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... For Educators, Trainers, and Leaders

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Distance Learning, an official publication of the United States Distance Learning Association (USDLA), is sponsored by the USDLA, by the Fischler School of Education and Human Services at Nova Southeastern University, and by Information Age Publishing. Distance Learning is published four times a year for leaders, practitioners, and decision makers in the fields of distance learning, e-learning, telecommunications, and related areas. It is a professional magazine with information for those who provide instruction to all types of learners, of all ages, using telecommunications technologies of all types. Articles are written by practitioners for practitioners with the intent of providing usable information and ideas for readers. Articles are accepted from authors with interesting and important information about the effective practice of distance teaching and learning.

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Distance Learning … for Educators, Trainers, and Leaders is undergoing a series of changes that will be explained in an upcoming issue.

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Twenty Guidelines for Successful Threaded Discussions

A Learning Environment Approach

David A. Wade, Joanne P. H. Bentley, and Sandie H.Waters

As part of an introductory course for instructional technology students, instructors from a Western university included asynchronous computer-mediated communication tools in a face-to-face course in order to increase participation among the community of learners. Throughout the experience, the researchers included many of the 20 guidelines presented in this article. Subsequent experience, research, and a literature review aided in the collection of the additional guidelines rounding out the final 20. Much has been written with regards to this topic, but few have attempted to create a "checklist" of guidelines to aid the creation process.

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During fall of 2004, the researchers taught an instructional technology course with plenty of reading and little time for a complete discussion in class. To minimize monopolization of class discussion among a few vocal students, we decided to provide an asynchronous computer-mediated communication (ACMC) forum, specifically threaded discussions, which are the most common medium for online courses (Tu & Corry, 2003).

The researchers used WebCT to manage threaded discussions. One of the researchers served as moderator for the online discussion. During the design process, the researchers added a feature they called the "questioning approach" (explained in greater detail later in this article). As the researchers finished the class and received some feedback from students, they realized they reached some success; however, it also prompted them to ask about the possibilities of specific guidelines for successful online discussions. If so, where are they found? The researchers quickly realized that there were many articles and books written about guidelines for successful threaded discussions, but not one that attempted to merge their suggestions. The purpose of this article is to outline and synthesize some of the aforementioned guidelines, and compare and contrast these guidelines with the researchers' experience.

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The design of threaded discussions may appear as simple as a teacher posting questions to an online forum and students responding to those questions. Many have participated in threaded discussions as students and have been trained by experience, rather than any specific guidelines. As online instructors, we place emphasis on encouraging discussion and community building, yet we never seem to achieve high levels of student participation (Bento & Schuster, 2003).

As online learning evolves, researchers find that there is more involved in effective discussion and, ultimately, in learning. Instructors should pay careful attention to planning, design, and management of threaded discussions (Mason, 1998; Orr & Smith, 2003; Tu & Corry, 2003). Evidence continues to grow that supports the notion that increased participation in threaded discussions leads to increased learning (Bento & Schuster, 2003). Therefore, strategies and objectives for increasing participation should be researched, evaluated, and shared. Like any instructional strategy, the instructor should consider realistic learning objectives for threaded discussions and allow for appropriate student participation to meet those objectives (Orr & Smith, 2003).

It is important to keep in mind that while some authors emphasize order and structure for threaded discussions, Rovai (2002) warns that too much structure can make a community of learners weak. Tu and Corry (2003) state that a rigid structure leads to dialogue and interactions that are shallow and stifled. Orr and Smith (2003) emphasize that participation in threaded

discussions requires students to be engaged in creative and critical thinking. Overemphasizing structure may take away from students' ability for creative thinking. It is then the responsibility of an instructor or moderator to find a balance between structure and creativity.

In the following sections, the researchers offer a summary of questions that may serve as guidelines for threaded discussions. The researchers do not profess this to be an exhaustive list nor applicable to each individual threaded discussion, but offer them as a starting point for online instructors and a contribution to the ongoing body of research surrounding threaded discussions. A thorough understanding of the ability and needs of your audience will help you make informed decisions concerning these guidelines. (See Table 1.)

Guidelines for Set-up

Tu and Corry (2003) suggest dividing a large class into groups of 10 to 15 to create a more manageable number of postings for students to read. We have found it necessary to create groups big enough to have critical mass for discussion but not so large as to preclude meaningful discussion. Generally, each threaded discussion cycle should last 1 week and should not allow for an unlimited depth of threads or the

Table 1
20 Guidelines for Successful Threaded Discussions

Guidelines for Set Up

1. Are discussion groups kept manageable (approximately10-15 people)?
2. Are threaded discussion cycles limited to one a week?
3. Is there a limit on how many layers deep a discussion can go?
4. Are there clear guidelines for what constitutes a substantive post?

Score ____ / 4

Guidelines for Participation

5. Is participation required?
6. Are students encouraged to post two to four messages per week?
7. Is there a detailed description of appropriate online etiquette?
8. Is it clear how unacceptable messages will be handled?

Score ____ / 4

Guidelines for Creating Discussion Questions

9. Are effective questions used to stimulate discussion?
10. Are students encouraged to generate discussion questions?
11. Do discussion questions facilitate exploration and review?
12. Do questions require students to integrate their life experiences?

Score ____ / 4

Guidelines for Moderating Discussions

13. Does moderator input encourage critical thinking?
14. Is feedback to students intended to promote learning?
15. Do instructions from moderator encourage personalized posts?
16. Are students encouraged to assist as moderators?

Score ____ / 4

Guidelines for Evaluation of Participation

17. Is there a clear rubric to evaluate student participation?
18. Is there a way to assess individual accountability in each team?
19. Do students get periodic evaluation on how they are doing?
20. Is it clear how their participation influences their overall grade?

Score ____ / 4

Total Score ____ / 20

discussion may be impossible to follow (Albanese, 2000). The intention is to set a manageable amount of discussion for both instructor and student to follow.

In addition, there should be clear guidelines for what constitutes a substantive post to avoid a common tendency to post "I agree" type replies. Although no general rule for the length of a substantive message exists, most online participants agree that one screen is appropriate. In other words, no scrolling should be required (Albanese, 2000).

Guidelines for Participation

The instructor has the critical role of encouraging and requiring students to engage in a discussion (Bonk, Wisher, & Lee, 2004). However, if participation is not graded, then students will tend not to participate (Alavi & Dufner, 2005). According to Collison, Elbaum, Haavind, and Tinker (2000), students should post regularly to stay engaged. Student interest in visiting a discussion forum is heightened when they know "new comments" will be posted at least every three days (Larson & Keiper, 2002). Ideally, two to four messages per week are appropriate (Tu & Corry, 2003). It is important to let your students know at the beginning of the course how often you want them to participate (Bender, 2003; Fisher, 2003).

The format and etiquette should also be made explicit. It is necessary that instructors emphasize a posting policy in the syllabus. Tu and Corry (2003) recommend that when unacceptable messages are posted, moderators handle the situation with caution. Communicate with those involved privately. If the message needs to be removed, obtain permission from the student who posted. Discussion topics, when appropriate, should allow students to call on life experiences and personal interests (Orr & Smith, 2003). In a study of 116 students, most students pointed out that clear instructions and feedback are essential for success (Alavi & Dufner, 2005).

Creating Discussion Questions

Effective discussion questions can be used to stimulate discussion. Questioning is a significant instructional design element for the promotion of effective discussion (Berge, Muilenburg, & Van Haneghan, 2002). Tu and Corry (2003) suggest that students can participate in the formulation of discussion questions and an individual student or a group can function as discussion moderators to facilitate discussions when appropriate. Research has shown that higher-level discussion questions stimulate higher cognitive processes (McKenzie, 1998). Online discussion questions should offer the opportunity to move the student forward to new information, backward to review information, and sideways to provide supplemental information (Driscoll, 2000).

Moderating Discussions

Moderators should facilitate discussions and stimulate critical thinking in students (Bonk et al., 2004; Tu & Corry, 2003). "If effective moderation is not available, the … discussion period may deteriorate into an unfocused, shallow discussion that wastes time and causes decreased motivation and a lack of interest among participants" (Tu & Corry, 2003). As students engage in discussions, it is advisable to provide appropriate feedback to keep students apprised of their location on the learning path (Orr & Smith, 2003).

To increase the usefulness of threaded discussions, Tu and Corry (2003) recommend that moderators encourage posts that are less formal than written papers but more formal than verbal conversations and real-time discussions. Encouraging students to personalize postings adds an essential human element to the dialog (Orr & Smith, 2003). It is also vital that the mod-

erator/facilitator establish appropriate guidelines for postings. The moderator should remove inappropriate postings and redirect threads that are off focus/topic (Utah State University, 2002). A diligent facilitator, with the skills necessary for guiding discourse, is required particularly during the initial forming of the online groups.

Evaluation of Participation

One way to help students engaged in threaded discussions is to create learning teams (Fisher, 2003; Orr & Smith, 2003). However, individual accountability is always a vital element of any team assignment, so as to give each student personal responsibility. Evaluation is a critical process that heavily impacts student participation (Warren & Rada, 1997). The challenge, then, is to create a well thought out guideline that encourages student participation. Instructors should be able to articulate (with examples) what quality work is and should intervene as the work is being developed to steer students in the right direction (Klemm, 1998). The course syllabus and in-class discussions should contain a clear explanation outlining what is expected of the student and the criteria by which he or she will be evaluated (Tu & Corry, 2003). Collison et al. (2000) suggest something like the following rubric to evaluate participation:

0 = no response.
½ = single entry, no interaction with other participants.
1 = responses build on the ideas of another participant and digs deeper.
2 = the response integrates multiple views.

In evaluating participation, the instructor should be prepared to provide immediate and regular commentary regarding a student's online participation (Tu & Corry, 2003). To help students stay on track, Bender (2003) suggests letting students know at specific intervals how they are doing in their participation for the course.

Description of the Course

The participants in the study are Utah State University students enrolled in a foundations of instructional technology course. Although this course was intended to be closed to nonmatriculated graduate students, there were two undergraduates in the class who are hoping to officially enter the program in the spring. The average age of the students was 27.

It is our belief that new graduate students come to a graduate program with expectations including that they will get a syllabus with the requirements and that once they complete the numbered list they will have earned their "A." This is a carryover from their experiences in undergraduate programs. Without a specific rubric, students feel insecure about their understanding and often tread lightly.

The course had 28 graduate level students including master's and PhD students. Because of the limited class time, the large class, and the large amount of readings, the researchers deemed it necessary to provide a threaded discussion component capable of facilitating out-of-class discussions about the course readings while allowing students to process the content and form their own opinions. For 5 weeks (out of a 6-week course), students were to examine the readings and then participate in a threaded discussion. A description of the assignment and the "questioning approach" that we used can be found at www.it.usu.edu/~jbentley/research/publications just as it was posted to the threaded discussion board.

Findings From the Class

Statistics

- There were a total of five discussion assignments given.
- General decline in number of responses found:
  - ◊ First assignment responses = 66
  - ◊ Second assignment responses = 73
  - ◊ Third assignment responses = 67
  - ◊ Fourth assignment responses = 49
  - ◊ Fifth assignment responses = 38
- Two students did not participate at all
- Two students scored perfect scores on their responses

After the second assignment, we elicited feedback with the following:

> The results are in for the first assignment and Dr. Bentley, Sandie and I were pleasantly overwhelmed at the responses to the first assignment. I enjoyed reading many of your posts and found I became particularly interested in your questions. I will be summarizing the major points to give to Dr. Bentley and Sandie Wed. morning so that you can have the opportunity for a classroom post-mortem if you would like.
>
> I have had some initial feedback from class members and it has been quite positive, with a few suggestions. Before we make any major tweaks I wanted to provide this forum to give your feedback so we hear from everyone AFTER you give your first post to assignment #2. In your spare time between your analysis assignment and readings please reply to this post by answering the following questions (cut and paste if you want):
>
> ◊ What do you like about the discussions and are they contributing to the goals of learning and class participation?
> ◊ Do you like the answer/question format?
> ◊ What could be improved? How do you suggest improvement?

Feedback

There were a total of 10 responses to the post for feedback. The responses are summarized below specific to each question(s).

What do you like about the discussions and are they contributing to the goals of learning and class participation?

Most of the comments about the threaded discussions were positive and included the statements, "it keeps me thinking about class when I am not in class," "I have enjoyed the discussions … I find it very interesting to see how other people think," "I love to read these posts," and "It helps me to form an opinion about some things I didn't feel so opinionated about."

There were also some negative responses to the discussions. Two of the students commented on the length of the posts and the time to read them. "I only wish I had the time to read every post and all the readings" and "I agree that the volume of the responses is pretty overwhelming. In addition to the number of postings, the lengths are also too much."

One student did not like being required to make postings, but also recognized that there would not be as much participation unless there was a requirement for postings. Another student suggested that there were too many opinions being presented and not enough conclusions from research.

Do you like the answer/question format?

Few but opposing views were expressed in regards to this question. One student stated, "I find the question/answer forum very useful, in that there are so many perspectives being offered. Sometimes it opens up a whole new way of thinking about something." On the other hand, a different student asked, "If my postings are not read to what do they contribute? Is it participation when discussions are primarily in one direction (i.e., I read a couple and post a response plus question, but do

not go back to see any responses to my questions)? Whatever it is, it is not dialogue."

What could be improved? How do you suggest improvement?

All 10 respondents to this forum gave suggestions for feedback. Two students remarked that the breadth and number of posts in the discussions were too large and that the class should be divided in to three or four groups and/or the posts should be limited to a word maximum. They suggested that this would lead to more intimate discussions and time to read the posts of others.

Other students did not like that fact that it was mandatory to make two responses. "I think that this artifice[i]ally pushes the conversation in a wrong direction as some people will feel forced to contribute." They suggested that only one response and additional question be required and that this way the discussion would become a more "natural offshoot" of the topics.

Finally, another common theme was the observation that there are too many opinions and not enough supported facts. One student expressed the view that "opinion and evidence both have value, but when mixed, one has difficulty in interpreting between the two." Another student suggested that all works should be cited and that students should express and delineate their opinions as just that—opinions.

Conclusion

Gaining a better understanding of the online groups was the greatest take-away of this research experience. A great number of the 20 guidelines emerged from the teaching experience. We were able to include short discussion cycles, guiding questions, clear objectives, and requirements for the assignment. In addition to the syllabus, the researchers outlined the proper format and etiquette that students were to follow in making their posts. The researchers also encouraged students to explore readings and cite sources from readings in their comments, along with drawing on their personal experiences. The discussion moderator posted questions, cited readings, and gave feedback to students' postings in order to promote critical thinking. The moderator also encouraged students to use personal examples and humor to make the experience more interesting and enjoyable. Fortunately, there were no unacceptable messages throughout the semester.

As moderators of the discussion threads, the researchers were acutely aware of the correlation between evaluation and class participation, and they made it clear in the syllabus and class instructions that part of the students' grade was based on participation. A rubric was created for evaluating a student's participation.

One emergent guideline was that of small groups. With a group of 28 students, a huge amount of discourse was written through which students were required to sift. Students suggested that we break up in to smaller groups, but with only two weeks left of discussion threads the decision was made to keep the original groups. Future iterations of this course will include small group threaded discussions.

Future iterations of this course will include student roles including that of moderator (monitors appropriateness and focus of postings), synthesizer/researcher (used to create the initial "against" argument), lead (to pose the initial question), and readings expert (used to create the initial "pro" argument). Additionally, the evaluation rubric will be included in the syllabus. Through the feedback based on the rubric, the facilitator serves as a guide to support learning throughout the process.

As threaded discussions become increasingly more popular, we believe these guidelines will be helpful and informative. This article has examined 20 guidelines, a description from one of our own

courses, and findings from that course. The researchers encourage additional feedback and contributions to future iterations of this article. Additional research will help educators create user-friendly asynchronous computer mediated communication methods for eliciting community building, as well as content mastery.

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The Community College Leadership Perspectives of Quality e-Learning

A Case Study

Abed H. Almala

Many institutions of higher education, educational organizations, the business community, and learners are embracing e-learning for a variety of reasons and needs. These parties refer to key factors such as flexibility, using mixed interactive multimedia, Internet research, archiving, electronic networks, telecommunications, and cost to support the idea that e-learning could serve as a viable and qualitative learning alternative.

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Some educators and learners, however, believe that e-learning cannot—and should not—replace classroom instruction, pointing out that the quality of face-to-face education must not be compromised by e-learning. Nevertheless, professional and scholastic individuals with such reservations often recognize that e-learning can be a valuable supplement to traditional learning, an effective learning tool for mature and responsible students, and so should be pursued. Hence, quality of learning is a deciding factor as to whether e-learning should be considered as a total and effective learning environment.

Recent educational statistics and forecasts have revealed that e-learning is gaining ground in community colleges and universities nationwide. Investigating and assessing the planning and implementation processes of e-learning courses and programs at these institutions of higher education is necessary to determine the quality of a Web-based learning environment. Quality e-learning is a Web-based learning environment designed, developed, and delivered based on several dynamic principles, such as institutional support, course development, teaching/learning, course structure, student support, faculty support, and evaluation and assessment (Phipps & Merisotis, 2000).

Specific Research Procedures

Ensuring a quality e-learning environment is essential to provide students with the full range of benefits that e-learning entails. To provide a practical solution to the problem of evaluating the quality of e-learning and to answer the research question presented in this study completely and appropriately, a qualitative research method was used in investigating the e-learning process at a community college in Virginia. The purpose of using this method is to provide an in-depth look at and obtain new insights on the issues that impact the quality of e-learning courses from the perspective of the distance education leadership at this 2-year institution of higher education.

The qualitative data collection method used in this study was face-to-face interviews with three leaders involved directly in the community college e-learning process. Open-ended interviews were used in this study, and each interviewee was asked the same 10 sequenced and predetermined questions (Frankel & Wallen, 1996). Responding to the same set of questions may lessen interviewer bias and facilitate the analytical process. However, flexibility of rewording or generating new questions and making connections during the interview are limited, which could stiffen the interview atmosphere and outcome (Frankel & Wallen, 1996). The set of questions was on specific, major e-learning issues such as course offerings, cost, educational equity, accreditation, intellectual property, enrollment procedures, testing, and other administrative issues.

The author of this study and the community college determined the number of these leaders. When the process of gathering data, analyzing and compiling was completed, practical answers were provided to the following research question.

Research Question

To what extent does the community college plan for and cope with important e-learning issues such as cost, accreditation, course offerings, educational equity, intellectual property, enrollment procedures, testing, academic honesty, and administrative issues?

Research Population

This study investigated the e-learning process which is designed and managed by the community college to provide students and workers with quality education and training regardless of time and place. The community college under study provides asynchronous e-learning opportunities for students and employees, regardless of time or place, to complete a Web-based training session, certificate, or a degree program in several disciplines, such as computer technology, business administration and management.

The rationale for selecting this research population was to obtain a clear picture of the current and future planning for high-quality e-learning courses in a community college environment. The author of this study worked as a face-to-face lecturer at this community college. Its large population, convenience, and accessibility were reasons this community college was selected for this research investigation.

Findings

Face-to-face interviews with those three proactive and most involved e-learning leaders focused on several important e-learning issues. The following information was summarized based on what each leader stated in the interview in response to a set of ten prescribed questions.

Quality of e-learning instruction and cost factors

Most of the distance learning program's e-learning courses were developed by faculty members. The distance learning pro-

gram instructional technology staff provides faculty members with on-site training and assists them with the course development process. However, faculty members were not given release time to design and develop e-learning courses. The distance learning program's enrollment process and class size were largely flexible. Students are allowed to enroll in e-learning classes throughout the semester, and enrollment is fluid. The distance learning program and faculty members decide the maximum number of students allowed to enroll in each e-learning class. While this policy reduces the cost of developing e-learning courses in the distance learning program, it may negatively impact the instructional and e-learning environment, particularly the interaction process among students and between students and faculty members, preparing and delivering courses, and monitoring student learning progress more closely.

As the distance learning program is part of the community college, it is not a separate entity or learning unit. The college is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools, which evaluates all of the academic programs offered by the community college, including the distance learning program. To ensure further quality and effectiveness, all of the distance learning program's e-learning courses were reviewed internally by faculty, instructional technologists, and administrators. The course development process at the distance learning program undergoes three internal quality assurance processes: course proposal, peer review, and multiparty assessment. Student input via class evaluation feedback is considered in the multiparty assessment process.

Efficiency and Consistency in Electronic Course Offerings

Course offerings were mainly based on the needs of the on-campus degree and certificate college students. The distance learning program offers a variety of flexible asynchronous e-learning courses, regardless of the type and number of courses offered at other community colleges and universities in the Washington, DC metropolitan area due to differences in curriculum, student population, course delivery format, and support.

Student Services

E-learning and on-campus (traditional) students were offered the same student services. E-learning students have full access to virtual and traditional library resources, Internet services, online registration, and class schedules. They also have direct access to Blackboard technical support services and can order textbooks and parking permits by phone using a toll-free number. The distance learning program student support services were available to serve all distance learning students, including those who were taking asynchronous e-learning courses.

Ownership of Class Materials

Intellectual property is an important issue. Based on pertinent state laws and up-front, mutual understanding and agreement between faculty members and the community college, the college and distance learning program have put forth guidelines on who owns the developed e-learning course materials. For example, if the college spends more than $10,000 on developing the course materials, then the college owns the course. If the e-learning course is a joint project, then the college owns the course. If a faculty member develops the course completely, then he or she owns the course. Recently, distance learning program has resorted to developing e-learning courses based on joint effort and teamwork in which faculty members, instructional technologists and technical support staff are joined together to design and develop quality e-learning courses.

E-Learning Testing Process

In the distance learning program, e-learning class tests must be proctored; however, not all e-learning faculty members comply with this policy. A few e-learning instructors allow students to take quizzes and tests online. The distance learning program encourages faculty members to offer a variety of proctored tests, such as essay exams. While technology may alleviate some of the shortcomings of online testing, the distance learning program asserts its position that online testing cannot substitute for proctored testing due to issues of academic dishonesty and plagiarism. Students enrolled in the distance learning program may take these proctored tests at the distance learning program's premises, in any of the college campus testing centers, or at a distance site via an approved proctor. These testing centers are open for long hours on any day of the week, except Sundays.

Collaboration With Other Colleges and Universities

Through the community college, the distance learning program encourages and welcomes collaboration with other colleges, universities, and educational organizations as long as this strategy imparts benefits to the college and distance learning program. For instance, the distance learning program collaborates closely with other local public community colleges in sharing the educational services provided by Blackboard. The distance learning program also works with the American Association of Community Colleges on a variety of educational projects. The distance learning program offers advice and collaborates with other institutions to design and develop e-learning courses and purchase software licenses, computer equipment, and technology tools.

Specific Administrative Issues

In 2003, the distance learning program ended its continuous registration policy. In the past, students could register for e-learning classes anytime during the semester. Today, most of the e-learning courses have multiple sections throughout the semester, but some e-learning classes are offered only one time during the semester, with opening and closing dates. If an e-learning student cannot finish a course within the 16-week period, a class extension may be granted. However, this extension policy has complicated the evaluation process for e-learning courses due to the delay in receiving sufficient student feedback.

An increase in the number of e-learning students and shortage of staff has added more responsibilities to the already busy distance learning program administrators and burned-out staff. For instance, in addition to intensive day-to-day responsibilities, the distance learning program director must also be aware of state regulations, accreditation guidelines, and policies of the Virginia Community College System. The issues of more e-learning students coming in and the lack of staff have complicated the process of resolving problems promptly.

Decision Making

To some extent, the distance learning program's decisions were made based on feedback from faculty members, staff, and students. Specific joint decisions with academic deans and other supervisors were made on issues such as offering or terminating contracts to faculty members and introducing or canceling e-learning classes.

Analysis Methodology

The author used the specific qualitative paradigm known as interpretive analysis to analyze the collected data in this research study. The strategy of interpretive analysis was used to fully understand the complexities of issues drawn in planning for high quality e-learning courses. Vrasidas and McIsaac (1999) state that

"interpretive research focuses on the perspectives of the actors involved and attempts to understand the multiple layers of meaning presented by human action" (p. 25). The rationale behind using the interview in this research study was the flexibility of asking, repeating, and clarifying questions to reach a complete understanding of certain e-learning issues under investigation (Ary, Jacobs, & Razavieh, 2002). Interviewing individuals is also encouraged in the interpretive analysis research paradigm (Mertens, 1998), as researchers can ask participants questions related to a range of events and behaviors, such as:

> facts, people's beliefs about the facts, motives, present and past behaviors, standards for behavior (i.e., what people think should be done in certain situations), conscious reasons for actions or feelings (e.g., why people think that engaging in a particular behavior is desirable or undesirable. (Leedy & Ormrod, 2001, p. 159)

According to Hatch (2002), interpretation is "about making inferences, developing insights, attaching significance, refining understandings, drawing conclusions, and extrapolating lessons" (p. 180). The main research techniques applicable to this paradigm are interviews, observations, and document reviews (Mertens, 1998).

The main advantages of interpretive analysis are that (a) it allows the researcher to play an active role in the investigation process by linking the collected information to his or her own interpretation, (b) it can be used with any type of data, and (c) it is consistent with learning theories that support e-learning, such as the constructivist paradigm (Hatch, 2002).

Recommendations

The collected data in this research study were sufficient to offer a list of practical recommendations for the community college under study—and other public and private colleges and universities that are seeking guidance in planning for high quality or enhancing their current e-learning courses or programs. Institutions of higher education, faculty, policymakers, and government officials who are interested in electronic learning will benefit from the information and recommendations presented in this project to effectively design—and draw upon the necessary acts and laws that govern—high-quality e-learning courses and programs. Students and, therefore, local, national, and global communities, will reap the fruits of well-designed, efficiently run e-learning courses and programs.

This study's findings led to the following specific recommendations in reference to the issues that impact the quality of e-learning in institutions of higher education:

1. Diversify e-learning delivery format by offering synchronous e-learning courses to students and other interested parties.
2. Increase student and faculty support services.
3. Provide e-learning faculty members and students with orientation sessions and written resources to deal with issues arising from students' using electronically accessed data.
4. Train faculty members on how to conduct online testing.
5. Reduce the number of asynchronous e-learning students from the current level to 25-30 students per class.
6. Offer e-learning faculty members release time with pay to design and implement quality asynchronous e-learning courses.
7. If institutions of higher education harness and apply the principles of quality e-learning fully and effectively, e-learning students will have greater opportunities to succeed in quality e-learning environments.

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One School's Experience in Implementing E-Portfolios

Lessons Learned

Risa Blair and Lyndon Godsall

This article describes how a K-12 school in South Florida adopted a course management system with e-portfolio capabilities. E-portfolios are available tools, though more costly, in higher-end course management systems and are gaining recognition in the K-12 market. However, according to a recent survey administered by the technology team at the school, acceptance and integration of the e-portfolio is still evolving. Participants in the survey included 163 high school students who received training from their teachers to create e-portfolios in major subject areas. From the survey, students indicated that they are still unsure as to the application of e-portfolios. Once standards are established by the learning community, e-portfolios will realize their potential in academia and the workplace.

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Introduction

Anne Watson walked in to her home after a busy day in 11th grade. In the kitchen, her mom offered her a plate of fresh chocolate chip cookies. Anne was so excited that she could hardly get her laptop turned on and access the wireless network in her house quickly enough! She wanted to show her mom the e-portfolio she had been creating in the school's course management system (CMS) over the last 2 months in an interdisciplinary activity among history, AP English, music, and art. She and her class had studied famous English authors. She had chosen Jane Austen, a highly accomplished woman of her day. Anne had collected a diverse range of digital artifacts that included: PowerPoint presentations, Word documents, music of the day, video clips, and images. Her mother couldn't believe the quality, quantity and sophistication of what Anne had done for her project at school! Anne had produced an e-portfolio. Barrett (1997) and Siegle (2002) suggest that electronic portfolios can contain images, sound, video, text and mixed media. The e-portfolio development process facilitates student centered learning and enables students to embrace the entire learning process (Tosh & Werdmuller, 2004).

Just how exactly did Anne get to the stage where she effectively produced an e-portfolio of publisher quality? Anne goes to a school that has ubiquitous computing opportunities and a CMS that also serves as a virtual learning environment (VLE). Although e-portfolios may be developed using basic HTML and off-the-shelf tools, the CMS product Anne uses has a built-in wizard for developing e-portfolios. Anne's e-portfolio is the culmination of an implementation process that involved commitment, funding, training, and support of the school's administrators. The school chose to implement a course management system to enrich curriculum delivery and the learning experience for students and teachers. The administrators eventually chose to adopt the enterprise edition of the CMS that included user-friendly, e-portfolio templates. Why would administrators choose to upgrade to the enterprise edition of a CMS that supports e-portfolios? The advantages of housing e-portfolios within a CMS are threefold: (1) student work can easily be shared within their respective classes, (2) the CMS parent company manages the server space the way the school's system is configured, and (3) student work is secure, as it is housed within the school's intranet and password protected.

Course Management Systems

What is a CMS? Course management systems were initially structured so as to fulfill demands for distributed learning, in which students participated in hybrid courses or simply used the CMS for enrichment. Currently, many course management systems serve as the basis for online education. Just like ice cream, there are many flavors, with varying features. Major players in the market today are WebCT, Blackboard, Angel, and e-Learning. A course management system is a software package designed to run either on the provider's server or the school's server; administration may also be through the provider or the school. There are also different course configurations that may be developed using CMSs. A straight distance education class will rely strictly on the selected CMS, with no face-to-face component. A hybrid DE class will rely heavily on the CMS, but will have some face-to-face component. Of a hybrid model applied at Nova Southeastern University, Schlosser and Burmeister (1999) wrote, "The … model is based on an understanding that a 'best' balance both of face-to-face and distance instruction and of media may be established for a given group of students and instructors" (p. 45). Schlosser and Burmeister have suggested that the best balance for distributed learning combines

both face-to-face synchronous and online asynchronous components.

Traditional face-to-face classes may use CMSs for enrichment purposes. This is most common in the K-12 setting; however, there are many schools beginning to follow the model of the Florida Virtual High School. By providing courses online, traditional high schools can save millions of dollars in costs for brick-and-mortar structures. High schools can expand their offerings through advanced placement courses available online, at varying costs. Some of the best high schools, whose students would ordinarily not have access to these courses, can take advantage of advanced placement courses online. Some of the best teachers in the field are chosen as online teachers for advanced placement courses in their respective fields. Technology, including course management systems and online learning, has opened the doors for students to take college courses while they are still in high school.

School administrators decided to adopt a CMS in order to not only be competitive in the independent school market, but also to provide students with an excellent introduction to online education in order to prepare them for college. The implementation of the CMS started with a basic version and eventually progressed to the enterprise version that included a school portal. So, instead of having to use standalone file transfer protocol (FTP) software, the enterprise version provided the school with a user-friendly interface for copying items (including word processor files, images, sound clips, video clips, etc.) to the CMS server. Furthermore, teachers and students became enthusiastic about being easily able to create e-portfolios utilizing mixed media.

E-Portfolios

Although administrators chose to integrate an e-portfolio system that integrates smoothly with the CMS, Gibson and Barrett (2003) identify the possibility of an alternative path whereby the e-portfolio could be created using generic tools such as word processors, HTML editors, PDF file formats, and multimedia authoring tools. Although, paper portfolios have been used in the educational environment for a long time, the digital age has brought about a renaissance of portfolio development for both teachers and students (Gibson & Barrett, 2003).

The purposes of educational portfolios include development, presentation, and assessment (Barrett, 1997; Hewett, 2004; MacDonald, Liu, Lowell, Tsai, & Lohr, 2004; Mason, Pegler, Weller, 2004). Benefits of using an e-portfolio can be threefold and serve as the following: (1) an educational tool for the learner, (2) a mechanism for monitoring the institution, and (3) a showcase of skills for potential employers (Tosh & Wermuller, 2004). Table 1 displays key features from major providers of course management systems that feature e-portfolios.

Initially, when the school adopted the CMS, the e-portfolio feature was not available. However, as the product evolved, e-portfolios became a standard feature of the academic suite.

Training

Teacher training clearly needs to be conducted before student training, as students are already so technology savvy, their teachers easily become threatened. Hird (1997) and Jukes (2004) suggested that kids are very cyber-savvy and expect teachers to be their equals, if not better prepared to use technology.

Several steps were taken to develop effective training for teachers. First, the instructional technology team brainstormed and developed a list of the most important tasks to teach the teachers in order to create with the e-portfolios. Next, the team prioritized and ordered the tasks for effective implementation. Finally, the

Table 1
Comparison of Course Management Systems

Feature	Angel 6.2	Blackboard 6	WebCT 4.1
File Exchange	Students can upload files to a shared course or group folder. Students can download all the contents of a folder at one time. Students can share the contents of their personal folders with other students and their instructors.	Students can upload files to a shared group folder. Students have a private folder into that they can upload and download files. Instructors can upload files to the personal folder of a student. Students may share their e-portfolios with teachers, classmates, and external users.	Students can upload files to a shared group folder. Instructors can upload files for the class to see.
Student E-Portfolios	Students can create a personal home page that may include photos and personal information. Students have a private folder and a team folder for displaying their work. Students can create a private folder that is accessible system wide, to display their work.	Students can create a personal home page that may include photos, personal information, and links to important Web sites. Blackboard also provides the option of creating e-portfolios to archive a variety of works in different file formats. Students may also save their e-portfolios to a CD-rom.	Students can create a personal home page in each course in that they are enrolled. Students can use their personal home page to display their work in courses. Students may export their homepage to a CD -rom.

team designed and presented training sessions in sequential chunks with a "show, practice run, do" (SPD) methodology. In other words, the team demonstrates the new technology, has a volunteer practice the new technology with the group (or act as a guinea pig), and then, finally, all teachers work through the process. The most successful training follows this progression, in that it appeals to learners with different learning preferences, including visual, tactile, and auditory learning styles.

By providing training to the teachers and using a "train the trainer" approach, teachers easily guided their students through the e-portfolio development process. Teachers became empowered, embraced this new technology, and became very enthusiastic about the possibilities of using e-portfolios in the classroom and even for future cocurricular projects. Because teachers had a good working knowledge of the technology and were enthusiastic, when they presented the e-portfolio projects to their students, the students were not only quick to understand the technology, but also quickly shared in teachers' enthusiasm. As noted by Järvinen, Lindh, and Sääskilahti (2000) teachers need to have not only empowerment and enthusiasm in working with technology, but also ongoing training and support throughout the implementation of the new technology. The teacher training is viewed as a success because teachers were able to teach and engage 163 students in the e-portfolio development process!

Student training typically follows two unique paths. For the technology-savvy teachers, the team follows a "train the trainer" approach, in which they train the teacher and the teacher trains the class. For the teachers seeking a more "technology on demand" approach, the instructional technology trainers cooperatively and seamlessly present the e-portfolios lessons

to the class. Although there isn't typically enough time for students to pick up all of the subtle parts of the lesson within the class, since the technology is a supplement to the subject matter area, students generally grasp the main points of each lesson very quickly. Furthermore, there are very often computer-knowledgeable students in each class seeking to excel, who tinker with the software or technology offered, and quickly master the high-end qualities of the programs or hardware. According to the school's survey of 163 students (see Appendix), 64% found it easy to create e-portfolios.

How could the technology team improve the implementation of e-portfolio training? Since classes are only 45 minutes in length, training time was very short. Teachers were barely able to grasp the benefits of e-portfolios. However, even with this short training time, teachers were enthusiastic and trained their students. Brand (1997) suggests that teachers need time and flexibility to fully engage in technology activities. Teachers and students are beginning to see the benefits of integrating e-portfolios into the curriculum. By elevating the importance of the teacher technology training and including e-portfolio training in the half-day summer technology workshops, teachers can feel even better prepared to use the technology with their classes. However, even with the little amount of training teachers received, they were still truly inspired by the idea of electronic portfolio and wanted to create projects with their students.

The implementation technology team trained the teachers. They wanted to find the effects of the training of the teachers on the students, so they examined how students felt about e-portfolios, training, and the learning process. Future projects include the creation of e-portfolios next fall in the first trimester to follow summer reading assignments. Additionally, students will develop interdisciplinary projects at the end of the second trimester.

E-Portfolio Projects

Teachers have asked students to make e-portfolios to profile English authors, to conduct investigations of presidents (where each child is assigned a president to research), and even to post science lab experiment results. Lab reports are actually written as e-portfolios. E-portfolios are also used for presenting end-of-trimester work, including digital pictures of paintings, drawings, and sculptures in art class, and projects in graphic design and photography. Presently, students are exchanging e-portfolios with each other and their teacher. Students share their research of 24 presidents and have the opportunity to learn about all 24 presidents, instead of just one. E-portfolios are also used for peer review of work, self-assessment, and teacher-assessment. Teachers are able to assess projects on different levels. Students benefit by developing e-portfolios for at least three reasons: (1) they are engaged in a project that has a constructivist base and need to use critical thinking skills to proceed; (2) they are excited about working with the new technology and work to push it to the limits; and (3) because they are engaged and active in the process, they produce a quality project. The benefits described above are in line with the key elements of the school's mission statement, as e-portfolio development fosters creativity and critical thinking skills, and readies students to embrace the college experience. This K-12 school is dedicated to developing individuals by offering excellent academics, as well as empowering students to express their creativity and independence.

Using E-Portfolios for Faculty Development

Faculty development is a critical component of teaching at any level, whether for K-12 teachers or college professors. Without faculty development, teachers are unable to keep up with technology and

theoretical shifts in the educational process. By providing faculty development in an online mode, in which the final project culminates in an e-portfolio, teachers can see how much they have learned about particular topics over time. For instance, if the instructional technology team provides faculty training on educational games for teacher use in a traditional classroom, although they are providing a good service to teachers, they are not necessarily adhering to constructivist principles and enabling them to fully integrate the skill set. Whereas, if the instructional technology team presents a traditional class in developing assessments using educational games, provides online instruction (as support for the class session) and examples, and requests that each teacher submits a couple of sample assessments to his or her e-portfolio, then each teacher really has a much fuller learning experience. Plus, the teacher has also developed the basis for building an e-portfolio showing various assessment strategies. The learning experience is much more complete for the teacher. The teacher is both intellectually and professionally stimulated. Best of all, the teacher is using the technology as a means to an end, not merely using technology for the sake of using technology. Constructivist principles are at work here. The teacher literally adopts the technology to construct his or her own reality, to achieve an important assessment task, and to build his or her personal e-portfolio.

The Benefits of E-Portfolios Versus Paper Portfolios

E-portfolios provide students with ongoing opportunities to develop collaborative projects to not only share with other students in their classes, but also to see the obvious progress they have made from semester to semester, or throughout the scope of their class. The simple format for managing e-portfolios for either single or multiple classes makes this an excellent tool for student use. Now, why would students choose to develop an e-portfolio rather than a traditional Web site? First, students can easily follow wizard-driven instructions in the CMS to compile their e-portfolios and add text documents or various types of media, including pictures, audio files, movies, presentations, and the like. Second, students don't need to learn a whole new language like HTML or JavaScript in order to produce effective Web sites and timeless memories. Third, students can easily share their e-portfolios with their classmates or teachers, and even be involved in cross-curricular projects that culminate in e-portfolio development.

Why would teachers choose to have their students develop e-portfolios rather than traditional Web sites? First, teachers do not have to learn and train students in Web development skills in order to create e-portfolios. Second, teachers can be comfortable with projects developed within a CMS because they will be shareable and easily monitored by the teacher. If students were to develop Web pages in a free space on the Internet, it would be very difficult to monitor what students are writing for presentations within the scope of the class.

According to Mason, Pegler, and Weller (2004), and Tosh and Werdmuller (2004), e-portfolios can be used for short-term purposes, but the basic concept is that the learners will contribute continuously to their e-portfolios throughout their school experience, and draw on it for such things as job interviews and maintaining a record of achievement. For instance, a student seeking to demonstrate talent in debating could insert a video clip into the e-portfolio. Likewise, a student with skills in image editing could include a high-end original graphic design created in Adobe Photoshop or Adobe Illustrator and saved in an appropriate Web-friendly format. Evidence suggests that portfolio assessments have had a positive effect on student learning (Santos, 1997; Sweet, 1993; Tierney,

Carter, & Desai, 1991; Wolfe & Sui-Runyun, 1996).

Evaluation

In a recent survey of 163 high school students who created e-portfolios using a CMS, the students were asked about their experiences. Nearly two thirds (64 %) said that the process was easy.

With the advances in digital media, students are able to add a variety of documents to their e-portfolios. "An e-portfolio is a Web-based information management system that uses electronic media and services. The learner builds and maintains a digital repository of artifacts" (Tosh & Werdmuller, 2004, p. 1). When asked to respond to the question "What document types did you include in your e-portfolio?" students responded as follows: Word document (113), images (121), PowerPoint (104), audio file (39), video (24), PDF (7), and Excel spreadsheet (2).

E-portfolios can play an important role in evaluating student progress. Many of the students in the survey stated that they would prefer to have an e-portfolio assigned as a form of assessment as opposed to a test. However, the majority (54%) of students selected a traditional test rather than an e-portfolio to be used for assessment at the end of a trimester when asked "Would you prefer your teacher assign a semester-long, e-portfolio project rather than a test at the end of the trimester?"

These high school students are deemed to be cyber-savvy, as they have used laptops in a ubiquitous environment for over five years. Even these students are somewhat noncommittal about using e-portfolios for applying to college or for jobs. However, MacDonald et al. (2004) have suggested that the key objective of an e-portfolio is to help students organize their work for presentation to employers. As Wheeler (2003) has noted, "ePortfolios should ultimately support the reflective practices needed for life-long learning. This implies ePortfolio applicability and portability within K-12, to higher education, and on to career" (¶6). E-portfolios are an excellent method for not only reflecting state standards and the NETS·S across the curriculum, but also for helping student teachers develop an organized process for displaying academic work in a variety of media over time (Avraamidou & Zemball-Saul, 2002; MacDonald et al., 2004). E-portfolios also serve as an outstanding tool to be used in conducting employment searches (Bucci et al., 2004). However, the survey indicates that these students (73%) do not see the application of e-portfolios for applying for college or jobs when asked, "Can you envision using e-portfolios to apply to college or for a job?"

Conclusion

The student Anne Watson recently stated that she acquired a summer position because her mother passed along her e-portfolio to an executive at a local Fox network affiliate, who was so impressed that she took her on as a summer intern. Such is the power of an e-portfolio! Obviously, the producers of the major CMS products have also recognized the power of e-portfolios, in that they have chosen to integrate them into their present systems. In fact, course management systems have made the process of developing e-portfolios simplistic for both students and teachers. Therefore, the training process for IT departments has proven to be very straightforward and beneficial for those involved.

However, in a recent survey of 163 students with state-of-the art technology and ubiquitous computing opportunities available, the students were mixed in their reactions toward e-portfolios. For example, when asked, "Can you envision using an e-portfolio to apply to college or for a job," 117 said "no" and 46 said "yes." Students

can easily produce e-portfolios, but cannot make the connection between production and application. E-portfolio-savvy teachers and high school guidance counselors can begin to bridge the gap between production and application. In order to be e-portfolio savvy, however, both teachers and counselors need to be trained or at least shown actual student-developed e-portfolios, and the benefits of producing such projects should be explained. The process is a gradual one, and through ongoing technology training, and perhaps even student or parent pressure, use of e-portfolios for college admission will become the rule.

However, college admissions counselors have not yet set standards or developed a rubric for creating e-portfolios that effectively encapsulate the skills, knowledge and talents of these students. As a first step, standards should be developed that comply with NETS·S standards to allow students to see the application of e-portfolios for their high school coursework. Ultimately, standards should be established for evaluation of students as they apply to college or for work. After all, an e-portfolio should serve as a self-assessment and reflection at a personal crossroad (Barrett, 2000).

ULTIMATELY, STANDARDS SHOULD BE ESTABLISHED FOR EVALUATION OF STUDENTS AS THEY APPLY TO COLLEGE OR FOR WORK. AFTER ALL, AN E-PORTFOLIO SHOULD SERVE AS A SELF-ASSESSMENT AND REFLECTION AT A PERSONAL CROSSROAD.

Appendix:
E-Portfolio Student Survey

		Number of Responses	Response Ratio
1.	Was the experience of making your e-portfolio easy?		
	Yes	104	64%
	No	59	36%
2.	Was your training sufficient to prepare you to make your e-portfolio?		
	Yes	108	66%
	No	55	34%

Rate these statements from 1 to 5.
5 = I definitely agree and 1 = I do not agree

The top percentage indicates total respondent ration; the bottom number represents the actual number of respondents selecting the option.

		5	*4*	*3*	*2*	*1*
3.	I found the experience to be valuable and it added to my understanding of the subject	9% 15	21% 34	40% 66	12% 20	17% 28
4.	I would recommend e-portfolios to other students.	15% 25	23% 38	26% 43	17% 28	28% 29
5.	Making e-portfolios is very time consuming.	25% 41	23% 38	23% 37	17% 28	12% 19

		Number of Responses	Response Ratio
6.	Did you share your e-portfolio?		
	Yes	100	61%
	No	63	39%
7.	Would you like other teachers to use e-portfolios		
	Yes	64	39%
	No	99	61%
8.	Can you envision using e-portfolios to apply to college or for a job?		
	Yes	46	28%
	No	117	72%
9.	What did you include in your e-portfolio?		
	Word Document	113	69%
	PowerPoint	104	64%
	Images	121	74%
	Excel Spreadsheet	2	1%
	Video	24	15%
	Audio File	39	24%
	PDF	7	4%
10.	Did you embellish your e-portfolio		
	Yes	62	38%
	No	101	62%
11.	Would you prefer your teacher to give you a test at the end of the trimester rather than an e-portfolio to demonstrate your understanding of the material?		
	Yes	72	44%
	No	91	56%

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Upon Reflection

A Case Study of a Simultaneous Hybrid Classroom

Sandra Ratcliff Daffron and Edward Webster

College courses often have to be offered the same term on both main and branch campuses to satisfy student requirements. For small programs, offering 2 identical courses on 2 campuses is expensive, whereas combining the enrollment numbers of both campuses usually will justify the salary of 1 instructor. There is a way to offer small enrollment classes on both campuses while offering students the flexibility of attending class each week either online or in the classroom. This case study describes how a professor developed the simultaneous hybrid course model to teach the same material in the classroom and online at the same time.

Background and Purpose

Scheduling courses on multiple campuses for students to meet academic program requirements while maintaining sufficient enrollment to pay course expenses, is a challenge. Administrators often have to cancel courses on a branch campus due to low attendance, forcing

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some students to drive long distances to attend the same course on the main campus. Other students wait until the following year when the course is offered again on the branch campus, taking the chance that low attendance may result in cancellation.

This article documents how one program administrator/professor and a graduate assistant solved the dilemma of low enrollment classes on multiple campuses. The instructional design of a course that was to be taught in the classroom and online at the same time required careful consideration to ensure: separate but equal student assignments, online and in the classroom; similar transfer of learning, online and in the classroom; minimal increase of instructor workload; and that techniques were practical and used readily available technology.

The ideal solution accommodates a diverse student preference for delivery of courses while maintaining quality of education, and is economically viable and keeps the instructor's workload manageable (Arbaugh, 2000).

Setting

Western Washington University (WWU) has approximately 75 students in a continuing and college education (CCE) master's degree program. Students plan to become teachers, trainers, or administrators of educational programs for adults. All are adult students and attend classes at either the WWU main campus in Bellingham or a smaller branch campus in Everett, a Seattle suburb that is a 1-hour drive from Bellingham. Some students drive 2 hours from south Seattle to the Everett campus, while others drive 2 hours from Canada to the Bellingham campus. Students typically drive to the closest campus directly from work for evening classes. However, to meet required offerings, students may need to drive to the other campus or wait for a year for the course to be offered again.

In 2003, the traditional classroom CCE graduate courses began to use a multimode, or hybrid delivery, strategy with the course management system Blackboard. Students quickly embraced the flexibility and convenience of attending class each week face-to-face (F2F) while using a distance-learning (DL) portal to pick up class material and submit assignments. Dede (1990) and Brook, (2003) describe the evolution of distance learning as a powerful change in the classroom and one that will soon impact delivery and participation of all education. The popularity and success of hybrid courses in the WWU CCE graduate program served as the foundation for the development of the simultaneous hybrid course model to address the issues of minimum enrollment, student commute time, and instructional delivery preference.

Instructional Design Considerations

Three instructional design goals were identified as crucial to the success of the simultaneous hybrid course: create the proper learning environment for F2F and DL students; use similar but customized course material for F2F and DL students; and minimize instructor workload by streamlining tasks. Meeting these goals would mean that both F2F and DL students would have equal course work and a similar transfer of learning without doubling the instructor's workload.

Course Structure

Simultaneous course activities were carefully set up using a F2F orientation, one set of class activities and materials, and a coordinated lesson plan for each week. A F2F meeting for the first class helps the students get acquainted and bond, a necessary activity to reach a good level of

discussion during the term. As Sullivan (2002) points out, minimum levels of acceptable class participation should be established for grading online students, and although quite different than in the classroom, these minimum levels help the instructor gauge the presentation success of material each week. Collaborative and group presentation projects typically takes longer for DL students to complete, due to the asynchronous nature of online communication. Format options for final presentations were developed to allow both DL and F2F students to use their predominant and most comfortable learning styles. Deubel (2003) shows that the use of multiple learning approaches can provide flexibility and help ensure equal transfer of learning for both F2F and DL students. Table 1 shows that most elements of the course were identical for both the F2F and DL students.

Course Material

To maximize the instructor's productivity and minimize student confusion, all students purchased the same textbook, and all other course material was exchanged using Blackboard. F2F and DL students used identical procedures for receiving course material from and sending course material to the instructor. Course documents, previously printed on paper, were "printed" on "electronic paper" using the ubiquitous PDF (portable document) format. Some course documents only existed on paper and were either recreated in a word processor file or optically scanned for distribution to students in the PDF format. F2F and DL students reliably downloaded and viewed course materials using PDF reader software, available free for both Mac and PC.

Blackboard areas were created to hold all material specific to that week's instruction. PDF versions of Power Point presentations, supplemental reading material, and related URLs would be uploaded to Blackboard for both DL and F2F students. Arbaugh (2000) found that content modularity helped the instructor organize the course for both groups of students and maintain the week-to-week course schedule. A student unable to attend class one week could keep up by accessing all the week's materials online and would no longer have to miss class due to work or family obligations.

All course material was posted on Blackboard 1 to 2 days before the F2F class meeting to insure that all students had adequate time to download, print and review that week's instruction materials. The instructor efficiently distributed course material to all students in a single step with full confidence that all students

Table 1
Course Structure

Item	Face-to-Face Classroom	Distance Learning Classroom
Course description	Identical	Identical
Course objectives	Identical	Identical
Reading assignments	Identical	Identical
Writing assignments	Identical	Identical
Individual project work	Identical	Identical
Class participation credit	In class	Online
Collaborative project work	In class	Online
Project presentations	In class and online	Online

Table 2
Course Material

Item	Face-to-Face Classroom	Distance Learning Classroom
Syllabus	PDF	PDF
Class announcements	In class	DA
PowerPoint presentation	In class & PDF	PDF
Lecture	In class	DA
Formal readings	Textbook	Textbook
Supplemental readings	WEB & PDF	WEB & PDF
Student assignments	RTF	RTF
Group assignments	RTF, PP, & In class	RTF, PP & DA

Key: F2F = face-to-face classroom; DL = distance learning classroom on Blackboard; PDF = portable document format document file (electronic paper); DA = digital audio recording (instructor & students); PP = PowerPoint presentation files, posted as a PDF file; WEB = URLs to Internet Web sites; RTF = rich text format electronic files that can be read by any word processor.

could reliably access the material. Table 2 shows that most of the major areas of course material are identical for both DL and F2F students; lectures and presentations are quite different in delivery format but virtually identical in content.

Instructor Workload

To streamline instructor workflow, every effort was made to develop systems where an instructional task was performed just once for both groups of students, using clearly defined steps. Learning objects, stored in a department wide Blackboard-based repository, were quickly copied to the course site with a menu-driven Blackboard copy utility in one operation. Daffron and Webster (2005) found these reusable electronic resources required little work for the instructor and were used by both DL and F2F students. These audio lectures, presentations, documents and interviews from other courses provided powerful supplemental learning material in a variety of formats for various learning styles.

However, some tasks required different effort for each group of students and were examined and planned carefully to be sure the most effective and time efficient methods were chosen. Simple and robust technology solutions were chosen to ensure that the delivery method did not get in the way of the course itself.

Implementing the Simultaneous Hybrid

The simultaneous classroom and online teaching model required careful research, planning, and implementation of nine major components.

Component 1: Electronic Recording

Videotaping lectures for DL students to view with streaming technology was researched. It was found that the labor and equipment cost of video recording and preparation for Web streaming was considerable and required extra instructor time to coordinate the process. Moreover, academic video productions with modest budgets often are "talking heads," videos that encourage students to listen to the instructor's voice and take notes, rather than squinting at a tiny face on their computer monitor. An all-digital audio only recording solution was chosen that used voice recorders like the Olympus DS-330 and WS-110 to record F2F classroom lectures and meetings.

These recorders are simple to operate, low cost, and hold many hours of audio with no internal moving parts. The recorder connects to a USB cradle to download recorded audio files to the instructor's computer in seconds. The Digital Speech Standard (DSS) or Windows Media Audio (WMA) format voice file can be uploaded to Blackboard and immediately available for students to download and listen to using free, easy to use player software. These highly compressed audio files require little disk space, sound great and download very quickly; the WMA format has an added advantage of allowing the student to begin to hear the recording in just a few seconds after the download from Blackboard has begun. The instructor made the learning experience for DL students come alive with sound with a modest one-time investment. Recording and uploading lectures and announcements added no more than 10 extra minutes of work for the instructor each week. Since the initial class, telephone interviews of guest speakers and experts from around the world have been recorded and posted on Blackboard with little effort and virtually no cost.

Component 2: Weekly Announcements

Brief announcements were posted each week on the opening text page of Blackboard and all students were expected to login several times each week for updates. More detailed announcements were made in the F2F class and then audio recorded for posting on Blackboard, to ensure that both F2F and DL students received the same week-to-week information. Audio recordings of all weekly F2F classroom announcements and explanations of assignments kept DL students well informed. This short recording saved the instructor from typing a duplicate update message for DL students each week and was a great help for F2F students that missed class or arrived late. Students in the F2F class appreciated the opportunity to listen to the audio recording of classroom announcements again to make sure they heard all details correctly.

Component 3: Weekly Lectures

A 30-minute to 1-hour weekly lecture followed the class announcements in each F2F class. The instructor recorded the lecture and uploaded the audio file to Blackboard the following morning. When F2F students asked questions during the lecture, the instructor repeated their question before answering to improve the intelligibility of the recording for DL students. DL students listened to the recording as they viewed the accompanying PowerPoint slides, closely recreating the F2F classroom lecture at home. Synchronization of slides to the instructor's lecture was very simple and required no extra work; the instructor simply read the title or number of the new slide when presented. The recorder microphone often did not pick up all F2F student comments in a large classroom; the instructor would either repeat the comments or move the recorder closer to the students.

The PDF handout version of the PowerPoint presentation had three slides per page and space next to each slide for notes and questions for use by both F2F students in the classroom and DL students at home. DL students were encouraged to post their lecture questions and comments in their weekly discussion forum on Blackboard for all students to share.

Component 4: Course Presentations

As in most graduate courses, students in the F2F section made assigned presentations to the rest of the class. Audio recordings of the presentation as well as their associated PowerPoint and other presenta-

tion materials were posted on Blackboard to allow the DL students to hear as well as see their F2F cohort's work.

It was just as important for F2F students to hear and see the same assigned presentation from their DL cohorts. Some DL students simply purchased a digital recorder to record their presentations and posted the audio file as well as and presentation material on Blackboard for all to see and hear. Other students chose not to purchase a digital recorder; and used free QualComm PureVoice recorder software to digitally record their presentations at home for upload to Blackboard along with their presentation material. Both F2F and DL students used the free QualComm PureVoice player software to listen to these DL student presentations. Effective use of simple technology enabled DL students to both develop what Brook and Oliver (2003) call an "online learning community" and share their work electronically with minimal extra work for the instructor.

Component 5: Class Activities

The second part of the F2F class each week was an activity, usually a small group discussion on pertinent topics. A recording was not made of this portion of class for the DL students. Instead, the DL students were given a similar discussion topic, posted on Blackboard 1 day after the lecture audio. This 24-hour delay encouraged the DL students to listen to the lecture before discussing online and allowed revision and clarification to the DL topic based on the discussion success in the F2F class. Often, F2F students participated in the Blackboard DL discussions, enriching the discussion with ideas and opinions from the F2F class. Sometimes the F2F class period spilled over onto the DL discussion the next day, benefiting both groups of students and giving the instructor more time to clarify discussion questions. This component, the chance to do the class activity over, often sparked a lot of enthusiasm for the instructor—a chance to do the activity again! Teachers, as well as students, "learn by doing, experiencing, and engaging in trial and error" (Deubel, 2003). A side benefit for the instructor and students of this portion of the class was the opportunity for the instructor to continue the discussion or activity beyond the class or to change the activity if it didn't work well in class. As often happens, students think about the class discussion after the F2F class and want to continue the discussion or add something they find from their readings. The F2F students have told us they appreciate the opportunity to go online during the week and add their comments to the DL class for reaction and they felt this expanded their opportunity for learning. One F2F student told the instructor that she always listened to the audiotapes during the week to make sure she covered all the information presented.

Component 6: Group Discussions

Problem-based learning exercises presented in the second half of the F2F class and online in the discussion forum gave the students a chance to put theory into practice. Experimentation quickly showed that certain discussion scenarios work better in a F2F setting, while others work better in DL format (Sullivan, 2002). Finding similar but equal discussion topics for both groups was a significant challenge at first. Fully understanding the differences between F2F and DL student discussions was key to finding similar topics that worked well for both groups; whether it was the F2F students discussing issues with full eye contact or the DL students discussing issues asynchronously in a cyber classroom.

As Sullivan (2002) found, group activities are valuable but time consuming, and often difficult to conduct online. Collaborating entirely online can be quite a chal-

lenge, and many DL students found that meeting at convenient times on weekends with their groups was a more efficient way to work on group assignments. A blend of individual and group work for both the F2F and DL sections proved to be a highly effective way to maintain interest in the class material. Students tell us a side benefit of this is bonding with their fellow students. Students who work in the F2F class also use the group pages of Blackboard to stay in touch during the week and to post files and their work. The privacy of the group pages works well for either the DL or F2F groups.

Component 7: Transfer of Learning and Assessment

A combination of humanist, behaviorist, and constructivist approaches was used to prepare material for the simultaneous hybrid class. All students were involved in weekly discussions so the instructor could assess that learning is taking place. The instructor closely monitored the situated, or context, cognition in both the DL discussion forum on Blackboard and the F2F group discussions. As Arbaugh (2000) and Deubel (2003) found, this type of feedback often resulted in course content adjustments that would better foster the generation and construction of new information from previous experiential knowledge. All carefully crafted exercises were open-ended and had no one correct answer. No definitive solution typically created spirited discussions for both the F2F and DL students. Deubel (2003) tells us certain action verbs such as *identify, compare, contrast,* and *explain* frame the discussion exercise, helping students develop answers more thoughtfully.

The instructor provided many varied Web and multimedia resources to both the F2F and DL students, encouraging the view of the problem from a variety of viewpoints. Blackboard provided equal access to these resources for both F2F and DL students as they tackled similar problems. These "discovery" or "just-in-time" learning resources were in as many different media formats as possible to appeal to a wide range of learning styles, including newspaper and journal articles, Web pages, and audio/video material. Sullivan (2002) says to use as many types of formats as possible to keep DL interesting. Students were encouraged to provide their fellow students with electronic resources that supported their position; the instructor evaluated these student provided resources for reuse in future courses.

Component 8: Course Syllabus

The course syllabus was put together to allow for the activities of the F2F and the DL students in the same document; Arbaugh (2000) tells us this is important to show unity and fairness of the course work. The syllabus was posted on Blackboard approximately 1-2 weeks before registration began. Originally, two syllabi were prepared, one for F2F and one for DL students, acknowledging the difference in delivery of materials and class discussions for both groups. However, F2F students would occasionally miss the F2F class and then would join the DL class discussion. As was noted earlier, students that attended the F2F class would regularly listen to the lecture recording posted for the DL students. It became evident that a single syllabus was all that was needed to accommodate both groups of students.

The combined course syllabus had the same goal, objectives, course requirements, and the same assignments and scheduled readings. The major difference for the F2F and DL students was in the weekly schedule. The DL students' schedule changes each week, one day after the F2F class to accommodate the posting of the audio lecture recording. Discussion for the DL students occurs during the day or night

throughout the week, whereas the F2F class discussion is limited to the second part of the class night. An example of the syllabus (Table 3) for a typical week shows how the two classes (F2F and DL) are posted together, accommodating both the DL and F2F students.

Component 9: Course Management System

The Blackboard site was prepared with an attractive banner, a text announcement welcoming students, including the date, time and location of the F2F meeting. Self-help resources in the Course Information area included a student-created tutorial for Blackboard, the software links for using the audio recording, helpful links to campus resources, and instructions on using cyber-library services. Electronic files and useful Web sites were posted in External Links. The Course Documents area contained a folder for each week that the audio lecture, PowerPoint, handouts, and other material specific to that week's class

Table 3
Course Syllabus Sample

WEEK 8: FUND RAISING ISSUES FOR PROGRAMS	
F2F CLASS MEETING *November 13, 2003 6:00pm* *Miller Hall, Room 166 / WWU campus*	
BEFORE CLASS …	1. Read Smith Bucklin, Chapter 4,5 2. Download and print PP #8
CLASS AGENDA	1. Weekly lecture and PP #8 2. F2F class assignment #3 presentations 3. DL class assignment #3 presentations (DA recording playback with PP in class) 4. Discussion of funding issues
ASSIGNMENT #3 **GROUP FUNDING PLAN**	1. Present group plan to F2F class with your PP (Your audio will be recorded for DL class) 2. Upload your PP to Week #8 Blackboard forum by November 14 for review by DL class
DL CLASS MEETING *November 14-19, 2003* *Blackboard / www.courses.wwu.edu*	
BEFORE CLASS…	1. Read Smith Bucklin, Chapter 4,5 2. Download F2F class DA lecture and PP #8 3. Download F2F class assignment #8 (DA & PP) 4. Download DL class assignment #8 (DA & PP)
CLASS AGENDA	1. Weekly lecture (DA) and PP #8 2. F2F class assignment #3 presentations (DA recording playback with PP) 3. DL class assignment #3 presentations (DA recording playback with PP) 4. Week #8 Blackboard forum on funding issues
ASSIGNMENT #3 **GROUP FUNDING PLAN**	Upload your group funding plan DA recording and PP to Week #8 Blackboard forum, no later than November 12 to insure review by F2F class

Key: F2F = face-to-face classroom; DL = distance learning classroom on Blackboard; PDF = portable document format document file (electronic paper); DA = digital audio recording (instructor and students); PP = PowerPoint Presentation files, posted as a PDF file.

topic. Weekly discussion forums were located up in the Group Discussion area. Both DL and F2F students worked on group projects and used their group areas on Blackboard to easily share files and messages about their collaboration project. Each student in the class had access to fellow students' and instructors' e-mail addresses. The Grade Book was set up for both F2F and DL students. Ideally, all PowerPoints and related materials and Web sites are all posted before the students enroll in the course. Sullivan (2002) tells us this provides the structure for the course work that is needed for both groups of students and to accommodate those who have to miss a F2F class and want to join the DL students for the week.

A week before the first F2F class meeting, the instructor sends to all students a welcoming e-mail that contains a course syllabus, a complete explanation of the simultaneous hybrid course, and a short personal questionnaire. The students are encouraged to post a one to two paragraph biographical sketch of their life's story on the Discussion Board forum called "This is My Story." Virtually all students reply and answer the brief questions and most send the instructor a small digital picture as requested. An easily accessed "gallery" on Blackboard displayed the students' home e-mail address, telephone numbers, and other voluntary information, as well as their digital photo.

Instructors presenting DL classes know the value of students meeting one another and getting acquainted the first night of class. Warkentin, Sayeed, and Hightower (1997) and others conclude from their studies the importance of students meeting for the first class. Therefore, in an initial e-mail, all students were strongly encouraged to attend the first F2F class meeting. Most students attended and met the instructor and fellow online and face-to-face cohorts in person. Sullivan (2002) suggests students be encouraged to post questions about class assignments and procedures on Blackboard so all can share in the answers and minimize a duplicated effort. The instructor encouraged the use of e-mail or a separate discussion group called "Sidewalk Talk" for more personal and specific communication between class members and with the instructor.

Instructor's Workload

The instructor's workload did not increase significantly with the simultaneous hybrid class. This one issue has been the most surprising element of this case study and the most difficult selling point to other faculty. However, it is true! All the major elements of simultaneous hybrid classes are the same: class preparation, material, activities, assignments, and delivery. The only additional work came from holding a second discussion online for the DL students after the F2F class. To reemphasize the point made earlier, participating in the DL discussion allowed the instructor to clarify comments made in the recorded class lecture more thoughtfully, often leading to additions and improvements in future presentation of the same material. The instructor found that, often during the week, students in a F2F class would send e-mails for clarification of assignments, questions about the points made in class, or e-mails about additional thoughts they had about the class discussion and activities. The e-mails now appear online as a part of the DL class discussions and the instructor finds she actually saves time in answering multiple e-mails by conducting the discussions as a part of the DL work. While discussions for the DL class requires additional time, time spent answering F2F class e-mails is reduced.

Implications

The use of a simultaneous hybrid course model in adult education courses at Western Washington University has proven to be a great challenge both pedagogically

and technically. The experiment has proven that it is possible to conduct the same course simultaneously for both F2F and DL students while maintaining both the quality of instruction and instructor sanity. Before attempting to use a simultaneous hybrid course plan, it is important to fully understand both the differences and similarities in F2F and DL learning environments as found in the Arbaugh study (2000).

Often it is difficult for the instructor to accept that in technology enhanced education they are less the "sage on stage," and more of a "guide on the side." However, as Deubel (2003) tells us, it is equally important for the instructor to remember that high technology resources replace paper, not the teacher and the need for sound teaching practices. The simultaneous hybrid is a good solution to the problem of small class sizes, limited course schedules, and delivery preferences; everyone wins! Students are very pleased with the flexibility this affords them and throw their energies into the class rather than into the commute. Discussions often are quite elaborate; often, students become fast friends and colleagues as a result, (Sullivan, 2002; Warkentin et al., 1997). As a result of this first simultaneous hybrid class, this method of delivery has been used for many of our program's classes. The location of future simultaneous hybrid courses may alternate each week between the main and branch campus, giving students even more flexibility in attending class.

The use of simple audio technology to enhance online learning for this professor has grown to include courses in which telephone interviews of guest professors from around the world are routinely included as part of weekly course material. In one seminar class, students were very enthusiastic about the opportunity to get to know other cultures, and educators from 12 other countries were interviewed and audio recorded with questions about educating children and adults in their country. The recordings were posted on Blackboard and the 12 educators from across the world participated in the DL course. The students listened to their recordings, conducted in-depth studies about the 12 countries, and e-mailed their questions back to the educators. The educators graciously e-mailed responses to the students and a new understanding of a global community was established for all. What was the cost for this unique learning opportunity? A few dollars for the phone calls, but the results were priceless! Upon reflection, a simultaneous hybrid classroom works!

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Online, Campus, or Blended Learning

What Do Consumers Prefer and Why?

Paul Epstein

With the explosive growth of online learning, including the recent entry of not-for-profit institutions, a difficult challenge emerges for educators: directing the growth productively by finding the right balance of online and classroom learning. Offering a blend of both kinds of programs will achieve higher enrollment and more fulfilling educational experiences.

Results from a recent survey released by High Voltage Interactive reflect a positive trend for the online education industry. In December 2005, nearly 1,000 adults were polled on a variety of points regarding their education. While female and male respondents were approximately equal, most of the responses and those with the highest quality came from adults between the ages of 25-64. A staggering 74% of those polled indicated they would be interested in taking classes online. This is outstanding news for postsecondary educators seeking to expand their online enrollment.

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While online education is increasingly appealing to students, classroom meetings also remain important. Forty-three percent of respondents with a stated preference for online classes indicated that they preferred to supplement their learning with weekly classroom meetings. Surprisingly, only 20% of all respondents prefer to exclusively participate in a campus-based program; the remaining 38% would prefer an exclusive online education. These results suggest that distance educators should blend online and campus-based programs to suit potential students.

Traditional, campus-based not-for-profit institutions seem to have an advantage because they have well-developed, proven, in-classroom curricula. By offering some of their materials and lessons online, they can appeal to the majority group identified in the survey that prefers a blended learning environment.

When participants were asked to state why they preferred online learning opportunities, the most common responses were

"working at one's own pace" (especially men) and "working on one's own time" (especially women). Next in priority was "having no commute to class"—a particularly important factor to the youngest respondents. These priorities should not be ignored.

While most respondents have high school diplomas or higher, it's interesting to note that 38% of the respondents have only completed high school. Since this was the largest group of respondents, it's apparent that there is an interested pool of potential applicants for further education even at the associate's or bachelor's degree levels—both traditionally dominated by on-campus schools. Furthermore, today's fast-paced world of career development necessitates offering postsecondary degrees that fit students' extremely busy schedules. Online education fills this need, as shown by the survey results.

However, while time management seems to be a high priority for many people, the continuing value of face-to-face education cannot be ignored. The most common reasons given by respondents for preferring a physical classroom setting were "credibility in the workplace as a key concern to online degree programs," followed by an "enjoyment of face-to-face interaction with students and teachers." These results indicate a need to expand public acceptance of online degrees, but they also show that personal interaction in the educational setting cannot be overlooked.

Online instruction allows students a number of ways to deal with time management and work with others. A synchronous method requires students to be online at the same time as other students in their class, while an asynchronous method enables students to work any time they want without having to attend class at the same time as their peers. The self-study method, in which there is no instructor involvement, allows students to access and interact with course material on their own. The High Voltage survey showed that of those respondents preferring online instruction alone, 59% prefer the asynchronous method. This indicates the value of working with an instructor, while still valuing the ability to work according to one's own time constraints, rather than on a set schedule.

Online asynchronous coursework can provide an answer to many problems. By increasing the number of these programs, more people might be able to receive their postsecondary degrees at a time when it might be otherwise impossible. Work and family demands make it difficult to fit specific class meeting times into an already tight schedule. The ability to work on one's own time and at one's own pace, as allowed by online education, opens the educational door for many people. As more online courses are offered, enrollment rates will also increase.

The growing prevalence and acceptance of online degrees is reflected in the answers provided by those who opted for a completely on-campus program. In the survey, this group was asked how they might be convinced to consider online education. Fortunately for distance educators, "I could not be convinced" ranked very low for both genders. Accreditation continues to be a critical issue in online education, since "knowing the value of the degree" ranked highest for both sets of respondents. Distance educators must continue their work to increase recognition of the legitimacy of their programs.

The ability to forge relationships with other students also ranked high among students who prefer campus-based studies. Relationship building, even virtually, is preferred in both groups. Males ranked "sharing knowledge with others" very highly overall, while the results for the female group are not quite as decisive. This means that distance educators seeking to expand enrollment should pursue methods for reaching students who are not yet interested in taking online courses. Within

the marketplace, these students' priorities can be more deeply explored to create better online programs that address the specific needs.

For schools pursuing diversification of their program offerings, it is interesting to note that the highest ranked area of study was business (50% of respondents). Education and human resources were the second most popular programs, followed by accounting. Respondents were least interested in online studies in fashion, architecture and information security. Some of the most surprising statistics show there is great demand for studying alternative medicine, human resources, and culinary arts programs online.

As the prevalence of online learning grows, new opportunities arise for private and not-for-profit institutions. Technology allows schools to reach a broader student base and to offer their programs according to students' preferences and time constraints. The results of this survey can serve as a starting point in discovering the most appropriate ways to guide the growth of an invaluable method of teaching.

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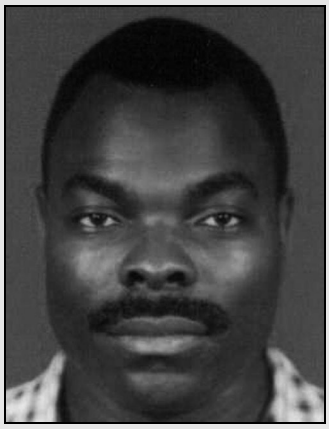
Distance Education and the Well-Being of the Rural Poor

Case Study of the Kabongo Region in Democratic Republic of Congo

Banza Nsomwe-a-nfunkwa

As a result of war and the economic situation in the Democratic Republic of Congo, the people of the country are suffering extreme poverty. The population of Kabongo depends on agricultural output and the generated income, primarily from the production of cassava. At present, cassava is suffering from diseases and the consequence is a decrease in production. The decreased production leads to less food, and therefore even higher rates of malnutrition. Also, there are fewer products to sell, resulting in less money, more children with no access to school, a higher rate of school dropout, a lack of clothing, a lack of access to medicines and a higher rate of street kids stealing or begging. As a result of the problems leading to decreased production of cassava, the rural people in the Kabongo region are seeking a solution to the problem. By solving the problem of the diseases affecting cassava there will be increased production of cassava and an increase in farmers' incomes.



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To solve this problem, we suggest a functional education program for the rural people on cassava. The objective is to develop a teaching and learning curriculum designed specifically to meet the needs of rural people; this curriculum will be focused on adult learners who are illiterate, as well as not able to speak the official language, French, or even the four national languages. The people of Kabongo will frequently only speak the local dialect. These people are geographically scattered and isolated in the local area. To solve the problem of the scattered nature of the target audience, where there is an absence of electricity, telecommunication (and in short all new technologies are lacking), we have chosen to produce a distance education program using radio broadcast. To enable learners to provide

feedback and reduce the need for direct contact between the rural adult learners, our plan is to use "radio broadcasting reception centers." These centers will be staffed by trained people, who are qualified teachers, and at the end of training they will be posted to the reception centers. These facilitators will assist adult learners, answer their questions, explain complex aspects of information broadcasted, organize workshops and practical activities, as well as provide "counseling" services.

In the case of this rural distance education by radio, linear design will be predominantly used; in some cases in which the learner or learning activities need another rhythm of learning, the linear design will be combined with other instructional designs to achieve the objective.

This curriculum will be the first in the domain of rural, illiterate, adult learners. Also, it will be the first time a curriculum has been designed to meet the specific needs of the rural people in the Kabongo region.

Introduction

Kabongo is located in the province of Katanga in Democratic Republic of Congo. This region is characterized by various daily problems. Transportation in this region is a major issue, and reaching nearby major cities is problematic. The principal means of transportation to Kamina, a city only 200 kilometers away, are truck, train, and bicycles. During rainy season, this 200-kilometer trip can take up to two days by truck or slow train. This area also does not have electricity, running water, television, radio broadcasting, and Internet; essentially, there is a total absence of all new technologies.

In the Kabongo region, the vast majority of people are farmers, and they live off their agricultural produce. From the sale of their produce they gain money and participate in the standard economic cycle; therefore, they are able to buy clothes, medicines, send children to school, and try to fight against premature school dropout, along with being able to deal with the normal daily problems.

This corner of Congo is facing a very high level of poverty. The poverty was intensified by the consequences of 5 years of war, and recently diseases present in cassava plants. Cassava is the staple food source for most people in the Kabongo region. Its importance is that the root is eaten as bread and the leaves as vegetables. Cassava is central to the rural economy. Cassava is currently suffering from diseases, and these have very negative consequences on the production rate and quality; the decrease of cassava production seriously affects the well-being of rural people.

In order to see an improvement in the well-being of the rural people, it is essential to solve the problem with cassava production. The best way to solve this is to provide information and functional education about cassava production, diseases present in cassava, and related environmental issues.

Education in the rural area of Kabongo faces many obstacles: these include a high rate of adult illiteracy, language problems because these adults are often able to speak only local dialects and not the national languages, and the scattered geographical nature of the people within the area. As a result, it is essential that there is a specific curriculum designed for adult learners to counteract the issues related to cassava.

The development of a teaching and learning curriculum for isolated rural adult learners, and the delivery of such a curriculum via radio broadcasting is the most effective means to inform and educate the people facing such circumstances. This curriculum will be divided into two sections: a compulsory (in some ways) and an elective component. The compulsory section will contain information about cassava

production, cassava diseases, and some content will be focused on the environment and issues related to soil. The elective section will contain lessons about Kabongo's history, general knowledge, public awareness campaigns, and community building.

Cassava Problems and Solutions

Network of Cassava Problems, Causes, and Effects

As a result of war and the economic situation in Democratic Republic of Congo, the population is suffering extreme poverty. The population of Kabongo depends on agricultural output for their income, and much of this income generated from the production of cassava. Cassava is the most important staple food and accounts for up to 70% of the population's income in the Democratic Republic of Congo (IITA, 2000). At present, cassava is suffering from diseases, and these diseases are resulting in a decrease in production. The decreased production leads to less available food, and consequently higher malnutrition. Also, there are fewer products to sell as a result of less money in the economic cycle, and therefore more children are not able to access education, there is a higher rate of premature school dropout, a lack of clothing and medicines, and an increase in the rate of stealing and begging. From the decrease of cassava production the level of poverty is increasing; and the well-being of the people of Kabongo is negatively affected.

As a result of the problems leading to decreased production of cassava, the people in the Kabongo region are seeking a solution to the problem. The result of solving the problem of the diseases affecting cassava will lead to increased cassava production and hence an increase in the incomes of the rural peoples.

From Figure 1, we can read that the central problem is the decrease in the production of cassava. Some of the causes for this reduction are diseases (mosaique du manioc, bacterie du manioc, anthracnose du manioc, structure brune du manioc, cercosporioses), magical beliefs, bad luck from ancestors, lack of knowledge of diseases, agricultural cycles, environmental issues, and problems with the soil. The consequences of the reduced production are malnutrition and under-nourishment, inability to send children to schools, higher school dropout, poor choices for lifestyle, and a lack of clothing and medicine.

Network of Methods and Solutions

The aforementioned information outlined how the decreased production of cassava is affecting the well-being of the rural poor of the Kabongo area. Hence, there will now be an analysis of how to solve such decreased production of cassava and suggestions presenting the methods and means used to solve the problems. The promise is that a functional education program designed for the rural people about cassava diseases, its origin, and how to fight against such diseases can alleviate the situation. Also, this program should include the new techniques of cassava cultivation and practices, along with information on soil and the environmental situation.

An increase in cassava production is central to overcoming decreased cassava production. To seek this solution, functional education regards the present diseases and their origins as critical. Also, the people need to be educated to overcome the acceptance of diseases, education including more modern farming methods, an awareness of environmental issues, cultivation of cassava, and replacement crops, all of which will result in improved conditions for the rural people.

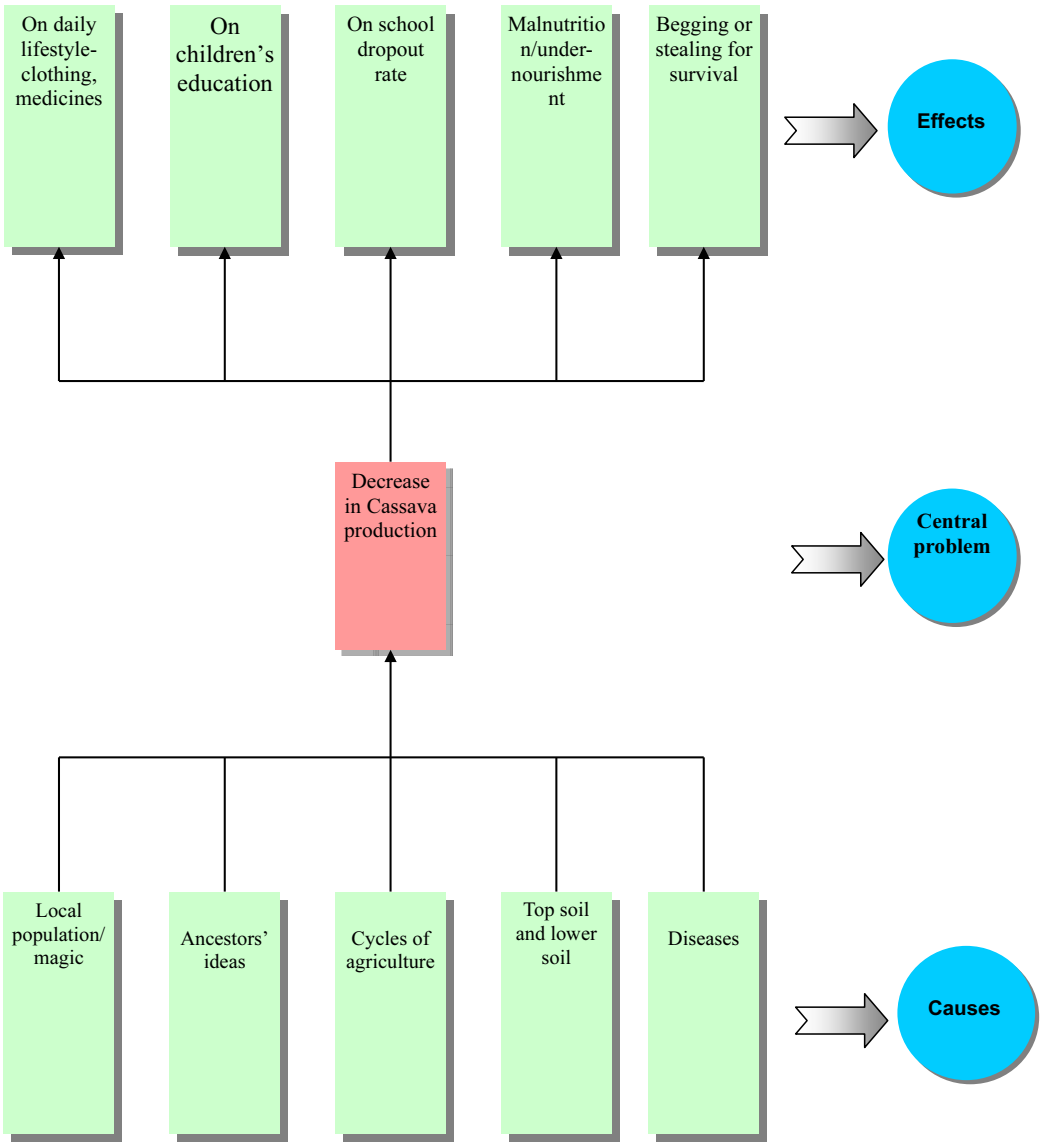

Figure 1. Network of Cassava problems, causes, and effects.

Curriculum for Rural Distant Learners

Our objective is to develop a teaching and learning curriculum for rural people. This program will be focused on adult learners who are illiterate, cannot read and write French or any of the four national languages but are only able to speak their local dialect. These same learners are geographically very scattered in the local area; hence distance education is our chosen mode of teaching.

Furthermore, instructional objectives will assist the teacher in selecting appropriate content, teaching strategies, resources, and assessment, and can also support the teacher in educational activities (Cohen, Manion, & Morrison, 1998).

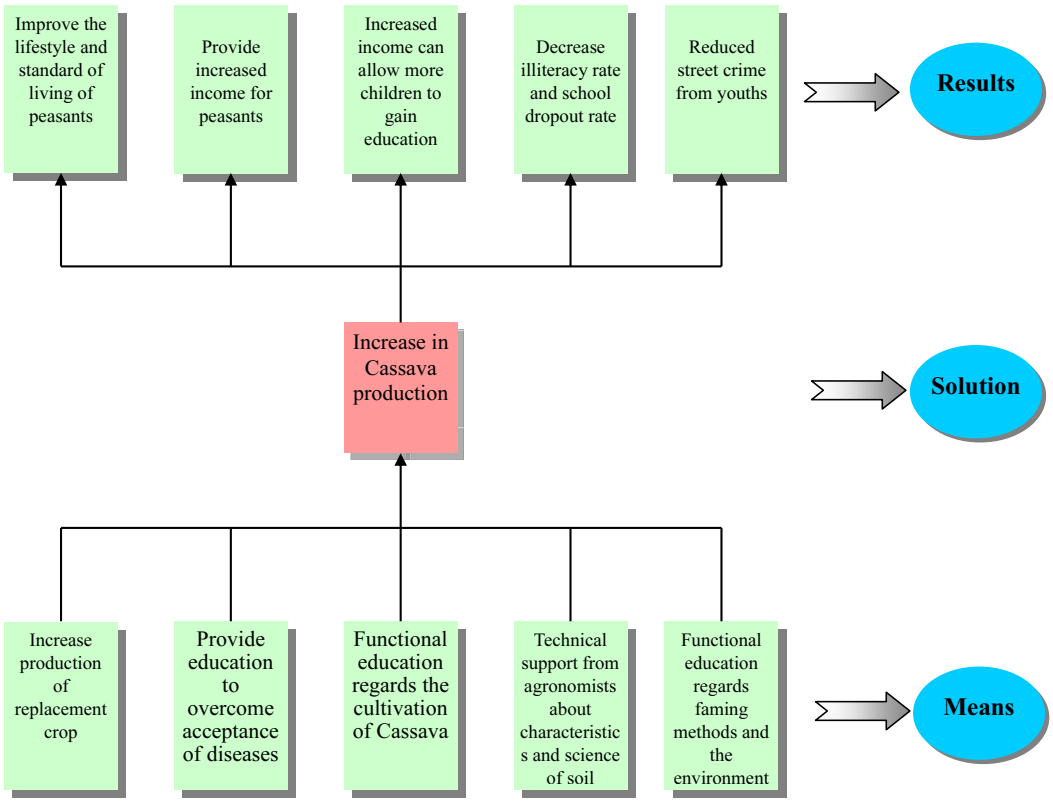

Figure 2. Network of methods and solutions.

As stated above, this program has two parts: a compulsory and an elective. In this specific case of distance education for adult learners who are illiterate, some questions concerning planning, implementation, and evaluation will constantly present themselves when designing the curriculum.

PLAN

When planning, many questions are raised: How is the curriculum developed? How is the subject matter developed? How are curriculum objectives defined? How is curriculum content selected? How to organize the curriculum content? We start to think about the learner (target audience), teacher (and facilitator), and the instructional technology. Dunn, Beaudry, and Klavas (1989) contend that it is crucial for teachers to match their teaching styles with students' learning styles; every person has a learning style. It is as individual as a signature. When the students' learning styles are identified, then classrooms can be organized to respond to their individual needs.

The Kabongo target audience constitutes adult learners (who are illiterate) living in scattered rural areas of the Kabongo region, and who are generally only able to speak the local dialect (Kilubakat), but not French (the official language) or the four national languages. Most of our learners are farmers, leaving the village in the morning at about 5 a.m. to go to the fields; they work all day and return home in the afternoon at about 5 p.m.

Research was conducted in the Kabongo region to ascertain the most convenient times for the local citizens to receive educa-

tional broadcasts and the reasons for this preferred time. The results showed that 79.9% responded that evening time was the most convenient and 20.1% felt that mornings were convenient. Those preferring evenings indicated that during morning time, they were busy with agricultural work and other daily activities. Their preference for evening time was because by evening time everyone is already back at home and ready to listen to the broadcast and available to meet others for discussion. As a consequence, it is important that the classroom environment provides opportunities for the adult learners to feel accepted in the classroom and have teachers/facilitators who listen to their requests and can respond to their specific questions. That is why Tomlinson (2002) contends that students seek affirmation that they are significant in the classroom.

In the planning of curriculum and delivery, a major point of consideration has been to place the learners at the center and make the program meet their needs, such as taking into account the time available for the learners, the age of the learners, and the cultural behaviors of the learners. The primary goal is the overall well-being of the learner, so we have to equip learners with skills to address and overcome daily problems. These skills will enable them to address the problem of the decreased production of cassava and help them develop the skills to solve future problems. This program will also enable these adult learners to draw on their previous experience in agricultural fields to deal with present and future problems, all of which can allow the learners to participate in the new lessons. This method will provide the adult learners, who culturally must be respected because of age and experience, to draw on their farming experience with cassava and share their methods and successes. The learning plan is to keep the adult learners motivated by involving them in all kinds of activities and practices; in this way they will cooperate and participate to the program.

Teachers need to consider the following questions when matching their learners. How is each learner's self concept being developed? How does a teaching style meet learners' individual differences of need, interest, ability, and skill? How does a teaching style develop in each learner? How does the organization of the class and school facilities foster security in each learner?

In this stage of planning, the distance educator is determining tasks to be done at the end of each module and by the end of the curriculum. They must also plan the way learners will cooperate among themselves, with the teachers, or with the facilitators. Here we think that practical activities, workshops, small seminars, and simple discussion will enable the learners to have a hands-on, interactive role in their learning. Also the teacher must plan and think about the technological tools to be used for delivering content. In the case of the Kabongo region, radio broadcasting will be the chosen form of technology, with the use of other media, such as DVD, CD-ROM, tapes, print, and booklets. Those technologies will help with the transmission, but the content should always respond to the needs of the learners and should be translated into their local language (Kilubakat). During the research survey, local citizens were asked which language they would prefer the broadcast in. The local citizens overwhelmingly requested Kilubakat (92.1%). Other languages that were offered as choices were Tshiluba (0%), Kikongo (0%), Lingala (0%), Swahili (4.9%) and French (3%) (Nsomwe-a-nfunkwa, 2005).

Geographical distance between the broadcasting center, teachers, and learners will certainly be an issue. The reality for the local citizens in the Kabongo region is that the people are scattered throughout different rural villages. To address this problem, qualified teachers will be trained in the content and they will become facilitators at the end of training sessions and

will be sent to different "radio broadcasting reception centers." These facilitators will have the role of assisting adult learners by answering their questions, explaining sections of the broadcast that were not understood, and organizing workshops and practical activities. They will also provide counseling services to support students through their learning.

After introducing the situation for the learners and teachers, it is then appropriate that the instructional technology and design is discussed. The article has mentioned some of the realities of Kabongo, which can plainly be characterized by no electricity and no access to advanced technology; hence, the primary technology to be employed is radio broadcasting and other media. Considering the old machines, the target audience, and their needs and challenges, what kind of instructional design is going to be used for the Kabongo distance education adult learners?

Many authors have written about instructional design models: linear design, branched design, hyper-content design, and learner-directed design. Taking into account the differences between the learners in Kabongo, a linear design, designed by Simonson (2006), will be predominantly used.

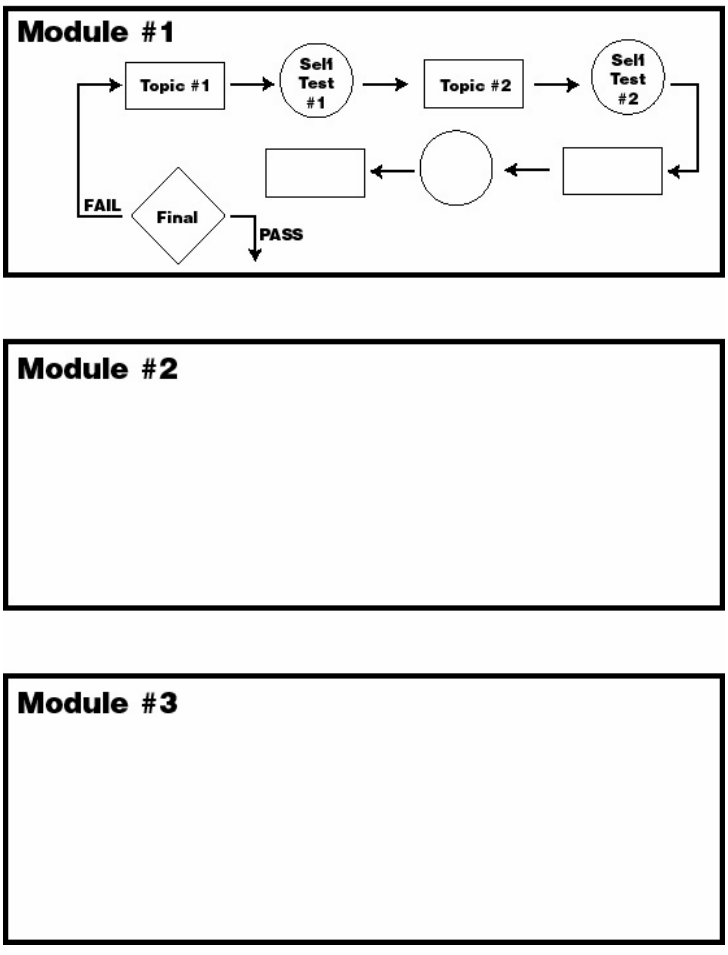

Figure 3. Linear design model. Used with permission.

In the case that a learner or learning activities need another rhythm of learning, other instructional designs will be employed. The overall goal is to meet the objective for every module and for every adult learner.

Implement

Scott (1999) said a curriculum, however well designed, must be implemented if it is to have any impact on students. Fullan and Panfret (1977) said that implementation is a critical phase in the cycle of planning and teaching a curriculum.

After planning, it is time to implement what has been planned. This implementation is where the adult learners start to receive lessons from radio broadcasting. Before starting the broadcast, the reception center will have already received all didactic supports such as booklets, prints, pictures, DVDs, CD, tapes, and so forth.

Students will study every day, and the facilitators must ensure that the adult learners master the daily module, pass the daily test and, after success, then pass on to the following module. In some cases, the student will have to pass a practical test held out of the reception center; the facilitator can then confer with the student if he can continue on to the next module and if necessary pass the oral or practical test. Here, all distance learners will be receiving the same content at the same time, but they will be in different locations within the region.

A common problem facing distance education programs is feedback; in the case of the Kabongo's cassava education program, the solution lies in the training of facilitators who will be located in the local area. The facilitators will report to the radio broadcasting center; these reports will encompass didactics needs, difficult questions where support is required, the evolution of learners and their participation, the quality of content broadcasted, and the attitude of adult learners towards the program. Also, the facilitators will be the connection between the radio broadcasting reception centers and the radio broadcasting center. The radio broadcasting center will try in some ways to help learners of different radio broadcasting reception centers to share their experiences by inviting some adult learners to participate in the preparation and broadcast content and engage in discussions at times. During the research survey stage local citizens were asked if they would like to participate in the preparation and broadcasting processes in a community radio on a weekly basis. There was an overwhelmingly positive response, with 86.7% asking to be involved and 10.3% who indicated they did not want to participate and only 3% who were undecided.

As this will be the first opportunity for the rural people to have a radio broadcasting center in their own area, it will be important to try to respond to the requests of the local people. If the information gained from the survey can be followed, then it is possible to meet the needs of the community. During the research survey, citizens were asked if such things as agricultural issues, health issues, educational issues and cultural issues would be good points to focus on. 89.3% of the community responded with a definite yes to the aforementioned issues and 0.1% said no with 10.6% of the responders undecided.

Following the implementation steps is the evaluation of the two precedent steps.

Evaluation

Mager (1984) points out that if you are teaching things that cannot be evaluated, you are in the awkward position of being unable to demonstrate that you are teaching anything at all. Intangibles are often intangible because we have been lazy to think about what it is we want students to be able to do. This is another important step, from which the designer will discover

if the curriculum was helpful and useful following the need of the learner.

Talking about evaluation, we think about planning and implementation. From here, it can evaluate the work of the student and discover if he has mastered what was planned for him to master. In the case of the Kabongo distance education broadcasting, the evaluation process must include an assessment to ensure the learners understand the issues related to cassava and are able to transfer this knowledge to daily life. If the result of students' evaluation is very good, this can enable the designer to understand that the plan was greatly successful; if the results are poor, this will let the designer reconsider the design, the content, the tools used to deliver the content, the environment, and the instructional design, and hence review the areas that are leading to poor performance.

Formative evaluation, and in some ways the summative evaluation, will be used to evaluate learners. The formative evaluation will allow the teacher and the learners to understand the evolution and the mastery of the present module prior to continuing on to the next module. From the formative evaluation the teacher will be able to provide some assistance and advice to learners. That is why Fehring (2005) stated that students have the right to know about their own literacy learning achievements, and that this is still the most salient reason for the assessment and reporting processes used in teaching and learning educational environments.

In terms of formative evaluation, the Kabongo distance education broadcast also faces some obstacles due to the illiteracy of the local citizen, and hence we must use oral evaluation. Questions will be asked to adult learners and, from their answers, decisions will be made concerning their mastery of the modules. Also, from practical activities, discussions, presentations and explanations, and workshops on the module, the teachers and facilitators will decide if the students can make the transition to the new module.

Concerning summative evaluation, attention should be paid to the cultural issues of local people in the Kabongo region. These cultural values include that adult answers are the correct answers. If we have to tell the adult learners, who are fathers to at least five children and considered the spirit, the chief, the decider, the person most responsible for the family, that their answers are incorrect; this will manifest itself as a frustration for those adult learners. Possible consequences could be that, step-by-step, the learners will lose motivation towards the program and, potentially, adult learners could drop out.

Summative evaluation is important in the sense of motivating learners. The Kabongo distance education broadcasting case is the first experience of teaching adults and often illiterate learners in that corner of Congo, and hence the plan is to provide a "certificate of participation" to all adults who participate in the program. This can motivate others to come and join the program in the future, for either agriculturally based curriculum or for other social/educational based curriculum.

Radio Broadcasting

When assessing the technology, each resource should be examined for its unique qualities and its potential benefits for rural teachers and adult learners. In the case of the Kabongo region, we should not use a tool because it is new and available. Each innovation should be suited to the needs and the realities of the environment. It has been said by many that there is a tendency to dispose of old machines. This is a good idea for some parts of the world, but a very bad decision for those who have never seen nor touched such "outdated machines." This is the case in the Kabongo region in the Democratic Republic of Congo. In Congo, 60% of people are

affected by a high rate of poverty and live in rural areas, where they have never seen electricity, television, radio broadcasting or computers. The area has roads in very poor condition, slow trains, and the people are scattered throughout the region. In such a situation, if we have to deliver distance education to isolated learners, the first choice would be radio broadcast. Such a method is practical; people are able to buy a radio receiver and batteries, and not rely on electricity. They can all receive the lessons simultaneously. Given the local realities: the scattered population, the high rate of illiteracy and language diversity, we believe that radio remains the most popular, accessible, and cost-effective means of communication for rural people of the Kabongo area. Radio can overcome all of the aforementioned obstacles.

In order to achieve success, radio broadcasting combined with booklets, DVD, CD, and tapes can ensure the delivery of information. All content to be broadcasted must be contained on DVD, CD, tapes, and printed booklets. These will be used as didactic support. The content will be the same in the DVD, CD, tapes, and booklets. This means that the DVD will use local language and will contain voice, images, and content. The CD will contain voice, images, and texts; and tapes will contain voices, and the booklets will have written text and pictures. (Booklets will be useful for literate people.)

In comparison to other distance education based on radio broadcasting, our innovation is that the rural people will first be trained to become facilitators in different villages that are chosen as centers of reception for the broadcasting. Second, before the broadcasting of lessons, all materials such as booklets, DVD, CD, and tapes will be sent to the areas. Third, when broadcasting the content, the facilitators must be with the rural adult learners, organize a short explanation on location, collect and answer any questions from the learners, discuss the content with the learners, and plan some activities as practice for the learners. Fourth, the trained group originating from different villages (centers of broadcast reception) will travel to the central broadcast place for curriculum evaluation and from this evaluation consider alterations to the curriculum.

Time of Delivery

The radio will broadcast every day from morning to evening, but the educational content will only be in the evening, following the wishes of the target audience. There will be lessons three times per week focused on agriculture, three times for lessons on values and community building, and two times for general knowledge. Sunday morning is culturally the time of religion, and at noon as for all days, the national news will be broadcast.

Management and Broadcast

The radio broadcasting will be managed by the nongovernment organization called Community and Social Development Organization (www.odcs-rdc.org) located in Kabongo. Experts who make up the broadcasting management team will be native speakers of the local language, Kilubakat. This team will include expertise in areas such as: information and communication technologies, distance education, adult education, adult psychology, journalism, agriculture, and climatology.

In terms of the broadcasting regulations, the first regulation will be that everyone hoping to become a broadcaster for this educational radio must be an educator. They must understand the principles of education; teaching and learning and the psychological principles of rural adults. The radio will be used as a tool to reach the remote target audience, so it is very important in this step to follow the qualification criterion to become a qualified teacher of distance education. The second condition is also very important, and that is mastery

of the local language (Kilubakat). The target audience, as stated previously, constitutes rural adult learners who are illiterate, and often cannot speak French or other national languages, only their own local language.

It is hoped that gradually they can train the local people to become presenters to share local farming knowledge. The local people expressed in the survey that 88% would like to listen to broadcasts made by the local community and only 1.3% answered no. There was 10.7% undecided on the topic.

Timetable

As noted above, every week there will be three lessons focused on agriculture, three lessons focused on values and community building, and two lessons devoted to general knowledge. Each lesson we take one hour; there will be two information delivery sessions, the first segment will be 20 minutes and then a 5-minute break (containing some music, perhaps), the second segment is 20 minutes, and 15 minutes at the end of the lesson for review and discussion.

Suggestion

Distance education should be regarded in the case of the Kabongo region as a vital option in continuous rural problem solving, youth empowerment, and a means to fight premature school dropout. The Democratic Republic of Congo, and in particular the region of Kabongo, has a majority of the population living in rural areas, and they are poor, illiterate, physically isolated and scattered, and facing all kinds of daily problems. The schools are characterized by late primary entrance, high grade repetition and a high rate of dropout. Distance education can be a good way to empower the rural people, youth, and women. These groups can be offered all kinds of skills and then they will be able to solve the daily problems encountered in the agricultural sector, along with other sectors such as education and training, family planning, environment and pollution, communication and transportation, and electricity and water.

Conclusion

This curriculum is innovative as it is the first one in the domain for rural, illiterate, adult learners. Also, it is the first time a curriculum has been designed to take into account the needs of rural people in the Kabongo region.

This distance education curriculum will be delivered by radio broadcast and it will use an experimental curriculum. After its effective implementation, evaluation will

Table 1
Broadcast Timetable

	MON	TUES	WED	THURS	FRI	SAT	SUN
AM	LI	LI	LI	LI	LI	LI	LI
	ADV	ADV	ADV	ADV	ADV	ADV	RELIG
NOON	NI	NI	NI	NI	NI	NI	NI
PM	M	M	M	M	M	M	M
	RA	RA	RA	RA	RA	RA	KB
EVENING	KH	KB	KH	K	KH	KB	K

Key: LI = local information; ADV = advertisement; NI = national information; M = messages; RA = recreation activities; KH = know how; KB = knowledge being; K = knowledge; REL = religion.

allow for development and enhancement as well as develop into other subjects.

It is believed that distance education is an appropriate means to educate rural people in different ways on all kinds of challenges they are facing in their daily life. Also in the case of the Kabongo region, where they are facing numerous social and economic issues such as a high rate of illiteracy and permanent school dropout, family-related problems, issues of environment and pollution, agricultural problems, bad roads and transportation, and a lack of telecommunication, we are sure that through distance education we will succeed to educate the population of Kabongo. This education will empower them with specific transferable skills and these skills will allow them to be able to solve the different kinds of problems they are facing and those that may be encountered in the future.

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Measuring Outcomes in K-12 Online Education Programs

The Need for Common Metrics

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Introduction

Online learning at the K-12 level is growing rapidly, as educators, parents, and students discover the benefits of learning unconstrained by time and place. States and school districts are offering full-time and supplemental programs to students across all grade levels in order to provide a greater number of courses to students in rural and urban schools; to meet the "highly qualified teacher" requirements under the No Child Left Behind Act; and more generally to strive toward public education goals of equity, access, and a high-quality education for all students.

This rapid growth, however, has challenged policymakers responsible for overseeing public education. One of the challenges that policymakers face is the lack of common measures of outcomes and quality in online programs. Although most programs track student outcomes and other measures of quality, these measures are not consistent across programs, and a metric used by two programs with the same name (e.g., course completion rate) may not

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in fact measure the same thing. This lack of consistency makes measuring outcomes across programs difficult and hinders development of appropriate policies.

This article begins with a brief overview of the scope of K-12 online education in the United States. It then explores outcomes measures in general before discussing how three programs—Illinois Virtual High School, Virtual High School, and Connections Academy—track student outcomes. It uses these examples to discuss the need for consistency in outcome measures, and calls for common, agreed-upon metrics to be developed and used voluntarily by online programs in order to facilitate development of suitable policies for guiding the sustainable growth of online education.

The Scope of K-12 Online Learning

K-12 online learning in the United States is rapidly growing as new virtual programs are continually emerging. These include both online supplemental programs that provide virtual courses to students who are otherwise enrolled in brick-and-mortar schools, and full-time virtual programs sometimes known as "cyberschools." The distinction between the two is beginning to blur as students opt for full course loads from supplemental programs, and cyberschools offer part-time enrollment. Adding further complexity is the American tradition of local control, which in an age of readily available courses and course-building tools essentially means that any local school district can launch a virtual program regardless of official state policy.

Bearing those caveats in mind, the current tally of states with significant virtual learning activity is:

- Ten states with both statewide supplemental and full-time cyberschools, including Missouri, Georgia, and Mississippi, which passed legislation in 2006 to allow both.
- An additional 17 states with statewide supplementary online programs,

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including North Carolina, which expects to launch in fall 2006.
- An additional 12 states with full-time cyberschools, including Indiana, which recently amended its charter law to allow virtual charters.

In the 2005-2006 school year, an estimated 600,000 students took supplementary courses (Smith, Clark, & Blomeyer, 2005) while 65,000 enrolled in cyberschools (Rotherham, 2006). While still less than 1% of the total U.S. student population, this number is growing rapidly, having doubled since 2003.

What and How to Measure

What outcomes a program should measure is a complex issue that should be strongly influenced by the mission of the program. A program created to make advanced placement courses more accessible to students will have different metrics than a program created to increase high school graduation rates. The mission determines measures of success, and program measurement ultimately needs to indicate if a program accomplishes its goals.

Another factor to keep in mind is how program evaluation data will be disseminated. In an online program that serves multiple schools, disaggregating completion rate data by school and sharing this information externally might negatively impact some relationships with local school districts. However, collecting these data for internal use will help identify potential weaknesses, assisting in optimal resource support allocation.

A final factor in determining what to measure is program type. Full-time programs will measure graduation rate and are often required to conduct state-mandated assessments, while a supplemental program will not have such requirements. A statewide program will likely track items that measure the participation of schools by geographic region, while a district program would focus on individual school participation rate.

Despite these variances between programs, there are some common issues surrounding measures of success, which include:

- Inputs versus outcomes: Many quality assurance measures historically used in education have been inputs, such as teacher/student ratio, and ensuring that courses meet state standards. Education policy is increasingly moving toward outcomes-based assessments, such as graduation rates and performance on state assessments.
- Outcomes measures may be divided into two categories: those that are specific to the online program, and those that transcend the program and can be used to compare results across programs. The latter may include measures that compare online programs to face-to-face courses and schools. One example is scores on advanced placement exams for students who have taken an online AP course; another is results of state assessments. An example of the former is the course completion rate of the program. Because there are no common standards, the program calculates its own completion rate, making it difficult to compare the rate to that of other programs.

Examples: Measuring Outcomes

Illinois Virtual High School

The Illinois Virtual High School (IVHS), a supplemental, statewide online program serving all students in Illinois, was created in August 2000 by the Illinois State Board of Education (ISBE). IVHS was created after a 6-month planning process led by the Illinois Mathematics and Science Academy (IMSA) and the Central Illinois Distance Education Network, with the involvement of the state educational agen-

cies, the governor's office, and educators representing the diversity of educational systems in Illinois. IVHS opened for classes in January 2001 and was co-operated by ISBE and IMSA for the first 2 ½ years and since that time has been operated by IMSA on behalf of ISBE. Since its creation, IVHS has had nearly 9,000 semester enrollments.

A variety of factors, including start-up conditions, emphasis on collaboration, mission statement, and industry practice have influenced what metrics IVHS tracks. For example:

- The quick creation of IVHS resulted in its entire course curriculum initially coming from licensed sources. Thus, for the first several years, IVHS tracked the percentage of courses being offered that had been developed by IVHS, as this metric was an indicator of the reduction in ongoing operational costs.
- The strong emphasis on collaboration resulted in IVHS tracking the number of schools that agreed to participate in the program, the number of schools currently enrolling students, and the geographic distribution of these schools. Each of these measurements helps tell a part of the IVHS success story in regards to collaboration.
- According to its mission statement, IVHS is to "provide Illinois students and their teachers with increased equity and access to the highest quality educational opportunities." As a result, IVHS tracks the percentage of enrollments coming from low-income schools (schools with 25% of the students qualifying for federal free and reduced lunch program, which at the time was the needed percentage to qualify as a low-income school. The percentage has since been changed to 40%).
- Industry practice dictated the tracking of completion rate and growth in enrollments. IVHS discovered that these straightforward terms still had slightly different definitions from program to program. IVHS measures enrollments on a semester basis and defines an enrollment as a student enrolled after the published last day to drop (approximately 5 weeks into the term). The completion rate is defined as the percentage of enrollments that receive a passing grade of 60%, including those students passing the course as a result of an extension past the end date of the semester.

IVHS also conducts student surveys each semester and has recently begun conducting regular school surveys. In addition, IVHS has had several external program evaluations conducted. While it may not be possible to plot this information on a graph, this information is critical for managing an online program.

Determining what to measure is an evolving process. During its recent strategic planning process, some new measures were identified when indicators of success were selected for the five IVHS strategic goals. These 16 indicators provide a focus for IVHS management, although other metrics are still required for ongoing operational program feedback.

Connections Academy

Connections Academy launched in 2001 as a provider of curriculum, technology, and school management services for full-time virtual public schools. In 2005-2006, Connections Academy schools—which include charters, contract schools, and pilot programs—served 6,500 students in 11 states in grades K-9. Approximately 70% of students come to Connections Academy schools from other public schools, 30% qualify for free or reduced price lunch, and 12% are special education students. Ethnicity typically mirrors that of the state the school serves. Students attend their Connections Academy school from home with guidance from a "learning coach" (most often a parent or extended family member)

under the supervision of a certified teacher with whom they interact via phone, e-mail, and Web conferencing. The Connections Academy program has been accredited by the Commission on International and Trans-Regional Accreditation.

To serve these students while meeting state reporting requirements, Connections Academy has developed a sophisticated learning management system that captures and analyzes a wide array of data.

- "Student progress" uses three intertwined metrics: attendance, participation (including completion of lessons and response to teacher communications), and performance (scores on online quizzes and grades on portfolio items). The teacher uses these data to apply a qualitative tag—ranging from Satisfactory to Alarm—based on his or her knowledge of that student. Each student's qualitative status is updated in real time on the student and learning coach homepages. Each month these data are reported to the school's governing authority, which compares results against the school's goals (typically 75%-90% Satisfactory on each metric). These accountability reports also include statistics regarding teacher quality (such as "highly qualified" status under NCLB) and student withdrawals from the school by number and reason for that reporting period.
- The Longitudinal Evaluation of Academic Progress (LEAP) is an electronic pre- and posttest. The pretest establishes a baseline in reading and math for each student, and also identifies discrete skills that need additional work to ensure optimal performance on the state test. For most schools, the goal is at least 75% of students show a year's academic growth. Connections Academy updates LEAP test items to improve the test's predictive power regarding the state test, and has revised major swaths of its curriculum—including middle school math—to improve student performance on both.
- Connections Academy also engages a third party to conduct annual parent satisfaction surveys. Parents grade the overall program and respond to specific questions regarding curriculum, technology, teacher responsiveness, community activities, and more.
- Finally, Connections Academy schools must ensure that all of their students participate in state standardized testing, which they do in person at proctored settings. Their aggregate scores and their progress against adequate yearly progress benchmarks are reported publicly through each state's school report card system. Like every American public school under No Child Left Behind, the Connections Academy schools are focused on fine-tuning their curriculum and instructional programs to improve their state test scores.

Virtual High School (VHS)

VHS is a member-based nonprofit collaborative of high schools offering online courses. During 2005-2006, VHS offered over 200 full-semester, year-long, summer courses and middle school course modules to over 7,500 students in over 350 member schools, in 29 states and 19 countries. VHS annually measures its progress toward meeting program quality and growth goals. Growth is measured annually by measuring the number of schools in the collaborative, the number of courses being offered, and the number of students enrolled. Current quality indicators fall into three categories: quality of courses, quality of professional development, and quality of services. In addition to growth and quality data, VHS annually surveys its students, teachers, site coordinators and school administrators to collect self-reported data on other aspects of VHS quality which are not easily measured by student achievement data.

- Quality of Courses: Rigor and quality of VHS courses are measured by AP exam pass rates, percentage of AP students taking the AP exam, course completion rates, and percentage of students taking courses for credit recovery who recover credit. During 2004-2005:
  - ◊ 70% of the VHS AP students who took the AP exam passed with a score of 3 or higher. This compares favorably with the national AP exam pass rate of 62% for all students taking the AP exam;
  - ◊ 80% of VHS AP students took the AP exam, while nationally, 74% of all AP students take the AP exam;
  - ◊ 85% of all VHS students successfully completed their VHS course with a grade of 60 or higher. VHS has a 3 week no penalty drop period at the beginning of the semester, and has a 2-week period at the end of the semester for students to finish work.
  - ◊ 88% of students who took summer courses recovered course credits. Survey data indicates high levels of satisfaction with development of 21st century skills, student collaboration, and student engagement in course content.
- Quality of Professional Development: VHS provides online professional development to teachers to develop the necessary pedagogical and technical skills to succeed as online teachers. Indicators of the quality and rigor of VHS's teacher professional development program are:
  - ◊ the percentage of teachers who successfully complete the online professional development course as evidenced by demonstration of online teaching skills mastery; and
  - ◊ the percentage of teachers able to successfully navigate their first semester of teaching online, meeting all VHS's standards for online course delivery.

  In 2004-2005, 84% of VHS teachers successfully completed VHS training, and 90% of VHS's first-year teachers demonstrated the successful habits of practice of effective online teachers.
- Quality of Services and Program: Most VHS member schools participate through an annual membership contract, which requires renewal every spring for the following school year. Indicators of the quality of VHS services and program are:
  - ◊ membership retention rates; and
  - ◊ school seat utilization rates.

The membership retention rate is defined as the percentage of schools that renew membership from one school year to another. Seat utilization rates are based upon the number of student seats a school uses as a percentage of the total number to which the school is entitled as part of its membership contract with VHS. In 2004-2005, 84% of member schools renewed their membership. During the same school year, member schools utilized nearly 85% of the student enrollment seats they were entitled to, indicating high levels of interest in VHS courses and membership benefits.

In addition to these retention and utilization rates, VHS survey data is collected to determine satisfaction with services from VHS, including technical support, communications, and administrative and management systems.

Shared Notions of What Matters

Despite the significant differences in these programs, IVHS, Connections Academy, and VHS share some notable commonalties in their mission-driven measurement systems. Because the specific metrics vary, these commonalities might best be understood as emerging notions of what matters most in measuring online program success.

- *Context matters*: All three programs track "customer demographics" either at the individual student level (Connections Academy) or participating school level (IVHS and VHS), because knowing who is taking a course provides important context for outcomes. Carefully tracking who is teaching the course is also important as a contextual quality measure; while NCLB provides a useful universal baseline for "highly qualified" teachers, leading online programs like VHS recognize the need for specific training in the virtual environment. Accreditation and third-party evaluations also serve as contextual measures of course quality that add important dimension to student outcomes.
- *Persistence of effort matters*: Both common sense and emerging research dictate that online students must be "in it to win it." In other words, academic results can only be measured where academic effort is actually made. Thus, metrics for enrollment and course completion are enormously important for online supplementary programs and, as noted above, subject to variations among programs. IVHS and VHS differ slightly in their definition of "enrollment" (3 weeks vs. 5 weeks for "no penalty" drop, similar policies regarding extended time to complete), and concur on requirement of a passing grade for completion. Full-time programs like Connections Academy typically track persistence of effort not at the course level but at the student level, where withdrawal from the school is monitored both "prior to engagement" and throughout the year.
- *External validation matters*: A significant litmus test for online course success is external student academic outcome measures such as the advanced placement tests (especially important to VHS), state standardized achievement tests (a key driver for Connections Academy), and the emerging array of "end of course" and high school exit exams in a growing number of states. Satisfaction data, when gathered in a rigorous and objective way, can also provide an important outcome measure (though not necessarily linked to academic outcomes, as discussed below).

The Need for Common Measures

The examples above demonstrate that online programs take seriously the need to measure the success of their programs through extensive data collection. While each program individually has a strong evaluation process, the lack of common measures demonstrates the challenge for parents and students who are making education choices, and policy makers responsible for overseeing these programs. Currently, there are no *Consumer Reports* comparisons of online programs or courses, no *Good Housekeeping* seal of approval, and no Underwriters Lab testing the products. Yet, accountability is a critical component if online programs are going to flourish. Not only must online course design and delivery be of high quality, online programs need to publicize their standards and how they measure against those standards.

Several studies have been published that address online course and program effectiveness in higher education, but there are no generally accepted national criteria for K-12. The Sloan-C Five Pillars of Quality identify five elements of quality online programs: learning effectiveness; cost effectiveness and institutional commitment; access; faculty satisfaction; and student satisfaction. Quality Matters, funded in part by the U.S. Department of Education's Fund for the Improvement of Postsecondary Education, is a peer-reviewed interinstitutional project led by Maryland Online. Quality Matters focuses on online course quality, and has created a process for certifying the quality of online courses and components. But how is fac-

ulty satisfaction measured with data other than self-reported survey data? Does student satisfaction lead to higher levels of achievement? Even in higher education, the identification of elements of effectiveness, though research-based, has not led to generally accepted measures of effectiveness.

Although standards for online course and program effectiveness have been identified, data-driven yardsticks for measuring against those standards are not generally agreed on or in use. There is no general agreement about what to measure and how to measure. Even for measures that most programs use, such as course completion rates, there is variation in the metrics because the online programs that measure course completion rates do not measure in the same manner. When does the measure begin? How is completion defined? Do students have a "no penalty" period of enrollment in the online course during which they may drop from the course and will not be considered when calculating the course completion rate? Is completion defined as a grade of 60, or 65? How are students who withdrew from the course after the "no penalty" period counted, especially if they withdrew with a passing grade?

This lack of consistency in measures is, in part, a result of the rapid growth of online education across the country. Online programs have undoubtedly helped schools and students by increasing the number and quality of choices available to student. A national consensus on how to measure the effectiveness of online courses, teachers, and programs, including how to calculate and communicate the results, would mark a further significant step forward in the sustainable growth of online education.

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Best Practices in Distance Education

Lynn M. Smith

Introduction

Best practice pedagogy is becoming more of an important issue as initial implementation technological problems and challenges are solved and online education becomes a more prevalent method of instruction. Whether it is professional development, training, or content courses, high school, undergraduate or graduate, electronic courses have saturated the education and training markets. The continuum of material contained in these electronic courses varies greatly from well-planned, -designed, and -delivered products to a text-based list of information. As a result, a plethora of best practice recommendations in distance education have been developed by a number of organizations to improve quality of distance courses.

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The Concord Consortium, a research-based group that investigates online technologies, states the following in their learning model for online teaching: "Asynchronous collaboration, explicit schedules, expert facilitation, inquiry pedagogy, community building, limited enrollment, high quality materials, purposeful virtual spaces and ongoing assessment" (http://www.concord.org/courses/cc_e-learning_ model.html, 2000). A large part of the research conducted within the Concord Consortium focuses on the instructional design to promote inquiry and deeper thinking. The techniques utilized to promote the dual goals of inquiry and deeper thinking are visual models, peer collaboration, multiple revisions, scaffolding, and ongoing assessment. Other organizations have developed similar best practice lists that mirror the Concord model (Chickering & Ehrmann, 1996, Palloff & Pratt, 2003).

It is this area of best practice distance education pedagogy that this article will focus, more specifically, on the design of high quality elements that promote higher-level thinking. This article outlines an appeal for instructional technology and distance education (ITDE) managers to understand the strong connection between distance course design and student under-

standing, achievement, abandonment, and opportunity for plagiarism and, further, to consider that the use of visual tools is a research-supported technique for accomplishing these goals. There are, therefore, many questions that face the ITDE manager when deciding on appropriate and powerful methods to design distance education courses. Is distance education being taught in a manner that allows for students to learn and understand material, or is it presented in a largely text-based format? Does the present format of lesson presentation increase student achievement or are there better methods? Does the presentation of material affect student achievement or dropout rates? Can students understand complex materials via a text-only format? Do best practice online methods increase student satisfaction? Are there methods for addressing and reducing the incidence of online cheating and plagiarism? There is growing concern among online instructors that the methods used to instruct students may not be working at addressing the questions above. So, what does the ITDE manager look for when deciding to improve or initiate online instruction? The answer focuses on four areas of concern: higher level thinking, assessment, dropout or abandonment rates, and plagiarism or cheating and a best practice measure that, if implemented, will make a huge positive difference.

Higher-Level Thinking

Deeper thinking and promotion of student inquiry have been an educational concern for many years. In online courses, it becomes a larger concern since many instructors, struggling with the technology, simply input large volumes of textual material into their online courses. Further, the level of thinking required from students is often limited. Most online courses, according to Jonassen (2002b) support "knowledge acquisition and reproductive learning." He expounds on the problem: "First, acquiring knowledge does not lead to or facilitate complex skill or problem solving development. Second and more insidiously, knowledge acquisition assumes an absolutist epistemology in which content is believed to be the truth" (p. 778). Peirce (2003) reiterates this view when he cautions against seeing students as containers to fill with knowledge. Additionally, he promotes the use of higher order thinking skills in online environments. Meyer (2002) concurs and cites the profusion of text-based instruction in distance environments that do not promote higher level thinking or problem solving.

One method of addressing these significant issues of concern that arise in online environments is the use of visual representations (Jonassen, 2002a; Meyer, 2002; Peirce, 2003). An unintended consequence of the use of visual representations may not only benefit from higher quality instruction but, as some studies (Jitendra, 2002) indicate, students are more satisfied with the use of visual representations in teaching. Watts (2003), in another study, calls for the application of quality face-to-face good practice measures in distance education courses. She promotes the expanded use of critical thinking skills and renewed appreciation for diversity and relationships. She suggests that technology has the potential to increase appreciation of varied cultures and human diversity. Watts believes that technology can be the vehicle to bring people and cultures an increased sensitivity toward others. Jonassen (2002b) and Conrad and Donaldson (2004) also put forward methods to increase higher level thinking skills and critical thinking. They subscribe to the notion that distance education courses should not mirror the lecture-then-test format so common in face-to-face instruction, but it should be an opportunity to innovate and employ engaging and proven methods. Jonassen further explains a type of problem-solving activity called story-problems, in which one essential compo-

nent is the organizational graphic organizer. Jonassen also champions the crafting of complex deeper thinking activities as a method for promoting systemic change in online teaching environments.

Assessment Techniques

High-quality assessments go hand in hand with deeper thinking. Assessment in an online environment is becoming a crucial issue to understand and employ because of the free access to the Internet. This phenomenon has drastically increased the incidence of plagiarism among students in the online environment (Mason, 2002). For this reason, the use of quality and deep assessments must be adopted. The attributes of quality assessments, according to Mason, are: they are authentic and holistic; they are the vehicles for improvement; and they are reliable, valid, and cater to a variety of learning styles and needs. Visual representations meet each of these criteria as assessment tools. They require the production of a unique product; they cater to differing learning styles; they are tools for educational improvement and, by utilizing an assessment rubric developed by Hyerle (1996), they could produce a quantative score. Visual representation utilized as assessment tools are a powerful weapon in the arsenal of student improvement tools.

Cheating and Plagiarism

Plagiarism or outright cheating has arisen as a grave concern for online educators due to unlimited student access to material. One method of reducing the likelihood of students copying someone else's work is the use of visual representations, which produces a unique product that can not be copied from others, facilitating original work and thoughts. This forced processing of the material adds to student understanding and reduces the impact of rampant plagiarism (Mason, 2002).

Dropout and Abandonment Rates

The reported dropout rates from distance education courses are very high. A recent study by Wang, Foucar-Szocki, and Griffin (2003) has indicated that the current dropout rate from distance education courses is 26%. The analysis of reasons why students choose to drop out of distance courses indicates lack of motivation, poor instructional design, and lack of interactivity. Given these factors, instructional design again becomes a key issue for online courses. Wang et al. (2003) also recommend the use of graphics, among other strategies, to decrease the dropout rate and improve instructional design.

There have been some studies (Diaz, 2000, 2002; Institute for the Advancement of Education, 2003; Lorenzetti, 2002; Parker, 1999; Wang et al., 2003) conducted on dropout rates in distance education that will be synthesized and connected to use of graphic representations. Diaz (2002) recommends the use of good practice measures and further research to reduce online course dropout rate. He reiterates the view of extant literature in the field of distance education by stating that the student and course design factors are important for increasing the retention rate. The fulcrum for the balance of distance education success rests on student understanding and the delivery of content. Both of these criteria can be centered by the use of visual representations. Diaz's views are supported by anecdotal evidence (Carr, 2000; Lorenzetti, 2002) and quantitative evidence (Parker, 1999; Wang et al., 2003).

Quantified Good Practice Techniques in Face-to-Face Classrooms

One place to begin to explore the instructional design issue is with research-supported best practice methods in the face-to-face classroom. Several studies have been conducted to quantify good

practice methods by documenting their effect on student achievement. Marzano's ideas have endured; they are based on a firm foundation of well researched and documented studies. Marzano conducted a meta-analysis of instructional methods, examined the results of these studies to determine effect size, and then translated these results into percentile gains. The resulting data generated a list of nine instructional strategies that have been shown to increase student achievement based on the meta-analysis performed. The strategies from the synthesized studies listed in order of effect size from largest to smallest are, "Identifying similarities and differences, summarizing and note taking, reinforcing effort and providing recognition, homework and practice, nonlinguistic representations, cooperative learning, setting objectives and providing feedback, generating and testing hypotheses, questions, cues, and advance organizers" (Marzano, Pickering, & Pollock, 2001 p. 7). Marzano translated the effect size data to percentile gain, and these percentile gains ranged from 45-22 percentile points. These data indicate a powerful potential for instruction and increasing student achievement. Each of the instructional strategies mentioned above have good practice applications in distance education.

Effective Distance Education Strategies and Design

Courses offered at a distance are still education and, therefore, while input and output modes are different, they still require a set of design strategies that accommodate good educational practice. Good design and educational foundational features of distance courses have been studied from a number of perspectives (Berge, 2002; Egan & Gibb, 1997; Hacker & Niederhauser, 2000; Jonassen, 2002a; Mayer, 2002; Robles & Braathan, 2002; Simonson, Smaldino, Albright, & Zvacek, 2000; Watts, 2003; Winnips, 2001). What is known about this area of study is that good practice methods that work in a classroom also appear to work in distance education. According to Brabee Fisher, and Pitler (2004), today's technology supports Marzanos' nine strategies for increasing student achievement. Some of the supportive technologies are word processing technologies that accommodate making graphic organizers, the building of analogies and allowing for collaborative editing and dialoguing. Inspiration™ software is also a facilitative tool for the development of complex mapping and visual organizers. Digital media creation tools (iMovie™, PowerPoint™, HyperStudio™) are also direct supporters of the creation of nonlinguistic representations.

In a study conducted by Mayer (2002), the component questions of visuospatial thinking effectiveness were investigated. Through experimentation, it was determined that deepest learning resulted from simultaneous dual input of verbal (spoken words) and visual (graphics). This is the definition of visuospatial thinking, and this is the condition in which true understanding takes place. Mayer (1989) also states that, according to his research on effect size differences for understanding with text alone versus text and graphics, "People learn more from words and graphics than from words alone." This idea has deep roots within human history; as Aristotle also said, "There can be no words without images." Mayer's view is a constructivist view of learning. Egan and Gibb (1997) also promote constructivist theory for designing online instruction. They studied the components of optimal student-centered learning tools and their application in telecourses. To maximize student outcomes, active, multimodal, visual activities must be employed in telecourse development. This trend promoting constructivism continues in a study by Berge (2002). They studied a variety of e-learning strategies to determine their effectiveness as tools of distance education. Their findings highlight the importance of interactions among

students and between the instructor and students. They persist with emphasis of communication as a tool for development of self-reflection and inquiry skills.

Effect sizes were studied by Berge (2002) from a number of e-learning strategies, and the results indicated the importance of learner-centered approaches to instruction. The results also support the findings of Marzano et al. (2001) with regard to effect size of graphic representation use. Berge also urges distance educators to use effective learning strategies and construct valuable learning experiences for distant students. Mayer (1989) also measured effect size with use of visuals in distance education. He found significant differences in understanding between text alone and visuals and text combined. Hacker and Niederhauser (2000) also encourage active participation and collaborative problem solving along with effusive feedback and use of real-world examples in distance education.

Good practice distance techniques are also reiterated by the principles put forth by a number of authors in the field (Clark & Mayer, 2003; Conrad & Donaldson, 2004; Henry, 2002; Madrazo & Vidal, 2002; Meyer, 2002; Rosenberg, 2001; Schank, 2002; Simonson et al., 2000). These authors advocate the important aspects of the use of visuals in distance education to simplify, connect and explain thinking, increase collaboration and student understanding. Clark and Mayer (2003) promotes the use of technology in graphic form to increase understanding and support problem-solving skill development. Schank (2002) states that "memorization has no impact on behavior; it does not translate into learned skills" (p. 79). This notion of learning is rooted in the assumption that memorization meant learning had occurred. This assertion has little evidentiary support in fact or practice. Learning has occurred if the individual processes the information, anchors it in experience, and transcribes the information to the long term memory. Graphic representations facilitate and support this process. The assertions that graphic representations form a basis of distance education good practice measures are echoed by other studies and discussed below in multiple facets.

Cyrs calls for increasing the visual thinking skills because the new technologies lurking in our future will allow for more access to information for students. This freer access and improved technological tools should not be an invitation to continue less-than-exemplary educational practices, but should free instructors to deliver similar content with better methods and spectacular results (Cyrs, 1997a, 1997b). Cyrs also calls for the essential and expanded use of visual tools to sift, organize, and relate the multitudes of information now available to students, and he encourages online educators to expand their teaching skills to the capacity of the technologies available using the best distance education methods available.

Scaffolding is one unique method for online instruction that structures teacher-student interactions for maximum understanding (Winnips, 2001). Scaffolding forwards the notion of the production of a quality product or task with the goal of less teacher support and more student independence. Teacher support is in the form of modeling and coaching with the end result, after multiple teacher-student interactions, of true understanding and increased motivation. Employing scaffolding in conjunction with graphic organizers is a visual method for showing student growth or progress through a complex unit.

Nonlinguistic representations as a separate category of good practice strategies in distance education have been researched by numerous people (Astleitner, 2002; Cyrs, 1997a, 1997b; Wolsk, 2003) and are an effective tool to increase student achievement in a distant environment. The results of these studies indicate a positive correlation between increased achievement on a

particular measure and use of a graphic representation.

Early work by Bernard and Naidu (Bernard & Naidu, 1992; Naidu & Bernard, 1992) developed to assess the relative strength of the use of concept mapping in distance education produced conflicting results. Although the use of concept maps had a significant effect in cognitive outcomes, a distinction was made between high- and low-persistence concept mappers. After the data were disaggregated based on the level of persistence, the results demonstrated that the high-persistence mappers scored considerably higher on the cognitive measure while the low-persistence mappers achieved much lower on the measure. This finding, according to the authors, could have been due to the increased time spent with the academic material while mapping. Although there were many limitations to the studies (clarity between high- and low-persistence mapping groups, selection bias, group equivalence) the authors conclude that the use of solid, research-based face-to-face classroom strategies can be of great benefit in distance education settings.

There is a fundamental shift in interaction, learning paradigms, and assessment techniques that must result from the change as one moves from face-to-face to distance teaching. Effective online assessment must be authentic, ongoing, multidimensional, and reflective to be effective in a distant environment. The added benefit is that online assessments allow the instructor to give weight to each student response to assess his or her own individual understanding (Robles & Braathan, 2002). The move away from multiple choice knowledge level assessment techniques in distance education is mirrored by Peirce (2003), Mason (2002) and Conrad (Conrad & Donaldson, 2004).

Conclusion

There is a call from experts in the field to have distance education students move away from regurgitative, text-based knowledge education to in-depth, higher-order thinking activities for two purposes; deeper understanding and plagiarism avoidance. Graphic representations also have the potential to increase student achievement in distance classes and to reduce dropout rates. These two results have enormous impact in the field because a serious look at factors that allow for student success in the ever-widening and pervasive field of distance education is necessary.

So, as the ITDE manager is faced with the myriad of questions and pressures that require balancing cost and benefit, there is a call for consideration of the issue of quality in online course design. The potential benefits of this consideration run the gamut from reduction of plagiarism, to deeper thinking, and movement away from knowledge based-only material, to more student satisfaction, to better retention rates. While wading through the choices for online instructional design, ITDE managers should look for the following essential components: high quality assessments that focus on unique and demonstrative products, visual delivery modes that promote higher level thinking and inquiry and high quality, and visual design that promotes understanding and student satisfaction

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ITDE MANAGERS SHOULD LOOK FOR THE FOLLOWING ESSENTIAL COMPONENTS: HIGH QUALITY ASSESSMENTS THAT FOCUS ON UNIQUE AND DEMONSTRATIVE PRODUCTS, VISUAL DELIVERY MODES THAT PROMOTE HIGHER LEVEL THINKING AND INQUIRY AND HIGH QUALITY, AND VISUAL DESIGN THAT PROMOTES UNDERSTANDING AND STUDENT SATISFACTION.

The Mid-Term Tune-Up

Getting Student Feedback Before it is Too Late

Natalie B. Milman

Introduction

> I was extremely disappointed with this course. I don't feel I got all I could have/ should have out of this class. I felt like I was going through the motions of being there.

Have you ever read a comment like the one above on one of your course evaluations, often months after you have taught a course?

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How did it make you feel? If you are like me, reading such a comment was quite frustrating. It was frustrating not only because I found it hard to believe that a student would end any course feeling this way (how could he or she go through the motions without asking for help, how did I not realize that there was a student that I was not "reaching"?), but also because it was too late to do anything for this student or to change what I was doing.

This comment, from a course evaluation of a class I taught in 2001, made me realize that I needed to do something to garner feedback from my students *before* the end of the semester. Therefore, I decided it was time to develop a strategy to solicit feedback from my students—at the mid-term—before it was too late. That way, I would be able to address their concerns, and even change the course, to meet my students' needs, if necessary.

What is the Mid-Term Tune-Up?

The "Mid-term Tune-up" is an evaluation tool for requesting feedback from one's students at the mid-term (well, it could be used any time during a semester or workshop), and not just at its completion, as is the case with most courses and workshops. Just as every car needs a tune-up to see what is working well and what needs to be

repaired, so do most classes and instructors! The Tune-up typically consists of two questions, although I occasionally add one or two additional questions. Table 1 contains the prompt and questions of a Tune-up I used recently. A question that I have begun to include more recently (see Item #4 in Table 1) asks students whether or not they give me permission to share their responses in a publication or conference, while also emphasizing that their permission or refusal to share their comments will not affect their academic standing. I plan to add a request for inclusion in my own digital portfolio in subsequent Tune-ups. (NOTE: This is for Institutional Review Board purposes, as well as to inform my students about how I might use their responses). I inform all of them also that their responses will be shared with the class. In cases where a student might post an inflammatory remark about another student, I will delete the reference to the student in question.

I developed the idea based on some approaches I had learned about at the University of Virginia Teaching Resource Center (see http://trc.virginia.edu/home.htm) while a doctoral student and graduate instructor. The first approach that influenced the development of the Tune-up, the "one-minute paper" (see Magnan, 1991, for a description), was an excellent approach to use in my face-to-face (F2F) classes, but not in my online ones, particularly those taught asynchronously. And, although a second approach that I discovered, "anonymous feedback" (see Martini, 1998) could be developed easily for my online students, I found it to be too open-ended for what I wanted to learn from my students. Specifically, I wanted to learn what was working well for my students and what was not. Another approach, the "mid term

Table 1
Mid-Term Tune-Up Prompt and Questions

Just as every car needs a tune-up to see what is running well and what needs fixin'— so do most courses/ instructors. I would like to know what you believe is running well with our class and what needs fixin' by completing the answers in this "survey."

NOTE: This is anonymous and voluntary.

1. What's running well? (What most helps you learn in this class?)

2. What needs fixin'? (What impedes your learning, and how can realistic improvements or changes be made?)

3. Please write any other things you'd like to share here.

4. I give Natalie Milman permission to share my anonymous comments in future publications in scholarly journals or educational conferences. I understand that my permission or refusal to share my comments will not affect my academic standing at The George Washington University.
   a. Yes, I give Natalie Milman permission to share my comments in future publications in scholarly journals or educational conferences.
   b. No, I do NOT give Natalie Milman permission to share my comments in future publications in scholarly journals or educational conferences.

evaluation" (see Loevinger, 1993) seemed to fit what I had hoped to learn from my students, although the questions were different and, as a former elementary school teacher, I just had to make the idea more "interesting" for my students. So, the Mid-term Tune-up idea was born!

What Tools are Available for Creating Mid-Term Tune-ups?

For the past few years, I have used Zoomerang (see http://info.zoomerang.com/), an online survey tool, for administering the Mid-term Tune-up. I maintain a free account with Zoomerang. It allows me to develop a survey with up to 30 questions for as many as 100 respondents. The data are available (which I copy and paste to word processing or HTML editing software) for up to 10 days. After ten days, to access the responses, I would have to upgrade to one of its subscriptions (which are much more expensive than not having to pay anything!). Many other online survey tools exist, such as SurveyMonkey (see http://www.surveymonkey.com/) and QuestionPro (see http://www.question pro.com/), among many others. The features vary from tool to tool, but many offer a free version, or at least a free trial version that you can test out. I use Zoomerang because it was one of the first online survey tools available for free and it continues to serve my purposes for a simple, easily accessed online survey tool. It is easy to modify previously created surveys. Plus, although I know how the tool works, it is very easy to use.

What Have I Learned From the Mid-Term Tune-Up?

I have learned many things as a result of using the Mid-term Tune-up in my classes over the past few years, not only about my students but also about my teaching. I have learned, for instance, that some students have felt overwhelmed by some of the work I assign, hated a particular text, and/or did not like working in groups. Some of these things I could not change, whereas others I did not want to change. More importantly, the Tune-up provides a means for my students to communicate with me about what helps and impedes their learning, in a risk-free way.

For my online courses, I always provide feedback in written format as a PDF file that may be downloaded from one week's lecture. Although at times redundant, I make sure to respond to each comment. In my F2F courses, I always share the students' responses as a handout and then discuss realistic solutions with the students.

I do not know if it is having over a decade of teaching under my belt or the Mid-term Tune-up, but I am finding that, like my end-of-semester course evaluations, the Mid-term Tune-ups tend to be generally very positive. In places where I can make changes, I make them. In areas in which changes cannot be made, I explain why. Perhaps it is this simple communication in a risk-free environment that has helped to improve things all around, as well as my teaching and my students' learning!

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A Half-Hidden Asset

Craig Ullman

I've just come up with a big, brilliant idea to change the nature of education in America, but I'm going to need a lot of help. Students have moved from learning in school to daylong learning; they consume media anywhere, anytime, and now that is going to happen with education. But schools aren't like 7-Eleven's: they close, and that's the problem I've just solved!

In every community in the country I'm going to put a learning center; maybe not open 24 x 7, but certainly during the day and nights and weekends, too. In each center, I'm going to have computers with broadband connectivity, and lots of other educational resources right at the kids' fingertips; if they require newspapers or magazines—even books—it'll all be right there on the shelves waiting for them.

Of course, it's going to take a lot of money to throw up all these buildings, wire them, and install the hardware. And I've got to hire about 70,000 people to staff the places …

Say, what? This infrastructure already exists?

Oh, of course: the public library. There are thousands of *public libraries* all over the country, virtually every one with Internet access, and many with a lot more—video conferencing facilities, movie theatres, classrooms, even coffee bars. And yet, typically it's up to each individual student to figure out how to (or even if they should) integrate the public library into his or her education.

For most public libraries and most school systems, there is no legal, bureaucratic, or even personal connection between the leaders of the two organizations. Libraries are funded by a hodgepodge of state laws, and they're run by all sorts of different structures. This terrible complexity makes it nearly impossible for any national mandate to leverage public libraries to help student performance,

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assuming that the thought even occurred to anyone in Washington.

Even worse, librarians traditionally never thought of themselves as educators, or even education-enablers. Rather, they help provide access to information. That's why librarians, unlike teachers, don't need regular retraining and recertification (Perhaps the reason why the public has such a high opinion of librarians is that so little has been expected of them.)

One could argue that providing access to information is no longer relevant when you've got companies like Google dedicated to offering users access to all the information in the world. One could also argue that most libraries these days are developing all sorts of additional functions—reading circles for children, poetry classes for seniors and so on—that the traditional role of a librarian has already been superseded by the need to address new issues to support their communities.

Libraries, therefore, don't need to be officially given a clearly defined set of tasks from the local school system to support student learning. Mere logic, I realize, is a cowardly tactic when talking about redefining the roles of two different organizations with two extremely different power structures.

And yet.

You have all these beautiful public spaces, staffed by professionals, surrounded by resources both on-task for schoolwork and wonderfully off-task. After all, the great pleasure of a library is the staggeringly high rate of serendipity it fosters: you never really know what you need until you start looking for something else.

Maybe the leaders of public libraries and public schools can start looking at what each has to offer. Who knows what they might unintentionally find?

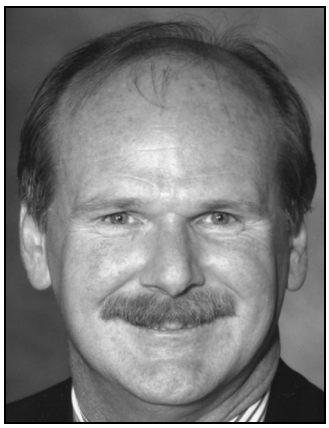
THE LIBRARY—

. . . BEAUTIFUL . . . STAFFED BY PROFESSIONALS . . . RESOURCES . . .

Camelot, Calamity, and Some Common Cents About Distance Education

Don Olcott, Jr.

Once upon a time, in a far-off land, the King awoke one morning pondering the question "Do I really know what my Camelot subjects want from the Crown?" Later that day, at his Knights Roundtable, his First Knight echoed these sentiments and asked the King, "Do we really know what the other Kings are doing with their subjects in the surrounding Kingdoms? Are we really harnessing our available resources and focusing on delivering what our subjects need, not just what they want?"



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This dialogue seems to be as applicable today as it was for Camelot. Today, continuing and distance education deans engage their staff in open dialogue about what we do, do we do it well, and how do we know we are doing it well. Moreover, as we reflect on the evolution of distance education over the past 20 years, we are simultaneously amazed and perplexed at the changes that have defined the profession. This has never been more true than in the hallowed halls of the modern university. At times, we wonder who is steering the ship, where it is going, and whether the distance game has a major role in the university's future.

The last 20 years, perhaps, could be viewed in three general phases. The first phase, from 1985-1995, would be the Camelot period. The second phase, from 1995-2003, might be described as the Calamity phase. The current phase, beginning around 2004, would be the Common Cents

phase. These may seem like humorous descriptions of the field until one examines these periods of the distance education continuum. You, the reader, can decide for yourself whether your experiences and views on the field coincide with these phases. Let's look at some of the key characteristics of each phase.

The Camelot Phase: 1985-1995

Defining Characteristics

- *Technologies*: Primarily satellite broadcasting, PBS programming, correspondence programs, one-way instructional video; two-way compressed video arrives in early 1990s; some audioconferencing.
- *Organizational Structure:* Universities tended to house distance delivery in the current structures (e.g., TV studio, technology center, PBS affiliated station, etc). Continuing education organizations managed correspondence study and slowly began assuming new responsibilities for distance learning support services to students. Distance education was viewed with skepticism and as an auxiliary service of the university … most faculty and senior administrators viewed it as second class higher education that was just another of those innovations that would eventually die a slow death.
- *Instructional Formats:* In general, differentiated instructional attributes for distance learning was an anomaly. Most programs were taught exactly like traditional face-to-face courses, designed like traditional courses, and evaluated like traditional courses. The formal instructional design paradigm faced considerable resistance by faculty and it would take a few years before faculty and administrators alike figured out that teaching at a distance requires new design approaches that would achieve the same outcomes.
- *Financial Model:* Distance education would save or make the university money. This was the university's version of "*Save the Planet"* by advocating to legislatures, funding agencies, and accrediting bodies that academic quality and free enterprise could coexist in the academy … or so the story goes. The formal funding mechanism for many universities during this period could be aptly described as the "Scavenger Model," building distance programs on existing budgets and targeting any new or available moneys primarily at the technologies that were viewed as the silver bullet success factor for all distance learning programs. Quality, design, faculty training, student outcomes, and institutional budget funding would have to wait.
- *Student Services:* Student services were face-to-face and done by staff. Online student services were in the future. Campus-based models, including student fees, were just applied to off-campus distance programs. In didn't matter that a student 200 miles away didn't use the health center, attend football games, etc.: charge them anyway.
- *Accreditation and Assessment:* Accrediting agencies evaluated distance education programs using the same criteria required for traditional campus academic programs. However, in the early 1990s, the North Central Association and the Western Cooperative for Educational Telecommunications began examining different approaches for reviewing distance education programs.

In sum, the Camelot period had high aspirations for distance education in expanding access to higher education. In retrospect, these aspirations fell short of the lofty expectations set for distance education. Technology drove the engine with

little focus on design, assessment, and mission alignment with the core mission of an institution. And, the field learned a hard lesson that distance education done well costs money and that making money on the enterprise for many institutions was the exception, not the rule.

At the same time, the Camelot period began to raise "realistic" opportunities for distance education in expanding access, serving working adult learners, and mainstreaming various technologies into the regular classroom as well as for distance delivery. Accrediting agencies soon began to see the light that perhaps different approaches for assessing distance education would be needed. Institutions, at least those that really took distance education seriously, soon realized that dedicated funding to support the enterprise would be needed in the future. Research in distance education began to grow, and dedicated journals were soon to hit the academic newsstand. A brave new world it was not. However, the possibilities were gathering momentum.

The Calamity Phase: 1995-2003

Calamity, in and of itself, does not necessarily mean instability for the field. To the contrary, it means a period of significant transformations that pave the way for the future of the field. What are some of these transformations that characterized the calamity phase?

Defining Characteristics

- *Technologies*: Emergence of the World Wide Web and the Internet. Online learning begins to evolve and the learning management systems (e.g., E-College, Blackboard, WebCT, and others) emerge in the private sector. Statewide telecommunications networks primarily dependent on video-based programming are being scrutinized in this new era. Integrated Technology Systems Design, the combining of multiple technologies to deliver programs and courses, begin to take shape. New terms that confuse the field, such as blended learning and hybrid learning, appear in the literature and in professional conference presentations.
- *Organizational Structure:* Universities begin experimenting with new organizational models. Some are built on previous continuing education and outreach units, while others are separate distance learning units, instructional technology centers, and/or centers for teaching and learning. Some universities go as far as creating separate and global units such as Penn State's World Campus, the University of Texas System TeleCampus, and variations of virtual universities. Community colleges during this period are more focused on using distance learning to expand access to all learners. Many universities still stumble over their elitism and cumbersome governance and policy structures.
- *Instructional Formats:* Instructional designers finally have their day in court. Increasingly, distance learning units and even faculty begin to understand the critical role that design plays in developing and assessing distance learning courses.
- *Financial Model:* More and more universities are dedicating reoccurring funding to campus distance education. Federal and private funding sources increase available resources for distance learning initiatives, particularly collaborative partnerships between K-12, community colleges, and universities. Universities, in general, still operate on a cost-recovery model for distance education, and many under the illusion that distance learning will create extensive new profit centers.
- *Student Services:* Transition period from old labor-staff intensive models of ser-

vices to the integration of online student services into many distance learning programs. Online admissions, registration, financial aid, marketing, general academic advising, and assessment begin to emerge. Eventually campus student service organizations begin to learn from the distance learning managers and automate campus services for students. Universities still grapple with technology fees and student fees for distance learners.

- *Accreditation and Assessment:* Increased focus on the instructional design also increases focus on outcomes assessment. Competency-based assessment gains some ground among some universities largely because of the work of Western Governors University.

The Common Cents Phase: 2003-Present

The common cents phase, while building on the calamity phase, has some distinct characteristics. This phase could aptly be described as *distance education at the crossroads* phase. Moreover, distance education's future is not secure, not well-defined, and devoid of visionary leadership that is defining the future for the profession. This profession truly is at the crossroads.

The Common Cents Trends

- Distance, as a functional term, is obsolete. Today, students are taking courses 300 yards from the faculty member's office or 10,000 miles away. Universities are beginning to finally understand that education is education is education, regardless of how, where, when, and through what facilitative technologies are employed. Terms such as distributed, virtual, hybrid, and blended are equally obsolete if, in fact, they ever were useful to the profession.
- Financial efficiency of distance learning is more focused by most institutions and programs that continually lose money will be phased out. Conversely, institutions are engaging in broad-based technology planning that encompasses the entire continuum of technologies to serve all students.
- Mainstreaming, or the integration of distance learning into the day-to-day operations and organization of the university, is increasing. Instructional development, student services, assessment, and fiscal efficiency are examined based upon their role in serving all students of the institution.
- Be careful what you wish for in higher education. Distance learning advocates in the previous Camelot and calamity phases complained that the university didn't value distance learning and viewed it as second-class education. Well, we've come full circle and institutions are fully integrating distance delivery into the mainstream academic culture. Advocating that distance education should be separate but equal is a weak argument today. The result will be more centralized organizational structures for distance learning and the new distance learning organizations that were created in the calamity phase may disappear along with continuing education units that have enjoyed managerial oversight for distance learning. Universities have finally recognized that throwing funds at multiple organizations on the campus to play a role in distance education is simply poor fiscal management. And it's the same people who have been throwing the money who are now advocating for the centralized focused approach. C'est la vie!
- Accreditation agencies are focusing on student learning outcomes for all instruction. Assessment will increasingly target showing that students are learning what faculty state they are supposed to learn and demonstrate.

The Future: Obsolescence or a Brave New World

Distance education has made considerable progress during the past 20 years in expanding access to higher education. At the same time, the winds of change have taken it from second-class academic citizen to the mainstream of the academy. Change is inevitable for most professions, and distance learning has truly arrived at a crossroads. Where are we going and how will we get there? Do you want to thrive or just survive in the next 5 years? How will you do this? The following are what I think will be the characteristics of successful distance learning organizations in the next 5 years. Agree or disagree, it's up to you, but you may want to give these and others some thought as you prepare for the next winds of change.

- Online education will be strategically designed to support the mission of the university. Alignment with the university mission will be mandatory, not optional.
- Faculty will play an increasing role in planning and vision for distance learning.
- Online student and faculty support services will be designed to serve all students and faculty of the university, regardless of location, time, and space.
- Online programs will be responsive to learner and employer needs, not what academicians think they need.
- Multiple-language instruction for selected programs will increase, particularly for national and international markets.
- Design team models will emerge that support scalable growth of programs without proportionate increases for instructional and administrative costs. Scalability is ultimately about serving more students at less cost, not the same costs as enrollments increase.
- Assessment and research of distance education will be an integral value across the institution.
- Selected market response: institutions will focus on doing lots of what they do best.
- Distance learning programs will be marketed and priced for profitability.
- Economic development and workforce training will be an expected and measurable outcome of university distance education.
- Pay attention to advances in mobile technologies. Mobile technologies will be cheaper, faster, and more efficient for transmitting data sets in multiple formats.
- Sophistication of online language translation capacity will increase.
- Online systems will have enhanced security features for protecting personal and professional data and information.
- Know your students and their learning characteristics. Today's traditional age students are sometimes referred to as "millennials" and are using multiple technologies simultaneously and multitasking in their approach to learning. These students may look the same in the classroom, but they are learning very differently when they go home or to their dorm rooms.

As Will Rogers so eloquently stated, "Even if you're on the right track you are going to get run over if you just sit there." Are you on the right track for distance education at your university? Camelot, calamity, or common cents, it's your choice.

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and development of custom courses. Hartnett recommends estimating the costs for design and development using several approaches, then making a subjective decision.

> Method 1: Best Estimate Method. This method estimates costs by trying to determine how long the project will take, including the work of anyone involved, and multiplying the number of hours by a pre-determined hourly rate.
>
> Method 2: Screen (page) Count Method. This method estimates the number of computer screens or content pages an online course would have and multiplying that by $200-$500 per screen page, depending on the complexity of the information displayed.
>
> Usually, a one hour lesson led by an instructor would use 3-5 screens or pages of content. These 3-5 screens or pages would make up a major topic in a course. Simonson, Smaldino, Albright, and Zvacek (2006) have described a model for organizing distance education courses that uses the *topic* as the basic building block. Topics are combined to make modules, and modules are combined with complementary modules to make units of instruction. The Unit-Module-Topic (UMT) model is becoming widely used by course designers (Simonson, 2006).
>
> Method 3: Seat Time Method. Probably the oldest method is to estimate student seat time and multiply that times a predetermined cost, often up to $25,000 for one hour of instruction. This amount is the often quoted, if little used, industry standard.
>
> Method 4: Comparative Project Method. For this method, the costs for developing a new course are compared to the costs for developing a similar, previously developed course, where costs were carefully recorded.
>
> Method 5: Time Feel Method. For this method, the amount of time that is needed to complete a course is estimated to determine the number of hours needed to complete the design and development; this number is then multiplied by the going rate for those involved in the process.

Obviously, these methods involve a considerable amount of subjectivity. Two examples are provided next to clarify how costs are often estimated.

Example 1: A Comparative Project Method. At a recent convention of the Iowa Distance Learning Association, Bowers (2006) described the costs for outsourcing the design and development of courses for an extensive online program. Bowers identified these out-of-pocket costs for the design and development of an online course:

- Course Development Fee = $2,400
- Peer Reviewer Fee = $600
- Clerical Staff Support = $1,500
- Instructional Design and Media Development (Embanet.com) = ~13,500

Estimated Total Cost = ~$16,000

This cost did not include the costs associated with the staff that supervised and coordinated the design and development process.

Example 2: Estimating Using the Best Estimate and Screen Count Methods. The typical three-credit college level course has somewhere between 12 and 15 modules. A module is usually a week of instruction that typically would have 3 hours of content presentation, which means there would be at least 36 hours of content instruction during a semester (A rule of thumb is that for each hour of content instruction or delivery, students will spend about 2 hours outside of class studying, preparing, or completing assignments).

Most often, a professor, instructor, or teacher has already collected the content materials for a course: the lectures, videos,

audios, PowerPoints, and other learning experiences.

A. Best Estimate Method—

- Overload to Instructor: $3,500
- Course Design, Subject Matter Expert: ~200 hours @ ~$60/hour = $12,000
- Production Costs: ~200 hours@ ~$40/hour = $8,000
- Production Materials: ~$1,000
- Indirect Costs: ~ 40% =$9,800

Total Best Estimate for 12 Module, 3 Credit Course = $34,300

B. Screen Count Method—

- ~3 screens/pages of instruction per topic
- ~5 topics/module
- 12 modules/3-credit course = ~180 screens/pages of instruction @ ~$250/page =

Total Screen Count Estimate for 12 Module, 3 Credit Course = $45,000

These two methods for estimating the cost for designing a 3-credit online course give a cost estimate range somewhere between $34,300 and $45,000.

And Finally, accurately determining the cost for developing an online course is a subjective activity. Costs "depend," and many consider cost information proprietary. Quality instruction is expensive. Let us not kid ourselves. Whether costs are easily identifiable, or hidden within existing personnel budgets, the design of an effective online course requires talent, skill, and preparation, all of which mean "money."

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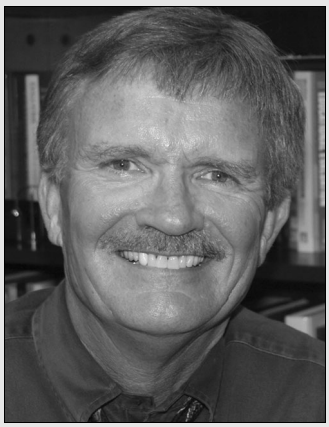
QUALITY INSTRUCTION IS EXPENSIVE. LET US NOT KID OURSELVES. WHETHER COSTS ARE EASILY IDENTIFIABLE, OR HIDDEN WITHIN EXISTING PERSONNEL BUDGETS, THE DESIGN OF AN EFFECTIVE ONLINE COURSE REQUIRES TALENT, SKILL, AND PREPARATION, ALL OF WHICH MEAN "MONEY."

It Costs How Much?

Estimating the Costs to Design and Develop a Distance Delivered Course

Michael Simonson

Course design and development is a basic process traditionally accomplished by a teacher, professor, or trainer, often with the assistance of an instructional developer and sometimes with the use of production specialists such as graphic artists, videographers, and computer programmers.



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Face-to-face classes are most often designed by the teacher or trainer who is also the instructor. As a matter of fact, most educators consider the design and development of courses to be their responsibility, and often claim that courses they produce are their intellectual property.

The popularization of distance education has begun to change the traditional and largely private course design and development environment. With the advent of hybrid courses taught partially at a distance and partially face-to-face, and online courses taught almost totally at a distance, the design and development of courses has become more visible and costs have come under greater scrutiny.

The Sloan Foundation has defined online instruction as having at least 80% of the course content delivered online (Allen & Seaman, 2005). An online course is taught by an instructor who delivers the content and interacts with students.

Estimating the cost for the design and development of an online course is little discussed in the literature of distance education. One exception is a short paper by Hartnett (2002), who describes various processes for estimating the cost for the design

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