Their were a number of additional WBT programs on the horizon and the team wanted to make design modifications that could be put in place with the upcoming programs. An evaluation form was developed and a process defined for capturing participant responses. The main components of the new form are listed below.

- Program Relevance and Timeliness
- Content and Practice Exercises
- Network and Computer Issues
- E-Learning Environment

Implementing the New Evaluation Form

The implementation of the new evaluation form has evolved over time. The first distribution was through email using MS Word. Evaluation forms were sent to participants after the training. Participants then sent their completed form back through email and the results were manually entered into a database. The process was time consuming and didn't allow for anonymous feedback, which may or may not have affected results. Even so, this was better than no feedback at all.

The second phase linked the MS Word file to the WBT program. This improved the response rate, but was still very cumbersome as the participants had to save the file, then attach it to an email and the results were still manually entered into the database.

At this point, the team solicited the help of the IT department and designed an evaluation using the same development tools they used to create the WBT program. The evaluation then matched the look and feel of the rest of the program and appeared as the final stage of the training as opposed to an annoying add-on. The results were dumped into a database, which eliminated the manual data entry and allowed for anonymous feedback.

The additional of Level One evaluation to TDS TELECOM's WBT programs has brought the team one step closer to their initial drivers.

- Improve Instructional Design
- Justify Development Costs
- Gain Support for Continued Exploration
- Ensure Training Effectiveness

There is still much work to do and other levels to evaluate, but this start has given the team the support and backing they need to continue down their e-learning path.

Recommendations

- ❖ If you're not already familiar with the different levels of evaluation, do some research. It's important that your organization agree on a methodology whether it be Kirkpatrick's or someone else's. This is key to ensuring understanding of the results.

- ❖ Take some time to determine your drivers. Ask yourself why you want to evaluate your training. The end process will differ depending on the drivers you determine.

- ❖ Next, determine how you want to use the results. If you're not going to use the data, don't capture it – you'll just be wasting your participant's time. This discussion will lead you into what to ask, how to ask it and when to ask.

- ❖ Get your IT team involved early to help you figure out the technical issues and options. They can consult on the mechanics of the implementation of your evaluation process.

- ❖ Don't give up. If at first the response rates aren't what you had hoped, remind yourself that some is better than none. It may take your participants a while to realize you REALLY want their input and are REALLY going to use their feedback.

Summary

E-Learning at TDS TELECOM is a continually evolving practice. The Training Team continually researches new tools, practices and methods for providing training using alternative delivery methods. As their delivery methods evolve, so too, will their evaluation processes. Future goals of the team include increasing response rate, building a database to capture the evaluation results, publishing reports on the results of the evaluation data and exploring Levels Two, Three and Four. As we continue to see articles like Kaliym Islam's "*Is E-Learning Floundering*?" published in the May 2002 issue of e-learning magazine, it is clear that we all need to take a close look at evaluating our programs and showing the benefit they are having on employee performance.

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Islam, K. (May, 2002). *Is e-learning floundering? How to identify shortcoming and prepare for success. e-learning Magazine,* 3(5). Duluth, MN: Advanstar Communications.

Biographical Sketches

Renee Stoll is the Training Manager at TDS TELECOM. She has been a classroom trainer for over 10 years including 2 years in West Africa as a Peace Corps volunteer. Renee's interest in e-learning stems from the need to provide training to over 3500 employees across 29 U.S. states within TDS TELECOM. This geographic dispersion has challenged her and her team to design creative training solutions that are high quality and cost effective. Evaluation has become a focus, in part, to ensure the effectiveness of the new ground her team has forged in e-learning.

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Institutional Responses to Plagiarism in Online Classes: Policy, Prevention, and Detection

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Introduction to Plagiarism: The Prevalence of Cheating

Several research studies examine the reasons students cheat. The studies of plagiarism among college students are many, and the evidence presented in these studies typically suggests that plagiarism is rampant. These studies would estimate that 40 to 60 percent of students cheat during their college careers. Some go lower: in "Plagiarism is Rampant, A Survey Finds," the *New York Times* reports in 1990 that researcher Jerold Hale called plagiarism "an epidemic hurting 30 percent of the student population across the country." Some researchers go higher: Charlotte Allen, writing in 1994, attested, "Most studies of college cheating indicate that the percentage of cribbers has not changed much over the past twenty or thirty years: About 60 to 80 percent of college students admit, as they did during the Sixties and Seventies, to having fudged an exam, term paper, or problem set at least once during their four years." Donald L. McCabe and Sally Cole (1995), the president and executive director, respectively, of the Center for Academic Integrity, reported that "more than half" of the MIT students surveyed in 1992 "acknowledged" that they had engaged in unsanctioned "collaboration."

Less is known about graduate student behavior. One study (Brown, 1995) found that graduate business students believed they were more ethical in their academic behavior than were their undergraduate counterparts. Brown reported, however, a similar incidence of academic dishonesty—as well as similar explanations for their behavior—among the graduate and undergraduate students in the study. In another study of graduate students, Love, et al. (1997) discussed the need to consider undergraduate behavior when investigating graduate student behavior. The prevalence of plagiarism in undergraduate education may well affect the graduate education arena. The authors mentioned a study by Greene and Saxe (1992) that found 81% of the undergraduates they surveyed had cheated at least once. Of these, 77% indicated they intended to pursue graduate education. As a result, behavior as an undergraduate is probably relevant to behavior as a graduate student.

A problem with all these studies is that they generally do not differentiate categories of "cheating." They may specify that "cheating" includes sneaking answers into exams and plagiarizing. But what do they mean by "plagiarizing"? Do they only mean submitting papers written by others? Or do they include copying passages without attribution? Do they mean failing to cite sources of ideas? Do they mean patchwriting? Such specifications are seldom offered. So, when we look to these studies to learn how prevalent plagiarism is, we have to know in advance what we ourselves mean by "plagiarism." Also, we have to be alert for cues as to what the researchers mean by it; whether they include plagiarism in their category of "cheating" or "academic dishonesty"; and whether they communicated these distinctions to research participants whom they were surveying.

Examples of "plagiarism" and "cheating" definitions in reports of research may illuminate the problem. Doris Dant (1986) made clear that she includes copying papers and copying passages of source texts when she said that although 94% of the high school students she surveyed reported having received instruction in attribution of sources, 80% reported having "copied some to most of their reports." But consider how this does—or doesn't—compare to Richard Fass's findings in the same year. Reporting a decline in ethical behavior that he dated to the 1960s, Fass pointed to two surveys. In one, "approximately 40 percent of the university students surveyed considered cheating to be a normal part of life, and 30 percent felt no guilt about cheating in college." In the other, "approximately 75 percent of the high school students participating in a recent California Department of Education survey admitted to cheating on tests, and more than 42 percent believed that there were sometimes good reasons to do so." But then we learn what Fass meant by "cheating": his category includes writing tutors' assistance in the "style and structure of a paper"! It is hard to determine from all these studies whether academic dishonesty actually is on the rise; and it is impossible to determine whether plagiarism is—precisely because so many disparate activities are variously included in the category of plagiarism.

But when the studies specify their categories, they provide some illuminating snapshots. Christopher Hawley (1984), for example, reported that the Bureau of Applied Social Research conducted a 1964 survey of 425 undergraduate students at a Midwestern university. "Fifty-one respondents (12.0%) reported that they had specifically asked another student or some other person to write a paper for them while at college and sixty-two students (14.6%) indicated that they had actually handed in a paper written by a colleague." Follow-up research to the 1964 would determine whether we have a greater problem today. Most faculty belief/fear/suspicion is that we do, especially because of the Internet. However, Lunsford and Ede (1994) cautioned that the pedagogical use of testing norms—and the culture of individualism that underlies it—can bring teachers to a "near obsession" about plagiarism.

The few longitudinal studies do indicate a rise in the incidence of plagiarism. Schab (1980) reported a study conducted with 1,000 Georgia high school students in 1969 and again in 1979. "A significant increase in plagiarism was revealed, as indicated by the change from an admission in 1969 of 63.5 percent of those going to college to 78.7 percent in 1979. Among the others, the 1969 group's figure was 70.1 percent while in 1979 it had increased to 81.1 percent."

Reasons for Cheating

One study examines the correlation between procrastination and plagiarism (Roig & DeTommaso, 1995). The authors found that students who scored high on the plagiarism scale showed a main effect for procrastination. Although not statistically significant, those who scored high on procrastination also scored high on plagiarism. Roig and DeTommaso believed grade, time, and task pressure play an important role in cheating. These factors seem to play a significant role in a student's perception that cheating is the only acceptable alternative to lessen the stress associated with the above factors.

Love et al. (1997) found that the professors play a role in the likelihood of cheating where "the leniency of professors and a tendency to avoid addressing issues of cheating and plagiarism were seen as factors contributing to cheating and plagiarism among graduate students." Simmons (1999) added ways in which teachers support plagiarism, including the fact that in large classes it is unlikely to be recognized. Howard (1993, 1995) identified patchwriting as a type of plagiarism. Students patchwrite when trying to learn unfamiliar discourse. However, because most people patchwrite, Howard (1993, 1995) recommended that patchwriting not be considered a form of plagiarism and academic dishonesty. Later (2000), she recommended discarding the term plagiarism altogether, and instead specifying the textual behaviors (fraud, patchwriting, failure to cite, failure to provide quotation marks) traditionally covered by the term.

We may also consider cultural beliefs. One of these is that the plagiarist suffers from a moral disease. As early as 1936, Loomis et al. referred to plagiarism as a sort of "kleptomania." In 1989, Mallon refered to it as a "virus." And Geosits and Kirk (1983) and Nienhus (1989) searched for a "cure." Another recognizable cultural theme associates plagiarism with sexual transgression; the plagiarist is an adulterer or rapist (Howard, 2000).

Intellectual historian Ong (1982) asked why plagiarism matters to a culture. When print was introduced to Western civilization, he said, exclusive printing rights were granted. "The drift in human consciousness toward greater individualism had been served well by print. Of course, words were not quite private property. They were still shared property to a degree." Rhetorician Clark (1994) specified what this can mean for pedagogy: "Concern with plagiarism in writing center instruction reflects a pervasive cultural concern with intellectual property rights that has gained particular prominence in academia."

Where does all this leave the educator? First, it suggests that we should strive to identify just what is at stake when we believe we are facing plagiarism. Has the entire paper been downloaded or borrowed from someone else? Has the student patchwritten from a source? Second, it suggests that plagiarism matters very much to contemporary academic culture. Third, the textual behaviors we gather together under the heading of "plagiarism" may actually be occurring more frequently today than they were in earlier decades. Fourth, the types of assignments we give and the conditions under which we give them may affect the likelihood of students' resorting to outlawed textual strategies. Fifth, our reactions to the incidence of these outlawed textual strategies may evoke in us some powerful emotional responses, in which students' writing becomes mixed up with our own fear of contamination, and deviance.

Institutional Strategies to Prevent Plagiarism: A Case Study from UMUC

The University of Maryland University College has developed a two-pronged approach to deal with issues of plagiarism. The first is to have an effective policy that clearly defines plagiarism; provides specific procedures for students, faculty, and staff to follow; and details the penalties for plagiarism. The second approach is to educate students and faculty on how to recognize and avoid plagiarism.

UMUC Plagiarism Policies and Procedures

University of Maryland University College's official policy concerning academic dishonesty and plagiarism is posted at http://www.umuc.edu/policy/policy_files/m15025.html. This policy was recently reviewed by the university community and updated. The main points of the policy are:

- Plagiarism is the presentation of another person's ideas or products as one's own. Intent is not a factor.
- The burden of proof rests with the faculty member. The faculty member must show the plagiarized documents. Without evidence, a student cannot be accused of plagiarism.
- When plagiarism is documented, the faculty member notifies his/her supervisor. After discussion with the administrator, the faculty member discusses the alleged plagiarism with the student. The student may not withdraw from the course.
- If the student admits he/she plagiarized, the faculty member may adjust the grade for that portion of the assignment, the entire assignment, or give the student an F for the course.
- The faculty member notifies the dean who sends a letter to the student describing the act of dishonesty including a description of the agreed upon sanction. The dean sends copies of the letter to the Chief Academic Officer and Provost, and to the faculty member. The provost may approve suspension or expulsion from the university.
- The student may appeal to the provost if the student believes the procedures were not followed.

Educational Opportunities on How to Avoid Plagiarism

UMUC's second approach is to provide education opportunities for both students and faculty to increase awareness of plagiarism and how to avoid it. The institution looks for ways to make the topic visible for both students and faculty. Below are some examples of such initiatives.

Faculty Focus: Workshops; LIBS 150, Support; and turnitin.com

UMUC has several strategies for helping faculty avoid, identify, and as necessary, detect plagiarism. As early as 1995, the University offered a series of face-to-face workshops on designing plagiarism-resistant assignments. This initiative was eventually expanded, in 1997, by offering the workshop online to serve the entire, worldwide faculty population. In 1999, a workshop dedicated to topics concerning writing, research, and plagiarism was successfully developed. Over 200 faculty have participated in the two workshops that have been offered. In spring 2001, at the General Faculty Meeting, strategies were reviewed for how to avoid plagiarism, especially through deliberate design of writing assignments. Over 300 faculty members were present.

UMUC faculty may now participate in the new, required, online course for undergraduates pursuing a major at UMUC. In an effort to assist faculty to update their research skills, one of the library faculty is offering a faculty section of the course, LIBS 150, so faculty may become familiar with it, and offer their feedback on its content and purpose. Interest in this section has been phenomenal. The course closed in one week, it was capped at 100 participants. All UMUC Faculty worldwide also have access to "turnitin.com" a plagiarism detection service to which UMUC subscribes. With permission of students, faculty may submit student essays to check for plagiarism to help find and prevent plagiarism. UMUC provides faculty members with guidelines.

UMUC supports a full-time director for the Effective Writing Program whose primary responsibility is to assist faculty in all curricula in creating and evaluating effective writing assignments. The director conducts workshops for faculty. The Effective Writing Program's comprehensive web site, http://www.umuc.edu/ugp/ewp/intro.html, provides information on how to help students avoid plagiarism. The site also has materials to help students manage research materials and document sources. The Center for Intellectual Property, at http://www.umuc.edu/distance/cip/links_plagiarism.html provides resources about plagiarism and potential responses to the problem is currently conducting research on plagiarism policies at institutions across the United States to identify best practices and provide further information to students and faculty on how to address academic integrity issues.

Student Focus: LIBS 150, Online Writing Center, Newsletter, the Virtual Academic Integrity Lab

UMUC also offers undergraduates help in avoiding plagiarism. All students must take a library skills course, LIBS 150: Information Literacy and Research Methods, within the first 15 credits of their career at UMUC. This course introduces online research methods and documentation. UMUC's Online Writing Center offers a self-help interactive tutorial to help students recognize plagiarism and ways to avoid it. *http://www.umuc.edu/ugp/ewp_writingcenter/modules/modules.html*. The tutorial, *How to Avoid Plagiarism,* provides a posttest with certificate to be presented to faculty to show successful completion of the module. The Online Writing Center also has links to other online writing resources.

The Office of Library Services offers an online guide to proper citation format that can help students learn when to cite and how to do so properly. The Center for Intellectual Property provides resources about plagiarism and potential responses to the problem. UMUC has its own *Online Guide to Writing and Research,* which covers plagiarism concerns. Links to the Writing Guide are in all online courses as well as through the Online Writing Center. *Put it in Writing* (http://www.ad.umuc.edu/docs/G54-01.html) is developed primarily for our students in Asia but may be used by all UMUC students to help them understand proper writing technique. In spring 2002, *News @ UMUC*, a bimonthly newsletter for undergraduate students, focused on plagiarism with several articles on how and why to avoid to it.

Real people are also available to help online students with their research and documentation concerns. The Online Writing Center has writing advisors who will review student essays and provide feedback and help in writing. The reference librarians at UMUC's Office of Library Services are available by e-mail and telephone to assist both students and faculty with research concerns.

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Assessing Career Impacts of an Internet Degree Program for RNs

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The Collaborative Nursing Program

The Collaborative Nursing Program (CNP) is a joint effort of the nursing programs at five University of Wisconsin campuses – UW-Eau Claire, UW-Green Bay, UW-Madison, UW-Milwaukee, and UW-Oshkosh – with support and facilitation provided by UW-Extension. One of the University of Wisconsin System's first collaborative distance education programs, the CNP has been available to Registered Nurses since spring semester 1996. Courses have been offered by audiographics, compressed video, public television, WisLine[1] telephone discussion sections, and, since spring semester 1998, the Internet – making it possible for nurses to remain in their communities and on the job while completing a baccalaureate degree.

CNP students affiliate with one of the five UW institutions, which becomes their *home institution*, where they are admitted, register for classes, apply for financial aid, receive advising and other student services, and ultimately are awarded their degree. As of May 2002, 215 nurses had graduated from this program. Over 200 students are enrolled in one or more nursing courses in any given semester, with about 300 enrolled in the program, some taking only general education courses. Students are predominately (96%) white and predominately (92%) female, highly motivated, and geographically bound. Most (69%) CNP students are between the ages of 35 and 54, and work full time in nursing (72%). Most (45%) are employed in acute care settings. Seventy percent of nurses enrolled in the CNP have Associate Degrees in Nursing (ADN), with most others having nursing diplomas.

The Study

During the fall and spring semesters 2001-02, the Learning through Evaluation, Adaptation, & Dissemination (LEAD) Center of the University of Wisconsin-Madison was contracted to evaluate the CNP. The study was supported by a U.S. Department of Health and Human Services, Division of Nursing grant to UW-Madison's School of Nursing. The study was intended to determine students':

- Views of attainment of academic goals
- Assessment of the learning environment
- Assessment of their experience with the technology
- Opinions and assessment of educational support services
- Professional and personal outcomes resulting from their educational experience.

[1] WisLine is a telephone conference service available to Wisconsin educational, governmental, and non-profit groups.

The LEAD Center conducted structured telephone interviews with ten CNP students during the fall 2001. Interview findings shaped the development of a survey instrument that was mailed during the late spring 2002 to all CNP students and graduates in the program's database – 535 nurses. 253 usable responses were returned, for a response rate of 47%. Respondents fell into the following categories:

❖ Graduates	91	36%
❖ Currently enrolled	125	49%
❖ Not yet enrolled, plan to take courses in the future	24	10%
❖ Withdrew from program	13	5%

Findings

In each of the five areas of the study, findings were positive suggesting this program is effectively meeting learner needs and that students are well satisfied with the program, its faculty, support services, and the technologies used to make learning accessible to working nurses.

Attainment of Academic Goals

Sixty-seven percent of respondents said that the the CNP has made it possible for them to begin working toward the BSN degree sooner that expected. Before enrolling in the CNP, respondents had considered returning to school to complete a BSN for an average of 4.67 years (range is 0 to 30, standard deviation 5.16).

When asked to identify the top two reasons for enrolling in a BSN completion program, 77% identified "*to prepare for future career advancement opportunities*." Sixty-six percent reported they enrolled in a BSN completion program for "*personal enrichment or satisfaction.*"

Learners chose a distance education program (CNP) because it made studying more convenient to their work schedule (87%), more convenient to their personal schedules (73%) and they thought they would save time by not having to travel (51%). Another 42% of respondents said it was simply too far to travel to a campus for classes. If a distance education program wasn't available, 61% of respondents report they would not have enrolled in a campus-based program.

Learning Environment and Technology

Since all CNP courses are offered via technology, questions about the learning environment were linked to the technologies used. Analysis of responses was split into those who had taken Internet courses and those who were had taken courses offered by other technologies. Internet students were slightly more satisfied than those using other technologies.

CNP Learners who were "satisfied" or "very satisfied"

	Internet Courses	Other technologies
Instructor's responsiveness	89%	88%
Access to instructor	91%	87%
Quality of instructors	94%	87%
Quality of courses	94%	90%

Educational Support Services

In examining educational support services, responses were again divided into those who took Internet courses and those whose CNP courses were delivered by some other technology. Among those who indicated they were satisfied or very satisfied, Internet students again report a slightly higher rate of satisfaction in most categories.

	Internet	Other technologies
Quality of advising	85%	87%
Access to advising	85%	77%
Advisor's responsiveness	85%	86%
Quality of technical support	81%	71%
Availability of tech support	80%	74%
Quality of library services	82%	67%
Availability of library services	81%	69%
Orientation to CNP	87%	84%
Orientation to distance ed	82%	74%

Career Impacts

Respondents were asked whether their experience in the CNP had affected their careers in any of the following ways:

Promotion	8%
Increased responsibilities	13%
Change in employer	14%
Increased salary	15%
Change in area of practice	17%
Greater satisfaction with nursing career	69%

1999 Study

An earlier (1999) study of the CNP, completed by the Wisconsin Survey Research Laboratory [2], explored four broad features of the program:

- Issues of cost and access
- Technologies and learning modalities
- Availability and quality of support services
- Impact of the program on nurses' careers.

This study demonstrated a clear preference for Internet technology and substantially increased rates of access to the Internet among Wisconsin nurses; almost 85% now had Internet access at home or work, contrasted with only 43% in a 1997 study. Study findings informed the fall 2000 decision of the Steering Committee[3] to go to an all-Internet program. Other distance education delivery modes are being phased out , with the last audiographics course slated for spring semester 2004.

[2] The Wisconsin Survey Research Laboratory, a unit in the University of Wisconsin-Extension's Division of Continuing Education Extension, closed in May 2000.

[3] The CNP Steering Committee is comprised of faculty/administrative representatives from each of the five UW institutions with nursing programs and a representative from UW-Extension.

Comparing the Two Studies

Populations

The response rate for the 2002 study was lower (47%) than the 1999 study (60%). The CNP has also experienced growth during the three years between studies – 387 vs 535 students.

There are two noticeable differences in the populations of the two studies:

	1999	2002
Actual graduates	60	215
Grads as %age of total population	16%	40%
Had taken an Internet Class	51% of respondents	77% of respondents

Expectations and Findings

When we undertook the 1999 study, we expected the age of the program (operational only three years) and the relatively small number of graduates (16%) would result in few career impacts. We expected the 2002 study to demonstrate greater positive impacts on nurses' careers. We were surprised to discover that among the two groups, the impact on careers was nearly the same across the two studies. If anything, the earlier group experienced slightly more career *rewards* than had the recent group, especially in the area of satisfaction with their nursing careers.

Comparing CNP Impact on Nurses' Careers

	1999 Study	2002 Study
Promotion	10%	8%
Increased responsibilities	19%	13%
Change in employer	16%	14%
Increased salary	14%	15%
Change in area of practice	18%	17%
Satisfaction with nursing career	78%	69%

While CNP students were asked about future plans in both surveys, due to different wording of questions, only two areas can be compared. The 2002 group is somewhat more interested in supervisory or administrative positions, while the 1999 group is a little more interested in entering a masters program.

Comparing Future Plans of CNP Students

	1999	2002
Pursue a supervisory or administrative position	10%	17%
Pursue entry into a masters program	52%	49%

Summary and Conclusions

Both studies reveal a high level of satisfaction with the program; across all indicators, current and past students rate the CNP highly. The shift to an all Internet program has reduced barriers to access to the program, making a nursing baccalaureate degree a real possibility for working Wisconsin nurses.

Given the growth in and greater maturity of the program by 2002, we had expected to see increased career impacts attributed to participation in the program. Perhaps career impacts won't be experienced for an even greater period of time, perhaps the indicators of career impacts we selected were insufficient, or perhaps respondents are reluctant to attribute these impacts to participation in the program.

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Using the Northwestern University Collaboratory With K-12 Students

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What Is the Northwestern University Collaboratory Project?

The Collaboratory Project is a Northwestern University initiative developed to support the integration of Internet technologies into the K-12 curricula. The Collaboratory was initiated with a four year, 1.8 million dollar grant from Ameritech in 1996. A team including a web designer, a programmer, and an educator was hired. The Collaboratory Project team began by helping teachers learn how to use a browser and bring Internet resources to school for student research. Then, as a team, we supported teachers in putting student work on the web. Our K-12 teacher clients gave us feedback about what they felt would be useful applications of the Internet in the classroom. Internet-based software applications were created to answer the teachers' requests and we stepped out of teaching webpage creation and into dynamic ways of using the web to support teaching and learning.

With teacher help, Collaboratory Resources, including the following, were developed:

Reading. Kids read books and write reviews. Peer recommendations are important. So we created "the Internet Book Club" as a place to select a book from a teacher's reading list and post a review. Other kids read the reviews to select the books to read. Kids can also contribute and read their own writing and poetry.

Research. Kids enjoy getting sources from the Internet but lots of classroom time can be saved if the students have a list of pre-searched links from which to do their research. Teachers can create a "Cybrary" that is accessible from any Internet connection so students can do their focused research using teacher-recommended materials.

Sharing. Webpages for sharing student work: Kids create beautiful art work, stories, and poetry, and they need a place to show it off on the web. When a classroom decides to put its work on the web, deciding what to post can be a mammoth job which includes finding an acceptable place to post the material, learning html, posting webpages, finding an appropriate audience to view and comment on the work and figuring out how to get those comments back to the students. MediaSpace was the Collaboratory Project's answer to this challenge. In MediaSpace, students can contribute images, sounds, text and short videos to share with peers. Classrooms can build entire projects by copying and pasting writing work into a web form and clicking 3 buttons on an image/sound/movie contribution form.

Data Collection. The Survey Studio was designed to enable teachers to design and administer surveys online. A web-accessible database stores results and dynamically generates webpages that display the results. Data can be analyzed in a variety of statistical formats.

Discussion and Chat. WebBoard with WebMaster Conferencing was the first discussion forum used for asynchronous discussions. It also had an integrated chat function for real time interactions.

Teachers used these tools in their classrooms as ways to communicate what their students were doing in a large variety of projects. Some teacher comments include:

- ❖ "My students go to the computer lab and begin working on their research right away. They are interested in reading the web pages and they come back to class with notes that they can use in their papers."
- ❖ "Before the Cybrary, students did lots of searching and at best, came back with printed webpages that they needed to use for research."
- ❖ "They can look at other kids' projects and get ideas of how theirs should work and look."
- ❖ "The data is great to have for teaching math and also for me to get an idea of what they know before we start an activity or unit."

Teachers came to workshops to watch us mentoring and modeling collaboration. Converting a unit into a web page became less important than the content and the students' learning. The reason for posting curricula on the web is to provide an opportunity for other educators to see it and to use it. The reason for putting student work on the web is so peers can learn from each other.

In 2000, we created and opened the Northwestern University Collaboratory, a laboratory for collaboration on the internet in which teachers create and manage engaging projects for their students and in which students contribute and share work. The webpages are dynamically generated. The focus is the curriculum, not webpage design. Standards were written to guide the curricula and the use of technology to enhance them.

Our teacher clients commented about the time it takes to get to after-school workshops, their tiredness after school, and their inability to always do their best work at the end of the day. They do not like to miss school for workshops either. In answer to their concerns, we created complete documentation with illustrations and examples so they could work from home. Then, we created an eCourse which replaced our 15 hour workshop. The eCourse was designed to meet the needs and timelines of the teachers. The eCourse is available for educators who want to use the Collaboratory to develop technology-enriched, project-based learning activities that meet Illinois State Learning Standards and Goals for their students. Librarians, media specialists and technology facilitators who are collaborating with classroom teachers are encouraged to participate.

Teachers said about the eCourse:

> "I enjoyed the class because I could do it on my own time. I could work late at night or early in the morning. When I finished the course I had 15 hours credit and I had a project I could use in my classroom!"

What has happened to the level of projects in the Collaboratory? They were stronger, much better written. And, they are used in the classroom!

Many teachers do enjoy creating their own units and curriculum. With the eCourse, they can do this on their own time at school or home. They can create the projects and activities with partners or by themselves. They are working when they have their "stuff" available.

The Next Steps

In 2001, we started Collaboratory Sponsored Projects. Collaboratory Sponsored Projects are standards-based projects and activities that can be used in the classroom. Sponsored Projects may involve "experts" in a particular curricular or content area. They can be developed by Collaboratory teachers, associates, volunteers, or experts and may include such areas as seasonal themes, historical events, science, and community research. A Sponsored Project can easily be "shared" by teachers and their students without having to create their own Collaboratory project. Collaboratory Sponsored Projects are "supported" by Collaboratory staff, associates, and/or volunteers. A sponsored project involving an expert was **Kid-Made Toys From Around the World**. Teachers who participated with their students say:

- The teachers and students enjoyed this project and the toys they created.
- An atmosphere of technical skills and collaboration was developed.
- Primary teachers are interested in joining this project when it starts up again in March.
- Several teachers have expressed an interest in creating their own projects within the Collaboratory.

Another sponsored project created by teachers was **Steps to Success: Creating Science Fair Projects**. It impacted the classroom:

- The Cybrary gave students a wide variety of science fair topics to choose from and resources for research.
- MediaSpace contained examples which supported student topic decisions.
- MediaSpace examples gave parents an overall picture of what students were expected to do in a science fair.
- The Survey Studio survey gave students and teachers an overview of participant knowledge and experience.

The Future Collaboratory

K-20 educators create projects, activities, and resources they can use in their classroom with their students. They participate in projects written by other teachers. They form collaborations. Teachers, students, and experts mentor each other.

In 2002, the Collaboratory Project received a grant from the National Educational Computing Association, NECA, to create a NEXUS for art, music, and writing in the Collaboratory. NEXUS means a synergy, a coming together, a connection, link, center, or focus. The Collaboratory Nexus application is being designed to encourage and support communication, mentoring, and creative collaborations through sophisticated Internet-based media and communication tools. It allows users to contribute, share, discuss, discover, and exchange digital information using video conferencing, chat, forums, and messaging and document posting and viewing.

Biographical Sketch

Bonnie Thurber is responsible for developing and implementing programs and professional development at the Collaboratory Project. She lead the team that created the Collaboratory in Your Classroom eCourse and the documentation that supports the eCourse and the Northwestern University Collaboratory. Before moving to Northwestern University, Ms. Thurber was a tenured faculty member at National-Louis University's National College of Education (NCE), Evanston, IL, where her primary assignment was to the Baker Demonstration School, the preK-8 laboratory school for NCE.

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Creating Virtual Communities to Support Online Instructors

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The proliferation of distance learning in higher education creates the need for new communication venues to support online faculty. Although, many published research texts provide adequate suggestions and recommendations promoting good techniques for online moderators, the research does not adequately address the unique and temporally sensitive needs of faculty members. The purpose of this workshop is to explore the aspects involved in the Art Institute Online's effort in building a faculty lounge to support the social, developmental, and communication needs of a geographically separated university. The seminar examines the steps required to identify and establish goals; the logistics of building a faculty support area; and ideas to ensure faculty participation once the lounge is operational.

Introduction

Instructors who teach online courses are often isolated geographically from one another and from their hosting institution. The term "university" implies a community of learners and facilitators who contribute to the body of knowledge. On-ground institutions enjoy the ubiquitous exchange of ideas in commonplace venues such hall conversations, faculty lounge coffee discussions, lunch meetings and paper memos delivered in attendance folders or posted on bulletin boards. It is a challenge for online institutions to provide meaningful communication to serve the same purpose.

How does an online school bring geographically dispersed faculty members together to inform, elicit and inspire educators to improve performance? Many online education resources focus on the student experience and curriculum materials for delivery of the course. When faculty accept the role of online facilitator, a host of new challenges ensue, including a change in instructional style, increased preparation time, and reduced interpersonal contact with students (Milheim, 2001). Failure to provide the basics in faculty interaction and support results in a host of undesirable consequences, including: social isolation; missing the big picture about how the university is structured; overlooked policies, deadlines, calendars and training opportunities; and the omission of shared knowledge and experience among faculty about their field and teaching in the online classroom.

The kinds of experience faculty members can share with one another include online teaching tips, classroom experiences, and anecdotal lessons learned about unique encounters in class. In addition, participants experience consequential value in social contact and peer relationships through online work. The institution that recognizes these needs and provides adequate resources to meet them stands to dramatically improve faculty life and the quality of classroom instruction.

The Art Institute Online (AIO), a virtual university affiliated with the Art Institute of Pittsburgh, offers degree programs in Graphic Design and Multimedia/Web along with a host of general studies courses to support on-ground Art Institute schools across the country. Students complete each course entirely online through asynchronous web communication with faculty and fellow students dispersed throughout the US. Currently, over 100 adjunct faculty members serve as facilitators for AIO. In each 6-week session, students participate in class discussion a minimum of 5 out of 7 days. Faculty members are expected to check course discussions and answer questions within 24 hours.

In addition to philosophical support by the institution, developers will require a coherent approach to develop an interactive web-based faculty support resource. Those steps entail how to identify and establish the goals and benefits of a properly implemented faculty lounge; the logistics of building the virtual space, including technology, personnel, and information resources; and ways to encourage participation and utilization of the tools provided.

Current research in online faculty resources tends to focus on suggestions and recommendations that faculty members receive training and orientation about distance education, instructional technology and online facilitation. Short (2000) and Howell (2001) describe a framework for training and development which promotes learning for students with different learning styles. Finding out what kind of learner the students are can help to provide direction as to how online coursework should proceed during the term. Williams (2001) and Howell (2001) describe the importance of online discussion as a powerful tool for development, and recommend evaluating the difference in discussion-based learning against traditional lecture-based methods. The need for online faculty support materials and services is well-established by Howell (2001) who mentions studies that suggest the more time people spend online, the greater likelihood they will develop symptoms of loneliness and depression. Cagle (2001) also mention the need for a dose of education theory in addition to technology application training when conducting faculty development activities. Lan found that the more administration provided technology and instructional support to faculty members, the greater their likelihood to become motivated and develop positive attitudes toward the learning environment (2001). Lee (2001) also showed that faculty motivation, commitment and satisfaction were greater when facilitators received instructional support for their distance education courses. Finally, Yucht (2001) describe the results of an institution's successful efforts to build an online teacher lounge, where teachers can discuss personal and professional topics that shape the life of the classroom instructor. These studies support the notion that online faculty resources are warranted, encouraged, and supported, but do not provide ample evidence of successful implementation.

Establishing the Goals

The rationale for developing and implementing a faculty lounge should stem from a set of problems or needs the organization identifies. These problems can begin with general descriptions, such as "We need to increase communication between online faculty members, because they are isolated from each other, and from us." A more specific set of problems help refine the required inclusions in the toolset, such as, "We cannot easily disseminate reference information such as job descriptions, referral forms, and contact information" or "The faculty need to follow a process for pre-reviewing their courses and letting us know any content or technical difficulties prior to the first day of class." The kinds of problems that the faculty lounge addresses do not all need to be extant. The solution may proactively deal with issues before they arise.

For AIO, the reasons to initiate a project to support online faculty began early in the program development. After starting up in 1999, the school experienced rapid growth, both in student numbers, faculty members to teach them, and support personnel to develop, write and deliver curriculum. As with any dynamic organization, the need to communicate to all parties is highly important, but traditional means were not available. Moreover, AIO's operational model represents a major change from the system to which most faculty are accustomed. For instance, some students attend AIO courses exclusively, gaining their degree entirely online. Many other students are "hybrid" students, attending on-ground courses at one of 11 schools currently participating in the project.

Finally, to manage, administer and direct students at a distance requires ongoing training and support. All AIO instructors undergo an initial 6-week training course using the same platform students encounter. Once instructors gain the initial orientation and begin teaching in the online environment, it is important to continue to offer additional training in advanced facilitator skills.

Before undertaking a project that imparts widespread change for communication across the university, it is important to sit down with stakeholders and identify the goals. With targets identified, the project can move forward with the understanding that development is a process. As a living resource, it can be modified, extended, and improved. Although specific content topics will vary from one organization to the next, the general goals will likely include similar goals as those discussed in the next section.

Goals of the AIO Faculty Lounge

The Art Institute Online's (AIO) education team members initially identified the following objectives that the online faculty lounge should address:

- ❖ Increase communication with and among online faculty members.
- ❖ Build an online learning community.
- ❖ Provide a centralized location for reference information (job descriptions, contact information, policies, procedures, etc.) for online faculty members.
- ❖ Provide basic online instructional support and development for faculty members.

These goals were established with the understanding that as the faculty lounge grows, additional benefits and objectives will arise. A key design criterion is to create an architecture that is flexible enough to support future modifications. For this reason, the faculty lounge is a dynamic endeavor with no fixed end-result. Instead, the faculty lounge can grow to incorporate the needs of users and the hosting organization. Like some online courses, the faculty lounge should take on a life of its own, providing users with a rich, interactive environment.

Identify the Potential Benefits

Answer the question, "And what would that do for us (the faculty, the students, the courses, the administration, etc.)?" How will we know when we have been successful? Following are a list of ways to measure whether the faculty lounge project has achieved its stated outcomes:

- ❖ Faculty will report that they feel a greater sense of community;
- ❖ Faculty members find answers in the lounge spending less time searching for information;
- ❖ Administrators receive fewer phone calls and emails asking for repetitive information;
- ❖ Facilitators engage in faculty-driven professional development by sharing practical ideas for classroom management and problem-solving;
- ❖ Faculty members are able to cite example of techniques or approaches they have learned in the faculty lounge, techniques which improve their experience and the experience of the students;
- ❖ The quality of education improves as measured by student participation, discussions, and student surveys;
- ❖ Administrators communicate with the faculty in timely and effective manner.

These outcomes help build the vision for what the online faculty lounge can be and can accomplish. This knowledge inspires the passion and provides motivation for the starting, continuing, and improving the resource.

Building the Faculty Lounge

The practical steps involved in creating the online faculty lounge will vary depending on the technology resources available. The university may have extensive forums and discussion areas developed in-house, or they may rely on third-party products such as Blackboard or WebCT to create a suitable architecture for online lounge hosting within the delivery environment. These tools may significantly differ from those the students experience in the online delivery platform.

The first step is to identify the technology available on the hosting system. Most of the goals stated for the AIO faculty lounge can be addressed with web pages and a threaded discussion forum. AIO used the Intralearn platform, hosted by Embanet to deliver both online classes and host the faculty lounge. In this way, faculty members experience the delivery mechanism from the role of student and participant, rather than facilitator only. Moreover, the interface is one to which participants are accustomed, and does not require conversion from or to another system. The link to the faculty lounge can be easily placed in the same area the faculty uses to access their courses. If additional technologies are needed to meet the objectives, such as chat-room, white-board discussion, voice and/or video, those resources should be identified and mobilized from the start of the project. The next step in this project is to ask the following questions: who will conduct ongoing coordination for site content and faculty lounge resources, and who holds the initial static information to be included on the site? The role of the coordinator is important, and the responsibilities may not be readily apparent.

The Coordinator

Without a coordinator to drive participation and content, a virtual space will sit virtually unused. Regardless of the quality of the content, worthy intentions and adequate resources available, someone must be responsible to build, design, and post new content. Moreover, the coordinator must check in and administer the forum like a classroom, by welcoming newcomers, asking for meaningful input, and challenging the participants to dig into their areas of expertise to benefit others. The coordinator should help create regular interaction opportunities for faculty members in order to facilitate sharing of ideas and building a culture of online participation.

Conclusion

Creating any substantive project requires setting and achieving a host of smaller goals that support a main purpose. Building an online faculty lounge is ultimately about helping instructors to improve instructional and learning performance in the classroom. Ongoing development and support will continue for many months. Underlying the purpose of the faculty lounge is the implied social contract that stimulates participants to improve and grow as a result of peer accountability. The commitment to improve is a joint responsibility, shared by administrators and faculty members alike. The faculty lounge is a support system and set of practices to help establish and achieve a more fully realized sense of the term “University”.

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Biographical Sketches

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An Evaluation of Student Satisfaction With Distance Learning Courses

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Background Information

Since their introduction in the 1990s, distance-learning courses have grown dramatically in the number and variety of courses being offered. Today, both graduate and undergraduate courses are taught via distance learning (James, 1997). Many of these courses use the Internet as the primary means of communication between faculty and students, as well as among students, while others rely on a blended mixture of traditional classroom learning and distance learning methodologies. Phillips (1998) stated that "on-line universities" provide students with the flexibility to take classes at their own pace. A unique feature of much on-line learning is "asynchronous collaboration." This allows students and faculty to interact with each other and the course material at a time and a place, which is convenient to them. This is in strong contrast to the synchronous environment that is prevalent in traditional classroom settings.

Despite the many potential advantages of Internet-based courses, there has been a lack of systematic research on the relative effectiveness of such courses (Moesel, Dass, Werner, & Fouts, 1998). Kroder, Suess, & Sachs (1998) described issues they faced in launching a web-based graduate course in a collaborative effort between the University of Texas-Irving and Pace University in New York. For example, both students and faculty felt the web-based course required substantially more time than a traditional course in a classroom. Nevertheless, 80 percent of the students said they would take another on-line course in the future. James (1997) described a survey of MBA graduates of the University of Wisconsin-Whitewater that analyzed their reactions to a planned emphasis using on-line course offerings.

In the search of the literature to date on distance learning, only limited research was found (University of Idaho, 1995). For example, Sherry, Fulford, and Zhang (1998) devised a measure of satisfaction with instruction for distance learners. Arbaugh (2000) found that perceived usefulness of the learning software as well as the perceived flexibility of taking courses on-line were both related to student satisfaction with their on-line courses.

A review of the American Society for Training and Development's (ASTD) Web site (*www.astd.org*) finds a great deal of information on e-learning, including a "Daily News" section, which features articles on e-learning appearing in each days press. A sampling of two days (June 4 & 5) yielded an average of 17 articles per day on the subject. Many of these are related to vendor issues, several offer a very "observational" approach to how to and how not to do e-learning, but none of them offer any hard data on e-learning programs. ASTD also offers an electronic "webzine," an Internet magazine, called *Learning Circuits* which deals exclusively with the topic of electronic learning (*www.learningcircuits.org*). A search of this web site offers a lot of hands-on tips for e-learning, but very little actual research on how to make it more effective.

The On-line MBA at Whitewater

The University of Wisconsin-Whitewater began planning an On-Line MBA program in the fall of 1996. After researching several long-distance delivery systems, LearningSpace from the Lotus Corporation was selected as the primary instructional tool. In LearningSpace, students can access courses using an Internet browser such as Netscape or Windows Explorer or they can access the course using a Lotus client. The Lotus client is loaded directly on the computer hard drive for faster access to the program. In addition, students purchase CD-Roms, which contain instructor developed support material and course information.

Research Into Distance Learning at UW-Whitewater

The purpose our project is to explore On-Line learning in more depth than that of previous work. Due to the evolving nature of the On-line program itself, our research has also changed over time. Our primary research tool is a survey administered Administering surveys to students who take classes in the On-Line MBA program does the research. In the most recent phase we also give a survey to students in a traditional MBA program. This session traces the development and evaluation of our research.

Study 1

The sample population for this study consisted of students enrolled in courses for the On-Line MBA program at the University of Wisconsin-Whitewater during the fall 1998, spring 1999, and fall 1999 semesters. The survey was given to 206 students in 10 different MBA classes, all of who met electronically. As independent variables, six issues were tested to determine their impact on student perceptions of the on-line course experience. These are:
1. Perceptions that training was sufficient
2. Perceived problems accessing the course
3. Accessing the course via the notes client server vs. an Internet browser
4. Accessing the course from home, school, or work
5. Part-time vs. full time employment status
6. Attending school part-time vs. full-time

For the dependent variables, a factor analysis of the 31 remaining questions on the survey revealed five major issues. The results of this factor analysis identified the following five factors:

- Level of communication with the instructor
- Level of technical expertise and assistance needed
- Interactions with other students
- Effectiveness of delivery method
- Likelihood you would recommend this course to others

1. Does the amount of technical training received impact student perceptions?
Students who felt they received adequate technological training had more positive feelings concerning the five issues studied. Statistically significant differences were found concerning the level of communication with the instructor and the perceived effectiveness of the delivery method, such that those who felt that they had been adequately trained were more positive about both issues. Interestingly, the relationship between training and interaction with other students approached statistical significance, with students who felt more positively about the training were also more likely to be positive about interaction with other students. It should be noted that students in general had overall positive perceptions

concerning each category, i.e., the first four dependent variables were measured using a seven-point scale, and all means were above 4.0. The last variable, "recommend course to others," was measured using a yes/no item, thus ranging from 1 to 2. This may explain why there was little difference between the groups concerning whether or not the students would recommend the course to others.

2. Do access problems impact students' views of on-line courses?
Experience has proven that ease of student access is a critical factor for on-line courses. Students (and faculty) quickly get frustrated with new technology that does not work properly or is not user-friendly. Moesel et al. (1998) suggested students who had greater problems accessing the course were less positive about on-line courses. The student's ability to access the course was significantly related to the perceived level of technical expertise needed for the course. Additionally, the relationship between access problems and two other variables approaches statistical significance, namely, level of communication with the instructor and recommending the course to others were both more positive when access problems were less of a problem.

3. Does the use of the Notes client versus the Internet to access their course impact student perceptions?
Students were able to access courses in two ways, via Lotus Notes off their hard drive or via the Internet. Does the method of access make a difference? None of the dependent variables were significantly related to whether students used the Notes client versus the Internet to access their course. This is surprising, given the delays that often occur when students must use the Internet to access their courses. However, for this sample at least, means of access was not strongly related to any of the outcome measures.

4. Does accessing a course at home, work, or school impact student perceptions?
How students access the course was significantly related to their willingness to recommend the course to others, with students who could access the course from work more likely to recommend the course to others. Additionally, students who could access their courses from work were more positive about the level of technical expertise needed, although this relationship only approached statistical significance. One of the many benefits of on-line courses is the time flexibility. A student's ability to access the course prior to work, during a mid-day break, or after work appear to find this flexibility to be a great benefit.

5. Are student perceptions impacted by employment status?
In general, student's employed full-time had more positive attitudes towards on-line courses. Full-time employment status significantly impacted whether or not students would recommend the course to others. Further, the relationship between full-time work status and the perceived effectiveness of the delivery method approached significance. This could also relate to the issue of flexibility. Full-time workers taking a graduate program at night value the ability to fit the course of study into their schedule, and thus develop more positive perceptions of a program that allows for this flexibility. Full-time workers also don't have the time to 'learn how to do it', so sufficient training and assistance is more critical to them.

6. Are student perceptions impacted by full- versus part-time student status?
As expected, part-time students generally perceived on-line courses more positively than full-time students do. Part-time students were significantly more positive about the on-line approach as an effective delivery method, and were more likely to recommend the course to others. Although not statistically significant, part-time students held more positive feelings concerning level of communication with the instructor and level of technical expertise required. These findings support current literature that suggests that one of the major benefits of on-line courses is that active people can benefit from the time flexibility of on-line courses. On-line courses allow students to do course assignments when work, family, and other responsibilities are not as pressing (Phillips, 1998). On the other hand, full-time students did hold significantly more positive perceptions concerning interactions with other students.

This is likely because full-time students were on campus for other classes and therefore were able to meet in person with each other for group projects and other assignments.

Study 2

A second study (still in progress) was begun in fall, 2001. The survey was given to 320 students enrolled in 14 On-Line MBA courses and to 246 students enrolled in 16 traditional (classroom) MBA courses. This study used the following factors:

- Instructor interaction
- Course structure/effectiveness
- Course content
- Interaction with other students
- Overall satisfaction with the course

While this study is classified as a "work in progress" it is interesting to note that on all five factors noted above, the on-line courses were rated higher than the traditional courses. While some of these differences were not great, for three of the five factors the differences were statistically significant (course structure/effectiveness, course content, interaction with other students).

Conclusions

While these research projects are on going they do offer some tentative conclusions about on-line learning. Our most recent findings – that on-line learners have as high or higher satisfaction with the factors of the course are, of course, based on a relatively small sample, but do suggest that on line learning can be a very effective teaching tool. Our findings also support the idea that flexibility is a key issue in student preference for on-line learning. We are also finding that (like most areas) there is a strong learning curve, both for students and for faculty. Initially, concerns with technology dominated a lot of thinking, but through effective training, support and interaction these issues appear to diminish significantly.

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Biographical Sketches

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The Development of Highly Interactive Reusable Object Modules

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Introduction

A prototype system of web sites containing several different subject disciplines, executable instruction sets and reusable concept object modules has now been extensively utilized and evaluated. A diverse student population, liberal arts majors, non- traditional students, and 35% Hispanic mix in contemporary math, calculus III students, and linear algebra students was the composition of our test sample. The performance of the system has been flawless and the student response (interviews and written evaluations) has been excellent. Executable mathematical functions, dynamic graphics, and concept-oriented animations have generated positive feedback. We are now working to bring the system to a fuller expression of its potential by the addition of more disciplines, reusable concept object modules, and executable instructions. It is time to broaden the base of utilization by providing workshops for K-12 schools in our area, local community colleges, and the other branches of the University of Texas System. The Assistant Vice Chancellor of Academic Affairs who is also the Director of the UTTeleCampus has given us a letter of support for this project. Presentations have been given at several conferences in which this system was demonstrated and abstracts have been accepted for additional presentations this year. Thirty-seven of thirty-eight liberal arts majors said the sites were helpful and that they would use them if they had access from their home computers

Description of the Web Sites

The web site has three major components. **Subject disciplines**, listed in a left navigation frame. Each major subject discipline has a right frame page with a link to a **facilitator sites** composed of 10 to 12 executable instructions, which are commonly used in the study of the subject discipline. These are not applets. Also found on this page are links to **reusable concept object modules** that are similar to chapters in a textbook dealing with some concept found in the study of the subject discipline but these reusable concept object modules are highly interactive unlike the traditional text. The prototype is a suite of web materials forming a web-accessible library of mathematically oriented content object modules. Authenticated access to the site will be made available to interested colleagues at other institutions. Once inside the site, the user sees a navigation frame on the left and a larger frame to the right. In the left frame or navigational frame the **subject disciplines**, which are all links, and an inventory of the supporting executable instructions in the facilitator sites are found. Clicking on the subject discipline link brings up the main page for that subject discipline in the right frame. A click on the words Linear Algebra in the navigational left frame brings up the main page for Linear Algebra in the right frame. This right frame contains three major items, a link to the facilitator site for linear algebra, a detailed graphic showing how a matrix must be set up to input it to the executable instructions, and a group of links to the available concept object modules on topics from linear algebra. As the user accesses the main subject page or moves from there to facilitator sites or to the associated object modules, the navigation frame stays visible. This is an innovative feature of the system that allows a user working on the linear algebra facilitator site main page site, or any of the linear algebra object module sites to branch immediately to any of the other subject areas appearing in the navigational left frame. An integral calculus student deep into an object module dealing with the concept of definite integrals as probabilities can, with the click of a mouse, reach the statistics site if desired. The ability to easily transfer from one subject discipline to another is one of the major innovative features that make this suite of web sites an integrated multidisciplinary system. Each subject area has a similar arrangement. This organization makes the whole system user friendly, versatile, and easily expandable in three ways. It is a trivial process to extend the number of subject disciplines. Also the executable instruction sets can be easily expanded or created. As the object modules are completed it is a simple task to add them to the system by inserting the links on the main page for the discipline under study.

Current Inventory and Utilization of the Web Site

The web site presently has the following course disciplines available: linear algebra, calculus, statistics, college algebra, and some utility sites composed of special functions such as a set of several plotting routines and solving functions, algebraic and differential equations. All together we have about 50 executable instructions available that our students can access. These executable facilitator sites are part of the highly interactive parts of the reusable object modules. The students working in a linear algebra facilitator site or object module can with the click of a mouse transfer to the calculus facilitator site to do an integration, the plotting facilitator site to do a plot or use one of the linear algebra functions such as row reduction or to another object module in another subject discipline. These sites are called facilitator sites because they facilitate the checking of ideas and the correctness of homework attempts. Each facilitator site has a complete set of instructions explaining how the input must be typed and arranged in the input window of an executable instruction, a drop down menu with the names of the executable instructions, and then an evaluate button. A user types the expression to be operated on into an input window, clicks on the drop down menu, selects the executable instruction desired, and then clicks on the evaluate button. The Mathematica kernel in the server does the operation and the results are instantly sent to the client's computer for observation.

Development of the Executable Instructions in the Facilitator Sites

These highly interactive facilitator sites used by the object modules are made possible by using a new version of Mathematica released this year by Wolfram research, webMathematica. The kernel, which is the computational engine, is stored and executes in the server. A Servelet engine, Apache Tomcat 4, and J/Link, which shows Java how to understand the Mathematica language and Mathematica how to understand Java, all work together in a Java run time environment so that a Math Server Page can be used to initiate a Mathematica session in the server and return results to the client. The Math Server Page (MSP) is an html page containing some special tags <%---%> enclosing some code called mathlets and can be identified by its ".msp" extension. The mathlet and the extension activate the Mathematica kernel through action of J/Link and the Servelet engine. The computation is then done in the server and not the client computer. The result is then sent to the client's browser where the result is displayed.

Development of the Reusable Concept Object Modules Work

In addition to the facilitator sites we have designed a variety of reusable concept object modules. These concept object modules are initially produced as Mathematica notebooks. Then, most of the Mathematica instructions are stripped out and the remaining part is partitioned into small segments. These segments are then stored with the appropriate extensions so that IBM's techexplorer will interact with them when they are loaded into the browser. Before finally uploading to the server, linkage code is added to each partition so that the user can communicate directly with the facilitator sites if desired from each site page of each object module. These concept object modules are accessed from the main pages for the different disciplines as was true for the facilitator sites. For instance, when on the linear algebra main page, the student can click on the Matrix Operation link and transfer to a set of web pages that provide detailed illustrations of different matrix operations. These explanatory pages have text, graphics, animations, and in-line executable instructions that allow on the spot computations. As another example, the calculus main page has a link to a concept object module that discusses line integrals. The 38 pages of this module include explanatory text, examples, graphics, animations, dynamic animations, practice exercises with executable instructions, and the solutions to the exercises. The object modules use IBM's Techexplorer to interface with the Mathematica kernel. This inexpensive software makes possible inline executable instructions. Techexplorer also understands MathML and therefore allows the transfer of mathematical symbols to the user's screen. So far we have developed six of these concept object modules.

Alternatively, and an approach now under investigation, is to use Word 2000 with MathType 5.0 to develop the object modules in html. Then we add the needed links to special executable instructions and the facilitator sites. This approach holds promise and does away with the need for a third party program, techexplorer.

Evaluation Results

The facilitator and object module sites have worked well and have been given positive evaluations by our students in linear algebra and calculus 3. Out of 45 evaluations in linear algebra, there were some suggestions as to how we could improve our sites but there was no negative feedback. I have included several specific student comments that represent a cross section of the over all student response to our web site.

Linear Algebra Evaluation

- "I love the website. I've used it for homework & study in this class & in Programmer Algorithms (Note: this is a senior level computer science course). It's faster and more user friendly than Mathematica and you can access it via the Internet. The visual graphics make the graphs come alive and show us what is happening in reality. Being able to move them in 3D fashion is a great plus."
- "I thought that the website was of great help. I was able to log on quickly and without hassle. I like that I was able to access it from home, anytime I needed to. The website was simple to use. I did not have to spend hours trying to figure it out, like some websites out there. The graphics on the computer helped me to see what was happening. I am a visual learner. Most professors do not spend the extra time developing projects like these. I found it very helpful."
- "The math web site helped me out numerous times. It is so refreshing to be able to check your answers. I could get a better understanding of how to do assignments thru this web site. I would highly recommend this web site to anyone who is in any math class. The site boosted my average in the class by at least one letter grade."
- The web site was very useful in helping me to understand this course. It was very easy to use and I feel contributed to my knowledge in this subject. The visual graphics you used during class really helped me "see" what was going on rather than viewing a 2-dimensional picture in the text book."
- "The website is Awesome! I was going to ask if we came back next semester an asked for the password if we could continue to use it for reference! I would love to see other math areas integrate COSC techniques into their classes. The graphics brought the concepts to life! It was so great to be able to see the orthonormal vectors in 3-space. It helped my understanding tremendously!"Great website, I don't know of any other

helped my understanding tremendously!"Great website, I don't know of any other website that offers so many different things. It's easy to use, very user-friendly and everything that you need is there. —Keep it up."

Conclusion

When a student reads the explanation of a mathematical concept in an object module, he or she might be requested to plot, differentiate, integrate, or take a limit of a function, or perform regression analysis or any number of other activities. All of these operations, plus many others, are now interactively possible using an adaptation of the new technology described in this paper. This freely open interactivity permits student exploration and thereby opens a window that infuses education with the excitement of discovery. It has been proven repeatedly that high interactive learning modules, especially those with high visual content result in significantly improved learning gains [1, 2, 3, 4, 5, 6, 7, 8]. Students can investigate ideas of their own to determine how changes may affect the outcome of a calculation or of a graphical picture that they might never attempt by hand. The interactive functions can be defined for a concept in any course in science, mathematics, engineering, or technology. Then the text, graphics, etc. are developed to describe the concept for the appropriate subject discipline. In the concept object modules in-line executable instruction are integrated into the text, providing a highly interactive teaching tool. If students work in groups using the computer, this approach will help foster more collaboration.

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Biographical Sketch

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The Evolving International Role of a Research University: An MIT Perspective

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The role of a research university today, compared to fifty years ago, now needs to be aware of the global picture and interconnectedness. If tertiary education leads to greater understanding internationally and empowers students, what role should a research university play? At MIT, several programs are currently underway that address this question.

MIT offers some distance learning programs but does not offer degrees solely through distance learning.[i] There are other universities that concentrate on that area. MIT is interested in researching new educational technology such as interactive online tutors (e.g. PIVoT[ii]), and initiatives such as the Open Knowledge Initiative and Stellar[iii]. MIT is also looking at new pedagogies that are goal-oriented, non-linear and experimental and new ways of collaborative learning such as the Technology Enabled Active Learning project (TEAL[iv]).

MIT employs many different models for distance learning or technology-enabled education as part of teaching tools that have global dimensions. MIT provides outstanding content by its faculty and innovative research in ways of teaching and learning.

MIT Models of Global Learning Initiatives

Publishing Model

The latest project that has received much publicity is OpenCourseWare. This is a project to put MIT course materials up on the web free and open to the public. This is not distance learning, however, as no interaction occurs between teacher and learner, but it is an invaluable resource for students and teachers across the globe. "The idea behind MIT OpenCourseWare (MIT OCW) is to make MIT course materials that are used in the teaching of almost all undergraduate and graduate subjects available on the web, free of charge, to any user anywhere in the world. MIT OCW will radically alter technology-enhanced education at MIT, and will serve as a model for university dissemination of knowledge in the Internet age. Such a venture will continue the tradition at MIT and in American higher education of open dissemination of educational materials, philosophy, and modes of thought, and will help lead to fundamental changes in the way colleges and universities engage the web as a vehicle for education. MIT OpenCourseWare will provide the content of, but is not a substitute for, an MIT education. The most fundamental cornerstone of the learning process at MIT is the interaction between faculty and students in the classroom, and amongst students themselves on campus."[v]

MIT Learning Networks

Learning networks are used in many different programs at MIT and are defined as spatially dispersed communities connected together by a variety of communication technologies where everyone is a learner and a teacher, and many opportunities exist for collaborative research[vi]. Examples of these partnerships include the Singapore MIT Alliance (SMA) and the Cambridge MIT Institute (CMI).

Using asynchronous and synchronous technology as well as on-campus immersion, the Singapore MIT alliance is MIT's largest distance learning project and is an innovative engineering education and research collaboration between the National University of Singapore, Nanyang Technological University and MIT (http://web.mit.edu/sma).

This model can best be described as follows: "At MIT, we are using the broader bandwidth Internet2 to deliver five new professional masters degree programs to students on our Cambridge-based campus and to students 12 time zones away in Singapore. But beyond formalized distance learning, SMA involves collaborative faculty research, student exchanges and a wide variety of activities that result in a type of global campus spanning the Pacific".[vii]

Current MIT Initiatives From CAES to Reach Global Audiences

MIT is a community of over 10,000 students, faculty and staff. In 2001-2002, MIT's international student population comprised 8% of undergraduates and 38% of graduate students from 109 different countries. MIT students need to be prepared to enter a global economy and MIT is connected to research institutions all over the world. The MIT International Science and Technology Initiatives (MISTI), for example, have cultural exchange and global programs that have reached thousands of students worldwide. This paper can only touch on a few of the current and planned initiatives from MIT and the focus of this paper will be on the initiatives of CAES – one of MIT's main centers of technology enabled education and distance learning – that collaborates with other MIT schools and departments.

Using some of the models described above, over the last year, CAES has increasingly focused on disseminating its knowledge globally particularly to developing countries through distance learning. The reasons for this outreach are several: the world is transitioning from an economy based on manufacturing and natural resources to one that is more focused on information and knowledge; developing countries have become very active in web based distance learning (e.g. Pakistan, Uzbekistan, Tunisia, Algeria, Jordan, South Africa, Tanzania, Iran); and technology can increase access to larger audiences.

The following three projects are the latest initiatives of CAES (http://www-caes.mit.edu/index.html) :

MIT World

One of the most successful projects of CAES, ***MIT World*** follows a similar model of OpenCourseWare to bring content to global audiences. Although there is no interactivity, intellectual content from MIT can now be seen from Mali to Massachusetts – or indeed by anyone with a computer, Internet access and RealVideo player. ***MIT World*** is a free, open, video streaming web site that currently provides on-demand video of significant public events at MIT (http://web.mit.edu/mitworld). It is the venue for the MIT community, alumni, and the public at large to have access to video taped events at MIT. Content includes: 2001 Nobel Prize in Physics Lecture by Wolfgang Ketterle on "The Coldest Matter in the Universe" and Nobel Laureates David Baltimore, John Hume, Charles Townes, Franco Modigliani, Paul A. Samuelson, and Robert M. Solow. Lectures cover a broad range of subjects including the arts, economics, politics, computer science and management.

Africa Virtual University

More than 190 students from eight sub-Saharan African countries (Ethiopia, Ghana, Kenya, Mozambique, Rwanda, Tanzania, Uganda and Zimbabwe) participated in an MIT course without leaving their continent, through a partnership between CAES and the African Virtual University. Using asynchronous and synchronous methods, CAES offered a six-week curriculum loosely based on MIT's Introduction to Computers and Engineering Problem Solving (1.00), which teaches the Java programming language. The resulting course, Java Revolution, was uniformly distributed regardless of equipment and bandwidth.

Thirteen learning centers participated, and we expect to enroll more African students in MIT courses in the future. Java Revolution featured videotaped lectures via satellite, a web site for course materials, e-mail moderated by teaching assistants, and two live videoconferences.

Two Interactive Web-Based Courses

With financial support from Pfizer, CAES and the Harvard MIT Division of Health Sciences and Technology have created the first two in a series of free, interactive web-based courses for healthcare professionals: "Good Practices in Clinical Research" in Spanish and English primarily for physicians in Latin America; and Fungal Infections: Virtual Grand Rounds as a response to a disease that is endemic in many developing countries (http://figrandrounds.org/fi/index.html)

Learning International Network Consortium (LINC)

The Director of CAES, Professor Richard Larson, is the Principal Investigator for a new project that we hope will receive funding this summer and will begin its first year of planning by September 2002: the Learning International Network Consortium (LINC). Using the train-the-trainer model, CAES plans to bring world-class educational opportunities through distance learning to those who have not had access to quality education.

LINC is an MIT-managed initiative aimed at the creation of a global community of scholars and practitioners who seek to use modern computer and telecommunications technologies to increase the reach and impact of higher education especially in developing countries. LINC will be a voluntary e-learning network and resource center connecting and building upon individual national and international efforts currently underway. Using e-learning and related technologies, LINC will empower educators working in their own country to bring higher education to a wider population. Students of current 'brick and mortar' university programs will join faculty members and others in collaborative research and development to help create positive change. Educational content will focus primarily in the areas of science, engineering, management, humanities, arts and social sciences.

The key purposes are to empower organizations within countries, especially developing countries, to design, create and operate top quality higher-education e-learning systems; to share educational materials, exercises and courses for the mutual benefit of learners across all participating countries; and to become the top tier community of scholars and practitioners whose focus is technology-leveraged higher education internationally.

The Consortium will be assembled from diverse efforts now operating within many developing countries, utilizing best pedagogical practices whenever possible. LINC will bring world-class educational opportunities to those who do not have access to quality education by partnering with and training teachers in developing countries, who will then work within their own country to increase outreach. At the same time, those in developed countries will have the opportunity to learn about different cultures through the educational networks established by LINC. Members of LINC will be colleges and universities, not-for-profit organizations, foundations, private corporations and selected governmental agencies. Expanding and sustaining e-learning efforts throughout the developing world will be the primary focus of LINC. The reasons behind the initiative include:

- ❖ Developing countries are likely to fall further behind the developed world in terms of economic growth and prosperity, without some feasible system for educating their youth. This in turn could lead to larger inequities in the distribution of the wealth of nations and potentially act as a destabilizing factor in world events.

- ❖ Establishing a two-way exchange of content between the developing regions and the developed world will enhance mutual understanding and provide a rich source for cultural studies.

Some of the specific goals and services of LINC are as to:

- ❖ Host an annual international conference on "e-Learning in the Developing World" that would share "lessons learned", present best practices in e-learning and project plans for future years.
- ❖ Design the management and membership protocols and processes of LINC, leading to a sustainable and readily growing organization.
- ❖ Create and distribute a variety of educational content both intra-country and across national boundaries.
- ❖ Using the train-the-trainer model, design systems and utilize technology to leverage scarce teaching resources within and between countries to reach a maximum number of learners. LINC would provide resources that would focus on training those who in turn would train others in the technology, pedagogy and business of e-learning.
- ❖ Create and maintain an easy-to-use web platform for communication among LINC participants and for assisting in the hosting of educational materials.
- ❖ Host a complete searchable repository of international e-learning projects and activities that are underway, so participants can identify potential partnerships and other synergies.
- ❖ Establish a global network of learners to advance the sharing of skills and raise economic standard of living.
- ❖ Raise the educational level of population globally.
- ❖ Undertake collaborative research and development, involving faculty and students at existing institutions of higher education, to further this effort.

Conclusion

CAES plans to leverage its educational technology projects and direct much of its attention globally to developing countries.[viii] Distance learning and technology-enabled education will allow increased access to tertiary education -- a scarce resource in many countries.

Biographical Sketch

Janet Wasserstein joined CAES as Communications and Development Officer in March 2001 and has responsibility for external affairs, resource development and special projects. She has worked at the Massachusetts Corporation for Educational Telecommunications (MCET) and Harvard Art Museums. Before moving to Boston from London she was Cultural Affairs Administrator at the American Embassy in London where she organized programs, lectures, and conferences, and initiated the Small Grants Program for academics. She obtained her B.A. through distance learning from the UK Open University and a Masters in Management in Human Services from the Heller School, Brandeis University.

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[i] MIT offers: one degree (Systems Design Management Program) through distance learning that requires one semester on campus; off campus computer and engineering for credit graduate certificate courses through CAES' Advanced Study Program; and short non credit courses through the CAES National Technological University partnership.

[ii] For details about PIVOT see http://www-caes.mit.edu/research/pivot/index.html

[iii] For details see http://web.mit.edu/amps/projects/index.html

[iv] For details about TEAL see http://www-caes.mit.edu/research/teal/index.html

[v] OpenCourseWare Fact Sheet http://web.mit.edu/ocw/ocwfactsheet.html. See also Report of the President 2000-20001 http://web.mit.edu/president/communications/rpt00-01.html.

[vi] Larson, R. C., "MIT Learning Networks: An Example of Technology-Enabled Education." September 1997. http://www-caes.mit.edu/people/larson/learningnetworks.pdf

[vii] Larson R.C. and Strehle G.P. (2002) *Edu-Tech: What's a President to Do?* Lawrence Erlbaum Associates

[viii] A discussion group from a virtual conference on *The Future of Technology in Developing Countries* connecting over 260 participants came up with the following findings: cultural and religious issues must be considered before any new educational strategy is implemented in developing countries; radio is a basic communication tool that serves education especially in areas where there is lack of appropriate bandwidth; and while English is widely used, one must use sensitivity to language issues and that many have difficulty with English as well as accepting new educational technology tools (see *www.col.org*)

Experiential Learning Activities in Distance Education: Challenges and Examples

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One of the greatest challenges faced in developing and teaching a course for Distance Education Delivery is to actively engage students with the course material so that their learning is maximized. This paper explores the potential for experiential learning activities in distance education.

Common themes in descriptions of experiential learning include the centrality of human experience as a valued source of learning, the potential for every experience to be a learning situation and the central role reflection plays in learning (Burnard, 1993, 1990, 1989; Kolb, 1984,; Pfeiffer & Goodstein, 1982). Three characteristics of experiential learning that are relevant to a framework for course development and delivery include: experiential learning as an attitude toward learning - questioning, problem posing, testing ....; experiential learning as a form of knowledge, as legitimate as propositional knowledge (textbook) and practical knowledge (knowing how); and experiential knowledge as learning through experience and learning from experience (Garratt, 1983; FEU, 1983; Keeton & Associates, 1976; Dewey, 1938).

Experiential learning cycles can be used as a basis for planning activities. For example, Burnard (1989) describes a cycle involving five stages: brief theory input, concrete experience, reflection, generation of new knowledge and application. An illustration from an assignment in a course developed and taught by the author shows how this cycle can be applied: students receive a brief explanation of spiritual assessment (Stage 1); they complete an audiotaped spiritual assessment with a 'client' (Stage 2); through a series of questions they are stimulated to reflect on this assessment - their thoughts, feelings, appraisal of the assessment questions (Stage 3); they discuss the new knowledge generated by this activity in a paper (Stage 5). The same cycle can be applied to the educator as she reads/listens to and reflects on the student's presented work.

In addition to assignments, experiential activities can involve the use of reflective questions and exercises, simulations/games, and videotaped scenarios. In all cases, if these are being evaluated for grading, the quality of the reflections should be the focus of grading, not the activities in and of themselves.

Challenges in designing and delivering experientally oriented activities for distance education include: fitting such activities within the curriculum framework of the program/course; planning activities which can receive their maximum benefit from distance education technologies; self-reflecting on one's own philosophy of teaching/learning to ascertain if it is consistent with the philosophical underpinnings of experiential learning; and evaluating experiential learning activities in a relevant and meaningful manner.

Experiential learning activities can greatly enhance learning for both student and educator. Such activities promote a partnership stance between the two. They increase student awareness, are real/whole/interactive, can be light-hearted and fun, and foster critical thinking. It is important to remember, however, that some students may find such activities to be uncomfortable or threatening and may prefer other means of learning.

In being involved in experiential learning, we may confidently agree with Dodo in Alice in Wonderland. When Alice asked the animals and birds that had fallen with her into the pool of tears how to get dry, the

Dodo told her that a caucus race would be the best thing. "What is a caucus race?" asked Alice. "Why," said the Dodo, "the very best way to explain it is to do it!"

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Biographical Sketch

Doreen Westera is an associate professor at th School of Nursing, Memorial University. She has been involved in nursing education for over twenty years, teaching in the areas of community health nursing, health promotion, counselling, and spiritual dimensions of nursing practice (the latter two courses by Distance Education mode). Professor Westera has also developed four videos which are currently being distributed in Canada, United States, Australia and the United Kingdom: Spirituality; Nurses and Spiritual Care; Spiritual Assessment; Community Assessment. Additionally, she is a Certified Canadian Counsellor and has a small clinical practice at a community agency.

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Are You Practicing What Research Is Preaching for Distance Learning?

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Introduction

Web-based distance learning environments are growing at an exponential rate but research studies to support the developments are limited. For example, when we review the research on reading and comprehension there are volumes of research studies and many methods that have been tried and discarded or adopted, many that have proven to be failures after long-term use and the research continues today. However, when it comes to web-based distance learning environments there appears to be an over emphasis on the fact that there are no significant differences between media presentations (Kozma, 1993). The research that is driving the development seems to be fed by the designers of web-based course management systems and those who are in awe of the technologies and their applications. So what we have today is a combination of research on how effective discussion boards are, what you can do with simulations, how many people respond in chat or bulletin boards, is there a difference in what students contribute, etc.

Research has shown that computers do leave a lasting impact—a cognitive residue on its users (Wijekumar & Jonassen, 2002) and a web-based learning environment may also be expected to do the same. This paper begins with an overview of current web-based learning environments and then reviews research studies in the areas of learner variables, tasks, and tools that should encourage more discussion and research in web-based distance learning environments.

Current Trends in Web-Based Distance Learning Environment

The current crop of web-based course management systems (e.g., WebCT, Blackboard, Angel) all provide similar functionality and they appear to drive the content, presentation, interactions, and assessment in web-based distance learning environments.

Research Highlights to Inform Distance Learning

There is some research that has supported the expansion and use of the web but there are some that should concern us. The research that supports the use of the web includes research on navigation (Barab et al. 1998; Montgomery & Stevenson, 1998), collaboration, problem-solving skills using Cognitive Flexibility Theory (Spiro et al., 1989), hypertext, and communication. The specific findings of these studies should influence our design of web-based learning environments. The following summary of research is divided into areas related to the Learner, Task, and Tools.

Learner

Learner variables and individual difference like field independence/dependence, prior knowledge, intellectual level, motivation, interest, self-regulation, and ability are critical components for any effective learning to occur. Tobias (1989) suggests that computer adaptive learning environments cannot reach every type of learner in every type of situation. This suggests that learners should be oriented to learning on the web and be trained to take address their individual learning needs and self-regulation.

Table 1. A *summary of These Tools and How These Tools Affect the Courses.*

Functionality of Tool	Manifestation in Course	Concerns
Documentation	Syllabi	Do the students read the syllabus?
Linked Web Pages	Course Notes	What do they read, when do they read it, and how much will they remember, and what are they using these notes for?
Bulletin Boards	Questions to answer Discussions	Who is posting and what are they posting? Are they reading the postings? Are the discussion activities relevant to their learning?
Chat Rooms	Discussions	Are these social gatherings or business meetings?
Quizzes	Timed Multiple Choice, T/F Tests Essays	Are these the only methods of assessment that are possible and should they be the only means of assessment in web-based learning?
Multimedia and other tools	Pictures, images, movies, etc.	Are these seductive details or relevant to the learning?

Learner control of their learning has shown mixed results and is very troubling. For example, even though Cognitive Flexibility Theory has shown improvement in learning of complex skills research has shown that students perform well only when they traverse all the links provided in the learning environment (Jacobsen, 1993; Jacobsen et al. 1995). In similar studies, students given the control of their learning chose not to traverse all the links and their performance was not improved (McKeague, 1996).

Learner control related to self-regulation and affordances has also provided mixed results. The self-regulated learners with good metacognitive skills know when and how to exert there control and monitor they learning, many others do not have that skill (Roth, 1995).

Task

Even though hypermedia may be similar in structure to the contents of knowledge structures in humans the same media can result in the construction of frail knowledge networks which may be caused by a lack of mindful engagement, surfing the web, and interconnected network of nodes (Salomon & Almog, 1998). Salomon & Almog described the possible "shallow associationist cognitive networks" that may result from students surfing the web and how these "networks would consist of trivial, frail connections, having no intellectual merit" (p.235).

Collaborative learning research is mixed and the most successful collaborative activities are explanation giving (Webb, 1995) and argumentation (Wiley & Voss, 1999). Additionally, collaboration requires a group of people to adapt to working together as well as accomplishing a goal.

Tools

Seductive details in the form of unrelated explanations in the text that signal the wrong schema for the learner, images that take attention away from important information, and other distractions like animations may cause more damage to learning (Harp & Mayer, 1998).

Conclusion

As the selected research reviewed in this paper shows, there are many issues and concerns that are not currently being addressed by the web-based course management systems and the designers of web-based learning environments. We need to dig a little deeper into the existing research and find more information that can inform us to improve web-based distance learning.

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Verifying the Learner in Distance Learning

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Introduction

Learners who receive training in the workplace, at their residences, or other sites outside the traditional classroom increasingly rely on the use of the World Wide Web. Much of this training occurs in the absence of an instructor, both physically and temporally. Reliance upon such asynchronous distributed learning systems increases the odds of various forms of training compromise, such as obtaining questions beforehand or enlisting a proxy for test taking in non-proctored, Web-based learning environments. How can it be determined whether the student online is the intended learner, particularly during individual testing?

To begin to answer this question, a workshop titled "Training on the Web: Identifying, Authenticating, and Monitoring Learners" was conducted in November 2001 at Carnegie Mellon University. The workshop was sponsored by the Army Training Support Center, which recognized that the increased use of computer technology for distributed learning systems might lead to future problems with online training and testing. There currently is no definitive evidence that compromise during online testing is a problem in the Army. However, the increased use of distributed learning coupled with reports of increased frequency of cheating among high school students (DeWan, 1994; McCabe, 2001) and college students (Argetsinger, 2001) is reason for concern. Most of the information gathered during the workshop is not specific to the military—it can also apply to educational and corporate settings. This paper presents a synopsis of the findings and recommendations.

Methodology

The workshop included presentations by experts and concluded with a brainstorming session during which the participants generated potential solutions. Thirty-one individuals from industry, academia, and government attended. The presentations covered the following topics: a) training and testing design, where a course and its assessment can be designed to diminish the possibility of cheating; b) test security, explaining how the Educational Testing Service prevents and detects cheating; c) Public Key Infrastructure (PKI), a system to authenticate and secure transmission of information across the Internet using asymmetric encryption; d) biometrics, the process of identifying people based on their physical, personal, and/or behavioral characteristics; and e) military legal issues regarding training compromise, where cheating is a failure to follow a rule or regulation and, therefore, can be treated as misconduct. After the workshop, an advisory panel met to discuss final recommendations.

Findings and Recommendations

Based on the presentations and discussions, recommendations were developed which are presented here in no particular order of merit. The recommendations are meant to function as general guidelines. The usefulness of any particular solution depends on the training situation. For example, the use of biometrics for identifying a learner might be useful for a course that covers sensitive material or courses that lead to some form of certification, but it may be an excessive measure for a course that is merely a refresher of basic general knowledge. Also, there may be privacy concerns and policies specific to an organization regarding the encoding and storage of individual biometric data.

Affirmative Obligations

Affirmative obligation statements involve presenting a statement that details appropriate and inappropriate behavior during a test. Learners are required to sign the statement or click on a "submit" or "accept" button on the monitor, as in the generic example below. Affirmative obligations assist in establishing that a transgression occurred.

> In accordance with (cite authoritative reference), I certify that the answers I submit are the result of my own work and that I have not had access to copies of answer sheets or solutions from others.
>
> Pressing the submit button to process your examination is your assertion that the above statement is true.
>
> Submit   Clear

Figure 1. A generic affirmative obligation statement adapted from the U. S. Army.

Biometrics

The Defense Biometrics Management Office described the four steps in the process of using biometrics for identification: capture, process, enroll, verify. The capture process is where the device obtains the biometric data (e.g., fingerprint, iris image, handwriting sample). The data are then processed and encoded to an easily storable form. This encoded data can also be encrypted to provide a higher level of security. The enrolling procedure occurs the first time an individual's biometric data are obtained and stored. The verification procedure occurs when an individual's biometric data are compared to stored data to determine if a match has occurred. The technology was demonstrated during the workshop.

There are some concerns with biometrics. For example, the technologies are not completely foolproof. There are two types of errors that can be made. The first is a false acceptance, when the biometric data of a confederate is accepted. The second is a false rejection, when the correct person is rejected as not matching his/her biometric profile. To lessen the chance for these errors, biometrics can be used in conjunction with a password, or more than one biometric can be used at a time to identify a person. The most common and promising biometric technologies are fingerprints, iris patterns, facial composition, and handwriting.

Fingerprint identification. This biometric identifies between 15 and 20 distinct minutia points (e.g., end of a ridge, joining of two ridges) in a single fingerprint, and then the distance and angle between the key points are measured. The fingerprint is thereby encoded as vector measurements between these points. The actual fingerprint is not stored but rather the polygon that connects the distinct characteristics of a fingerprint; thus, the fingerprint image cannot be duplicated from the encoded set of vector measurements, increasing security.

Iris patterns. Scanning a person's iris (the colored part of the eye surrounding the pupil) is a method that is promising, and may be a preferred method in the future. In this procedure, the pattern of radial marks and their relative position in the iris are obtained. The iris pattern remains identifiable, even though the size of the iris changes as the pupil changes due to lighting.

Facial composition. The facial composition method identifies points on the face (i.e., eyes, nose, mouth) and then measures the relative distance between these key points. The relative distance and angles between these facial components can be encoded in a similar manner as fingerprints and iris patterns.

Handwriting analysis. With current technology, handwriting analysis involves more than just the visual shape of the signature. The speed and pressure used to create the signature are measured in addition to the shape of the signature. The inclusion of speed and pressure make this biometric much more difficult to forge than just the visual aspects of a signature.

There are some other forms of biometrics, such as retinal images, hand geometry, vein pattern on the back of the hand, and ear shape. The technology for these forms of biometrics either are still emerging and/or may not be used due to the invasive nature of the measure. Cost is also a factor; to secure a computer with a fingerprint system can cost approximately $100 and an iris scanning system approximately $250. With further development, these prices are likely to fall in the future. Of the various biometric technologies, fingerprint scanning is the most mature method based on cost, reliability, and usability. During the workshop, the Center for Identification Technology Research, sponsored by the National Science Foundation, presented on future biometric technology, such as perspiration patterns, template aging, and body odor.

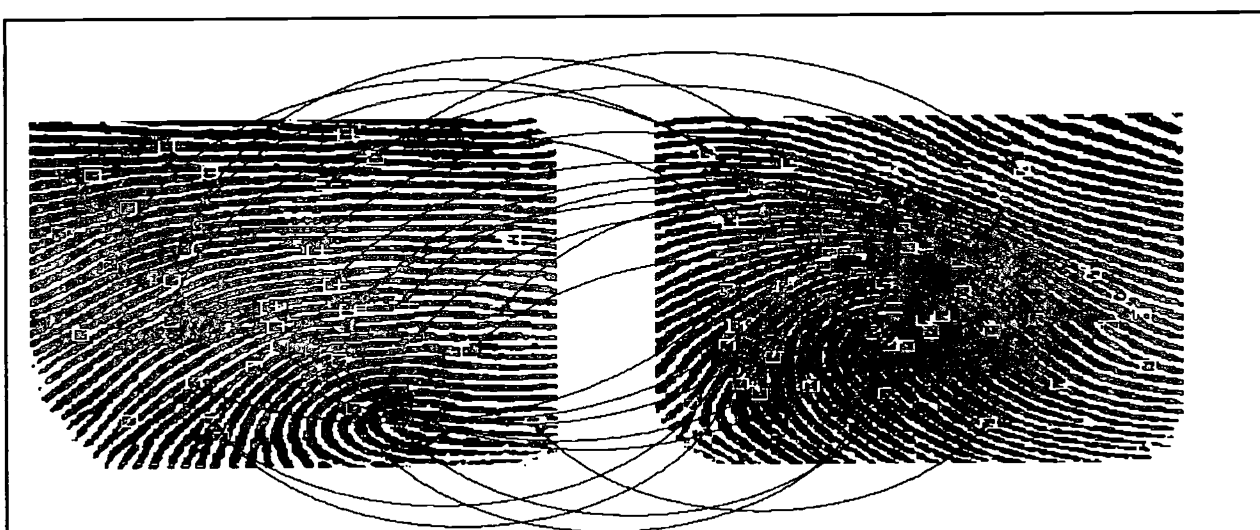

Figure 2. Fingerprints from the same finger, but taken at different angles. The lines link corresponding minutia points between the fingerprints.

Proctoring

There are two types of proctoring: live and virtual. Live proctoring requires that students go to a specific location for monitoring by another person; virtual proctoring involves using technology to monitor students at remote locations.

Live proctoring is expensive but hard to beat for high stakes testing situations where the consequences of cheating and not knowing material are severe. For example, it is imperative that a helicopter mechanic is aptly qualified to identify and repair faulty parts. There are several companies that provide live proctoring services.

For virtual proctoring, the advisory panel recommends using a layered approach depending on the critical nature of the test. Examples of how this layered approach may work are listed below.

- With high stakes tests, video monitoring and a biometric measure such as iris scanning may be used.
- For medium stakes tests, a single biometric measure may be acceptable.
- For low stakes tests, no proctoring measures may be needed.

Alternatively, or in addition to biometrics, students can be asked biographical questions (e.g., last 4 digits of social security number or mother's maiden name) during testing to help verify their presence. The final virtual proctoring recommendation is to track keystrokes and the web sites visited by the test taker. This can provide evidence if cheating occurs, and can also serve as a deterrent.

Public Key Infrastructure

The use of PKI limits unauthorized access to tests and assures that materials are not altered en route. As PKI encryption becomes more common, the ease of incorporating the technology into distance learning courses will increase.

Test design

The principal test design recommendation is to use performance-based testing, where the student must demonstrate performance proficiency. Successful completion of a performance-based test indicates that the test taker is able to perform the task, and pre-knowledge of test content becomes almost irrelevant. Other recommended design techniques are to randomize test items and use multiple forms. This reduces the utility of answer keys from previous tests.

The final set of test design recommendations involves setting limits. First, appropriate time limits can be set so test takers do not have time to complete the test plus look up answers in reference materials. Additional limits include restricting the number of times that a student can take a test and disabling computer "print/capture" options to reduce the possibilities of sharing test items with others.

Conclusion

It was the advisory panel's basic assumption and belief that learners generally will "do the right thing." The solutions, however, are meant to level the playing field, dissuading potential cheaters while not burdening those who never intend to cheat. The purpose of the study was to identify remedies to compromise in Web-based training and testing environments that can be implemented without hindering learning and prior to any problems arising

The overall recommendation is a layered approach based on the criticality of the test under consideration. In some situations the use of biometrics, live proctoring, and encryption may be warranted, while in other situations only the use of an affirmative obligation statement may be appropriate. The level of security would depend on multiple variables determined by a course administrator and organizational policy.

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Instructor and Student Perceptions/Attitude on the Design of Instruction for the Internet and ITV

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Introduction

Background of the Problem

Instructional design is aimed at improving instruction to ensure the learning of the individual. "Systematically designed instruction can greatly affect individual human development" (Gagne, Briggs & Wager, 1992, p. 5). Teaching at a distance, whether synchronous or asynchronous, requires the designer to place greater stress on the initial planning phase. Although distance education has become a viable alternative or addition to traditional education, there is little research on the instructor and student perceptions of the design of the instruction when the two major distance education technologies, the Internet and Interactive Television (ITV) are used. Therefore, additional research in this area has become the focus of this study.

Purpose of the Study

This study examined the perceptions of both instructors and students at the University of Northern Iowa, Cedar Falls, Iowa on the need for the instructional design process used when designing instruction for two major distance education technologies-- the Internet and ITV.

Significance of the Study

It is important to gain instructor and student perceptions/attitude on the design of instruction for the Internet and ITV. The information gained from this study provides an understanding of how the use of the Internet and ITV affects the design for instruction in distance education courses. The data acquired from the study provides administrators and instructors who are involved in distance education with decision-making information related to instructional design to enhance the distance teaching process. In addition, this knowledge can be used for the distance education program planners and educators to broaden the scope of effective learning experiences available to distant learners and to improve the quality of the learning experiences of the distant students.

Theoretical Background

There is very limited literature resources that address the issue regarding instructor and student perceptions of designing instruction related to using the Internet and ITV in distance education. Teaching at a distance requires greater stress on the initial planning phase (Simonson, Smaldino, Albright, & Zvacek, 2000). To secure the success of the planning, distance learning faculty should pay attention to some key issues regarding designing instruction at a distance.
According to Simonson, et al. (2000) the following issues need to be considered:

1. Who are the learners? The instructors need to have knowledge of general learner characteristics. This knowledge about the learners can help the instructor handle the separation of instructor and students successfully.

2. What is the essential content? The content of a course should reflect where this content relates to the rest of the curriculum. Instructors need to consider the nature of the content, and the sequence of information. Generally, the scope of the content for a course needs to be sufficient to ensure that the learning experience will result in desired outcomes. The identification of goals and objectives for instruction is necessary.

3. What teaching strategies and media should be used? Learner participation is important when distance educators decide which strategy or strategies to use. The instructor needs to think about selecting those instructional strategies that enable all the learners to engage actively in their own learning.

4. What is the learning environment? To completely understand distance education, one must examine not only the technology, but the learning environments that are created (Herring, & Smaldino, 1998).

5. How do you determine the quality of the instruction? Since so many different variables can influence the effectiveness of the quality of instruction, it is important that the instructor reflect on distance teaching practices. Formative evaluation is necessary for successful distance teaching/learning experiences.
6. The distance education instructor needs to address general learner characteristics, the nature of content, teaching strategies and media selected, the learning environment and evaluation. These are important factors related to designing instruction at a distance. Based on those factors, the study described in this paper reports on the perceptions of both instructors and students on the design of instruction when conducted via the Internet and ITV by focusing on four factors or areas: (1) the Internet and interactive television technology characteristics, (2) content organization, (3) learner considerations, (4) evaluation.

Statement of Research Questions

Surrounding those four areas, research questions are generated as follows:

1. What are UNI distance teaching instructor and distance learning student perceptions toward technology characteristics, content organization, learner considerations, and evaluation?
2. Is there any significant difference in perceptions of technology characteristics
3. between the UNI distance teaching instructors and distance learning students involved in teaching or learning the courses offered at UNI?
4. Is there any significant difference in perceptions of content organization
5. between the UNI distance teaching instructors and distance learning students involved in teaching or learning the courses offered at UNI?
6. Is there any significant difference in perceptions of learner considerations
7. between the UNI distance teaching instructors and distance learning students involved in teaching or learning the courses offered at UNI?
8. Is there any significant difference in perceptions of evaluation between the UNI distance teaching instructors and distance learning students involved in teaching or learning the courses offered at UNI?

Methodology

Participants

Eight instructors with ITV and Internet teaching experience and eighteen distance students enrolled in an ITV/web course were chosen to participate in this study. A mailed self-completion survey was distributed along with an introductory letter attached to the questionnaire. A total of seventeen students and six instructors returned their questionnaires by the deadline date. Among the six instructors, four were from the Department of Curriculum and Instruction, one from the Department of Educational Psychology and Foundations, and one from the Department of Science Education. The seventeen distance students were all from one graduate level Instructional Design course. Among the 23 returned surveys, three were not used in the study because one instructor only used ITV and two students' surveys contained missing important demographic data.

Instruments

The survey used in this study consists of two questionnaires, one for instructors and other for students. The two questionnaires were generally composed in the same way: both containing 26 items in which the same issues are addressed (except for in 23 and 24 items). The questions found in the two survey instruments were developed from issues and questions arising from the initial review of literature. The research questions served as guideposts in developing the specific items.

The four areas investigated in the questionnaires are identified as follows: the Internet and Interactive television technology characteristics being included in the first ten questions; content organization being identified by nine questions; learner considerations being defined in three questions; evaluation being covered by two questions. Two open-ended questions asking about the major strengths and weaknesses of using the Internet and ITV for teaching and learning the content are used to provide some detailed information to complement the UNI instructor and student perceptions related to those four areas investigated.

Validation of the instrument. Before doing this study, a focus group was used to test the research instrument to provide another source of information and a second data base. This group consists of one professor and five students in a research course in Fall, 2000. Since surveys are expensive and time-consuming, it is important to ask the right questions and to ask them in the right way. By conducting this focus group before initiating a survey, the researcher could formulate the survey questions more precisely. This focus group also helped the researcher to understand the prospective respondents' general perspective on the issues to be discussed, frame of reference to be used, and way of thinking and typical vocabulary when handing the topics at hand. The researcher applied the input provided by this focus group to the construction and revision of the two questionnaires.

In this study, a five-point Likert scale ranging from strongly agree to *strongly disagree* was used for the participants to answer the structured questions of the two questionnaires. Open-ended questions were also included in the questionnaires for more information about perceptions of strengths and limitations of the technologies.

Procedure

The five distance instructors and 15 distance students at UNI who participated in the study were given two weeks to complete the questionnaire and returned it.

Data Analysis

Both quantitative and qualitative methods were used to analyze the data. The data regarding the structured questions in the two questionnaires was statistically analyzed using SPSS 9.0 statistical software package. Means and standard deviations were calculated for each statement on the survey instrument. In addition, an overall cluster mean was calculated for each of the four cluster areas. An independent-samples t-test analysis was conducted on each of the four cluster areas to determine if there was a statistically significant difference that existed between the instructors' and students' perceptions of using the Internet and ITV for the design of instruction. An alpha level of .05 was used to determine significance. A coding system which a qualitative study usually applies was used to analyze the data regarding the open-ended questions in the two questionnaires which discuss the major strengths and weaknesses of using the Internet and ITV for teaching and learning the content. Some important themes were generated.

Results

Research Question 1 intended to determine the overall group means for each cluster of questions (see Table 1). The results based on mean scores among the two groups dealt with four clusters: technology characteristics, content organization, learner considerations, and evaluation. Generally, student cluster mean scores were rated lower than instructor cluster mean scores.

Research Questions 2, 3, 4 and 5 intended to determine if the differences found for the four cluster area means between two groups were significant at the .05 level. An independent-samples t-test revealed that the student group rated statements significantly lower than did the instructor group (see Table 2). Significant differences were not found among the Internet and Interactive television technology characteristics, content organization and learner considerations clusters between instructors and students. However, significant difference was found among the evaluation cluster between the two groups.

Discussion

The findings of this study showed that although the student group rated the four clusters of statements lower than did the instructor group, they still had generally positive perceptions of the design of instruction related to the four areas investigated in this study. The general themes generated through analyzing open-ended questions are presented as follows.

The distance instructors and students provided some major strengths of using the Internet and ITV for teaching and learning the content. They generally believe that the Internet and ITV technologies complement one another very well and provide good educational experience. Both instructors and students agreed that obviously the use of the two technologies overcame limitations of time and distance because it allowed students to interact outside of class and made courses available to those who otherwise could not come to campus to take them so that more students can attend class. Instructors could also reach more students who took interest in their programs. Students commonly believed that taking ITV classes saved time traveling to campus and they could work and go to school at same time. Regarding the Internet-based courses, students generally observed that WebCT was an excellent user-friendly tool for it definitely helped them master the content. They believed that it had expanded resources and provided up-to-date information that print articles would otherwise carry and the schedule for it was flexible. Communication via e-mail/bulletin board was easy, friendly, and quick. They could work on WebCT at any time that was convenient to them especially when their schedule is very tight. And this makes discussion more interactive. Concerning ITV classes, some students believed that since the schedule for ITV classes was more structured, and it allowed time for group discussion. And it was also good for students to promote camaraderie among themselves. Some students felt that distance learning via the two technologies was challenging and student-centered. Students could communicate the content with distance learners from different locations with a variety of backgrounds and focuses and on-site professionals with a wide variety of perspectives across the state.

The distance instructors and students also offered some major weaknesses of using the Internet and ITV for teaching and learning the content. The major concern for ITV is the technical difficulties for those at distance sites. Quite a number of instructors and students reported that technical problems had been frequent on the ICN which was frustrating. Having a personal contact could solve this kind of problem and establish great support for students.

Lack of interaction and sharing of ideas is another concern for the Internet and ICN teaching. Both instructors and students felt that face-to-face interaction with the professor and other students was not possible on the ITV. Often there were not much small group discussion and activity. Sound was sometimes a problem. All the facilities were not equal in terms of resources for sharing information. Some instructors felt that sometimes they were lost in not being able to connect with their students on a personal level. Students also had the same feeling of losing one-on-one interaction with the teacher and other students. Sometimes, they felt that classes were too large for interaction; thus, a large part of class became teacher-centered. Some students indicated that they were shy to be on ITV, which may have contributed to limited interaction. Regarding the Internet-based instruction, students felt that they had to accept ideas as they were. The use of the Internet was somewhat of an impersonal experience. In addition, students commonly felt the Internet resources were too vast and it was easy to lose focus. To them, the Internet was a great resource to obtain information; however, it was hard to find exactly what they needed sometimes. Besides, some information was irrelevant. Finally, students felt that the ITV teaching lacked spontaneity because this kind of teaching was very much structured and that lecture format dominated the class though they knew that lecture was the best way to transfer information under these circumstances. The findings of this study have indicated needed areas for improvement in the distance learning program at UNI. Specifically, strategies need to be developed to help distance instructors and learners to overcome technical difficulties, additional measures need to be taken to enhance instructor-student and student-student interaction, such as small group discussion, presentations and projects and to help students to find the resources quickly which directly satisfy their learning needs.

Table 1. *Overall Cluster Item Means for Each Cluster Group*

	Instructor **Mean**	*Student* **Mean**	*Total* **Mean**
Technology Characteristics Overall Cluster Mean	2.2400	1.9167	2.0118
Content Organization Overall Cluster Mean	1.8889	1.6370	1.6901
Learner Consideration Overall Cluster Mean	1.9167	1.4667	1.5614
Evaluation Overall Cluster Mean	2.0000	1.2000	1.4000

Table 2. *Independent-Samples t-Tests for Technology Characteristics, Content Organization, Learner Consideration and Evaluation Cluster*

	Mean	*SD*	*t-Statistic*	*p Value*
Technology Characteristics				
Instructor	2.2400	.33615	-1.878	.108
Student	1.9167	.31861		
Content Organization				
Instructor	1.8889	.46259	-1.032	.376
Student	1.6370	.42718		
Learner Consideration				
Instructor	1.9167	.87665	-1.367	.387
Student	1.4667	.50079		
Evaluation				
Instructor	2.0000	.36839	-4.243	.003*
Student	1.2000	.35355		

* Indicates a significant difference at .05.

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❖ Workshops ❖

Web Advances Continue: From Best Pedagogical Practices to Evaluation and Assessment Techniques

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Introduction

Online learning has matured to the point where most people are worrying not only about how they will do it, but also how they will assess and evaluate it. Clarity is needed for the online instructor — and those concerned with its successes and failures — in each of these areas. This paper reviews some of the pedagogical practices that we recommend for online learning, ideas for assessment, and finally some considerations for evaluating online courses.

Pedagogical Practices and Learner Assessment

Each online course is unique, with specific design and implementation being dependent on myriad factors including subject matter area, learning objectives, learner characteristics, instructor characteristics, and technological/environmental factors. It is the instructor or course designer's task to analyze these factors and select and adapt appropriate activities accordingly. Table 1 presents a review of some pedagogical activities that might be tried, as appropriate to the content area, in an online course. Each activity serves a particular learning purpose and can be used to meet different types of course objectives.

These activities can be conducted via synchronous or asynchronous communication tools, with each having unique characteristics and challenges. Overall advantages of synchronous activities are the spontaneity of communicating live, particularly when immediate feedback or response is desirable, and the increased likelihood that each contribution will get a response. Challenges include an increased need for structure and facilitation, especially with respect to turn-taking, and the lack of reflective participation. Online learning activities that are conducted asynchronously benefit from the ability of students to reflect on the discussion and carefully compose their responses. Some of the biggest struggles of using an asynchronous medium for learning activities is ensuring that students now how, how often, and when to respond to each other. If not carefully planned, activities can result in a series of isolated responses rather than true learning dialogues with students engage in message-posting rather than discussion-oriented behavior. Table 1 provides an overview of a few of the online learning activities that we encourage instructors to try, along with some differences to be considered based on the communication medium being used.

Assessment is an important component of online learning activities. While many in-class activities may not be assessed in any formal manner or only under the guise of a generic "class participation" grade, students generally tend to participate so long as they are attending the class. Essentially, if they are present, they may as well be doing what is asked of them. The online instructor has the added challenge of getting students to be present and visible in the course space. Providing some form of assessment of all course activities and letting students know that the messages they generate will be graded is an important way of providing them with incentive to be active learners. They are not a captive audience, and their participation in online learning activities often requires greater engagement and effort than similar participation in a classroom. Since the students are generating text-based records that can be reviewed for content and quality, letting them know that someone is reading their contributions and whether or not their work is of an appropriate quality and quantity is important.

A variety of assessment techniques may be used, varying in amount of feedback provided to students and labor-intensity on the behalf of the instructor. It is not necessary for instructors to provide lengthy, detailed comments to individual students in a large class; trying to do so is one of the things that is very likely to overwhelm and exhaust the instructor. Posting general feedback to the class at the end of each activity, pointing out students with excellent work by name, is an effective way of maintaining participation and quality. Rubrics can be used to give quick indicators of performance and assign grades. Students can provide each other with regular feedback by assigning them buddies to comment on each other's work on a regular basis.

Evaluation Techniques

The evaluation of online learning is important to many people. For instructors, it allows them to determine what is working and what should be changed. Potential students may wish to know how highly rated or effective a particular course is before choosing to enroll. Administrators want to know not only that an instructor is performing well and that students are learning, but also that the resources they have devoted to developing and delivering the course have provided a sufficient return on investment.

This evaluation can occur in many ways and at many levels. Instructors should document materials and assignments that worked well and did not work well so that such impressions can be triangulated with the students' learning results and student feedback in the formative interest of making improvements for the next course offering. Care must be taken to ensure that appropriate end-of-course evaluation questions are asked of students; evaluation forms from classroom-based courses may ask students to evaluate the instructor and the learning experience in ways that do not make sense (e.g. an instructor's delivery style) while ignoring important elements (e.g. how well the technology worked and an instructor's presence). In some instances subtle wording changes on a traditional evaluation form can change a student reaction from thinking "this was not applicable to this class," to being able to make an evaluative judgment.

At the curricular level, it may be important to evaluate whether or not an online course is adequately preparing learners to perform particular tasks in higher-level classes (or, in the case of online training, on the job). Doing so is a larger-scale evaluation endeavor than is typically undertaken, but it can be very worthwhile given the extensive resources that are often required to design and develop a new online course. Evaluation data may be collected by following up with learners at a later date as well as the instructors of subsequent courses (or job supervisors and colleagues) to determine if the learners are choosing to and able to successfully apply what they learned in the online course.

Closing

In summary, it is the combination of appropriate pedagogical, assessment and evaluation techniques that will allow online learning to flourish and become more successful for instructors, students, and other stakeholders. We have presented some ideas to get people started on the process of developing good practices in each of these areas, but even more importantly we encourage others to continue to experiment, reflect and share their results to help build the body of knowledge of best practices in online learning.

Table 1. *Sample Online Learning Activities*

Type of Activity	*When to Use*	*General Structure and Elements*	*Synchronous Issues*	*Asynchronous Issues*	*Learner Assessment*
Ice Breakers	When you want learners to get to know each other When you want to introduce a new topic (essentially, "ice-breaking" the topic)	Everyone gets an opportunity to share or participate; wide variety of potential activity frameworks, including Two Truths and One Lie, Coffee House Expectations, 20 Questions	Difficult to hear from everyone (turn-taking is necessary); certain activity frameworks will work better than others	Learners may only selectively participate and read messages; effort must be taken to encourage them to "meet" all classmates or read all messages in a new topic ice breaker	Assessment is generally not necessary, but you'll want to make sure everyone has participated
Role Play	When you want learners to see the multiple perspectives on a particular topic or to view a topic through the lens of different experts/theorists	Learners are assigned a role to play (role may be a perspective — like optimist, pessimist, journalist — or a person — like Kant, Nietzsche, Foucault)	Learners must fully understand their roles in order to be able to play them out in real time; Some form of turn-taking must be in place to ensure that all participants can be active	Learners must have participation guidelines and deadlines to ensure that dialogue takes place; summarization of discussion is important to bring closure, and effort must be taken to encourage learners to read the summaries	Learners can be assessed on the nature and quality of their participation (How much did they contribute? How well did they represent their assigned role) or the exercise can be used as a learning tool working toward a larger assessment like a paper or project

Table 1. *Sample Online Learning Activities* (Con't)

Type of Activity	***When to Use***	***General Structure and Elements***	***Synchronous Issues***	***Asynchronous Issues***	***Learner Assessment***
Debates	When you want learners to research and focus in-depth on two perspectives of a potentially controversial topic	Learners may be assigned a topic and a side, either as an individual or group, and given time to research the topic and prepare	Turn-taking must be carefully facilitated to ensure equality for both sides and all members of a group	Timing must be carefully structured to allow for dialogic interchange between sides; rebuttals should be deeper and more reflective than in a synchronous debate, with resources cited	Learners can be assessed on their topical research, development of arguments and rebuttal arguments; additionally the exercise can be used as a formative assessment of learner ability
Peer Feedback	When you want learners to help each other improve their work, learn to evaluate and critique, and/or practice using the terminology of the field with respect to student-produced documents	Learners are asked to review and comment on each other's idea and work; rubrics may be provided to help students focus on appropriate criteria	Students providing feedback must review material in advance and be prepared; students receiving feedback benefit from ability to seek clarification of muddy points in real time; important to have way of saving feedback for later use	Encourages more highly reflective feedback than synchronous feedback sessions; timing of making work available for critique and providing feedback is important; may wish to allow students receiving feedback time to ask their respondents for clarification	This activity should provide learners with formative assessment of their own work. Potential summative assessment areas include quality of feedback provided to peers and improvements made to own work based on peer feedback.

Biographical Sketches

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A Matrix for the Development of Instruments to Evaluate Web-Based Courses and Programs

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Abstract

As e-learning becomes increasingly popular, comprehensive evaluation is critical to quality improvement. This empirical study was based on a comprehensive review of literature and subsequent development of a multidimensional evaluation matrix. The matrix's components are six factors plotted against 5 subjects; each of the 30 cells is then categorized into evaluation levels of reaction, learning, behavior, and results. Factors include learner characteristics, technology, instruction, instructor, institution, and community, while subjects include learners, instructors, support staff, administration, and community. The matrix provides a flexible and holistic means to evaluate e-learning.

Introduction

According to the American Society for Training and Development (ASTD), e-learning refers to "anything delivered, enabled, or mediated by electronic technology for the explicit purpose of learning" (Tanquist, 2000). Online programs are increasing in number and becoming one of the most important new trends in education (Williams, 2001; Kirk, 2001). There has been a 72 percent increase in the number of distance education programs at higher education institutions (National Center for Education Statistics, [NCES], 1999). With the continuing growth of university-level courses offered at a distance, researchers are focusing their attention on the issue of program evaluation (Biner, 1993). However, "e-learning evaluations often do not receive the priority that they deserve" (Tanquist, 2000, p. 1). Although there has been limited research on how to evaluate DE courses in general, there has been little attention given to a more comprehensive evaluation of e-learning.

This research illustrates a comprehensive evaluation process. It highlights the reasons why it is crucial to evaluate e-learning, the evaluation process, subjects who should be involved, and the major factors and variables that need to be included in an evaluation instrument.

Research Questions

The research questions guiding this study were:

1. What is the value of evaluating e-learning courses and programs?
2. What is the process of evaluating e-learning courses and programs?
3. Who should be involved in e-learning evaluations?
4. What are the variables that need to be included in e-learning evaluation measures?

Value of Evaluating E-learning

E-learning is relatively new and is ridden with skepticism, caution, and resistance and one way to suppress such concerns about e-learning is through evaluation (Tanquist, 2000). Magalhaes and Schiel (1997) cited a lack of quality control in distance and traditional systems as one of their shortcomings and emphasize the need for ongoing evaluations. It helps to identify areas of a program that are producing negative reactions (Biner, 1993); to provide input that could help to improve the quality of the programs from their inception to implementation (Magalhaes & Schiel, 1997); and to analyze the strengths and weaknesses of a program (Foxon, 1989; Weigand, 2000). Developing and implementing online programs is a large investment hence the need to evaluate its effectiveness in terms of client satisfaction and economic return is apparent (Tanquist, 2000). If clients, in business in particular do not perceive a return on investment in tangible or intangible benefits, they may not be willing to continue to invest in the instruction (Boverie, Mulcahy, & Zondlo, 1994). Online learning not only involves the instructor-learner interaction but also other facets like learner-environment, learner-technology, and learner-learner interactions. Evaluation instruments should focus on variables within and outside the online classroom. Therefore, an evaluation of e-learning needs to be examined from a systems point of view as reflected in the matrix.

Research Method

This study was based on an extensive review of evaluation literature. Concepts commonly used in e-learning evaluation, evaluation variables, subjects or sources of data, and data collection procedures emerged. In addition to literature reviews, faculty and staff members were contacted for feedback on how to improve the developed instrument. The authors synthesized this information into a matrix (Table 1 – The Hatcher-Mungania E-learning Evaluation Matrix), which is used in the development of e-learning evaluation measures.

Phases of Evaluation

Based on the review of literature three types of evaluation are recommended: pre-course, formative (in-process), and summative evaluation. A pre-course survey or questionnaire is administered at the beginning of a course of study. It seeks demographic data from the learners, their characteristics, preparations they have made for the online course, and helps to identify any learner concerns before the course begins. Formative evaluation is used during instruction to identify aspects of the program that the participants consider successful or unsuccessful (Magalhaes and Schiel, 1997) and seeks feedback on any factors that may affect the teaching-learning process. To collect formative data, individual or group journals, submitted assignments, chats, audit trails, discussion forums, surveys or questionnaires are used. Summative evaluation is administered towards the end of the semester or after the course (post-course) to learners, instructor(s), administrative staff, support staff, and to community members. Summative data is obtained from surveys, questionnaires, focus group interviews, face-to-face interviews, or through group projects, and from individual or group final examination results. The aim of summative evaluation is to justify the implementation of an instructional technology, or to help verify whether or not the difficulties experienced at the formative level were resolved (Magalhaes & Schiel, 1997). Changes could be made in the program based on such information.

Pilot evaluation: Thyer, Polk and Gaudin (1997) suggest caution prior to widespread adoption of DE instructional media and the authors also recommend piloting evaluation instruments before undertaking an institution/organization-wide evaluation. The instrument developed as a result of this study is being piloted with online courses at the University of Louisville.

Subjects

Because e-learning is a collaborative effort the subjects for an evaluation include (1) learners enrolled in an online course or students who have dropped the course; (2) course instructor; (3) support staff like instructional designers, teaching assistants, and technical support staff; (4) administrative staff representing the institution; and (5) community members. These subjects are the source of data pertaining to various aspects of online learning. These five categories of subjects are labeled under columns A through E as indicated in Table 1. A data collection tool such as a survey is administered to each of these subjects to find out what their experiences are with regard to the six evaluation factors described next.

Evaluation Variables

The matrix consists of six evaluation factors: (1) learner characteristics, (2) technology, (3) instruction, (4) instructor, (5) institution, and (6) community's involvement. These factors are labeled A1 – A6. Within each of these factors are several evaluation variables that need to be included in any evaluation instrument. Due to space limitations, only part of the variables (A1-E1) are discussed to give a general idea of the kinds of variables that can be included in an evaluation instrument. The choice of the variables to include in an instrument would depend on the purpose of the evaluation and available resources.

Evaluation Factors and Variables

Learner characteristics (A1 – E1): Learner characteristics important to measure include: demographics, the learners' background knowledge, personality characteristics, expectations, communication competency, language level, keyboard skills, academic standing, previous online experience, familiarity with technology, time management, motivation level, study habits, learning preferences, and attitude.

Technology (A2 – E2): Technology is the most significant difference between traditional evaluation principles and e-learning evaluations (Tanquist, 2000). Aspects that could be integrated into closed-ended questions include: access to technology, technical support, homepage and content layout, ease of use, technical training, software and hardware used, cost of technology, and infrastructure.

Instruction (A3 – E3): Before much time and money are invested in e-learning, evaluation should be done during the development of materials (Driscoll, 1998). Some of the evaluation variables under this factor are content organization, quality, accuracy, completeness, difficulty, workload, time requirements, effectiveness of instruction, interaction, feedback, adult learning principles, relatedness of content to goals, and quality of instructional design.

Instructor (A4 –E4): The success of DE rests on the role played by faculty. A survey or focus group with instructors and students may be used to measure instructor effectiveness, communication skills, feedback quality and frequency, communication skills, content knowledge, attitudes, motivation, challenges, access, and interactions.

Institution (A5-E5): The institution needs to make arrangements for services such as registration, library, bookstore, and other student services to be available for e-learners (Wong, 1999). Issues to be addressed in an evaluation relate to institutional support, cost effectiveness, efficiency, quality, student demographics, cost benefits related to e-learning, and training available (Magalhaes & Schiel, 1997).

Community (A6 – E6): By virtue of the fact that online learning is a fairly new concept, it is essential to know to what extent society as a whole recognizes and supports those who are involved in it. This includes student support, recognition of credits for transfer or employment, and the esteem to which such courses and institutions are held in the community at large (Keegan, 1996). Subjects include employers, mentors, subject matter experts, parents, or other stakeholders. Subject matter experts could also be instrumental in determining the validity, correctness or completeness of course content (Driscoll, 1998).

Summary and Conclusion

Unlike in traditional educational settings where only the students' reaction and learning is normally evaluated, the matrix discussed in this study emphasizes the need of a holistic but flexible evaluation process that gathers feedback from various stakeholders such as learners, instructors, support staff, administrative staff, and community members on various aspects relating to learner characteristics, technology, instructor effectiveness, institutional support, and social support mechanisms in place for this new form of teaching and learning. "All e-learning activities should incorporate at least some form of evaluation" (Tanquist, 2000, p. 5). This is reiterated in this study by integrating evaluation tools in every stage of the e-learning process. Most stakeholders will be involved in e-learning in some fashion in the future and would greatly benefit from evaluations.

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Table 1. *Hatcher-Mungania E-learning Evaluation Matrix*

		Subjects				
		A	*B*	*C*	*D*	*E*
Evaluation Factors & Variables		Learners	Instructor	Support staff	Administration	Community
	1. Learner characteristics	A1 E-learners' Demographics, Communication skills, Motivation, Attitudes, Learning style, Personality, Prior experiences, Cost, Technical access & Competence, Reasons, Expectations & Preparations done for EL *Evaluation levels:* Reaction Learning	B1 E-learners' Characteristics, Motivation, Participation, Attitude, Expectations *Evaluation Levels:* Reaction Level Learning	C1 E-learners' Characteristics Motivation, Attitude, Expectations *Evaluation levels:* Reaction Level	D1 E-learners' Demographics, Attrition rate, Retention rate, Academic standing, Target population *Evaluation levels:* Reaction Level	E1 E-learning graduates' Employability Job performance, Transfer of learning Worth of Credentials, Job attendance rates, and Expectations *Evaluation Levels:* Reaction Learning Behavior Results
	2. Technology	A2	B2	C2	D2	E2
	3. Instruction	A3	B3	C3	D3	E3
	4. Instructor	A4	B4	C4	D4	E4
	5. Institution	A5	B5	C5	D5	E5
	6. Community	A6	B6	C6	D6	E6

Biographical Sketches

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Virtual Field Trips
for Early and Middle Childhood Educators

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Establishing a Need

With the advent of instructional technology (e.g., Internet and distance learning), virtual field trips substantially reduce or eliminate the logistics (e.g., transportation, permission slips, fees, and chaperones) associated with arranging physical field trips (Cooper & Cooper, 1999, 2000). Additionally, access to supplemental instruction content located at a prohibitive physical distance from the learner's home schools can widely enhance learning (Griffin & Symington, 1997). Field trips have also been shown to promote long-term recall (Falk & Dierking, 1997). As there is typically no commute involved with a virtual field trip, virtual field trips enable the learner to have access to and experience a wider range and variety of instructional content than those typically provided for in physical field trips.

Because of the Internet medium of virtual field trips, teachers can now expand and enhance their student's learning beyond the walls of the traditional classroom using this form of technology. Teaching strategies will include judging which virtual field trip choices are DAP, how to appropriately integrate the information into an early Childhood Education Program (ECED) Program, and methodologies that will them to extend their student's learning after experiencing a virtual field trip. In the process, teachers will provide their students with interactive learning experiences that will enable them to construct new knowledge, touch upon all students' specific learning modalities, and enrich their learning in a developmentally appropriate manner.

Theory and Assumptions

The workshop for early childhood is designed and based on Developmentally Appropriate†Practice (DAP) (Bredekamp & Copple, 1997), and supported by the National Association for the Education of Young Children (NAEYC) Position Statement on Technology for young children between the ages of three and eight years of age. The theoretical basis that supports virtual field trips and the use of technology in early childhood education emanates from the work of Seymour Papert and Jean Piaget (Haugland & Wright, 1997). The National Science Foundation (NSF) advocates the use of technology in Education America for the 21st Century (NSF, 1983). The NSF further recommends that children both learn through and with computers, and that computers be utilized to learn about computers.

Locating, Evaluating, and Selecting Virtual Field Trip Content Providers

Generally, locating a virtual field trip and/or content provider can be accomplished in three ways textbooks, Internet searches, and searchable databases. Two such texts used by the workshop presenters include Gail and Garry Cooper's *Virtual Field Trips* and *New Virtual Field Trips*. Both Cooper texts provide subject heading categories which may be of use to educators searching for a particular content area such as the Civil War or Marine Life. As new field trips are being frequently developed, Internet searches using a search engine (e.g., wisenut or teoma) can be utilized to locate specific providers and/or instructional content. Lastly, PacBell's Videoconference Directory (http://www.kn.pacbell.com/wired/vidconf/directory.html) or the University of Akron's K-12 Distance

Learning Resources (http://www.uakron.edu/distance/k12) are two examples of virtual field trip searchable databases. Additional information and/or questions may also be directed to the content provider, with contact information generally listed on the web site.

Evaluating the content of a virtual field trip is similar to that of evaluating a textbook for classroom use. Typically the content, method of delivery and supplemental print instructional materials (where applicable) are under the control of the third party content provider. In some instances, virtual field trip content providers may provide access to print materials prior to purchasing the field trip or may have demos or previews of individual virtual field trips. As an example, the Cincinnati Zoo web (http://www.cincyzoo.org) site contains print materials to accompany their virtual field trips. These documents are downloadable in platform non-specific format (i.e., Adobe Acrobat). The Southwestern Wisconsin Instructional Network Group (SWING) web site (http://www.swing.k12.wi.us/) currently has links to selected virtual field trip previews using Apple Computer's QuickTime format (http://www.apple.com). Both methodologies allow the classroom instructor to review content and delivery methodologies to ensure that the virtual field trips can be effectively integrated into the curriculum and meet intended learning objectives.

For the educator wishing to utilize a model to evaluate virtual field trips, Kirkpatrick (1996) provides a Four-Level Model of Evaluation, which serves as a summative assessment of for training programs. These levels include 1) reaction, 2) learning, 3) behavior, and 4) results. Student reaction to a particular learning program as well as instructor reaction can be used to judge the overall impact of the virtual field trip. Learning, defined as "a measure of the knowledge acquired, skills improved, or attitudes changed" (Kirkpatrick, 1966, p. 55) can be measured by traditional assessment techniques. In some instances, print materials included by some virtual field trip content provides can serve as summative assessment (e.g., objective tests). Behavior, typically residing in the affective domain, can be impacted by the virtual field trip's subject area (e.g., multicultural awareness). Lastly, results, as an overall effect on student learning, can be tied to standardized tests (e.g., Ohio Proficiency).

Integrating Virtual Field Trips Into K-8 Curriculums

Physical field trips without direct ties to curriculums and/or learning activities can only be considered as forms of entertainment. In a similar fashion, learners can perceive virtual field trips without proper integration as a form of media entertainment. While curriculum integration is more than merely showing a video during class, lesson plans designed to effectively integrate virtual field trips into the curriculum are perceived as one method ensure that the virtual field trip is not merely a from of classroom entertainment. It is important to realize that using computer technology with young children is a process of exploration and discovery, (Haugland & Wright, 1999). As children progress from kindergarten through the primary grades, they not only should be provided with opportunities to make choices about computer experiences but, the teacher should also use the computer for more directed activities that match grade-level learning objectives as outlined in the educational standards at both the state and local levels. Meeting these benchmarks for education in an appropriate manner requires providing children a holistic approach to learning through their educational experiences.

Because young children learn holistically, their learning experiences should be integrated during their early years of development therefore; there is no need for them to distinguish learning categories through separate subject areas. The relevant principle of instruction throughout early education is that curriculum should be integrated across subject areas. Integration of curriculum is accomplished in a variety of ways. Curriculum may be planned around themes or projects based on children's interests (Bredekamp & Copple, 1997). When developing curriculum, all developmental domains of young children should also be taken into consideration. Young children learn through relevant direct experiences and interactions within their environment. Therefore, an appropriate classroom environment must be designed and equipped with learning centers in which children learn through discovery, exploration, interactions with each other, and with hands-on experiences. In today's world, as computer technology becomes more capable and pervades more aspects of society, it is imperative to integrate it into the curriculum. More information is deemed important to learn than ever before and the base of essential information grows constantly (Roblyer & Edwards, 2000). An integrated curriculum can be enhanced through the use of virtual field trips. Appropriately chosen virtual field trips are capable of enhancing students' learning by providing them with experiences that are relevant, engaging, and meaningful to their personal construction of knowledge, (Katz & Chard, 1989).

Learning Theories

Educators credit theorists John Dewey, Lev Vygotsky, Jean Piaget, Jerome Bruner, and Seymore Papert with some of the fundamental premises of constructivist thinking. The following is a capsulation of each theorist's viewpoint.

1. Dewey is known for laying the theoretical groundwork form many characteristics found in today's educational system. He is primarily credited with laying the groundwork for the progressive movement in American education. Dewey's ideas support constructivist models of teaching and learning.
2. Vygotsky's work on human development and the social cognitive theory along with his twin concepts of scaffolding and the zone of proximal development are important for constructivists.
3. Piaget in internationally known for his complex theories on cognitive development in children. Piaget believed that through interaction within their environment, children are active participants in the construction of their own knowledge.
4. Jerome Bruner, like Piaget, was also interested in children's stages of cognitive development but emphasized "Learning through Discovery." Bruner felt that children were more likely to understand and remember concepts they discover in the course of their learning.
5. Papert, an American student of Piaget has profoundly influenced the field of educational technology. He felt that students could advance in their intellectual abilities more quickly with the right kind of environment and assistance. Papert also believed that children should play a big part in "teaching themselves." Papert was the developer of LOGO. (Roblyer & Edwards, 2000).

Classroom Environment, Climate, and Management

Classroom environment is a term that refers to a couple of very important dynamics within the educational context of a classroom: 1) the climate of the classroom, and 2) the management of the classroom. Classroom climate is a term that is used to refer to the teacher and classroom characteristics that promote student's feelings of safety and security, together with a sense of success, challenge, and understanding. Classroom climate is important because it encourages both motivation and achievement. Students learn best in a general atmosphere that is safe and orderly and that promotes success on tasks of worth and substance (Eggen & Kauchak, 1997). In a healthy classroom climate, students are viewed and treated as competent people and they understand the requirements of learning tasks, perceive them as challenging, yet believe they will succeed if they make reasonable effort (Brophy & Rohrkemper, 1987). Classroom management refers to the combination of teacher strategies and classroom organizational factors that lead to a productive leaning environment. This includes established routines, classroom rules, teacher responses to student behavior, and instruction that promotes a climate conducive to student learning (Eggen & Kauchak, 1997). The characteristics and outcomes of effective classroom management are as follows:

- ❖ Increased achievement
- ❖ Improved motivation
- ❖ Preventive strategies for behavioral problems
- ❖ Positive Physical environment
- ❖ Establishment of procedures
- ❖ Creating effective rules
- ❖ A teacher that listens and cares
- ❖ Communication with students

Organization and Planning (Eggen & Kauchak, 1997).

Pre- and Post-Instructor Activities

To ensure that learners benefit the most from a virtual field trip, instructors would do well to familiarize themselves with the selected virtual field trip. This includes the subject/content area, but how the material is presented, learning activities, types and method of interaction, and what resources are provided. In addition, Cox-Peterson and Melber (2001) recommend orienting the students to the virtual field trip to "reduce the novelty effect (which) can hinder the learning process" (p. 18). Properly designed and implemented set induction is one method to accomplish this pre-instructor activity. Summaries and conclusions as well as "closing" activities address post instruction activities. Tie to the curriculum may be accomplished by means of print materials available from the virtual field trip content provider (where applicable). Teacher implemented age-appropriate closing activities can also be used to both integrate the virtual field trip into the curriculum as well as reinforce student learning. Cox-Peterson and Melber (2001) suggest the use of multimedia presentation, which both organizes and captures the essence of the virtual field trip.

Lessons Learned

Deploying virtual field trips in the K-8 learning environments requires a significant amount of preparation on the part of the instructor. Perhaps, one of the major concerns of educator is the quality and relevance of virtual field trips as this is solely under the control of the content provider(s). Therefore, an important initial step for educator is to thoroughly evaluate both the content and forms of interaction used by content providers. Relevance to lesson plans and intended learning objectives provide a sound basis for selecting a particular virtual field trip. Reactions to a particular virtual field trip from educators as well as students can be used to assess the overall impact. All things considered, the questions to ask oneself are similar to that of purchasing a textbook or attending a concert: "Would I pay to access this virtual field trip?" and "What measurable impact will this virtual field have on student learning?"

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Mission Impossible:
How to Design an Online Course Without a Team

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Although research shows that it takes a team of experts to efficiently develop a high quality online course, not all course designers have the opportunity to use a formal team approach. Due to sparse or scattered resources, budget limitations, time constraints, academic procedures and policies that may not fully accommodate distance learning, or other reasons outside their control, some online course designers find themselves tasked with developing an online course from start to finish with little or no help. While not the ideal situation, with planning and perseverance, a quality online course can be produced under these circumstances.

Starting Points

When beginning to develop online courses, course designers must honestly assess their own skills and make plans accordingly. In this model, it is assumed that the course designer is also the content expert. However, developing and facilitating an online course requires a variety of additional design, production, technology, and communication skills.

Skill and experience related questions include:

- Are you comfortable with technology in general?
- Have you integrated Web technology into an existing face-to-face course?
- Have you created your own Web pages?
- Do you have a basic understanding of plug-ins and how they are used with Web browsers?
- Are you familiar with rules and protocol of online communication?
- Have you facilitated threaded discussions?
- Have you facilitated online chats?
- Are you familiar with successful teaching and learning styles relative to Web-based instruction?
- Are you familiar with your campus policies on issues related to online learning including Web accessibility, ADA compliance, and copyright guidelines?
- Are you comfortable learning new things?
- Do you know how to teach yourself new tasks in an efficient and effective way?
- Can you set deadlines for yourself and complete tasks on time?
- Are you familiar with library resources available to distance learning students?
- Can you easily view a piece of instruction from a student point of view?

In addition to a self-assessment, online course designers must also consider how the course will be delivered to students. The delivery method may have a tremendous impact on the development and facilitation timeline.

Delivery related questions include:

- What software or courseware is available?
- Will you need to acquire new skills to use it?
- Is there a course administrator? Or will I be required to enroll students?
- How will students register for the course?
- How will I get access to the online learning environment?
- What are the technical requirements for developing course materials?
- When will I have access to the learning environment?
- Is technical help available for students?

The answers to these questions and other skills and experiences will affect the time, budget, and in the end, the quality of the online course. If knowledge gaps are identified, consider potential sources of help and seek them out. Are there technology training, instructional design, or production resources available on campus? Are you really alone?

It helps to make these contacts early in the process. Sharing your own goals, experiences, strengths and weaknesses with these contacts will also help make the most of available support and resources. If no help is available in certain areas, prepare and list of tasks or needed skills and build this need for acquisition of new knowledge into the timeline for the course.

Planning and Timelines

When planning, it is important to consider all the roles and tasks. Aside from content expert, other roles include:

- Project manager
- Interface designer
- Instructional designer
- Media developer
- HTML author
- Editor
- Quality control analyst
- Alpha-tester
- Course administrator
- Course facilitator
- Technical support provider
- Online library resources liaison
- Self-motivator

Planning is the phase when the realistic appraisal of skills and experience meets the timeline. A realistic timeline must be developed based on the self-assessments and information gathering mentioned above. There may be a need to delay the actual development of the course in favor of increasing skill sets and working out details of delivery. The plan may also include development tasks and professional development that occur simultaneously in order to meet the deadline for delivery.

If development timelines are extremely short and help is very limited, it may also be necessary to drop extraneous media or programming pieces that are not essential to the instructional goals and value of the course. It is also important to add extra time for unexpected problems or steeper than expected learning curves. Media enhancements may be added to later versions of the course, allowing those course designers with little or no available help to build new skills over time and not to learn all possible skills in one development cycle. This practice of gaining mastery of new skills over time will also add to the quality of the course.

Course Design

Course content can be presented in an online format through various types of media including text, audio, video, animation, presentation software, instructional graphics, etc. There are also a wide variety of communication technologies available including e-mail, online chat, threaded bulletin boards, etc. When selecting the media or tools to use within a course, it is important that selections match instructional goals and objectives, the technical capability of the target audience, and the resources available to the course designer. For those designers with little or no help, external, online sources of pre-produced media may be available. There are also low no-cost communication technologies available.

Other design elements to consider include:

- Infuse your personality and teaching style into the course
- Creating effective discussions by eliciting critical thinking
- Break lengthy content pieces into smaller chunks
- Present complicated concepts or processes as informational graphics
- Add FAQ (Frequently Asked Questions) pieces based on your experience with traditional classroom students
- Remember that group work is still possible
- View the course from a student's point of view (or ask someone else to do so)
- Remove as many questions or unknowns as possible from learning activities
- Be aware of and follow any copyright and fair use policies on your campus
- Be aware of and follow any ADA or accessibility policies on your campus

Again, extras add to development time and require advanced skill sets. Instructional goals and objectives within the course should be the first determining factor in the decision to develop additional media, graphics, interactive pieces, or communication-based activities for the course. A mixture of well-presented content enhanced with instructionally appropriate media and thought-provoking discussions can result in a satisfying and effective learning experience for online students.

Facilitating Online Courses

Just as in the traditional classroom, online courses require more than just a content expert. They require a motivational coach, discussion facilitator, mentor, and mediator.

Other keys to facilitating online courses include:

- Set communication ground rules early in the course
- Lead by example in online discussions; your participation encourages students to participate
- Give feedback on a regular basis
- Set clear expectations on when and how feedback will be given
- Provide office hours for online students via bulletin board, e-mail, chat or phone
- Provide the students with a master calendar or checklist of all learning activities and due dates
- Provide students with list of contacts by topic (content, tech support, registration, etc.)
- Facilitate, mediate, mentor, and coach; be active and ever-present
- Develop time-saving techniques for yourself
- Try to anticipate technological glitches
- Build redundant or alternative procedures into the course to accommodate these glitches

- ❖ Get preferred or most frequently used e-mail addresses from all students

Evaluation in Online Courses

Online course development is a continuous cycle of development and revision. To keep quality high, use evaluation results to drive revisions to the course.

Ideas for evaluations include:

- ❖ Treat the first run of the course as a pilot, gathering extensive data from participants
- ❖ Online surveys before, during and after the course
- ❖ Small surveys for individual activities within a course
- ❖ Focus groups
- ❖ In-person, e-mail, or phone interviews with former students

Share Results and Experiences

At the completion of the course development process, it is important to share results and experiences – both good and bad. Sharing helps online course designers to reflect and plan improvements for future courses. Inexperienced faculty can also benefit from lessons learned by others.

Sharing can be accomplished locally through presentations, brown-bag informational sessions, or meeting with other online faculty throughout each school year to revisit lessons learned and share new experiences. As experience grows, some faculty may become mentors to others. Sharing can also bring visibility to the need for support of online course development and to the potential benefits of a team approach to online course development.

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Biographical Sketches

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A Smile for SMIL:
A Primer on Creating Cost-Effective SMIL Presentations

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Multimedia materials for educational, informational and entertaining presentations can be created simply and economically with SMIL (Synchronized Multimedia Integration Language), a basic html-like mark-up language that can coordinate the timing and layout of streaming video, audio, images, animation, and text. One can create and access SMIL with ordinary hardware, a variety of free SMIL editing tools and modest dial-up network connections (e.g. 28.8 kbps) making it a low-cost, low bandwidth and effective streaming media option.

Introduction to SMIL

What Is SMIL

SMIL (pronounced smile), Synchronized Multimedia Integration Language is a markup language similar to HTML (Hypertext Markup Language) that enables you to add tags to a text document so than you can easily combine and synchronize text, still images, animations, audio and video (Williamson, H., 2001). SMIL is a com. SMIL is standards based component of streaming media. SMIL is used to control various features of streaming media.

History of SMIL

The history of SMIL dates back to mid 1990's.

> In October 1996, a small group representing the CD-ROM and Web multimedia communities gathered at a workshop hosted by the World Wide Web Consortium (W3C), a group of researchers and industry representatives that strives to advance the growth of the Web by developing standards. Their task was to explore the creation of a language that could be used to synchronize multimedia on the Web. Unlike the scripting languages in use for creating multimedia, this new language would be descriptive. It would not require a programmer to make Web multimedia (Kennedy, T. and Slowinski, M., 2002, p. 40).

The W3C's offered the first SMIL specification, SMIL 1.0 on 15 June 1998 (W3C, 2001, http://www.w3.org/TR/REC-smil/). Although, SMIL 1.0 is relative simple to use in the creation of synchronize multimedia in web-based media, it is somewhat limited. Thus, the W3C offered the second and most current SMIL specification as of the press time of this paper, SMIL 2.0, on 7 August 2001 (W3C, 2001 http://www.w3.org/TR/smil20/). Whereas, SMIL 1.0 is simple and easy to get into quickly, SMIL 2.0 is more complex – yet much more powerful (Kennedy, T. and Slowinski, M., 2002, p.44).

Why SMIL

SMIL based Web multimedia presentations, which can also be developed on portable media such as CDs, can be created with just a typical free text editor as well with the various free and for cost SMIL editors. Thus, SMIL is a low cost investment with a significant return on investment for Web-based, broadcast like multimedia presentations. Although, many may be more familiar with less utilitarian applications, however, SMIL has many utilitarian applications such as text captions for audio and video, multiple language presentations, etc.

> The competitive market place will always offer a range of technologies to choose from. A solution that helps you meld the strengths of these technologies into a cohesive presentation is just that kind of Web multimedia we all need. SMIL is that solution. SMIL is "technology agnostic", it allows Web multimedia technologies to collaborate with each other. For example, Macromedia Flash is a great vector-animating tool. It is acceptable for streaming audio but it is not so robust with streaming video. RealNetworks' RealMedia is greate a streaming audio and video. Why not combine the strengths of each? SMIL allows that kind of collaboration (Kennedy & Slowinski, 2002, p.9).

Thus, SMIL should not be seen as a competitor of other web-based technologies, but as a significant value added companion of other web-based technologies.

How SMIL Works

SMIL basically works as a multimedia director, pulling together various multimedia components of various technologies in a television like presentation. SMIL orchestrates the timing, layout and hyperlinking of various multimedia in a given SMIL presentation. For example the following SMIL 2.0 code simultaneously plays an instrumental version of a song with an acapella version of another song, thus creating a third song in a virtually invisible white background with modified volume levels:

```
<!-- This section is necessary to use the SMIL 2.0 features-->

<smil xmlns="http://www.w3.org/2001/SMIL20/Language"
xmlns:rn="http://features.real.com/2001/SMIL20/Extensions">

<!--This section, the  header and layout section, describes the metadata and layout of the presentation-->

<head>
<meta name="Title" content="Cop the Math" />
<meta name="Author" content="Brandon C. Taylor, M.S." />
<meta name="Description" content="Educational, mathematical and lyrical remix of Youngin'" />
<meta name="Copyright" content="(c)2002" />
<layout>
<root-layout width="1"  height="1" background-color="white" />
<region id="vocals" soundLevel="800%" left="1" top="1" width="1" height="1" z-index="1"
background-color="white" fit="fill" />
<region id="instrumental" soundLevel="100%" left="1" top="1" width="1" height="1" z-index="1"
background-color="white" fit="fill" />
</layout>
</head>

<!--The this section, the body section, presents the content -->

<body>
<par>
<audio src="copthemath-a.rm" region="vocals" abstract="vocals" />
<audio src="youngin-i.rm" region="instrumental" abstract="track1" />
</par>
</body>
</smil>
```

SMIL code resembles HTML code in many ways. Thus, just as a web browser is required to experience HTML web pages, SMIL players or certain browsers are required to experience SMIL presentations.

Selected Free SMIL Players and Browsers

Players and Browsers Overview

Although, there are a number of SMIL players and browsers, I will focus on the free players and browsers. Today, the differences between a player and a browser are getting pretty fuzzy (Kennedy, T. and Slowinski, M., 2002, p. 10). A number of SMIL players and browsers also support experiencing other streaming media formats such as proprietary versions of SMIL code, audio/video files, etc. Some SMIL players do not support SMIL 2.0.

Real Player (http://www.real.com/realone/index.html?lang=en&loc=us)

SMIL players go, RealNetworks' RealPlayer is one of the best-equipped web multimedia players around (Kennedy, T. and Slowinski, M., 2002, p. 10). RealPlayer has a version for Windows, Macintosh, Linux, and UNIX. RealPlayer . RealPlayer Basic is the free version of RealPlayer. SMIL support is found in RealPlayer G2 and RealPlayer G2 Basic and later. RealNetworks latest player as of the press time of this paper, RealOnePlayer supports SMIL 2.0.

QuickTime(http://www.apple.com/quicktime/download/)

Apple Computer's QuickTime player versions 4.1 and later support SMIL, as well as many other multimedia formats. QuickTime is available in Macintosh and Windows versions.

Microsoft Internet Explorer 5.5 or later (http://www.microsoft.com/windows/ie/default.asp)

Microsoft Internet Explorer 5.5, or later supports experiencing SMIL 2.0 presentations only in its Windows versions of Microsoft Internet Explorer (Kennedy, T. and Slowinski, M., 2002, p. 14). Although, Microsoft has a streaming media product, Windows Media Player, its SMIL support is currently via its web browser as previously mentioned.

SOJA (http://www.helio.org/products/smil/download/)

SOJA is a Java based SMIL player developed by Helio, a small French non-profit organization. SOJA is best used to view SMIL presentations that do not contain proprietary versions of SMIL or other multimedia.

Selected Free SMIL Editors

Free SMIL Editors Overview

Although, SMIL code can be create with just a text editor such as Microsoft Notepad, there are a number of free SMIL editor tools that can greatly facilitate creating SMIL. Various free SMIL editors have both advantages and disadvantages, thus using multiple free SMIL editors may facilitate one's SMIL development. Also, some free SMIL editors create proprietary versions of SMIL presentations for a certain SMIL player. However, the ability to code SMIL without a SMIL editor is advantageous as the free SMIL editors are somewhat limited and thus may require manually coding some aspects of the SMIL code for various desired effects. Also, many of the free SMIL editors do not support SMIL 2.0.

Fluition (http://www.fluition.com/cgi-bin/download.cgi)

Fluition, by Confluent Technologies, has a free demo version of its SMIL editor. Fluition is particularly inclined to creating SMIL presentations containing videos. Fluition is available in Windows and Macintosh versions. Fluition's free version does not allow one to edit an existing SMIL presentation.

RealSlideshow (http://forms.real.com/rnforms/products/tools/slideshowbasic/index.html?key=8J62F1024050138)

RealNetworks' RealSlideshow is a very intuitive tool and has a lower learning curve than most other SMIL editors. RealSlideshow Basic is the free version of RealSlideshow. RealSlideshow is only available for Windows and it is best suited for creating SMIL presentations of still images with transitions and audio tracks for each image as well as a background music/audio track. RealSlideshow also creates a Realnetworks proprietary version of SMIL.

SMIL Composer (available on CD or via e-mail from an existing user)

SMIL Composer is a full-featured freeware SMIL editor by Sausage Software. SMIL Composer seems to only be available on a companion CD that accompanies the SMIL for Dummies book written by Heather Williamson and published by IDG Books Worldwide, Inc. or via e-mail from someone that has the software file. SMIL Composer only has a Windows version.

Presenter One (http://www.accordent.com/presenterone/)

Presenter One, by Accordent, is a SMIL editor that facilitates creating streaming audio annotated PowerPoint presentations in RealNetworks Real Media format. Presenter One Standard is the free version and is limited such as it is only allows the creation of not more than fifteen minute presentations. Since RealNetworks and Accordent's have a business relationship and that RealNetworks doesn't have its RealPresenter software available on its web site, it seems that RealNetworks has discontinued RealPresenter, which had similar features as Presenter One.

Magpie (http://ncam.wgbh.org/webaccess/magpie/index.html)

Although, Magpie (Media Access Generator) is primarily a tool for creating text captions for digital video files, it can export the captioned files in to a RealNetworks proprietary version of SMIL. Magpie is produced by the National Center for Accessible Media (NCAM).

Summary

In summary, given the availability of various free SMIL editors, the fact that SMIL presentations can be created with just a text editor, the various resources for learning SMIL and the various features of SMIL, SMIL is a relatively low-risk, low investment with a potential high return on investment.

Selected SMIL Resources

http://www.w3.org/TR/smil20/
http://www.w3.org/TR/REC-smil/
http://www.justsmil.com
http://www.smilbook.com
http://service.real.com/help/library/
http://ncam.wgbh.org/webaccess/magpie/index.html
http://edtech3.cet.uiuc.edu/efantis/html/fsi2000/introsm/introsm.htm

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Desktop Digitizing: Video and Audio for Media-Rich Instruction

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Fusion Learning Systems

Affordable desktop computer systems have made the delivery of asynchronous and synchronous distance teaching and learning utilizing powerful digital video (DV) within the reach of all educators. Educational research indicates that pictorial information is easier to remember than textual information (Anglin, Towers, & Levie, 1996; Braden, 1996) and so integrating video and audio technologies into distance learning environments can provide stimulating and powerful learning experiences that actively engage learners by exposing them to subject matter in different ways. However, the design, development, and implementation of digital video in today's media-rich world poses many challenges and can be a confusing process because there are so many affordable technologies, options, mediums, and programs for producing, editing, and encoding video. In order to select appropriate technologies for digital video production, you need to be aware of the following basic information related to the three key stages involved in the creation of high-quality educational videos: Pre-production, Production, and Delivery.

Pre-Production

Pre-production planning will save time and help insure quality. There are several elements to consider before you begin filming or shooting video: Planning, budgeting and storyboarding. First, determine the software and hardware that you will need to produce the quality and quantity of video files that you desire. When you are thinking of what you want to accomplish with a video production some basic items to consider include: What is your target audience? What content is to be delivered? How will the final video be delivered to the learner? What instructional strategies will facilitate the learning to be accomplished? What locations will you need for filming? Next, consider what you need to collect and prepare prior to filming such as: actors, scripts, props, and costumes. Once you have determined the preceding requirements, it is time for you think about budgeting for filming. Based on the time and money that you have available, the items on your list may need to be modified. Prior to video filming, the content, audio, and video scripts must be prepared and storyboarded. Storyboarding is the process of creating comic book-like pictures of the various scenes you plan to film and displaying video shots in a visual time-line, which allows for modifications and changes before actual filming takes place. By storyboarding, you can get an idea of how the different film shots you plan will work together. Remember, the main purpose of a storyboard is to help you understand what shots you will need to film and what those shots will look like (Long, 2002).

Production

To film and produce digital movies, you will need to have equipment, ranging from a camcorder and computer, to lights, microphones, and cables. Even if you already have existing computer equipment, it is important to understand what you have, what you might need, and how you will get all of the elements working together to edit and deliver digital video (Long, 2002).

Video Formats and Camcorders

Two basic video formats are currently available: analog and digital. Telephones and broadcast television have conventionally used analog technology, which accomplishes electronic transmission by adding signals of varying frequency or amplitude to carrier waves of a given frequency of alternating electromagnetic current. Analog camcorders such as VHS, SVHS, and Hi-8 are widely available and less expensive than digital camcorders. However, digital signals are more efficient, well defined, and orderly than analog signals and are easier for electronic circuits to distinguish. In fact, a computer processor can analyze analog data only by converting it into a digital form by utilizing an electronic process to change the analog (continuously variable) signal into a digital (multi-level) signal. Digital camcorders, which utilize digital "MiniDV" tapes, encode video signals, "in digital bits for storage, transmission and display" (Agnew, 1999, p.2) and provide better image quality, power, and flexibility than do VHS, SVHS, and Hi-8 cameras. Michael Rubin explained what "high-quality video" means by utilizing a ten-point scale where 1 is low quality video and 10 is high quality video, "If the high-quality video that broadcasters use is a 10 and lousy Internet video is a 2, a typical VHS rental video is about a 3. S-VHS and Hi-8 offer great improvements over older consumer formats, and rate around a 5. MiniDV clocks in at a whopping 9.7. Mini-DV images are more than twice as good as anything consumers have had access to in the past" (2002, p. 3).

There are many affordable digital camcorders available today. Fortunately, choosing one isn't too hard after you determine the features you want and what you can afford. Your main concern when buying a camcorder should be image quality: Purchase the camera that will shoot the best image that you can afford. Digital camcorders utilize either 1-chip or 3-chip, charge-coupled devices (CCDs) to digitize video images. Three-chip cameras, which are used for broadcast television today, deliver better color and do a better job of reproducing fine edge detail than 1CCD devices because a single chip camcorder uses a single imaging chip to grab a full-color image, while a 3CCD camcorder uses separate imaging chips for red, green, and blue information merging this more specific image information into a full-color file. When checking out a camera's image quality, consider questions such as the following: How is the overall color? Do I need the camera to perform in low light? What quality of sound do I need? Most camcorders have built-in microphones which are suitable for some purposes, but for serious audio work you may want to attach an external microphone, if so, make sure that the camcorder has an external microphone jack and headphone jack for monitoring audio while recording (Long, 2002). There are many different types of microphones, but the most common are handheld microphones and clip-on lavaliere microphones. When recording individual voices, lavalieres are the best choice because they are small, unobtrusive, and deliver good quality while handheld microphones are best for recording dialog or group conversations.

Desktop Digital Editing Systems

You may wonder, which desktop computer configuration is best for digital video work? A desktop computer system must have enough processing power and storage space to digitize audio and video. Ideally, beginners should try to buy a computer that is already set up and pre-configured for video work. Macintosh based systems have an advantage over Windows based systems when it comes to digital video because Firewire video support is well integrated into all Apple computer systems, while Windows-based machines don't usually have Firewire support built-in. Apple computers were the first to offer graphic software and photo manipulation; therefore, most photo-manipulation software was developed originally for this platform. Macintosh operating system works well with digital images and was the first consumer grade desktop computer to have high-speed graphic cards that offered millions of onscreen colors Macintosh computers have been widely used in much of the movie and TV industry, but Windows machines are gaining ground and there is now a very good selection of digital editing shareware and commercial software for both computer platforms (Jones, 1999).

When working with digital video more computer processing speed and storage space is better than less, so purchase as much processing power and hard drive space as you can afford. We recommend these minimum computer specifications for working with digital video: A Macintosh G3 or G4 Power PC or a Windows Pentium IV processor (minimum of 300MHz), 256 MB of physical RAM, a 60 GB hard drive, (any less than this and you are going to be frustrated) and a Firewire card.

If you are shooting or capturing analog video you will need a converter to change analog signals into a digital format for editing. Analog video, which has been digitized, is not as high in quality as native digital video. Firewire, (IEEE1394) is a high-speed serial data connection or port, which is used by DV camcorders and desktop computers. National Television Standards Committee (NTSC) is the television broadcast video standard used primarily in North America and Japan, while the Phase Alternate Line (PAL) standard is used primarily in Europe, Asia, and southern Africa. Video files contain multiple streams, generally one video and one audio stream. DV captured by Firewire can be stored in two different formats. The whole DV stream, both audio and video, is stored as one unmodified large digital video stream in the first format. In the second format, the DV stream is split and stored as separate smaller video and audio data streams. MPEG (pronounced M-peg) stands for the Moving Picture Experts Group, which develops and maintains international digital video and audio encoding standards employing procedures for developing, adopting, and reviewing digital multimedia to insure that video files can be played by standards-compliant video software on different computer platforms. MPEG is also the nickname given to a family of international standards used for coding audio-visual information in a compressed digital format.

Multimedia Architectures are plug-ins and system files that allow desktop computers to create, store, and play video files. Codecs is any technology for compressing and decompressing data. Codecs can be implemented in software, hardware, or a combination of both. Algorithms handle the compressing and decompressing of digital video for the different architectures. Different architecture have special codecs built-in, such as QuickTime, Windows Media, and RealMedia and some codecs are common to different architectures. Common video codecs include: Cinepak, designed for playing small clips on computers with single-speed CD-ROM drives; Motion-JPEG, used mainly for editing and video storage rather than playback; MPEG-1, developed for VHS quality on CD ROM; MPEG-2, a standard developed for digital TV, DVD-ROM and HDTV; MPEG-4 developed for the delivery of Web video; and Sorenson Video developed for high quality CD-ROM and Web applications.

Most of today's camcorders capture video at 29.97 frames per second. This odd number has to do with technological changes that were made when color television was invented. Video originally was filmed at thirty frames per second for black and white television. Each frame of video is numbered using a continuous track time code during filming. If you pause the camcorder and start shooting again, the camera picks up the time code where it left off. However, if you stop the camcorder between shots, breaks in the time code can occur, which makes later digital film editing more complicated. When you purchase new video film cassettes it is a good idea to "stripe" a continuous time code on the tape. This can be accomplished by recording the tape from beginning to end with the lens cover in place.

Filming is the key to successful movie-making process. Basic guidelines to ensure usable and reusable video footage include: Compose your shots carefully, use a tripod to help you to steady your shots, and be careful not to overuse zoom controls which can cause problems with focus. While you are shooting video, you may encounter problems with low battery power. We suggest that you use the camcorders' AC adapter during filming whenever possible. When you must use battery power you can extend the battery life by not using the LCD screen, not searching around on the tapes and changing tapes only when necessary, not rewinding and reviewing your footage, turning the camera off when you are not filming, and keeping the batteries warm if you are filming in extremely cold conditions.

Post Production

After filming you will need to use special software and hardware to edit, produce, and deliver digital movies. Digital editing software allows the user to transfer video clips to the computer, edit these clips, and then output them back to videotape, CD, DVD, and for the Web. Apple's iMovie, which currently ships with all new Apple computer systems, is a fully-functional, simple to learn and user-friendly digital editing software package, which can also be purchased separately online. There are more powerful and expensive professional level digital editing programs for personal computers such as Adobe Premiere, which is available for both Windows and Macintosh systems. A disadvantage of these powerful professional programs, in addition to being costly, is the fact that they take more time to learn and are more complicated to use. Long says that more advanced professional digital editing packages do offer editing tools that go far beyond the simple tools provided by simpler programs such as iMovie and suggests that if you have a choice, start out with iMovie, and work your way up to more serious programs, when and if you find that you want or need more powerful features (Long, 2002).

Uncompressed video files are huge and need to be compressed (made smaller) before being delivered to your target audience. Another way to provide smaller files is if you have ten minutes of video that you want to put on the web for low-end machines, you can chop it up into smaller chunks to make it faster and more efficient for your audience to download the files. Another strategy for Web video involves setting the data rate of digital movies slightly lower than the throughput of the user's connection if you want them to be able to watch your movies in real time. For a 28.8 modem, that means a data rate somewhere around two KBps, for ISDN around five KBps, and for T1 lines from five to 40 KBps. To deliver video at low data rates compromises are often made. The image size must be small, the frame rate low, and the sound compressed, which may make the image quality less than optimal. Nonetheless, there is still interesting video and sound, which can be delivered using the Web (Lynch & Holton, 1997) when the digital video is properly prepared. It is critical to assess the intended audience, their network access, computer processing power and memory configuration, and planning for delivery accordingly. Once a digital movie is edited, the final step involves selecting the delivery medium that you will use to supply the video to the target audience such as videotape, CD, DVD, or Web streaming, and finally, delivering the video.

Note: The Digital Video Producers, a group of video professionals at the University of Texas, Austin, headed by Diane Gierisch, Information Technology Services, is developing guidelines for digital video production and a complementary "Digital Video Guidelines" Web site. The first author of this paper may be contacted for additional information.

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