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ABSTRACT
                This paper introduces guidelines that can contribute to the
successful delivery of distance instruction to teachers using a variety of
delivery technologies. These guidelines have evolved from extensive
experience in teaching and administration of distance-delivered courses,
student evaluations, research studies conducted upon previous courses, and
from the literature. The guidelines are organized under the following
categories: (1) course design; (2) general delivery strategies, including
preplanning group sessions, promoting interaction, speaking strategies,
facilitating discussion, and questioning techniques; (3) computer technology
strategies for delivery; (4) student and administrative support
considerations; and (5) evaluation. Within each category, the guidelines are
offered as examples of techniques intended to make a distance delivery
experience more successful. (AEF)

Integrating Computer Technologies in Distance Learning as Part of Teacher Preparation and Inservice: Guidelines for Success

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INTEGRATING COMPUTER TECHNOLOGIES IN DISTANCE LEARNING AS PART OF TEACHER PREPARATION AND INSERVICE: GUIDELINES FOR SUCCESS

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Since Wyoming is sparsely populated with communities separated by large distances, distance learning and commu nication systems are in great demand. The delivery of teacher inservice especially, requires the use of distance . learning technologies. It is not uncommon to respond to inservice needs that include a small group of twenty or fewer teachers spread over 300 miles apart with as few as two-three persons per site. Practicum sites for undergraduates are sparsely distributed throughout the state as well. Conventional delivery systems, face-to-face inservice courses and on-site supervision of undergraduate practica, are becoming increasingly difficult to justify because of the time commitment required for travel. In addition, people in a globally based economy will find it necessary to use computer mediated technologies to access information and communicate with others (SCANS, 1991).

Distance delivery requires extra effort to insure that students' basic information needs are met and that as more complex computer technologies are introduced, a stronger support system for solving problems is needed. Incorporating the use of the Internet, course web pages, and computerized "chat rooms" adds a complex set of problems that can overwhelm some students. Problems can and likely will arise which, if appropriate support systems are not in place, will negate learning.

The purpose of this paper is to introduce guidelines that can contribute to the successful delivery of distance instruction to teachers using a variety of delivery technologies. These guidelines have evolved from extensive experience in teaching and administration of distance delivered courses, student evaluations, research studies conducted upon previous courses, and from the literature. Factors that seem to make a difference in the quality of distance instruction have to do with planning, instructional design and management, facility and support for teacher-student and student-student interaction, reliable technical support, empathy for student needs, and instructor training (Willis, 1993). The interesting finding is that these factors are the very same ones that are essential for success of a conventional face-to face delivered course (McKeachie, 1986).

Guidelines

We have organized these guidelines under the following categories: course design, general delivery strategies, computer strategies for delivery, student and administrative considerations, and evaluation. Within each category the guidelines are offered not as an exhaustive recommendations, but rather as examples of considerations or techniques intended to make a distance delivery experience more successful.

Course Design

A systematic method of planning developing, managing and evaluating the instructional process is basic to effective and efficient distance education, or any instruction for that matter (Kemp, Morrison, & Ross, 1998). But what should be included in thinking about such a systematic development of instruction? The traditional umbrella categories of analysis of the learning situation and the learner, delivery strategies, and evaluation must of course be considered, but three specific areas that should be considered for good distance delivery of instruction are suggested below.

The course design should help resolve the balance between formal structure and interactive dialogue. Including more dialogue can develop more interaction and community. Doing this has resulted in evaluation comments that were very positive from some students. Such comments usually remarked on the opportunity to "see a topic through its course," or "understanding another's position with greater clarity." Using lots of dialogue can result in negative comments however. For example, students sometimes remark on "time wasted in unrelated topics." This tension between time on task and time devoted to student interaction and community must be

addressed to provide both dialogue and structure in appropriate amounts.

The course design should be attentive to developing a learning community. Many hours can be devoted to designing course content and massaging subject manner, but equal time should be given to developing a learner-centered course that allows learners to build a support community within the class. Success in distance instruction is positively correlated with a sense of ownership and community among the students. Distance students at remote sites who have neither often drop out of courses and programs. Building community and ownership requires the use of learning strategies that are flexible and adaptive and the use of delivery strategies that incorporate interaction and dialogue.

The course design should identify goals, instructional processes and distance delivery procedures. Separation tends to heighten students concern regarding what is expected of them, so it is essential to provide learning structures such as a detailed syllabus that includes a course calendar, clear goals and objectives, assignments, grading policies, deadlines, and other expectations. Determine specifically activities such as registration and collection of fees, distribution of class materials, receipt of student papers, use of copyrighted multimedia and print materials, responsibilities such as grading, and other protocols and procedures the educational organization may require (Rezabek, Cochenour, Bruce and Shade, 1994). It is also very useful to determine the optimum conditions for instruction. Such considerations include: class size, number of sites, number and length of class sessions, variety of delivery modes, and other issues related to the course.

General Delivery Strategies

Preplanning Group Sessions. When planning group sessions, it is important to communicate the process as well as the topic/issues that will be addressed. Prior planning includes such items as developing a list of discussion questions or readings for reaction that can be sent to participants by email or posted on a web site. Another strategy is to create a scenario or case study for reaction. Sometimes, a videotape or satellite broadcast is available as a discussion item. A course web site can also be used to post a multi-media slide presentation produced by the instructor.

In planning and communicating distance delivery technology procedures, it is essential to increase the time interval before sessions actually occur. One convenient strategy is to send an email to all participants several days prior to the next group session with reminders of assignments, readings, or other key information to prepare for the session. Announcements, tips, or supplementary information can be communicated in this way to encourage consistent use of the technology.

Promote interaction and collaboration. We require at least three students per remote site and encourage these students to work together and develop a small learning community that can rely on each other for support throughout a course or program of study. Peer learning can support both the novice and experienced distance learner. These groupings often promote students to select learning projects of local interest, thus increasing the relevance and real-world applicability.

Another way to promote interaction is to restrict the use of lectures. Ten minutes of lecture over a distance delivery system appears to be the maximum time for a didactic presentation. Instead of more lecture time, we would suggest a variety of instructional options be incorporated. These options are viewing and listening (such as in lectures), writing, and speaking. Writing strategies would normally include the use of an interactive study guide, specifically posed questions or learning journals.

Speaking strategies could include discussions, presentations, and role playing.

Discussions can be held among all class members or among sub-groups established for that purpose. Sub-groups can be at a particular site, or from members assigned from specific sites. Regardless, sub-group discussions should be followed by a return to the class as a whole for summarization and further discussion. Discussion strategies require sufficient time to satisfactorily complete the discussion, which means a limitation to one or two specific issues. Individual and/or group presentations and projects are quite feasible in distance delivery situations. However, the course design should have a portion of class time built in for students to practice their delivery skills where feasible. As with discussions, role playing can occur within a site or across sites. Case studies, scenarios, and videotapes are effective starters for a role play. Again, planning and time controls are essential for successful role plays, and often instructors need to be proactive in getting role plays started. For example the instructor might need to ask someone from a specific site to take part, "I'd like someone from Casper to be a risk taker today and to take part in creating a scenario with me. We'll role play a situation to start a class unit on conflict mediation" (Rezabek, Cochenour, Bruce and Shade, 1994).

Group projects and presentations promote collaboration and can build a learning community. We have experienced students developing a group identity simply by having common experience in successfully overcoming the limitations of distance technologies. To encourage this process students should have opportunities to work directly with the delivery technology and to help one another with the mastering of each of the methods used in a course to connect students and instructor. Connecting and collaborating with peers in the distance education environment encourages student persistence, celebrates new learning,

and provides constructive feedback (Burge, 1994). Also, several students noted an increase in self confidence resulting from communication with people at different locations who acknowledged their ideas.

An important practice to follow is to design assignments that are practical and have application to the students' experiences. These activities should be designed for "think it through" level that have a reasonable time frame for completion. Also, it is important to provide time for students to share their work with each other for interaction. The assignments should be designed for reflectivity to allow a vehicle to express honest thoughts or concerns about the topics, issues, or any aspect of the course delivery.

Facilitate with spontaneity, balance, and humor. One student commented, "I really had to plan my responses and be ready for a pause in the discussion, so I could break in with my answer." This comment demonstrates the potential difficulty in facilitating spontaneous interaction at a distance, and hot topic discussions can become competitive. An instructor needs to periodically break into the conversation, if necessary, to widen the group by restating questions and responses or offering feedback before directing the discussion to another site or person.

It is very important to balance participation among the remote sites. Instructors should not show favoritism to any particular site or person, nor should any site or person be allowed to monopolize discussion. Without sufficient thought and preparation, it can be difficult to balance the participation among all sites. Another aspect of balance and participation is the tendency for students to conduct side discussions. As one student remarked, "Our group had to be made to talk with the entire class. Most of the time we tended to talk among ourselves at our site." Many learners need to participate and respond in order to feel a class session is a fruitful one. Side discussions can be acknowledged by incorporating local discussion time, and by insuring that each site has an opportunity to share during large group sessions.

The appropriate use of humor and self-revelation can be employed to create trust among participants and to humanize the distance environment. The use of appropriate humor can assist in establishing a warm, receptive learning environment. It can also enhance the climate for creativity, risk taking, and brainstorming; and can reduce anxiety at each site (Rezabek, Cochenour, Bruce, Shade, 1994).

Use questioning techniques that force learners to be actively engaged. Call on students by name and rotate questions among sites and students so everyone can expect a reasonable chance to contribute. Another technique is to use a random number approach to call on participants for response. Ask students to introduce themselves by name when they respond. Don't be afraid to wait after asking a question; give students a chance to think about the

question and position themselves to use the telecommunications technology. Check occasionally to see if everyone can hear or see. Students are notorious for not identifying technical problems until after class is over, so encourage them to speak up rather than accepting poor quality transmissions

Computer Technology Strategies for Delivery

A wide range of computer technologies can enhance the distance delivery of an inservice course or aid in communication with a practicum student. An effective way to communicate with a group or an individual is through use of email. The technology is fairly user-friendly now and most people have access to a computer and modem hardware. A group mailing list or listserve is fairly easy to establish. Email provides an effective way to interact among participants and the instructor. Reflective journals, responses to discussion questions, submission of assignments, and issues of concern can be communicated effectively. Email software is now available which makes the management of group mailing lists, and archival of documents simple to handle.

The Internet has probably caused the most excitement related to distance technology in recent years. Several strategies may be used to facilitate distance delivery of information. Web sites can provide a convenient way to distribute essential course information, class schedules, assignments, reading lists, and supplementary materials. Simultaneous web conferencing provides a powerful strategy for conducting discussion groups and reporting of professional experiences that can be interactive for all participants. Also, several multi-media applications make it possible to create visual presentations that can be posted to a web site. Participants in an inservice course can download and view the material as often as they wish. When used in conjunction with either email or a web conference, the communication can become interactive as well.

Another strategy that works well is to encourage the use of the Internet as a tool for information searching. However, the random way in which information may be posted on the Internet frequently causes problems with locating quality information desired for a topic. By designing assignments that provide guidelines and hints for conducting keyword searches, the chances for successful information retrieval is enhanced.

Student and Administrative Support

One of the most important set of guidelines learned for distance delivered activities relates to student support. Without extra effort in this arena, frustration levels peaked so quickly that negative impact on learning quickly became dominant. Technical assistance, cheerful "customer service", and non-threatening problem solving services are essential. Technical assistance before, during,

and after sessions is a must for success. Conventional communications systems need to be available as a backup for support to aid the participant in solving problems. For example, access to friendly assistance through a toll-free telephone number, and ability to talk to a "real person", is probably the most effective way to reduce frustration levels. The administration and support service personnel must realize that a facilitative and forgiving atmosphere must be maintained at all times. It is essential that the participant is led to feel that the institution cares about the individual being successful in the distance delivery of the program.

A shared responsibility for technical assistance should be accepted by the administration and the instructor. The administration includes clerical personnel, technicians, and administrators of the program. Anyone who may have contact with the student must assist with a facilitative and forgiving atmosphere and project the "customer service" orientation at all times. Assumptions about the expectations of students' technical expertise and responsibilities should be minimized. Quick feedback with problem solutions is essential. An atmosphere of willingness to coach participants through problems and repeat as many times as necessary must be adopted by all administrative, clerical, and technical support personnel. It is important to make follow-up contacts to determine any particular problems hat may have occurred rather than wait to hear from a frustrated customer.

In spite of all the best planning and technical support, problems will arise that cause frustration. The instructor must be prepared for these events and maintain a sense of humor and exhibit empathy for the participants. Alternative communication backup systems must be in place when these problems arise. Contingency plans must be communicated in advance to prevent high levels of frustration and fear from occurring. Clerical staff as well as instructors must be willing to fall back on conventional methods such as telephone and mail to communicate essential course information and technical assistance. At times, detailed step-by-step procedures are needed to insure success.

Additional effort is required to prepare for a distance-delivered activity. Clerical support is needed to send mailings and make personal telephone calls to insure that everyone is prepared and properly coached to join the activity. Adequate lead-time is needed to mail course packets and technical instructions to participants. Sometimes, practice sessions with the particular technology are needed to insure success for everyone. If possible, local technical support should be arranged to facilitate delivery.

Instructors should be accessible to students. There are a number of ways to accomplish this, but one method that has been successful for us is electronic office hours. These office hours are accomplished through a variety of approaches. First, the use of email and published email addresses allows students to access instructors 24 hours a day. This should be qualified by clear standards regarding the instructor's schedule, workload, and turnaround time for reading and replying to email. Don't raise student expectations above the reality of an instructor's ability to respond. Second, post office hours during which an instructor will be available by telephone to distance students only. Distance students deserve a period of time each week when communication between student and instructor can occur. Third, have a fax number that students can use to send materials to an instructor. Other communication aids such as 1-800 numbers, answering machines, voice mail, willing secretaries, and a policy of promptly responding to student needs can assist in accessibility and student satisfaction.

Class size and electronic delivery sites should be of a reasonable number. Our opinion is that student to instructor ratio should be no higher than 25 to 1. This derives from constraints created by student email and the need to facilitate a class in a pro-active manner. We have also found the optimum number of sites in an audio or video teleconference to hover around seven. We have experienced as few as one and as many as fourteen, but instructor's ability to effectively manage an interactive and collaborative class becomes severely taxed as these numbers grow. Also, issues of system operations, remote sites and facilities, and other infrastructure items can limit numbers.

Evaluation

This is a critical element in the effective delivery of distance education. No course in which we have been involved has ever approached perfection. In order to learn from a specific experience, feedback from those involved is critical. We recommend two formative evaluations, a formal one conducted at the mid-point of a course and a number of informal evaluations done at the conclusion of each class. If a few minutes at the end of each session are given up for informal formative evaluations, immediate feedback can assist in making changes in approach or content before following sessions. We also conduct the usual end-of-course summative evaluations, but it is important to seek feedback to specific concerns and questions. Students are also encouraged to respond to difficulties and problems by providing immediate feedback to the instructor or to the responsible administrative unit.

Formative evaluation during course delivery and after-course summative evaluations have played a part in the development of the guidelines suggested here. When asked whether they preferred face-to-face instruction or distance delivery, our students have been roughly divided into thirds. One-third preferred the face-to-face, one third preferred the distance delivery option, and one-third indicated that using both methods would be their preference. This result is perhaps tempered by the recognition that face-to-face instruction is not a true option for many of

the students, however our students have indicated a high comfort level with the distance technologies. Most of them have been overwhelmingly positive about their experiences in distance education (one of our graduate students is working on her Ph.D. at a distance and has received both her B. A. and M. A. at a distance). As one student commented, "Öthe good points pretty much compensate the bad."

Conclusions

We shouldn't assume that computer literate students do not need training and support to effectively use distance learning technologies. Developing an attitude of openness to new education technologies is an important step for everyone. Distance delivery problems require the presence of backup systems and an instructor with a proper frame of reference, i.e., a sense of humor, and skills in managing stress.

A majority of our students, indicate that they believe distance technology is an important, if not essential, educational tool and resource. Many have spontaneously generated ideas for further use of the distance delivery during their education. These suggestions include talking with teachers and students in other states and nations; mentoring student teachers in the field; conducting job interviews and/or admissions interviews; and other conferences.

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