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**INSTRUCTORS' BEGINNING EXPERIENCES IN
TEACHING BY VIDEOCONFERENCING**

By

BARBARA LYNN JACOBSON



A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Administration and Leadership.

DEPARTMENT OF EDUCATIONAL POLICY STUDIES

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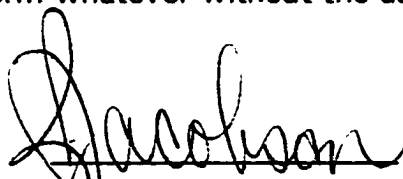
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ABSTRACT

The purpose of this study was to explore, through an interpretive research design of interviews and observations, the training provided to post-secondary beginning videoconferencing instructors and the instructional planning and teaching strategies used by those instructors. Five research areas guided the study a) types of preparation needed by first-time instructors, b) instructional planning and teaching strategies instructors used in the videoconferencing classroom compared to their traditional classroom, c) instructors' perceptions of their teaching in a videoconferencing environment compared to their traditional classroom, d) physical and human resource configurations need at the specific locations, and e) issues and problems identified by the instructors.

A central concern for most of the instructors in this study was the need for instructional design and technical support for preparing effective and interactive learning materials. Key to this was adequate release time and opportunity to practice teaching prior to the first class. The importance of personal pedagogical orientation and preferred instructional strategies was also clear. All five found their inability to read all the students' expressions while lecturing to them a major drawback to teaching effectiveness. Their uncertainty about how to transfer preferred strategies into the videoconferencing classroom meant that fewer strategies were used.

This study presented a good example of two bad examples of implementing distance education technology. To avoid duplicating these,

post-secondary institutions' administration must obtain faculty 'buy-in', provide training programs that focus on how to use the technology and develop student-centred curriculum, and at the same time incorporate flexibility to accommodate the individual orientations of the faculty. This, combined with the opportunity to practice with peers prior to actually teaching students, is guaranteed to result in a successful teaching and learning experience for faculty and students. If administration is unwilling to follow these recommendations, they should not even think of entering the field of distance education.

Additional research in design and implementation of instructional strategies, collaborative teaching, impact of remote site numbers and configuration, increasing student interaction, and need for administrative and student support systems will further enhance the recommendation in this study.

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CHAPTER 1

INTRODUCTION TO THE STUDY

The 1990s have placed Canada's post-secondary institutions in a state of turmoil and uncertainty. Government cutbacks, competition from other post-secondary institutions within and outside Canada, rising public expectations for access and flexibility in program offerings, increased demands for public accountability, and rapid technological changes are all forcing universities to reassess what they have been and will be doing in the future. "Some are aiming at nothing less than wholesale reconstruction, changing the way they teach, changing what they teach, and challenging the very basic assumptions of what a university education is" (Bercuson, Bothwell, & Granatstein, 1997, p. 69).

In an attempt to resolve some of these issues, post-secondary institutions are now taking a serious look at the world of distance education to determine how telecommunication technologies can be used to expand their programs and territorial boundaries and hence increase their student population and potential revenues (Gilbert, 1995). Olcott and Wright (1995) concurred that the "advances in technology afford institutions unique opportunities to deliver education and training programs to geographically diverse adult audiences" (p. 1). Walsh and Reese (1995) also addressed how significant distance education courses and programs could be to an institution, noting that:

Distance learning can actually provide a university with a strategic advantage in penetrating potential new market segments, such as corporate education, continuing adult education and job training. This has important implications for institutions seeking to make up for loss of revenues due to declining student population and ever-increasing competition. (p. 59)

The concept of distance education is by no means new. In fact, as Mood (1995) indicated, most writers in the field view the beginning of distance education as being in the mid-1800s. The introduction of correspondence programs allowed individuals to study wherever they were located, thus creating a physical separation between student and instructor and involving mediated interaction between the student and instructor through written correspondence. This interaction was further increased with the introduction of telephone tutors. Although theorists such as Garrison (1990), Holmberg (1977), Keegan (1986), and Moore (1988) have their own definitions of distance education, there is a general consensus that distance education provides formal educational opportunities to people where they are located rather than where the offering institution is located. Moore (1988) saw the goal of distance education as providing

educational access for students who would not have the opportunity to undertake education through residential programs. These 'distant' learners include those whose job demands, family responsibilities, and other time constraints make traditional education access unavailable. (p. 7)

Over the past 25 years, the media used in education have changed in many ways making the goal of distance education more achievable. With the emergence and adoption of telecommunications technologies, it is possible for individuals to take courses at their convenience and, unlike correspondence programs, to maintain a regular communications link with the instructor and fellow students using the Internet. While computer communications facilitates interaction among individual learners, video- and audio- conferencing link groups of students with each other and the instructor.

Of all the technologies presently available to provide synchronous instruction to groups, videoconferencing is now the fastest-growing delivery format for distance education (Ostendorf, 1996). One of the factors that

has led to this growth is the belief that the traditional face-to-face classroom setting is the model to follow, and videoconferencing comes closest to duplicating that setting. Its ability to link sites together through video so that all participants can see and talk to each other resembles a set of classrooms linked by two-way television. While other technologies are better suited to individualized learning and one-to-one assistance, videoconferencing can accommodate a variety of instructional strategies including collaborative and co-operative group learning. It is suited for courses in which discussion, demonstration, small group applications, or modeling is an important instructional component. The instructor can present the lesson content and then have students at all sites break into groups to discuss the content and report back.

Initially the most common format of videoconferencing was "to use one-way television transmission via satellite to a wide variety of sites, with 'live' audio-telephone communication back from the sites" (Bates, 1995). In this situation, the instructor, who would be at the originating location and may or may not have students at that site, can be seen and heard by the students at the remote locations. The students communicate with the instructor during specified times in the class by dialing a pre-arranged phone number. The conversation between the student and instructor is then amplified through speakers so that all sites can hear the discussion. The instructor, however, is not able to see the students and this is an issue for many educators. This concern can be overcome to an extent by what Garrison (1990) described as "true videoconferencing [which provides] for a two-way exchange of both live television images and audio signal between two or more sites and three or more individuals" (p. 74). This format allows the instructor to see the students.

However, no matter which technology or combination of technologies is used, the educational opportunities now available to the distant learner are many. In fact, as Dirr (1990) noted, "There is little doubt that the

technologies hold the power to help distance education overcome some of the barriers to traditional education” (p. 403). But he then expressed a concern, “The question is whether enough higher [education] educators will have the vision to understand the potential of the technologies, and the wherewithal to marshal the power” (p. 403).

Increasingly, individual institutions and universities are acquiring the necessary hardware to reach dispersed students and make more efficient and effective use of the institutions’ financial and faculty resources (Walsh and Reese, 1995).

The accelerated development of distance education programs across American higher education will require a renewed commitment to its most important resources . . . faculty. . . . However, responsibility for instructional quality and control, the improvement of learning, and the aggregate effectiveness of distance education still rest with the faculty (Olcott and Wright, 1995, p. 1).

Even with the recognized importance of the faculty member in distance education, the research on this group is rather limited (Beaudoin, 1990). Dillon and Walsh (1992) in a review of five distance education journals and the Educational Resources Information Centre (ERIC) located just 24 research studies on faculty and on issues concerning faculty participation in distance education. Of those studies, nine focused on faculty training programs, which addressed the skills required for distance teaching, teaching styles of distance teachers, and the training needs of faculty. None of the studies they reviewed addressed learning about how to teach at a distance from the faculty member’s perspective. This need for continuing professional development for faculty who teach at a distance with technology was also emphasized by Green and Gilbert (1995):

So what happens then when institutional pressure increases to support distance education and other *pedagogical* and *content* changes? The need for additional faculty support services to facilitate

these major transitions not only increases and becomes still more varied, but it often is recognized too late. Pedagogical change enabled by technology requires development services that help faculty understand, adapt, and adopt new teaching approaches. (p. 15)

More recently, Cyrs (1997a) reinforced this need for training.

Many academic administrators act as though distance learning was their field of dreams. Build the teleclassrooms, purchase the latest technology, and the students will come. Often forgotten is the training that the instructors needed for quality distance learning programs. . . . Students do not learn from the technology. They learn from the competent instructors who have been trained how to communicate through the technology. (p. 1)

Other studies have explored faculty attitudes and perceptions about the introduction of technology in the classroom (Inch, 1987; Sheffield, 1992; Snyder, 1995); use of distance teaching (Bankirer, 1988; Meacham, 1982); the diffusion of technology for teaching at a distance (Bolduc, 1994); the attitudes of higher education faculty toward distance education (Clark, 1993; Heath, 1996; Larison, 1995); and the use of distance education training for faculty development (Weitman, 1993). In many cases, faculty members were reluctant to use technology in their face-to-face classrooms (Rutherford & Grana, 1995) as well as to use it to teach at a distance. Willis (1992) commented on faculty development:

If . . . faculty development is important in traditional classroom settings, it is truly imperative in non-traditional settings in which distance delivery methods are employed. The need for faculty development in distance education has received national acceptance among teachers and administrators, although relatively little has been written about it. (p. 34)

Gilbert (1995) suggested that some institutions "are leaping at distance education as a near-term solution for financial and other problems –

without taking the necessary time to understand the 'solution's' requirements and to prepare faculty for effective participation" (p. 59).

What results is:

An investment in technology without a parallel investment of time and money in support for educators, learners, and the technology will quickly yield a disillusioned team of educators, disappointed learners, and a large monument to the waste of institutional dollars. (Gibson, 1992, p. 19)

Gehlauf, Shatz, and Frye (1991) made the point that instructors must put time and effort into "developing the prerequisite skills and abilities to effectively present material in a videoconferencing setting" (p. 20) – that providing the technical systems and turning instructors loose is not effective. In summarizing several studies (Burke, 1994; Evans Associates, 1993; Kromholz and Johnstone, 1988; and Shaeffer, Kipper, Farr and Muscarella, 1990) that looked at the competencies needed for teaching using videoconferencing, Cyrs (1997b) identified the competencies cited by all studies as: course planning and organization, verbal and nonverbal presentation skills, collaborative teamwork, questioning strategies, subject matter expertise, and involving students at the remote sites. These same studies recommended more training for faculty to assist them in developing these skills. According to Cyrs (1997b),

Anyone who says that teaching at a distance is the same as traditional teaching is dead wrong. Instructors need more planning time, more instructional support, and additional training to modify courses. (p. 18)

As an experienced trainer of distance educators and a distance educator myself, I sought a research topic in distance education which had the educator as its focus. The decision to look at videoconferencing and instructors' experiences with using this medium evolved from reading articles and books on distance education and talking to individuals who were working in this area. Videoconferencing, as a medium for distance

education, was just entering Alberta educational institutions when I began researching the topic in 1995, and therefore, there was not a great deal of local research. Most of the published research on videoconferencing was from the United States, Britain, and Australia and focused on the technology, leaving out the human factor, especially the instructor's viewpoint. I saw this as an important omission.

Purpose of the Study

The main purpose of this study was to explore the instructional planning and teaching strategies used by instructors who taught adult learners in a videoconferencing-based distance education setting. The following questions guided the study:

1. What types of preparation did first-time instructors require in order to teach comfortably using videoconferencing technology?
2. What instructional planning and teaching strategies did these instructors use in the videoconferencing classroom and how did these compare with their traditional classroom strategies?
3. How did the instructors' perceptions of their teaching in a videoconferencing environment compare to that of their traditional classroom?
4. What configurations – physical and human resources – at the specific locations were most helpful?
5. What issues and problems did the instructors identify?

It was expected that findings of the study would provide insights concerning distance education course development, preparation programs for instructors on use of the technology, and various teaching strategies that effectively meet the educational needs of the adult university student.

Significance of the Study for Research and Practice

Researchers such as Doerfert, Miller, and Miller, (1995); Keir and Ward, (1988); Kromholz and Johnstone, (1988); Lyons and Washburn, (1995); McRoberts, Sonkowsky, and Strand, (1995); and Shaeffer, Kipper,

Farr, and Muscarella, (1990) have identified attributes of voluntary or required faculty training programs and have reported the provider's view of success or effectiveness in developing and/or increasing teaching skills for distance teaching. However, no systematic research has been identified that explores from a faculty member's perspective, how he or she goes about learning to teach at a distance using technology and why he or she selects the instructional strategies used in the distance education course.

This study is significant because it addresses the practical training and instructional delivery issues first-time videoconferencing instructors perceived prior to and during the teaching of their course. Since the study took place during the time the courses were offered, it permitted data to be collected as the instructors experienced and developed their understanding of distance education and what it meant to teach via videoconferencing. For all but one of the instructors, this was a totally new environment and required some changes to their traditional methods of teaching. However, changes can create positive or negative experiences depending on how they affect an individual's life experiences; aims, purposes, and values; work context and working conditions; and the culture of the work environment. The timing of this study also enabled the researcher to observe, compare, and discuss the responses of instructors in two separate projects at the time they were forming their opinions and attitudes about using videoconferencing as a mode for teaching their courses.

The applicability of various technologies for distance teaching has not always been eagerly accepted and many studies have been conducted to determine their effectiveness. The majority of these studies have focused on the technology and how to use it, problems encountered, comparisons of various types, technological effects on student performance, and cost factors; others looked at the administrative concerns. Rarely investigated were factors such as: the unique attributes of the technology and how they affected teaching strategies (Denton and Clark, 1985); the type of learning

outcome desired and how an instructor, through the utilization of different teaching methods, could assist the student in meeting this outcome. As Chu and Schramm (1975) concluded, the question that needs to be asked is not whether to use the technology, but rather how best to use it. Dillon, Hengst, and Zoller (1991) agreed that "[f]uture research in the design of instruction for distance education need no longer continue to focus upon the media, but should rather attend to the method" (p. 40). Discussions about problems with the technology were part of all the instructors' stories in this study. However, the main focus was on how the instructors could use the technology to enhance the students' learning experience and to encourage interaction with the instructor and amongst the students at the various sites.

The study findings may create a greater awareness that the roles of the distance education instructor and student should differ from those within the traditional classroom. Moore and Kearsley (1996) believe that students "must also assume more responsibility for managing their own learning in terms of when they will study, how much they want to learn, and [how to] seek out information and resources" (p. 16). This, combined with the fact that many instructors are unaware of the capabilities of the telecommunications-based distance education media and the possible need to adjust their teaching styles and course materials, has created, as Moore and Kearsley (1996) pointed out, a situation where "[s]ome instructors may be very reluctant to give up their direct teaching role or teach via media" (p.16).

Dillon, Hengst, and Zoller (1991) in discussing the issue of instructor preparation, commented: "Research needs to provide distance educators with increasingly systematic guidelines for selecting instructional strategies; guidelines that are linked to the types of learning required by the demands of the new learning society" (p. 40). The findings of this study may assist individuals and institutions wishing to efficiently and effectively support faculty development to improve or expand distance education programs.

They may also provide guidance for faculty members who will be teaching a videoconferencing course for the first time or who just want ideas on what else can be done.

Terminology

For the purpose of this research, the following definitions of distance education and compressed videoconferencing will be used:

Distance education is the provision of formal educational opportunities to students who are not physically present with the instructor during instruction and where communication is conducted through various media.

Compressed videoconferencing is a method of communication that can transmit video and audio signals over special phone lines (Integrated Services Digital Networks – ISDN), switched- 56 kilobit lines, or T-1's (large "pipes" consisting of twenty-four 64 kilobit channels). Sites may support speeds using one-line (112 or 128 Kbps), two-lines (224 or 256 Kbps) and three-lines (336 or 384 Kbps). The lower rates typically involve some compromise in picture quality, particularly when there is rapid motion on the screen. Two way video and audio can take place making the system totally interactive (Divine, 1999).

Delimitations

This study was delimited to courses taught using one telecommunications-based medium, i.e., videoconferencing; instructors who were presently involved in teaching courses using this medium for first time; and courses offered by one post-secondary institution.

Limitations

The study was limited by the willingness of the instructors to discuss the issues at length, and the ability of the researcher to establish trust with interviewees and to help them identify the important aspects to be discussed.

Assumptions

The purpose of this study was undertaken on the basis of the following assumptions:

1. The methodological procedures were appropriate to meet the purposes of the study.
2. The use of telecommunications-based media was a viable means for teaching to remote sites.
3. Instructors were willing to share their views and knowledge regarding planning, given assurance of confidentiality and anonymity.
4. The planning of course content and teaching strategies for the distance environment was as important, if not more important, than it was in the traditional face-to-face environment.

Overview of Study

A description of compressed videoconferencing, including the use of digital communication lines, technology configurations, and classroom arrangements, is provided in Chapter 2. It also contains a review of studies on instructors' perspectives of teaching with compressed videoconferencing. The qualitative methodology used for this study is described in Chapter 3. Chapter 4 contains the five instructors' stories, and Chapter 5 provides a summary and discussion of the findings, recommendations, and implications for further research.

CHAPTER 2

VIDEOCONFERENCING FOR INSTRUCTION

This review of the literature provides a background to understanding and interpreting the data collected for this study. It is organized into three sections: first, a description of videoconferencing with a specific focus on compressed videoconferencing and related research on its use as a teaching medium, then a discussion of the issues addressed in studies that focused on faculty and their experiences with videoconferencing, and finally, findings related to the training provided videoconferencing instructors.

Videoconferencing

In 1964, AT&T introduced the PicturePhone at the New York World's Fair. . . . The vision was to provide a dial-up telephone solution with the ability to "video" conference with family, friends, and business associates down the street or across the country (Galbreath, 1995, p. 31).

Although the PicturePhone did not materialize in the 60s partly because it required a rewiring of the telephone system, the advances in technology and telecommunications that took place in the last two decades has brought about a renewed interest in videoconferencing for implementation within business, industry, and education, specifically, distance education.

Hakes, Cochenour, Rezabek, and Sachs (1995) believe that the "technology explosion of the 80s has promoted 'distance education' to be at the forefront of educational innovativeness throughout the 90s and beyond" (p. 26). Moore (1988) commented that,

the end of the 80s sees us on a threshold of a new phase of evolution for the application of communications media and education. These include the already long and established but still underutilized medium of audio conferencing, a relatively new medium of computer

conferencing, and most importantly the application of videoconferencing (p. 7).

Barker, Frisbie, and Patrick (1989) described two categories of videoconferencing – full-motion video and compressed video. Both these categories may use a two-way voice, two-way video link or a two-way voice, one-way video link. For instructors, the major difference between the two categories is the quality of the reception. Full-motion videoconferencing produces a quality equal to that of television because the signal is transmitted over private, dedicated telephone fiberoptic, microwave, or other high speed networks which only connect between the members of the group. However, full-motion videoconferencing is costly and educational organizations have turned to compressed videoconferencing as an alternative. Compressed videoconferencing systems are less expensive because public phone system networks are used to transmit the signal. As Reed and Woodruff (1995) commented, recent innovations in network telecommunications such as Integrated Services Digital Network (ISDN) have reduced compressed videoconferencing equipment and transmission costs, making it feasible for use in small colleges, businesses, classrooms, libraries, and even homes.

Compressed Videoconferencing

Roberts (1998) described compressed videoconferencing as “a method of communication that can transmit images and sound directly between classrooms or seminar locations. . . . [It] is interactive, and permits two (point-to-point) or several (multipoint) locations to communicate in real-time” (p. 9). To make this interaction possible, each location requires access to digital communication lines and at least a basic videoconferencing system. For multipoint sessions, the sites must link into a telecommunication device known as a bridge before all participants can communicate.

Digital Communication Lines

The number of phone lines used determines the quality of the video reception. The lowest speed (112 or 128 Kbps) is the least expensive because it uses only two phone lines, but results in a video reception that displays people's movements as jerky and presents a three to five second audio lag (Hakes, Cochenour, Rezabek, and Sachs, 1995). By using six phone lines (336 – 384 Kbps), the video reception is improved, but the cost also goes up. While the compression process can affect the quality of the resulting picture and sound, and can result in problems such as video "ghosting" or "image softness", audio delays, and/or audio "clipping" or echo (Reed and Woodruff, 1995), electronic enhancements to the basic telecommunications technology are improving the picture and sound reception without significant increase in cost. However, Irene Kirek, Manager, Centre for Distance Learning and Innovative Technologies at the University of Calgary commented that by experimenting with different numbers of digital telephone lines they

now believe that four lines is the most cost-effective solution for our needs. We felt that the two lines we used in 1992 did not give us the resolution we needed, and so we opted to pay the extra long-distance costs involved in using six lines. When a technical problem unexpectedly forced us to go from six to four lines, we did not notice any significant difference in the quality! We now use four lines and save one-third of our long-distance costs! (Roberts, 1998, p. 52)

In contrast, Paul Rixon, Network Manager for South Australia's Technical and Further Education (TAFE) network indicated that "We generally operate in the two-line mode and find the resolution adequate for both the point-to-point and multipoint courses which we offer" (Roberts, 1998, p. 53).

Compressed Videoconference System Configurations

Roberts (1998) described the basic videoconference system needed for each site as one camera, one television monitor, one microphone, a control tablet or system console, and an encoder/decoder (codec), which is a highly sophisticated modem. The codec "converts the television signal into digital form at the transmitting end (it encodes the signal) and then reconverts the digital signal to a television picture at the receiving end (it decodes the signal)" (p. 10). If there are students at the sending site, Sachs (1995) recommended the use of two cameras: one focused on the instructor and the other on the students. The basic system, however, does not provide all the instructional resources that instructors have come to expect in the traditional classroom. Media, such as those outlined in Table 1, can be added to the basic system to overcome this limitation.

Table 1

Additional Media Used to Enhance the Basic Videoconferencing System

Media	Use
Document Cameras (similar to overhead projectors)	Permits previously prepared or spontaneous visual aids to be transmitted between sites. Most document cameras are mounted above a light table to permit the use of transparencies and slides or to transmit pictures from books or information on paper.
Microcomputer	Transmits data and graphics that have been pre-stored or created during the class
VCRs	Allows for videotapes to be shown during the class, or for the broadcast to be taped and viewed at a later time.
Fax Machines	Provides for the exchange of hard copies of documents during the class
Additional Microphones	Allows each student to have a microphone or for one to be shared between several students
Additional Monitors	Displays what is transmitted to the sites and what is received at the sites.

Before teaching any classes using a compressed videoconferencing system, consideration must be given to the arrangement of the equipment and furniture at all sites. Since the visual and verbal contact is made through television monitors and speakers, it is important that everyone can

see and be seen as well as hear and be heard at all locations. Hakes, et. al. (1995), Ostendorf (1994), and Roberts (1998) have presented descriptions of room arrangements that are effective for both teaching and learning. Figure 1 illustrates an arrangement that accommodates students at the instructor's site and has two cameras, one focused on the instructor and the other on the classroom. Most systems have a built-in camera above the television monitor. It can be manipulated to give a long shot or close up of the instructor or to focus on other participants. While initially some writers encouraged instructors to focus on the student who was speaking, instructors found it difficult to manage to focus on the student and then move quickly to another student without wide swings of the camera picture. Now most systems use an automatic feature that can switch among speakers without input from the instructor.

Two television monitors, one for outgoing pictures and the other for incoming pictures, are also illustrated in Figure 1. Although it is possible to conduct a class with just one monitor, it is recommended that two be used to allow the participants to see remote sites as well as what is being transmitted from their site.

A portable microphone is shared by students and can be either push-to-talk or voice activated. An alternative is to have permanent microphones located in the ceiling or suspended above the participants' seating area. A disadvantage of both these pre-wired microphone arrangements is the limited number of students they can accommodate. Room size is also a consideration. The seating arrangement in Figure 1 is limited because of the table design. It does, however, make it possible to focus the camera so all participants can be seen at the remote sites. Figure 2 illustrates the use of a traditional classroom that has seats in rows and can accommodate large classes; however, there is a loss of visual contact unless additional cameras are installed.

Figure 1. Videoconferencing Classroom Arrangement

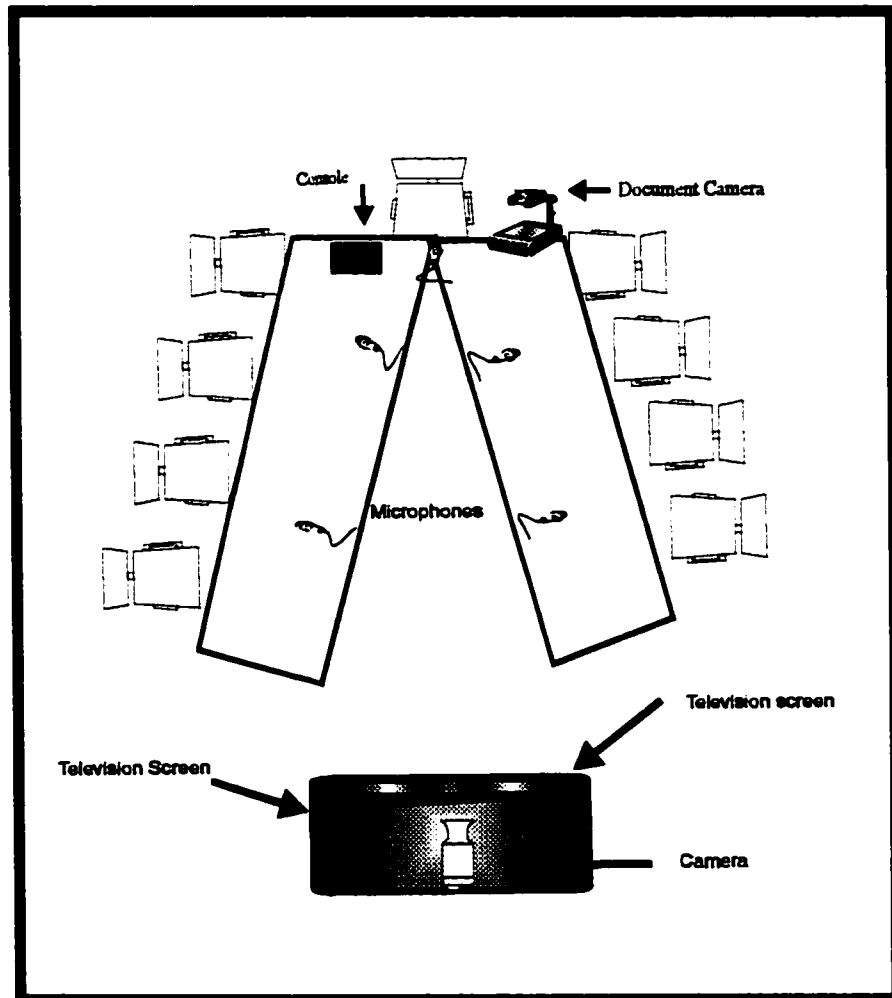
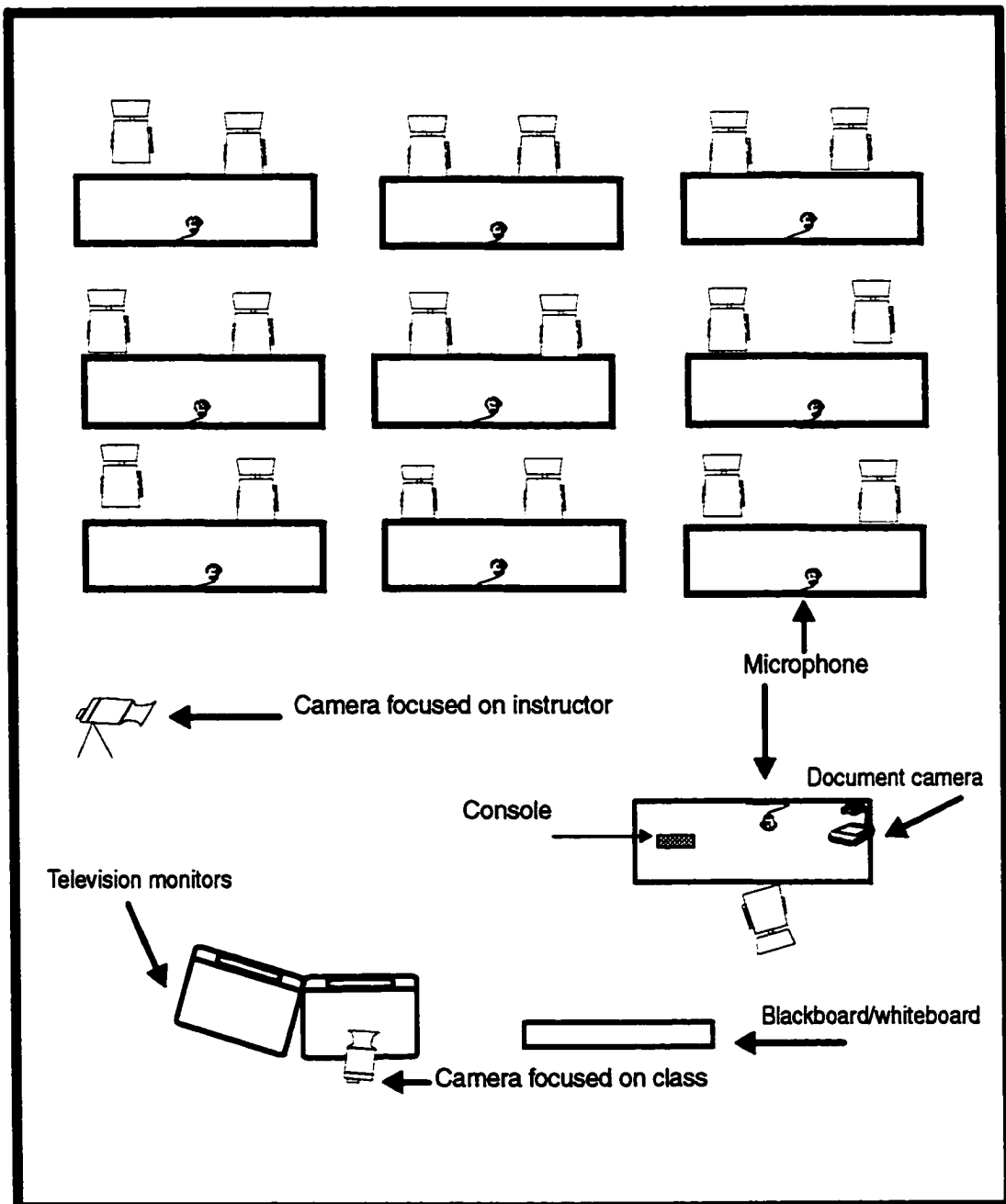


Figure 2. Videoconferencing Classroom Arrangement



The type of equipment purchased and the arrangement of the classroom both have an effect on the quality of teaching and learning that takes place. Roberts (1998), in her interviews with users of compressed videoconferencing, was told by one individual that,

The most important lesson that we learned from this pilot project was to be very clear with the supplier about what was required by way of technology and room setup. For example, the type of microphone and size of room provided were different from those requested. As a result, participants in the "remote" site indicated that it was difficult to hear one of the presenters well because the microphone did not pick up the sidebar conversations s/he was having with those in the room, and they felt uncomfortable as a very small group in the large auditorium that was provided (p. 32).

Another user commented about problems that occurred because of the voice-activated microphones.

One specific challenge to orderly interaction can occur when switching between various sites in multipoint videoconferencing. The switching is typically sound-driven – the bridge connecting the sites selects the site that has requested the floor. However, the bridge cannot distinguish between "approved noise" generated by a participant's comment and "unintended noise" generated by shuffling papers or side conversations (p. 47).

In addition, some institutions have put major funds into state-of-the-art videoconferencing systems. As a result, instructors find themselves having to go through great levels of security (i.e., opening many locked doors and cabinets) to set up and operate the system. Sometimes, institutions do not provide additional technical support so that instructors have to learn to operate the equipment and resolve issues on their own. The physical configuration and variety of the equipment, the level of technical support,

and the amount of security not only at the broadcast site but at all the participating sites are important considerations for the instructors.

As with the introduction of any new technology, problems may occur, and the approach taken to deal with them can have positive or negative results. In 1990 the University of Ulster in Northern Ireland acquired videoconferencing equipment to link three of its campuses – Jordanstown, Coleraine, and Magee College in an attempt to ensure class and course viability and meet the educational needs of individuals working in areas not immediately served by the university. Prior to this, courses were offered by an audio-conferencing system and the feedback received from instructors and students made it clear that it was not a popular format (Abbott, Dallat, Livingston, MacGabhann, and Robinson, 1993). However, “the addition of ‘live’ vision succeeded in winning positive recommendations from both students and the tutors involved” (p. 3). The attitude of instructors to unforeseen interruptions was one of flexibility mixed with tolerance and contingency. As one instructor commented “If the sound did not work, we set up the audio-conference 2000; if speech was not picked up, we used the mobile desk mike or moved the tables and chairs” (Dallat, Fraser, Livingston, Robinson, 1992, p. 18). Dallat, et. al. (1992) suggested that this high level of tolerance was “rooted in the knowledge that there was much to learn about videoconferencing; and secondly, since this was the first time the equipment had been used for teaching in the University of Ulster then problems were inevitable” (p. 18).

Although the technological opportunities available for use in the videoconferencing classroom are many, Moore and Kearsley (1996) offer four guidelines for media selection: it should enhance accomplishment of the learning objectives; it should be compatible with student characteristics; it should be appropriate for the learning environment; and it should be within the economic feasibility of the institution.

Instructors' Perspectives of Videoconferencing

Reed and Woodruff (1995) advise that, *Instructors considering use of compressed video will need to understand and work with the advantages and constraints of the medium to ensure a quality telelearning experience. In particular, instructors should plan to devote greater than normal effort toward preparation and development of instructional strategies that actively engage learners.* (pp. 1-2)

Some of the advantages and constraints of the medium were identified in a study conducted by Gehlauf, Shatz, and Frye (1991). The study focused on 25 Ohio University faculty members who had taught at least one videoconferencing course. The goal of the study was to obtain an understanding of what the instructors perceived to be: a) effective strategies for teaching a videoconferencing course, b) changes they had to make from their traditional classroom teaching, and c) the critical elements for a training program for videoconferencing instructors. A list of various instructional methods was developed, and the instructors were asked to rank how often they used each method in their videoconferencing classes. The participants

rated six different instructional methods (lecture, notes written by the instructor during lecture, groups discussion, overhead transparencies, slides, and videotapes) on a five-point bipolar scale. . . . In addition, the instructors identified and rated seven other methods of instruction (video disks, data, student presentations, maps, small groups, individual conferences, and demonstration) used in [videoconferencing] courses in the space designated as "other." (p. 22)

The top four methods ranked by the instructors were lecture, group discussion, overhead lecture notes, and overhead transparencies. When asked to identify the effectiveness of the methods they used, the four ranked most effective were lecture, videotapes, overhead transparencies,

and slides. In each of these cases, none of the instructional methods identified were from the "other" category although instructors had chosen to use them in their videoconferencing courses.

As for the changes made in their teaching, the number one change for all respondents was the reduction in class interaction. Although they ranked group discussion as their second most frequently used strategy, the instructors acknowledged a diminished use of small group discussions and simulations. Another change identified was the need to be more organized. "The participants conceded that they needed to spend more time planning and organizing for their [videoconferencing] courses than for their traditional courses. . . they felt a strong need to be well prepared for each televised class and that 'winging it' was not at all advisable" (p. 25). The inability to move around the room while teaching was another change that the majority of instructors identified.

Similar comments about teaching strategies and changes in teaching styles were obtained in a study conducted by Dallat, et. al. (1992) at the University of Ulster. They collected data through pre- and post-session questionnaire surveys of three instructors and ten students as well as class observations and student interviews. Because the instructors were not familiar with the technology, they were apprehensive about using the videoconferencing system. In the pre-session survey, they used their face-to-face classroom experiences as a benchmark and expressed concerns about

the limitations of the technology, about teaching being made over-didactic, about being distracted by the equipment away from students, and about the loss of informal contact among students at various points during the evenings that classes were held (p. 18).

At the end of the session, all the instructors indicated that the equipment was not as difficult to use as they had anticipated and felt that their teaching skills had actually been enriched because of the experience. A

major concern, however, was the lack of student involvement. One instructor commented, "Interactions were frustratingly weak because of sound uncertainties, lack of eye contact, small size of human form at the distant location [portrayed on the screen], and the fixed and temperamental microphones" (p. 18). Another emphasized the problems with the sound quality. "Ineffective interaction resulted when the microphones were not operating properly; inaudibility caused questions or contributions to be repeated and the flow of discussion was seriously impeded" (p. 18). (It should be noted that the audio system was replaced at all sites before the next session.) All the instructors felt that these things had a definite effect on their teaching style. Their use of instructional strategies such as small group work and simulations or games was limited because of restricted movement among the students. One instructor indicated that he took on a more dominant role than in his face-to-face classes "because group interaction was proving so problematic . . . and [he] felt obligated to 'keep the show going as best he could'" (p. 19). Although the instructors felt that the interaction during class was limited, they indicated that the students at each campus had developed a strong rapport with each other.

A recent study conducted by Biro (1998) at the University of Alberta Faculty of Nursing and the Departments of Nursing at three Alberta colleges – Grande Prairie Regional College in Grande Prairie, Keyano College in Fort McMurray, and Red Deer College in Red Deer – described issues that faculty and students had regarding their videoconferencing experiences. A unique characteristic of this study was the collaborative agreement between the university and the three colleges to work together to provide access to the nursing baccalaureate program.

The uniqueness of each institution's history, philosophy, faculty characteristics, values, local affiliations, and funding and enrolment realities, as well as the collaborative relationship agreed upon, and the forum for communication and teaching of courses between

geographically separated partners all contribute[d] to the collaboration experience. (p. 29)

This collaborative agreement added an element to instructor preparation that did not appear in the previously discussed studies – instructors from different institutions involved in teaching a course planned and taught together from their respective sites. Ten faculty, six of whom had previous experience teaching videoconferencing courses, took part in the study. Of the six, three were university faculty and had primary responsibility for an entire course. The other three were at the colleges and were responsible for instruction at their local sites. Most courses were offered to three sites with an average combined class size of 30 students. The college sites always had students, whereas the university site had students for about half of the offered courses.

In describing the need to be organized when teaching a videoconferencing course, one instructor commented, “You have to be even ten times more organized I find with videoconferencing. If you’re disorganized, you’ll come across *very* disorganized in videoconferencing” (p. 13). Some of the instructors, especially those who had the major responsibility for a course, felt that the combination of the collaboration and videoconferencing had definitely increased their workload. As one instructor indicated, she spent more time preparing the videoconferencing course than she had done for any other course she taught.

And not in the reading – because I was familiar with a lot of the reading. So it wasn’t my preparation for class. It was probably three days a week I would spend on teaching the class, getting the resources, getting them faxed up to the sites, making sure that everybody had the same information, collaborating (with the other instructors) so that we had a teleconference (to discuss) what we were going to do ... and all that. A lot more time. (p. 14)

However, one of the college on-site instructors described her experience as one of re-distributing her time. "Instead of maybe preparing a lecture note, or class activities, or whatever that would have to be done, the time was spent collaborating with the other instructors or faxing" (p. 14).

The instructors found that there was a need to adapt their teaching strategies to accommodate the technology and distance environment. In their traditional classes, the majority of the instructors valued highly relational, interactive learning. As one instructor commented,

We have a very strong philosophy about one-on-one or person-to-person interaction. That's very integral to learning. . . . It is the human contact that's critical to everything we do . . . most of nursing really is interaction with people; communication. How do you learn that by yourself? I don't think you do. (p. 16)

Although videoconferencing allows for interaction to occur, the instructors in this study did not feel that they obtained successful results even when they employed a variety of strategies. One of the features of their videoconferencing system was voice-activated microphones and, to prevent audio interruptions, the non-teaching sites used the mute function when not providing input. This feature, combined with the frustration level instructors and students had with the audio and video time delay, unclear images on the television monitors, and the ability to see only one site at a time, contributed to the lack of interaction between sites. Since there was a qualified instructor at each site, the students tended to interact with their on-site instructor and fellow students rather than share the discussions with all sites. Many of the instructors viewed this lack of interaction between sites as a hindrance to the students' learning. Bruce and Shade's (1995) findings, which are based on their personal experiences as videoconferencing instructors and comments from students on how to make instruction more effective, agreed with this view. They described situations where the

camera switched to a site where some of the students were obviously involved in their own discussion.

During one class, an instructor was presenting information and suddenly the camera switched to a site where the learners were talking and laughing among themselves. This was extremely distracting and disappointing to the instructor. . . . Depending upon the system, participants at various sites observed others yawning, talking, day-dreaming, eating, and clock watching. Sometimes, the camera was focused on a small group of learners who performed, while others took a passive role. (p. 20)

These activities resulted in “frustration for instructors and disappointment among other participants. Same site learners became aggravated with each other for talking during presentations” (p. 20).

The need to develop appropriate teaching strategies that would increase the interaction between sites was seen to be of prime importance by the instructors in both Biro’s (1998) and Bruce and Shade’s (1995) studies. As one instructor commented, “I think [videoconferencing] has great potential – but we have to work at the strategies. The method of delivering [to] and entertaining . . . the student” (Biro, p. 16). Bruce and Shade (1995) described how some instructors attempted to overcome these problems,

Instructors became more adept in engaging learners and balanced [sic] involvement of learners. Proactive instructors gave concise directives, spoke clearly, paced sessions, monitored the length of learners’ responses, clarified, and synthesized learners’ responses. Proper time management created a professional, respectful atmosphere among learners. (p. 20)

Another Alberta study, conducted by Haughey (1993), completed an evaluation of a videoconferencing pilot program that offered eight University of Alberta courses between sites at the Alberta Transportation and Utilities

offices in Edmonton and Red Deer. There were students at both sites for three of the courses; the other five had students at the Red Deer site only. The data were collected through questionnaires, focus group discussions, individual interviews, and observation. Unlike the courses in the previously mentioned studies, the ones selected for this pilot had already been offered by audioconferencing and therefore, were in a distance format. This meant that the course development time was reduced to some degree. As one instructor commented,

I prepared graphics in advance, which is something I normally do with a distance education course. I prepared a set of case studies for students. These are normally not required prior to the beginning of the course but are usually done a week ahead. I also did general overall preparation in terms of the structure of the course. I gave more thought to planning group activities given the different nature of the medium (p. 14).

This extra planning of group activities resulted, in general, in courses designed to be highly interactive. Small and large group discussions, focusing on case studies or handouts, took place in many of the classes with students leading the sessions. Students were also required to make presentations that required the use of audio-visual materials. In describing the student involvement, one instructor stated,

All are trying things and love it. There is more planning re the sharing of materials and trying different strategies. Some made big charts. Some use overheads but not as much (they often use it for objectives) since it takes time to focus and send the image. One tried small groups. We did a play - a chat with Florence Nightingale. One group came with posters and put them on the flip chart. We need to remember to write large. I'm loving new ways of looking at things. It's really exciting. (p. 15)

This comment is a definite contrast to those of the previously mentioned instructors. These results could be related to the way the instructors taught in their traditional classrooms. Haughey commented that "The usual pedagogical style of the instructor is important in determining whether the characteristics of the medium are fully exploited. All these instructors use a highly dialectic style" (p. 15). The student feedback about the instructional strategies used was also positive. In fact, they tended to list the use of open discussion as an optimal instructional strategy. "[S]tudents appreciated the use of group work which enlarged their opportunities for discussion" (p. 16).

These comments were positive, but there were also concerns. The instructors found it difficult to balance the discussion and involvement when there were students at both sites. To overcome this, the instructors "deliberately fostered presentations and discussions by assigning members from both sites to one group. However, the instructors themselves found that with the unequal numbers it was difficult to look at everyone" (p. 17). Another concern was the lack of clarity of the video picture. Since the camera was usually focused on the full class at the remote site, it made it difficult to observe the non-verbal cues of individual students. However, when comparing videoconferencing to audioconferencing, the instructors maintained that,

instead of having to have highly planned lessons with a lot of prepared graphics for visual interest as well as for content which was required for quality audioconferencing, the presentation skills required for videoconferencing were much easier: 'The visual cues kept you on track and provided constant feedback'. (p. 22)

One of the strategies in the videoconferencing class was the type of interaction that occurred between instructor and students. A research study at Edith Cowan University (ECU) in Western Australia (Oliver, 1995) focused on this particular videoconferencing issue. The initial findings suggested that

most of the interactions tended to be social and involved low-level cognitive activities, or focused on a small number of students. Some of the feedback received from students included: a) the course was uninteresting, b) they did not feel as if they were part of the class, and c) they could learn more on their own. Most of the instructors were able to sympathise with the students; but defended their teaching methods with statements concerning lack of preparation time, insufficient support, and little understanding of the technology or the theory of distance education. Oliver (1995) indicated that ECU planned to prepare some guidelines to assist instructors in the use of both the interactive elements of the technologies and a student-centred approach to teaching.

Moore (1993) reinforced these concerns by indicating that the most popular perception of distance education

is that the benefits can be obtained with little change in the ways that education is organised. . . school teachers, university professors, or corporate trainers can be transformed into distance teachers by moving them from a classroom to a studio, or by moving the cameras and microphones into their classrooms. (p. 1)

Moore pointed out, however, that not only administrators hold this perception. "Many teachers consider the conventional classroom to be an ideal teaching-learning environment and they seek to reproduce it for their distant learners" (pp. 1-2).

Clark (1993) conducted a national survey of American college and university instructors in 1992. He sought to obtain faculty attitudes toward college-level distance education and the use of specific media to teach their courses. The faculty members surveyed were in higher education institutions offering two or four year programs. Some had taught distance education courses while others had not. The results of the study indicated that, on average, instructors were negative toward the idea of personally using distance education to teach their courses. However, those individuals

who had substantial experience with using a variety of media in their teaching were more favourable to the concept. When given the choice of specific distance education media, videoconferencing was the one most favoured amongst the university faculty, followed by telecourses (TV-broadcasting) and audiographic teleconferencing. At the two-year college level, telecourses were the first choice followed by videoconferencing and audio teleconferencing. Videoconferencing was the only medium that received a positive response from the faculty at the four-year colleges (pp. 23-28).

Clark (1993) also asked the faculty to provide their concerns about teaching a distance education course. The major concerns were related to the quality of interaction, benefits of distance education, socialization and affective development, learner access to resources, additional course preparation and faculty rewards, and administration support (pp. 29-31). These results matched those of previously mentioned studies.

Maloy and Perry (1991) described the use of videoconferencing to provide 'better, faster, cheaper' training courses in designated areas of specialization for sailors in the United States Navy. Over the first two years of implementation, members from the Center for Naval Analyses studied the policy concerns, management issues, instructional matters, and level of student performance. The summary of the Navy's findings in the area of instructional matters (Maloy and Perry, 1991) highlighted the difference between face-to-face instruction and videoconferencing instruction.

Teaching techniques that are effective in a single classroom do not automatically transfer effectively to a [videoconferencing] setting. . . instructors must learn new communication styles and body language appropriate to maintaining contact with distant students. . . . Instructors must also learn to encourage student interaction at remote sites with deliberate techniques, such as asking distant students as

many questions as they would ask [if the students were] in a “live audience” (p. 43 - 44).

The instructors in this study also identified concerns with the effect the number of sites, the class size, and the scheduling process had on the students’ level of learning. They warned that

Managers cannot substantially increase the number of learners in multiple sites unless they simultaneously augment instructional support systems. These include on-camera ‘office hours’ for remote students, on-site subject matter experts, peer tutoring, [videoconferencing] small group exchanges, and learning centers.

These support systems are a hedge against depersonalization. (p. 44)

As for the scheduling of the courses, the general consensus of the participants was that training programs “must be the top priority and the scheduler must prepare to defend against disruptions” (p. 45). Maloy and Perry (1991) commented that although the scheduling problems that occurred in this study may have been due to the hierarchical structure of the navy, i.e., someone of higher rank overriding a scheduled training session, “the lesson is generalizable: interruption of orderly, planned instruction should occur only in an emergency” (p. 45).

In general in these studies, instructors tended to use the same or similar instructional strategies to those in their face-to-face classes, -- they worried about reductions in the amount of interactions with students, and they found that more time was required to plan videoconferencing classes. Some felt that the videoconferencing environment forced them to be more teacher-centred than they wished.

Training

Olcott and Wright (1995) described two major barriers found in their survey of the literature that inhibit instructors from participating in distance teaching. The first barrier is concerned with instructors’ perception that developing distance education courses may undermine their autonomy and

control of the course. The other major barrier to participation encompasses the broad area of compensation, training, and incentive structures for teaching at a distance. Many of the issues associated with this second barrier are affected by the priority given to distance education by institutions and academic units that, in turn, is reflected in administrative support and leadership. They identify administrators – President, Deans, and Department Chairs – as being important in setting “the climate for the academic culture’s receptivity to distance education across the institution” (p. 11). In addition, administrators control and allocate resources, schedule teaching assignments, grant release time, provide financial support, and support faculty training.

Some of the key practical steps that Olcott and Wright (1995) say institutions can take to increase instructor participation were to “develop a discipline-based research agenda for faculty teaching via educational telecommunications technology; establish training, release-time, faculty assignment, and compensation models with departmental chairpersons and with deans; and finally, support faculty involvement at regional and national distance education meetings” (p. 12). However, on a day-to-day basis, Olcott and Wright (1995) suggested that distance education advocates include as one of their strategies the creation of “a comprehensive faculty development program” (p. 13) which may include faculty workshops and forums, electronic networks and newsletters, awards programs, and the development of “a cadre of exemplary distance faculty who are willing to share their experiences” (p. 13).

As noted in Chapter One, numerous studies and reports recommended more training for instructors (Burke, 1994; Evans Associates, 1993; Kromholz and Johnstone, 1988; Shaeffer, et. al., 1990) and the provision of training was a key component of Olcott and Wright’s (1995) institutional framework for promoting faculty participation in distance education. Cyr (1997a) stated that:

It is incumbent on post-secondary administrators as well as corporate, government, and other user groups to provide the needed support and training for instructors who will be required to teach through any delivery technology, whether it be interactive video, telephone, desktop video, or the World Wide Web. (p. 1)

Purdy and Wright (1992) voiced their opinion that distance teaching was different:

Is teaching students through any or all distance education methods really nothing more than adapting traditional classroom approaches, techniques, or styles to situations where communication with the student is via written lessons or computer exchange in asynchronous time format? Is there nothing more to distance education instruction than putting a camera or microphone in front of instructors and allowing or encouraging them to replicate their traditional classroom teaching style or technique? Or, as we believe, does true distance education imply something much more than a simple modification of what is done in the "live" classroom? (pp. 2-3)

Ostendorf (1997) reported that more students are taught by videoconferencing technology than through any other electronic medium.

She went on to say:

Those instructors who wish to secure a place in the classroom of the future must first understand these technologies and the environment they are about to enter. They must step from the traditional classroom into the video world, accepting and adapting to its unique requirements. (p. 51)

In addition, Ostendorf (1997) described five elements that must be mastered to teach successfully by videoconferencing.

First, it is critically important to understand how distance learning differs from both commercial television and the traditional classroom. . . . Next, the instructor must be introduced in a general way to the

basic technology to be employed, and to the specific role the instructor plays in the delivery of instruction. . . . Third, course design must take into consideration the system capabilities, the demographics of participating learners, and the electronic tools available to execute the design. But above all, it must demonstrate a bias for direct learner involvement and participation throughout the lesson. . . . Next comes training and practice to achieve mastery of each individual teaching tool. . . . Finally, the instructor must master unique facilitation skills to assure that all remote learners can participate in interaction and other involvement activities equitably and with ease. (pp. 51-52)

However, in order to master these five elements, instructors must be given time and training. Dillon, Hengst, and Zoller (1991), in their study of instructional strategies and student involvement in distance education, noted that only,

A minority of the faculty interviewed reported receiving any training regarding the use of the [videoconferencing] system. Two of these sought help from another experienced faculty member. Those who received training reported that the content of the training covered only the operational and administrative aspects of the system (how to use the studio, how to use the courier service, who to contact when problems arise). None received any training on [videoconferencing] teaching, course design, or the distance learner. (p. 38)

Gunawardena (1990) quoted an instructor talking about learning to teach by videoconferencing as,

Learning theory and the process of learning is very, very important in the designing of programs that are effectively delivered this way, and it just isn't the question of essentially turning the camera on a professor in a classroom, although that has been done. . . . What really pays off is when you take the principles of learning theory as they apply to the electronic medium and you restructure your courses,

and you train your professors to take advantage of this medium, then you have a very powerful tool, a very powerful tool that most of higher education has no appreciation for. . . . If I were a young faculty member starting out today, I would learn everything I could about this medium [videoconferencing] because some of the greatest problems facing higher education can't be solved by any other way than by the creative use of technology. (pp. 42-43)

One of the conclusions of Gehlauf et. al.'s (1991) study was that a training program for all videoconferencing instructors was a must. The feedback from the instructor survey provided 29 specific ideas of what should be included in a training program and how it should be conducted. "Their immediate concern was for technical issues such as familiarity and practice with the equipment. In addition, the participants indicated a need to address pedagogical issues including more 'hands-on' or 'role playing' experiences to foster interaction with students" (p. 24). The need for training in the development of effective audio-visual materials and for how to work effectively with technicians and remote site co-ordinators was also identified.

The re-design of an instructor's face-to-face teaching style was described by one distance education instructor as having changed "to facilitate learner-centered instructional systems that promote knowledge generation through collaborative learning" (Gunawardena, 1992, p. 70). To accomplish this, her role became that of "a facilitator guiding and supporting the learning process. This is no easy task, and consumes much more time and energy than does teaching a traditional class" (p. 70). As early as 1981, Charles Wedemeyer noted:

What is different about learning via technology today is the scope of learning facilitated by technology, the altered role of teachers and learners, the changed environment for learning necessitated by technology, and the sophistication of the process used in developing

instruction that will be communicated by technology. (p. 111, cited in Purdy and Wright, 1992, p. 3)

The changed roles of instructors in the distance education enterprise and the support they need to develop the unique skills necessary for effective distance education were summed up by Gunawardena (1992) when she said:

A sound faculty development program is necessary to help faculty assume their new roles and responsibilities. Institutional support and adequate support systems for distance teaching, coupled with opportunities for professional development, are essential to sustaining faculty motivation and recruiting new faculty to the distance teaching enterprise. (p. 71)

Cuffman and MacRae (1996) provided a rationale for formal training programs for videoconferencing instructors. Included in their rationale was the need to help instructors adapt to the technology; to review or renew emphasis on how students learn and the various instructional methods available within the videoconferencing environment; and to link distance education to the institution's educational and outreach missions. Based on their review of the literature and their rationale, they suggested that "improvements in teaching [videoconferencing] courses requires a formal process of organized training programs [and that] training is beneficial for faculty" (pp. 4-5). They recommended that further study be done on the role and components of formal instructor training programs for videoconferencing.

Conclusion

It is apparent from the distance education literature and the interest shown by educational institutions that the demand for distance education courses will increase. This demand will also have institutions examining the various technological options available for delivering their courses. With many of the technical problems resolved and lower telecommunication costs,

the educational applications of compressed videoconferencing are becoming obvious. This, however, will not only affect the institutions, but will also have an impact on the instructional roles of the faculty members. As Beaudoin (1990) pointed out,

faculty accustomed to more conventional teaching modes will have to acquire new skills to assume expanded roles not only to teach distance learners, but also to organise instructional resources suitable in content and format for independent study. . . . [They] must be adept at facilitating students' learning through particular attention to process, unlike classroom-based teachers whose traditional role is largely confined to selecting and sharing content. (p. 21)

The reviewed literature identified a number of issues instructors had with teaching by videoconferencing. For some instructors, this new environment was difficult and threatening because, not only did they have to be adept at both content and process, they also had to have an understanding of the technology. However, even those instructors who were comfortable with the technology found it difficult to adjust to not being able to see all of the students all the time; to the inability to read the non-verbal clues of the students because of the small images on the screen; to the lack of interaction between sites; and to the extra preparation time required.

The need for training for all videoconferencing instructors was viewed as a necessity. The training, however, had to cover more than a demonstration of which buttons to press and who to call for technical assistance. Effective use of videoconferencing technology for interactive learning requires practice and planning as well as attention to instructional strategies.

Videoconferencing is not an easy technology to implement, not least because it involves high levels of cooperation, often from already busy staff. It is often threatening to instructors who have not reflected on their abilities

to provide interaction in their classes, and is much harder than face-to-face communications, so the instructor needs to be motivated to continue. However, if implemented correctly, videoconferencing capabilities can open up vast opportunities for the improvement and expansion of education and training for both instructors and students. With this in mind, I sought to conceptualize the experiences of five instructors who were using videoconferencing for the first time. Through discussions and observations of their classes, I documented the instructors' perceptions of their videoconferencing teaching compared to their traditional classroom teaching, their fears and/or concerns, and the challenges they faced. This documentation led to five individual stories, which I then used in responding to the research questions I proposed in Chapter 1 of this study.

CHAPTER 3

METHODOLOGY

Philosophical Stance

This study employed a qualitative research design that explored instructors' videoconferencing environments through observation, interviews, and the analysis of related documents. The qualitative methodology was chosen in order to obtain instructors' personal understandings of the environment and their reflections on their experiences in videoconferencing. Lancy (1993) described this approach as being "best employed in situations that have relatively confined temporal and physical boundaries [and] . . . ideal for phenomena that are patently complex and about which little is known for certainty" (p. 9). In this study, there were two videoconferencing environments. One environment had a local classroom and two remote classrooms; the other had a local classroom and six remote classrooms. In both situations, the classrooms were connected through compressed two-way, real-time, interactive audio and video technology. Part of the study focused on the extent to which instructors saw the remote classrooms as part of a single environment.

I sought to learn as much as possible about the expectations and experiences of videoconferencing instructors by listening to their stories and observing them in class. I knew from my experiences with training instructors on how to use distance education technology effectively to teach their courses that each person has his or her own concerns and questions. Although there were specific questions identified for this study, additional ones were raised during my interviews with the instructors. Edson (1988) described this as one of the reasons researchers undertake qualitative inquiry. "We undertake qualitative inquiry not so much from our recognition that we do not know all the answers to our problems but rather from an appreciation of the fact that we do not know all the questions" (p. 45).

According to Glesne and Peshkin (1992), "Qualitative researchers seek

to make sense of personal stories and the ways in which they intersect" (p. 1). Lincoln and Guba (1985) expanded on this idea, explaining that in their view, qualitative research was within the "interpretivist paradigm which portrays a world in which reality is socially constructed, complex, and ever-changing" (p. 6). The qualitative researcher accepts that realities are multiple, socially constructed and complex and, because of this, views the research as seeking understanding and interpretations about how participants develop the world around them. To do this, the researcher must have the following key characteristics: responsiveness, adaptability, ability to process data as it is collected, and to clarify, summarise, and validate the participants' contributions by probing the idiosyncratic and the unexpected (Taylor & Bogdan, 1984). Lancy (1993) further described the qualitative researcher as opportunistic: "By being on the scene, the researcher observes and collects incidents, artifacts, and quotations that illuminate the phenomena" (p. 9).

It is my belief that distance education technologies are here to stay, will increase in use, and as with all educational innovation, can either diminish or enhance the quality of learning. Faculty members are key to unlocking the technologies' potential; and because of that, a goal of this study was to identify ways to support faculty, and ensure their effective use of distance education technologies.

Multiple Realities

I assumed that the instructors would have different ways of understanding their videoconferencing experiences. Their realities of the situation would vary because of their teaching disciplines, past experiences, and beliefs and values about teaching adults and using technology as a teaching tool. Those individuals who had previous distance teaching experience, such as audio conferencing, were likely to relate to the experience differently than those who had no experience in this type of situation. In addition, my own distance education background as a trainer of

instructors in both audio and audio-graphics environments, instructional designer, and instructor meant that I brought my own realities of the effectiveness of videoconferencing into each of the meetings with the instructors.

My belief is that knowledge is constructed internally by individuals rather than externally, and because of this, there will be multiple realities of any given situation. Lincoln and Guba (1985), in describing the qualitative paradigm, classified this type of thinking as 'constructed reality'. They indicated that there are "always an infinite number of constructions that might be made and hence there are multiple realities. Any given construction may not be (and almost certainly is not) in a one-to-one relation to . . . other constructions of the same . . . entity" (p. 84). As well, they suggested that each individual's reality is "undoubtedly incomplete or erroneous to some degree" (p. 84).

In talking with the instructors, I expected that they would describe their own realities of the videoconferencing experiences. From these multiple realities and my own experiences, I hoped to obtain a better understanding of what it meant to be a distance education instructor using videoconferencing technology and how this knowledge would be of benefit to other instructors.

Selection of Participants

For the qualitative researcher, Lancy (1993) indicated that "[o]ne chooses the site(s) that will yield the maximum information regarding the specific topic/issue one is investigating" (p. 16). In my study, given the relative newness of compressed videoconferencing, I sought permission to interview three participants in a pilot study. The specific topic dealt with the use of compressed videoconferencing to provide university courses to students at remote sites. The three instructors, who were part of a pilot project, were the initial participants for this study. Two of them were teaching a full-year course; the other taught two courses, one each term.

These instructors had teaching experience in the traditional university classroom setting; however, the distance education format was completely new for them. For one instructor the course content was also new; the other two indicated that they had taught their respective courses for at least six years. Initial discussions for the project began in February 1995 and in late June the pilot project was approved to begin in September. The timelines for development were less than two months. I heard about the project after it had begun and immediately sought and received permission to study the instructors' perceptions of the experience. I approached the instructors in early January 1996 and all agreed to participate in my study. I planned a set of three interviews: one to focus on their previous teaching experiences; one on their experiences using videoconferencing; and the third following up on the second with additional questions concerning their experiences and to obtain their advice on teaching using videoconferencing and the training process for instructors.

I had only completed one round of interviews when it became evident that one of the instructors was unwilling to provide further interview time. He saw his participation in the pilot project as a task assigned by his chair and was unwilling to invest more time in the project than he considered necessary. I then sought access to another videoconferencing project that was on-going. The project, to provide baccalaureate education to students in six community colleges, had begun in Fall 1995. Instructors in the two courses being offered in Winter 1996 agreed to participate in this study. One of these instructors was new to videoconferencing while the other had taught a videoconferencing course in the previous year, and because of the negative experience, was eager to make changes.

Data Gathering

Glesne and Peshkin (1992), Lancy (1993), and Lincoln and Guba (1985) all agree that there are a variety of methods that can be used to gather data and that qualitative researchers must carefully analyse what they

want to learn. The three methods that seem to dominate are: observation, interviewing, and document collection. I used audio-taped interviews as my main source of data collection, but also observed the instructors teach and watched some video recordings of sessions. Table 2 provides an overview of the interview and class observation schedule. The instructors also shared with me course outlines, assignments, and material on videoconferencing that they had.

Table 2

Overview of Interview and Observation Schedule (* indicates full-year course)

Instructor	# of Interviews	Total Length (hrs.)	Timing of interviews	# In-Class Observations	Videotapes Observed
A	1	1	End of 2 nd month	1 – end 2 nd month	2
B	2	3 ½	End of 1 st and 3 rd month of second term*	2 – mid- 2 nd and 3 rd month of second term	3
C	3	4 ½	End 1 st , 2 nd , and 3 rd month of second term*	2 – mid- 2 nd and 3 rd month of second term	3
D	2	3 ½	Month prior to course; start 4 th month	2 – start of 1 st and 3 rd month	0
E	2	3 ½	Month prior to and after course	2 – mid- 2 nd and end 3 rd month	0

Interviewing Participants

Glesne and Peshkin (1992) described how in qualitative research, the nature of relationships "depends on two factors: the quality of our interactions to support our research – or rapport – and the quality of our self-awareness to manage the impact of self on our research – or subjectivity" (p. 93). For them, rapport is a "distance-reducing, anxiety-quieting, trust-building mechanism" (p. 94) that is necessary in order for participants to talk about themselves and their experiences. They warned that the appearance,

speech, and behaviour of the researcher would influence the quality of rapport that was developed with the participants and emphasized that “[t]he contribution of rapport to all modes of qualitative research remains essential. It is not separate from other aspects of doing good research, but an integral part of collecting data. Research could not succeed without the trust that rapport engenders” (p. 100).

Glesne and Peshkin (1992) illustrated some unique reasons for interviews:

The opportunity to learn about what you cannot see and to explore alternative explanations of what you do see is the special strength of interviewing in qualitative inquiry. To the above sets of circumstances add the serendipitous learnings that emerge from the unexpected turns in discourse that questions evoke. (p. 65)

Prior to the initial meeting, permission was received from the instructors to tape-record the interviews. By recording the interviews, I was able to accomplish two things: I had a complete record of what was said and I was able focus my attention on the discussion rather than note taking.

In developing a positive and relaxed rapport with each of the instructors, I began by explaining how I became interested in distance education, in the use of videoconferencing as a medium for teaching and, more specifically, in the experiences of the instructors who used the medium. I hoped that sharing stories about my first encounters with distance education and the experiences I had teaching others how to use audio and audiographics technology would help emphasize my genuine interest in my research area and the importance of their contributions. I also tried to establish a level of trust with each instructor by ensuring confidentiality of our discussions, carefully listening to each story, being attentive to individual feelings and reactions to the interviews, and sharing the interview transcripts for feedback.

However, after the first interviews, I realised that because of my

previous background in distance education, I was entering this research study with a positive attitude about the potential of distance education and may have biased the conversations both by my interest in distance education and the level of knowledge I had. I was, therefore, conscious that I could have created a bias toward positive stories. Having the conversations transcribed verbatim not only allowed the participants to review the transcribed data for accuracy, but also enabled me to listen for any evidence of my own bias. I was relieved to find that participants had readily provided their own views on compressed videoconferencing and did not seem to have been constrained by my enthusiasm.

After reading the interview transcripts, none of the participants suggested any correction that changed the overall theme of his/her comments. Two participants, however, made reminder notes for themselves of additional information that they wanted to discuss during our next interview. With the four instructors who were interviewed more than once, the transcript of the last interview was sent to them by mail and I followed up with a phone call a week later to get their feedback. None of the instructors had any corrections or additional information to add.

My initial interview plan was to hold a formal interview with the instructors in January and then meet with them informally on their video teaching days. I had hoped to have a second interview part way through the term and another one at the end. However, because of their schedules and varying levels of interest in discussing their experiences, the number of interviews, which took 1 to 1 ½ hours, varied – instructors B, D, and E were interviewed twice and instructor C three times. Instructor A was interviewed only once. Although he had no problem with taking part in my study, he made it clear that he was a very busy person and one interview would be all he would have time to give. He told me that he really did not see why his experience would be of any interest to me because

I'm teaching the way I always do. I haven't, and don't plan to, make

any changes in how I teach in the videoconferencing class just because I'm in front of a camera. Besides, I'll probably never do this again; so why try to get fancy and change the way I have done things for years.

The interviews were spread over the second term for two reasons. One was to avoid times of potential stress for the faculty, i.e., exams and assignment due dates. The other reason was to allow time for the tapes to be transcribed and the instructors to review the transcripts between interviews. For instructors B, D, and E, the first interview was held in their offices on campus. Since Instructor C taught a course at another College prior to his videoconferencing class, I gave him a ride to campus. We began the interview in my car and finished it in the fourth floor lounge of Education North. Instructor A was interviewed in the videoconferencing classroom before and after his class. In all the other cases, one of the interviews was conducted after I had observed the class. This gave us the opportunity to discuss how the class went and for me to clarify why the instructor did or did not do something. Three of the instructors (B, C, and E) also used this time to ask for suggestions on how they could change some aspect of their teaching or incorporate a particular technique.

The format for the interviews was semi-structured. I had developed some basic questions that were asked of all instructors, and after that, the questions were generated from the discussions. At the first interview, the instructors were asked to describe their teaching background; their general approach to teaching within the traditional classroom setting, including class preparation and student interaction strategies; their understanding of the role of the university instructor and the students; and, their preferred class size, room set-up, and instructional media. From there, the discussion focused on their understanding of distance education and the use of technology to teach a distance education course. They were then asked to describe their initial experiences in the videoconferencing environment including the

topics/assignments selected for the course, training, class preparation, student interaction, role of the technology, and the available support structures. During the remaining interviews, the instructors were asked to further discuss their teaching experiences related to: teaching on-camera, the effectiveness of the training program, the use of videoconferencing technology and other available technologies, their interactions with students, and ideas on what they would keep or change should they teach another videoconferencing course. Part of every instructor's discussions was a comparison of his or her traditional classroom teaching/environment to the videoconferencing situation. In particular, they focused on the amount of preparation time, the dynamics of student interactions, and the role of the physical environment.

Observing Videoconferencing Classes

In addition to the interviews, I was a non-participant observer in each instructor's class; and in the case of the three instructors involved in the pilot project, videotapes of several of their classes were also viewed. Because instructors A, B & C were involved in a pilot project, they were expected to video-tape their broadcast class. The instructors were encouraged to view the tapes to review their teaching. None of them did for various reasons – they did not have enough time; they had to make a special trip to pick up or view the tape; and/or they didn't see the need. One of the instructors, however, commented that the students were using the tapes at their sites for review or to catch up when they missed a class. The other two instructors (D and E) did not take the time to video-tape their classes. Both felt they had enough to handle without having to remember to put the tape in the VCR. By viewing the tapes rather than the actual class, I was able to observe more classes without actually attending, to replay the tapes as necessary, and to document the strategies the instructors used and compare them with those observed in the classes I attended and with others the instructors indicated they had used. I was also able to assess how

frequently, how long, and why instructors went to various sites.

Data Analysis

Glesne and Peshkin (1992) described data analysis as the organization of what “you have seen, heard, and read so that you can make sense of what you have learned. . . . To do so, you must categorize, synthesize, search for patterns, and interpret the data you have collected” (p. 127). According to Lincoln and Guba (1985), the analysis of data in a qualitative research study “must begin with the very first data collection, in order to facilitate the emergent design, grounding of theory, and emergent structure of later data collection phases” (p.242). The strategies and guidelines used to analyze the data, however, vary from study to study. Patton (1990) observed,

Because each qualitative study is unique, the analytical approach used will be unique. Because qualitative inquiry depends, at every stage, on the skills, training, insights, and capabilities of the researcher, qualitative analysis ultimately depends on the analytical intellect and style of the analyst. . . . Regardless of how analysis is done, analysts have an obligation to monitor and report their own analytical procedures and processes as fully and truthfully as possible. (p. 372)

For this study, I undertook the data analysis in two phases. During the first phase, multiple activities were occurring simultaneously and I kept a notebook to help with recalling events and decisions. During a three-week period, I was interviewing some instructors; transcribing the interview tapes for others; and attending classes, reviewing video-tapes, and summarizing the class observation data. Based on a strategy Glaser and Strauss (1967) referred to as memoing, I used coloured index cards to make notes referencing trends, unique features, similarities, concepts and words that each participant had discussed which might be pertinent to their individual experiences or correspond to what other participants had mentioned. Lauer and Asher (1988) described this preliminary identification process as

coding – the setting up and labeling of categories, which then become the variables of the study. . . . Researchers analyze the communication data, notice patterns, identify and operationally define variables, and relate them to one another. (pp. 26-27)

The original transcripts were then re-read to identify a preliminary list of key ideas. Themes emerged as the instructors reiterated similar experiences with teaching a videoconferencing course for the first time. These themes, in turn, were used as a basis for identifying questions that required further clarification and validation. By analysing the data as it was collected, I was able to focus and shape the study as it proceeded (Glesne and Peshkin, 1992).

I kept an electronic journal of ideas, hunches, and general thoughts as I read through the transcripts and reviewed the numerous journal articles I had obtained over the duration of the study. In addition, I created a computer file of quotations from the reviewed literature that I felt might have some relevance later in the study.

The second phase of data analysis took place after all the data had been collected and involved organizing, analysing, and interpreting the data. The analytical strategies suggested by Glesne and Peshkin (1992), Lancy (1993), Lincoln and Guba (1985), Patton (1990), and Rudestam and Newton (1992) were used as guidelines for planning this phase of the research process.

I began by reviewing all the data to identify what Lincoln and Guba (1985) referred to as “units of information.” These are words, phrases, or even whole paragraphs that contain information relevant to the study and “can stand by itself . . . in the absence of any additional information other than a broad understanding of the context in which the inquiry is carried out” (p. 345). Each unit of information was coded according to (1) the source of the information, i.e. interview transcripts, class observation notes, date, and page number, (2) which instructor provided the information, and (3) a key

word or phrase that best described the essence of the information.

Once all the data had been coded, the process of categorizing the units of information began. Glesne and Peshkin (1992) referred to this process as “entering the code mines” because of the tedious task of “sorting and defining and defining and sorting those scraps of collected data . . . that are applicable to our research purpose” (p. 133). The process used to categorize the data followed the steps outlined by Lincoln and Guba (1985). These included:

1. Selecting and reading the first unit of information from the master list and noting its content. This information was entered under the first category column of a computer-generated table. At this point, no name was given to the category.
2. Selecting and reading the next unit of information and noting its content using a “tacit or intuitive process” to determine if the information was similar to the first. If it was, the information was entered in the same column; if not, it became the first entry in the second column.

This process was continued until all units of information had been categorized.

Once all the units of information had been categorized and named, I asked two individuals to use these names as they read through the data to check my perceptions. The three of us then met to discuss their comments and to review the set of categories to determine any overlap, ambiguities, and missing, or incomplete areas. This created a revised set which I once again reviewed against the preliminary list of themes, checked quotations, and tried to ensure that I was comfortable with this final set. Last, I reviewed the categories in terms of my original research questions and noted where the conversations had taken us. The final set of categories were used to write each instructor’s story and to discuss the findings of the study.

Trustworthiness

In this study, to ensure the trustworthiness of the data and of my interpretations, I used the four criteria suggested by Lincoln and Guba (1985): credibility (true value), transferability (applicability), dependability (consistency), and confirmability (neutrality). (pp. 289-331)

Credibility, according to Lincoln and Guba (1985), is the extent to which findings and interpretations are seen as credible by those who were the sources of the data (p. 296). In order to address this concern, the following activities were built into this study: (a) member checks to verify the accuracy of my understandings and interpretations of the data, and (b) peer debriefing to allow me to discuss, analyse, and defend my position in relation to my methods, analysis and interpretations of that data with a disinterested peer – that is, "to an experienced protagonist doing his or her best to play the devil's advocate" (Lincoln & Guba, 1985, p. 308).

Transferability is the extent to which the findings of a study apply in contexts other than the one in which they were obtained. However, according to Lincoln and Guba (1985), unlike

conventional researchers [who] are expected to make relatively precise statements about external validity (expressed, for example, in the form of statistical confidence limits), the naturalist can only set out working hypotheses together with a description of them and context in which they were found to hold. (p. 316)

To assist individuals in determining the transferability of the data to be obtained in this study, an effort was made to identify as fully as possible the contexts within which the data were collected. Patton (1990) suggested that one way to check for external validity is to be "careful to limit conclusions to those situations, time periods, persons, contexts, and purposes for which the data are applicable" (p. 471). Reporting the findings of the study with extensive description in the participants' own words, also assures that others who read the study will have adequate information to

determine whether or not the study can be generalized to their intended population.

During data collection in naturalistic inquiry, dependability makes allowance for research designs to emerge and evolve further, theory to develop, and changes to occur which cannot be referred to as error in procedure (Lincoln & Guba, 1985). In this study, I shared the interview transcripts and the notes I took during the class observations with all the instructors. Once the stories were written, I asked the instructors for feedback. Only two of the instructors volunteered to read the stories and provide feedback. In both cases, they were happy with the end results. To check the dependability of the other three stories, I shared them with the two individuals who assisted with interpreting the data. Their suggestions involved adding more quotes to back up what or why the instructors did or did not do something. Glesne and Peshkin (1992) recommended these procedures which will help to "(1) verify that you have reflected the insider's perspective; (2) inform you of sections that, if published, could be problematic for either personal or political reasons; and (3) help you to develop new ideas and interpretations" (p. 147).

Confirmability, the last attribute of trustworthiness, uses the confirmability audit as its major procedure. By keeping journals and field notes, preparing data files, keeping all interview tapes, and storing all computer files on both disks and the hard drive, I have maintained an audit trail that can be retrieved for review at any time. Further, substantial portions of the data gathered and the analysis and interpretation have been audited by participants and peers.

Ethical Considerations

In discussing ethical concerns, Glesne and Peshkin (1992) referred to the principles of the Council of the American Anthropological Association. They call for: safeguarding the rights, interests, and sensitivities of those studied; obtaining informed consent; maintaining participant anonymity;

giving fair return for all services; and reflecting upon the foreseeable repercussions of the research. These are similar to the provisions of the Canadian Tri-Council Report on Human Ethics and the requirements of the University of Alberta and were followed for this study.

The participants were informed that approval from the Department of Educational Policy Studies was obtained, as outlined by the University of Alberta, before I began the study. All information that could identify instructors or courses remained confidential and was stored in a secure location to which only I had access. In reporting data, letter pseudonyms were used. Member checking of transcripts gave participants the opportunity to amend or withdraw any statements that put them at any risk prior to publication of findings, while also safeguarding their interests and sensitivities. In addition, every participant had the right to withdraw from the study at any time and for any reason.

Beyond these guiding principles, I have reported the conclusions as supported by the data, and have made every effort to expose my personal biases. This has been done to allow individual readers to use their own judgment to confirm or reject the conclusions presented in this study.

CHAPTER 4

FIVE INSTRUCTORS' STORIES

Each of the five instructors who volunteered to assist with this research project presented their experiences with the videoconferencing technology during personal interviews that took place at various times throughout the teaching term. Their stories provide an insight into their understandings of teaching adults, what is involved in distance education, how they teach their traditional classes, and how they adapted to the videoconferencing environment.

Context of the Experience

In reading the stories, it is important to understand the context in which the instructors were teaching. Instructors A, B, and C were involved in a pilot project that was a collaboration between a University unit and two Northern Alberta Colleges. The four courses taught were required first year courses within their specific departments of the Faculty. For this project, however, these courses were not part of any particular program. Rather, they were used to test the viability of such a collaboration using videoconferencing technology. The project was not continued at the end of the school year.

The 39 students in the pilot project were all located at six sites in Northern Alberta. In order to meet the minimum enrolment requirements set by the University, some of the sites accepted students who did not have the academic background required to take the courses. In some cases, the students were still completing their high school upgrading program and had not written their final exams when the pilot project began.

The technology at each site consisted of two television monitors, one camera which was mounted on the television monitors and focused on the students' sitting area, a console, a document camera, and movable desk microphones that were shared between three to five students. The

instructor's site also had a computer that could be used to create text during class or display pre-stored text.

The seating arrangement varied. Three sites used tables arranged in a u-shape with the students sitting on the outside of the U; two sites used rectangular tables with the students sitting beside and across from each other; one site was located in a narrow room with two rows of single, rectangular tables that accommodated two students each.

Approval for a September 1995 start was not obtained until late June 1995 and therefore, required finding instructors to teach the selected courses because instructors' teaching assignments had already been allocated. The three instructors selected were not hired until late August, and this had an impact on the amount of technical training and preparation time they had. The technical training and support was provided by one of the University's videoconferencing trainers, and the actual hands-on training, which provided an introduction to how to use the various components of the videoconferencing system, took about 45-60 minutes.

Instructors D & E were from a different Faculty. In this Faculty, distance education technology had been used for a number of years to offer courses to students at remote sites within Alberta so the decision of whether or not courses would continue to be taught that way was not in question. What was different was the use of videoconferencing technology to deliver the courses. While two videoconferencing pilot projects had taken place in 1980 – 1983 and 1992 – 1993, these occurred at off-campus sites. In 1995, the Faculty made the decision to implement videoconferencing as one of its delivery modes and began offering courses through the University's videoconferencing facilities. This decision by itself was nothing unusual. However, the program focus was a collaborative baccalaureate program between the University and a number of regional colleges in Alberta, and so this was a unique videoconferencing situation because each of the sites had a qualified instructor present during every class. This plus the fact that all of

the students had met the entrance requirements meant that instructors D and E were working in a different type of environment than instructors A, B, and C.

The technology at the sites for this project included two television monitors, a camera mounted on the monitors and focused on the classroom, a console, a document camera, and microphones. Some of the sites had been designed specifically for videoconferencing and in those rooms the microphones were fixed either on the desks or from the ceiling. At the other sites, movable desk microphones were shared between three to five students. At all sites except the university, the classrooms were arranged with rows of long tables facing the television monitors. At the university site, a large conference table that comfortably sat six on each side and two at one end was used. At each site, the instructor controlled the use of the console.

In August, prior to my interviews with instructors D and E, I was invited to attend a meeting to listen to the problems the instructors encountered the previous year and how they thought they could be avoided in the coming year. The atmosphere of this meeting was very negative; rather than having someone provide information on how to incorporate various teaching strategies to improve interaction, the 'experienced' instructors focused on what did not work. Instructors D and E were present at this meeting and indicated that their concerns about teaching via videoconferencing had been reinforced. Both, however, were not scheduled to teach until January and had different ideas on how to prepare. Instructor E, with a year's experience behind her, planned to do research, i.e., what was distance education; what teaching strategies work, what didn't; how to revise the curriculum to better meet the students' needs. Instructor D indicated that her schedule was such that she did not have the time to even think about the course, never mind plan to teach it via videoconferencing. This was something she would work on during the Christmas break.

Although the Faculty had decided to use videoconferencing to offer its program outside the university, instructors D and E did not receive any more training than instructors A, B, and C. They were introduced to how to use the technology but did not receive assistance with designing their courses for the videoconferencing environment.

The videoconferencing technology used by all the instructors in my study was basically the same. However, classroom arrangements, number and background of students, pilot project vs. on-going project, instructors' backgrounds, and training and preparation lead time made each instructor's experience somewhat unique.

Instructor A

This individual classified himself as an “experienced university instructor” who had taught six courses a year for the previous six years. During that time, he had taught the two courses which were to be videoconferenced about five or six times to groups of 150 to 200 undergraduate students in a large lecture theatre. In contrast, the first videoconferenced course had 25 students among six sites and the second course had eight students from three sites.

He considered himself to be a successful instructor and knew that he had a reputation for making the course material “entertaining.” To him, this was the purpose of introductory courses:

I tend to make the material entertaining and especially at the introductory level where it is a service course by definition. I see its major purpose is really . . . just to fire up people’s imagination, you know, and fire up people’s - - their interest in the area.

He went on to explain that while some lecturers tended to be too dry in an attempt to “maintain some kind of scientific, imperial, quality” it distanced or alienated students from an area “that I consider fascinating and with a lot of everyday applications.”

In his traditional classroom, he said, he was known for bounding around in an academic gown or lab coat and playing a role. This comment, combined with his first attempt to explain that he was known for “more of a, what’s the term? Not dramatic presentation but a little bit more – I have to be careful how I put this – I guess you could say that I rely on a kind of flamboyance,” provides some clues about his view of himself as a performer. Later in the discussion, he referred again to his style of teaching, “although I don’t talk about it much, my first degree was in Fine Arts and was in theatre and acting. I was a professional actor for three years so during that time I was in front of the camera and enjoyed performing.”

When he was approached to teach the two courses, he was unaware of the format that was going to be used. He had no idea what it meant when he was told that he had agreed to teach the courses by videoconferencing; but he got the gist of it in the first 45 minutes of the first training session. He confirmed that the training session had focused on how to use the technology but explained that there had been very little time before the first class began. Asked whether there had been any hints on designing his course for the medium, he explained: "No, No. But I'm very pig-headed about that and I probably wouldn't have taken much advice anyway." He went on,

I mean, you have your style, you have your, you know, I . . . I've used the document camera once or twice but, what I use here is really an old-fashioned delivery style because it is going back to using the overhead projector and screen. And, until something better comes along, you know.

He noted that he had been given some handouts that he still carried around with him: documents explaining distance learning and guidelines on how to dress. The trainer also sat in on all the sessions of the first term course and for him, "I mean, she had no purpose to be here. Everything worked well and the technology I can understand . . . I'm sure she got bored."

He used the overhead projector for all his classes because he disliked the blackboard; he hated turning his back on people and preferred to face them and interact with them as he worked. He went on to describe colleagues who had developed computer graphic presentations. "Hell, to me it looks like a lot of work . . . It's a 20 minute set-up and you also have to be quite computer-literate which I'm not." Not only did he disparage the use of the computer graphics, he thought that videos were time-fillers. He was always running short of class time himself and believed that an instructor only used film clips and videos when the person was "burnt out", didn't want to talk, and showed a film to fill up some space:

I don't use them much because I just don't. I find that I . . . can probably demonstrate in the restricted time I have in class, and lecture, demonstrate, what the whole experiment is by acting it out myself (rather) than by dimming all the lights and starting the projector.

Although he didn't use them himself even in his large traditional classes, he discussed the benefits of a video library for the students.

For this kind of delivery system, it would probably be helpful if we got copies of the video library that came with the text; or maybe I could go through them and select out certain sections and build a master tape that could be duplicated and sent to the sites so in their free time they could just view it out of interest.

He contrasted his videoconferencing experience with his traditional classes: "This is different. It's a different delivery style so I cannot rely that much on that kind of flamboyance – but I guess," he ended, "I should try my hand at it." He had a number of reasons why that was not feasible: "first, because I move too much. The camera obviously doesn't follow you." Then he added that he had to rely on "vocal inflections and vocal expressions because the picture isn't very clear." When he taught in the traditional classes he used facial movements and expressions from the subtle to the bizarre when he needed to get a point across. "That doesn't cut it here," he went on, explaining that when he looked at the pictures from the sites he thought they were very blurry and that the students must therefore find it hard to see his gestures. Sometimes, he complained, he even lost the definition of the students' facial features, which was something he relied on in his lectures. He used the second screen to keep himself in the frame of the shot: "I do use the second screen, but I use it peripherally. If I look at it I get very self-conscious. It's just like I use it to frame myself but I don't look at it."

He did not think that he had made any changes to his teaching: "I deliver the course just like I would here and, maybe that's a mistake." He explained that in this introductory course "the text was the tome, the bible, and I'm just there supplementing the text material and ultimately for questions that I might ask them that stem from the lecture materials." He believed the students had no need of library access because the material in the text was difficult enough. Furthermore, he knew many students found the text difficult because "the language . . . throws people off, the psych babble and complicated terminology."

He used multiple-choice examinations, again because he "made an executive decision at the beginning that the course must be delivered exactly as it is at the university." His rationale was that on short answer questions, "people can BS more and pull out a few extra marks or whatever and I want them to be prepared." He explained that if students transferred to the university and took further courses in his department, then they would be faced with multiple choice exams and "it's just part of the training, you know, to get used to it."

His first course had been a three-hour session one evening a week. He found the three hours to be "too much electronic information overload" and "too flat . . . to keep me going without feedback" and was pleased that in the second term the course was scheduled in two 90-minute blocks per week. He also preferred this time block for his traditional courses: "At an hour 20 you are just getting to the borderline of them shutting down their attention span and you are done."

Asked how he found interacting with the students, he explained, "No, I lecture . . . They seem to enjoy it, but I do occasionally stop and ask if there are questions, and rarely are there questions. The trainer had suggested I break more frequently for questions, and I did that a couple of times . . . I have kinda slacked off. It's just dead space

when I ask questions . . . so I've even cut down on that. Maybe I should start it up again.

This had not always been the case. Initially the students were 'firing' questions to him at the break and at the end of the lecture. "Invariably, the questions were off-topic and they reflected their understanding of what they considered the course to be about," he explained. "They were kind of insightful," he added. The questions ceased mid-way through the first course and he thought that it was because the students had "started to realise that 'This was a little tougher than I thought' and all of a sudden they started to clam up." He indicated that the situation had not changed during the second course even though he informed them that if they had questions, "they could stop me, but they don't." His explanation for this was "that could be a characteristic of this sample because they do tend to be quiet anyway especially with the Native people. So I don't know."

He thought the students appeared to be attentive although occasionally he would look up to find them chatting "or something going on or someone will come in through the back door and you see all the heads turning . . . And I have the sense of having lost them." At that point he used his voice through tone, pacing, and using examples to regain their attention. He described this experience to be "like teaching to a silent film." He thought the technology worked and the students were learning something, but there was something fundamentally missing for him:

It's a challenge because it's not human enough for me. When you are working a live class, . . . a live audience, especially the big class, I really rely on them for energy. I really feed off their energy especially my 8:00 a.m. class that I have this term. Everybody is dead. During that cold spot, everyone was miserable and half asleep and you really had to go in there and pump it up. And when I get a little trickle of feedback from them, it helps me. And it's not just a laugh or whatever, it could just be sensing that they are breathing . . . And

here it is just dead space. It was the silence that threw me off and also the delay in the delivery . . . You tell a joke and then you wait a few seconds before you see them laugh. You feel like, "Wow! That was a flop, my timing is really off." . . . Just give me a blackboard in a classroom with living people type of thing; it just doesn't equal it. . . . It's just that sense of losing that contact with the breathing individual, you know.

In his view, it was essential that students do the prescribed readings from the textbook if they were to be able to participate in discussions. When students failed the first couple of exams, he put it down to "I just don't think they were reading the text. I don't know what they were doing."

His students were at six sites at the beginning of the first course and at three sites for the second course. When asked whether he thought about them as a whole group or taught more to one site, he agreed that he preferred to have some sites on his monitor because he could see the students responding to his jokes, "laughing". Students at the other sites tended to "smoke [constantly], and look up occasionally, and take notes." A "flat" situation with "little energy" for him, he concluded. He did, however, "browse" the different sites during the exams "just to make sure that people are on task and the proctor is still in the room. . . . Not during lectures though. It's too complicated to do all the buttons and stuff. It just pulls me off-task."

The configuration of the rooms was also a factor he conceded. At the less responsive sites, the students sat around a table so that he was looking at the side of the person's head. He was used to, and preferred to have the students sitting lecture-style "so their attention is focused on the screen, I'm getting eye contact, and there is less likely to be this conflict of people chatting . . . to each other to pull them off-task. . . . I would at least feel that I had their attention."

Asked about interaction in his traditional classes, he said it depended on the size. In his small class of about 40, it was more laid back and “they’ll ask questions,” he explained. However, he went on, “when you are working in the theatre (the large classroom) it is so much more presentational and people rarely interrupt you.” In effect, he agreed, there was not much difference in his delivery style and the student reaction to it in his traditional classrooms and in his videoconferencing course. Neither did he see any difference in his preparation for both formats “other than the fact that I have to go and clear the overhead roll myself. In the lecture halls, they have them cleaned for you.”

In summing up his experience with videoconferencing, he indicated that the only advantage he could see to using this format for teaching was that “it gives students access to education that they just wouldn’t be able to get any other way.” As for the type of courses that should be offered in this format, it was his belief “that this type of delivery system is much more suited to more senior level, seminar based courses where there is more discussion.” However, he pointed out that the drawback to that was that the students couldn’t get into those without having the introductory level courses.

Instructor B

The opportunity to teach this particular full-year course was one this instructor had been looking forward to for some time. This, however, had nothing to do with the fact that videoconferencing was going to be used. The course was one his department restricted to instructors with a doctoral degree, and he now had his. He viewed the use of videoconferencing as intriguing. "I don't believe that technology for technology's sake is a good thing. But I am not afraid of technology."

In discussing how he was chosen to teach the course, he indicated that someone else had been scheduled to teach it; but after visiting the sites and meeting some of the students, the individual withdrew five days before the class was to start. He was approached by his Chair to take over the course because he was not teaching at that time and had previously expressed interest.

The instructor's teaching experience began in 1991 when he started the doctoral program. Since then, he has usually taught three first- or second-year courses over the regular school term and a course during both the spring and summer sessions. Until now, all the courses had been one semester long. He had also taught similar courses for another post-secondary institution for the previous three years. In each of these situations, the class size was between 90-120 students. The videoconferencing class had 18 students between three sites in September and was down to 7 between two sites in April. He indicated that this attrition rate appeared high; but after a fellow graduate student, who had taught off-campus courses, told him "the drop out rate is almost always 60-70 percent; that's the type of drop out rate you always get," he wasn't concerned.

The amount of preparation time and training on using the videoconferencing technology he had was minimal because of his late entry into the project. Using the technology, however, was not a concern for him.

It was his general impression that the technology was a minor component and the time required to learn how to use the "right buttons" was minimal.

Given that I only got 45 minutes before I went on, it was no problem; but, on the other hand the technology is very simple technology. . . . There are things that I probably could do with the technology that I don't because I don't have to. I could have taken more time to learn how to use the directorate; I know how to browse if I want to. But given that the most I ever work with is four sites and the students at [one site] are incredibly quiet, almost impossible to draw out, . . . it was never a problem with knowing where I wanted to be and asking questions and stuff with four sites. So I never worried about sort of browsing through and things.

In contrast, he indicated that the amount of time required for course preparation was a definite factor in how he taught regardless of the delivery mode. The content was such that the instructors were required to have a background in world history. The students were given "little chunks of history from all over the world so they can make choices as to where they want to sort of learn and find out things for future senior courses." He indicated that "absolutely nobody in this department has the ability to sort of sit down and lecture about China, Africa, Europe, and North America at the same time. A person needs to spend a lot of time prepping." By 'prepping', he was referring only to learning the content and preparing instructional materials and assignments for the traditional classroom.

Right now, because I am teaching it for the very first time, I'm putting in approximately four hours of prep for every hour I spend in front of the class. So that is in the neighbourhood of 12 to 15 hours of prep a week. . . . Even then I think that is inadequate. I could probably do at least another 6 to 8 hours of prep a week to get my lectures in even better shape. . . . To do the stuff with the video technology, . . . I

would probably have to add in another 6 hours of prep time a week, 6 to 8 hours a week to deal with the other parts of the technology.

To effectively create a seamless classroom using the videoconferencing technology was something he felt would be very time consuming for just one course.

It would be different if I was doing this for a living. If I had five courses on the video technology and I was teaching to 17 different sites ... and this was what you were doing, this was your job, not just a little part of your job then you would put that kind of time in.

He emphasized that "the instructors who work video technology have to be different instructors than the ones who teach in university, and they should be devoted full-time to teaching videoconferencing." He felt that it would be difficult for an instructor to be doing one type of preparation for "lecturing to the students in the classroom" and another type for the videoconferencing class. "You need to set your mind into what you are going to be doing continuously and always be thinking about that type of process in the video classroom." His reasoning for this was that "videoconferencing requires you to do different types of preparation for a class."

He went on to explain that the course was normally taught in a large lecture room to 90 to 100 students and tended to be lecture in format. Any class discussion was usually the result of questions from the students or ones the instructor posed himself. Although the videoconferencing class size was much smaller, the same lecture format was used "because it was designed that way [by the individual who was to initially teach]. Now, I might have designed it different." In his view, there were instructional methods that could be used in the classroom that avoided the lecture style. "I think the lecture style is where the problem occurs." He indicated that he did a few small group discussions early on when I had an opportunity to blend in some of the things I had done earlier into world history

because we were dealing with North American topics which I had primarily lectured about before. . . . It was not a problem. You just sort of cycle through the sites on board. It works very well.

However, he later stated that he did not use the discussion format very much because “of the lack of interaction between sites. The interaction that occurs comes from them to me and then I have to engage somebody else from the other direction.”

To get discussion happening in his traditional classes, he had tried a number of things. He liked to walk around as he lectured and explained that a favourite technique to get students involved in a discussion was to use sarcasm and irony. For example, after making an outrageous statement that “basically sets myself up in a position that is very poorly defended,” he would walk from the lectern into the seating area of the classroom and sit down amongst the students and ask “Well, do you believe what I just said? . . . Look this position is poorly defended. Don’t just sit there and accept it.” By doing this, he felt he was encouraging the students to see that “their ideas can take my position from me and that their ideas are validated.”

He used a similar technique to regain the focus of a student or group of students who were not paying attention. He would go over to the student/s, sit down, and continue his lecture from there. He had found these techniques to be effective in maintaining student attention and obtaining interaction between him and the students, as well as among the students themselves. In fact, he described the class discussions as “spontaneous and, at times, quite lively and involved.”

Since “neither of these techniques are possible in the videoconferencing environment”, he viewed the students’ learning experience as less valuable. He also found that many of his other teaching strategies had to be altered. His movement within the classroom was restricted because of the limited camera range and the one to two second delay in the signal. The result of this was that he tended to sit or just stand

still as he lectured; a technique he described as uncomfortable and unnatural for him.

Although he felt that interaction with the students was possible, it required a lot of planning, and that even with planning, there was no direct interaction between students at the different sites. All questions or comments were directed to him and he would re-direct them to other sites. He indicated that he literally had to have planned the steps in his head before walking into the room. He had to have a specific idea or question he wanted them to pursue using brainstorming. The few times he did plan the activity, he said it was “a piece of cake”. There was input from the different sites and some good ideas came out of the discussion. However, he stressed that he had to plan it. “Spontaneity doesn’t exist with these students on this video system. It could just be the students, given when I plan it, it works well.”

For all classes, he maintained a file of overheads and visual information such as cartoons, maps, and paintings that he brought into class. He would put the information on the overhead and leave it there while he roamed around the classroom talking about the related topic. This method of using overheads, however, was not as effective in the videoconferencing environment. Even if he had the computer background and hours available to convert the overheads into computer graphics so that they would project better, he still perceived this as a drawback to his teaching style. The room had to be darkened so that the camera could pick up the image projected onto the screen and, in doing so the students would not be able to see him. To him, this meant that the technique of leaving the overhead on while he discussed the material, as he did in his traditional classes, would not be as effective because he would not be able to wander around the room.

They can’t even see you when you are using the overhead [or computer]; they can’t see you and the material at the same time. So I can’t sort of leave an image on the screen and wander around and do

my thing and give them other ideas and then make reference back all the time to what is there like in a typical classroom. They can't see me. So you have to develop different techniques and that requires time.

Browsing through the sites to ensure that interaction occurred was something the instructor said, the students "do [it] for me. Every 15 to 20 minutes I just stop and ask a question. If nobody answers, then I ask specifically from somebody at a site. So I can bring up the next site and watch it for the next 15 minutes." Although this is what he thought was happening, class visitations and observation of the videotapes of the classes showed it was not the case. In this particular course, there was one site that had a group of very cohesive and responsive students who studied together and did not hesitate to ask or answer questions. Because of the feedback he received from the group, he tended to direct most of his specific questions to that site. He did, however, ask open questions, i.e., "Does anyone have any questions?"; but, he did not go out to specific sites to inquire. Although he mentioned that he viewed the sites as one big classroom, his method of asking questions suggested that he controlled which site was on the screen, and therefore, appeared to be teaching specifically to that site.

To be successful in this course, he stressed that it was essential that the students meet two requirements. One was to do the assigned readings prior to class. If this was done, he believed there could be more interaction because the students would "have some sort of knowledge base to work with." The other was to understand the concepts well enough to prepare written assignments. In his view, however, there were two obstacles to these requirements:

The textbook that was assigned to them [by the other instructor], this great big huge conglomeration of junk, is not geared that way. . . . It is very intellectual in its orientation. . . . I get the impression from

these guys when I deal with them that they're not into intellectual history too much. The ideas are beyond them at the moment. They are not ready to cope with ideas like that. Not that they couldn't, but they aren't interested in it.

The other one dealt with the academic level of the students. Because this was a pilot course, the university entrance requirements had not been strictly enforced. At two of the sites, the majority of students had completed their grade 12 and were academically prepared for university level courses. But at the other four sites, the majority of the students had not completed high school. This combination made it difficult for both the instructor and students. "One moment you may all of a sudden be talking at a basic level that for some of the students you are turning them off and the other times you are using a vocabulary that some students don't have the ability to grasp." It was also very frustrating for some of the students when it came to written assignments.

There is one clear requirement of the Department. When you do world history a certain portion of the grade has to be for writing assignments and these people are not ready for that. . . . I'd guess that 75 to 80 percent of the students [in four of the sites] do not have grade 12; haven't even finished the academic upgrading. They're not there and as a result . . . I just think that they can't learn the way the university would expect them to learn.

Commenting further about the make-up of the students, he indicated that "from my experience with working with Aboriginal people, they don't learn the same way and this also creates a problem." Although he did not feel that the two groups should have been taught in isolation, he did "think there are instructional methods in the classroom that avoid the lecture style and can be used to integrate those two learning approaches. I think the lecture style is where the problem occurs." However, as for the use of the videoconferencing system, the Aboriginal students appeared to be "quite

comfortable with it because it had been in use for four years and most of them had taken at least one course using the technology.”

In summing up his experience, he described a potential downside, “Since I am here and the students are everywhere, there has to be a mechanism, a support mechanism between the instructor and the other on-site administrators somehow or other. I can’t just be some voice on a telephone. There has to be some sort of recognition that their role and my role are co-ordinated; the two of us are on the same wave length and we are pursuing goals together. Otherwise, the students don’t have the support mechanism. So, they will regress into just sitting there and nodding their heads.”

The type of regressive behaviour he was referring to could also occur in the traditional classroom. However, he stated that he could ask the student to stay after class so they could “discuss a couple of things together and make sure that they are on the same wave length.” This option was not available when teaching via videoconferencing. “You can’t do that on the video, right. And, I can’t force them to phone me during office hours.” If a support mechanism “between me and the sites’ administration is established so that these people and I are on the same wave length, then I don’t have a problem because then what I would do is contact the student through the [site administration].” He closed by indicating that, “this technology is great. I think it can go lots of places and can do a lot of good things.”

Instructor C

After teaching this first year course or an equivalent of it for the past 10 years, this instructor described himself as a “veteran, seasoned instructor of the course without a section! The main reason he did not have a section to teach in September was that he had not defended his doctoral dissertation when the regular course assignments were made in March. However, when the department decided to offer this course as part of the videoconferencing project, his Associate Chair approached him to teach it.

He knew I was now eligible and in my evaluations I always get good stuff on sense of humour, performance angle, liveliness in the classroom, the dramatics. So I think he knew that visually I would work well and I am good at it.

He went on to further describe the feedback he had received about his teaching style. “I’ve got a strong teaching record, but especially in the areas of being entertaining, being good visually, that kind of stuff. Good student rapport and being very flexible.” Although he hoped that these characteristics were the main reason he was offered the course, he admitted that there was another reason. “But part of it was simply, they needed somebody to do it; I was an experienced teacher; and because I was still at the end of my program, I was still available.”

Most first year courses in this faculty had enrollments between 200 and 300 students. However, because of the heavy marking requirements and individual attention given to the students, the enrollment for all sections of this course had been restricted to 35 to 40 students. The videoconferencing section was no different. Initially there were 34 students registered between six sites. By the end of the year there were only 11 students and three sites. The main reason for the high attrition rate was an inappropriate screening of students. Although this was a university course that required a minimum of 65 in English 30, those individuals involved in

recruiting students for the project overlooked this requirement. According to the instructor,

They weren't even close to being ready. Easily 10 of them I wouldn't give a passing grade in grade 9, as far as their English is concerned. Their attitudes were just terrific. But reading comprehension was just terrible. They couldn't understand the questions on the exam, yet alone answer them.

He pointed out that this created a problem for him because his Department was "very vigilant about their standards. If you can't write the Queen's English, if you can't write competent English when you are at university, you should not pass." Once he was aware of the educational level of some of his students, he informed several of the individuals involved in the administration of the project of his Department's policy and that there was a very good possibility that at least 20 of the students would not pass the course. He indicated "I needed to know that the institution was behind me in those decisions, and they were." He had also encouraged a number of students to withdraw prior to the deadline so that they would not have a failing mark on their transcript. "So for the first time in my teaching career, I have had to directly advise students to withdraw." The big issue in doing this, however, was determining when the withdrawal deadline was and making sure that the students filled out all the papers before then.

Even though this instructor realized there were a number of students whose background in English was below university entrance standards, he did not appear to make any compensation for this during his lectures. The level of vocabulary he used in class demonstrated his extensive understanding of the English language. However, this was well beyond the comprehension of a grade nine student and in some cases, probably unusual for an average grade 12 student. For some of the terminology, he did provide an explanation and even went into the origin of the term. An example of this was his ten-minute explanation of the difference between

the words “heterogeneity” and “homogeneity” and their origin. At the end of his explanation, he asked the students to give him examples of similar words. However, none of the students at the four sites provided any examples. So, he went on to explain the difference between “spit” and “expectorate”. He commented after the class that although the students were not tested on vocabulary, “it is important that I make them aware of different words even if they don’t understand all of them or ever use them. That’s part of the educational process.”

The students’ level of vocabulary also had an impact on how the instructor presented the course material.

I have gone to more of a lecture style and away from the Socratic method for several reasons. Partly because I was running into the problem that if I used the Socratic method and the student would speak, it was, more often than not, that a student would misuse a word because his vocabulary was poor. So I would end up saying, “Wait a minute, you don’t mean ‘insinuate’, you mean ‘imply’, don’t you?” So we would get sidetracked and the student would be kinda put off. So after awhile I decided that I’d do most of the talking and then invite comments and sharing. . . . If you are teaching Socratically, you are trying to [teach] under the guides of question and answer and if the student isn’t answering the question in the way that your lecture needs him/her to answer, then that is on your mind. So I have found that this mode of delivering the material suits me well with the technology – speaking into the camera, mini-lecture, and then inviting student comments rather than the constant interaction between student and instructor that you would have in the genuine Socratic method.

The lack of reading comprehension and word usage also caused problems for a number of students when they were working through one of the novels in the course. He described his reasons for selecting Hard Times

by Dickens as, "The Department has a list to select from. My dissertation is on Dickens and comedy and Hard Times is his shortest, although maybe not his easiest." During a later meeting, he commented that the selection of that novel did create problems for some students. "Who knows how they dealt with it. I bet they didn't understand four words in a row. I tried to go over words and phrases that I thought they may have problems with, but who knows if I covered all of them. It's tough if they don't ask."

Another problem that was generated as a result of the selection of Hard Times was the inability of most students to relate to the concept of congestion in British cities during the Industrial Revolution. Prior to the beginning of the course all instructors involved in the videoconferencing project visited the sites to meet some of the people working on the project, including some students. It was at that point that this instructor realized the students might have some difficulty relating to the novel.

When you fly up there, you see that even the houses are what I would call a block between each house. And so, there is this wonderful sense of space and I realized that OK I'm going to have to work really hard to give them the sense of how claustrophobic a city can be because they haven't gone through that experience.

He pointed out that this would not be a problem in a traditional class because the students would have to come into Edmonton to take the course. To help his students get a feel for how crowded the cities were, he brought in pictures from that period and projected them using the document camera. This he indicated "worked out quite well."

In his traditional class, he used unannounced reading quizzes as his "major way of assessing who is best prepared for class and whose reading comprehension is best." He gives the students 13 of these quizzes, worth 10 points each, and then allows them to drop the three lowest marks to obtain a mark out of 100. He described these quizzes as "a means of gentle coercion to make sure they finish reading the work in time to discuss it. It

shows you whose reading comprehension is good, who is good at picking up details, and you can use your reading quiz to put something on there to highlight something they may have missed.” He felt that the students really remembered things that were included on the quizzes. Videoconferencing, however, did not allow for this type of spot testing. In order to include them, he would need a proctor at each site and he would have had to plan for that ahead of time.

You can’t proctor it by yourself because you can’t see all the sites at once. So the potential for cheating on reading quizzes is high. Especially if you have students, like we seem to be getting, whose reading skills are weak and whose reading comprehension is weak and they are reading a novel for the first time or they are reading a Shakespeare play. . . . And, they get panicky, and they are worried, and they feel compelled to cheat, or in some cases they are just unethical and cheat because that is what they want to do.... So there are things like that that are being lost with the technology.

Another method used in his traditional classes to get a feel for how his students were doing and to help them with their writing skills before they submitted a major paper, was to assign three or four small writing assignments. With these assignments, he expected the students not only to demonstrate their ability to write a coherent, grammatically correct paper, but also to use the correct format such as margins and spacing. He felt that these smaller assignments were beneficial to the students because he was able to give them written feedback and return them quickly. In the videoconferencing class, however, he only did one of these at the beginning of the course. He found that “it takes forever to tell them about the assignment and then send up a written copy; have them do the assignment and send down all their stuff; for you to mark it and then send it back up again so they have time to act on the advice you have given them for the next assignment. So it was just a total nuisance.” Although the students

had access to a fax machine and could have faxed their completed assignments, he did not consider that as a real option.

That's a possibility, except that this course is partly designed to teach them format. So to some extent you want to see how good they are at preparing a document. So that could work, but there are also issues of student confidentiality. So if you fax up a bunch of marked quizzes and they are coming through the fax machine, you can't always control, at the site, which students are standing there watching.

On the plus side, he stated, "because we have had so many different sites, I have had some of the brightest students I have ever had." He described how the students at one of the sites had formed a study group and that the

dynamics of the group was super. I had one course at another post-secondary institute with four or five students who got together to do that. And this is the second time I have seen it happen directly. It's really terrific. They are all doing better. They are all doing better than the other people.

Even though he had expressed some concerns about using quizzes and assignments, he could see some definite advantages for teaching using videoconferencing technology, and in fact, he was extremely enthusiastic.

I really like the medium, even on its own. So much so, that I would like to propose doing a course on the system on campus from one classroom to another. Your students can see you very well, and they can hear very well, and you can hear them.

He went on to describe some of the traditional classrooms that he had taught in as being large but "not big enough to put a microphone on; but, there are still some times where there's pretty bad acoustics." The size of the rooms also makes it difficult for some of the students to see the blackboard. In the videoconferencing class he used Windows' Write program

to type his notes during class and projected the text onto the screen. The students at all the sites were able to see it.

The system takes care of some of those things. What's also really wonderful about it is that I can walk in that lecture with a disk and everything I'm going to be putting on the blackboard is already prepared. The instantaneousness is wonderful. I like to do things with perception and my area of expertise is comedy and what makes people laugh and it has a lot to do with timing and speed. . . .They can't see what you bring into the classroom. So I'm interested in perception stuff, and you can take the camera off yourself; you can put on a top hat, and bring the camera back on yourself. . . . So there are ways, things you can do to surprise them and keep things interesting and to keep you from being boring. . . . Students these days want you to be NOT boring. Entertain me, and teach me on the side.

He did mention that there were problems with reading students' facial expressions. In his traditional classes, he relies on these to get clues of the students' level of understanding of the topic he is covering.

Sometimes you get the wonderful perk of seeing that a student is getting it; you see that glow; they are getting the big picture. You don't see that. You don't see the emotions in their eyes. Or little clues like "OK, I understand what you mean by whatever, so go on. No, don't go over it again, go on." And you can see who is bored and who has got it. You don't get those cues with this system.

Another area that he felt was missing when he taught the videoconferencing class was the personal contact with the students. In his traditional classes he had the opportunity to get to know his students. Students would stay after class or stop by his office to talk to him about the course or just things in general. By the end of the course he felt that he learned a lot from and about all his students through both their written

assignments and discussions in and out of class. "There isn't as much personal contact; so, you don't have as many cases when a student comes up to you and says, 'Oh, you know, I have been missing class but I'm sorry my boss has had me working on this extra project'. So I'm just guessing why students may not be in this class." In an attempt to overcome this void in his videoconferencing class, he gave out his home number and told the students to phone him if they couldn't call him during his office hour, which was Wednesday afternoon. He indicated that he usually had at least three calls a week during that time. However, "for the most part, they just phoned me at home" because that worked best for them. This allowed them to get help when they needed.

I'm very flexible about that. So that's sorta the price I'm prepared to pay for not being able to meet with them in person. So I said, sure phone me at home just don't phone me after 9:00 p.m. or something and that has worked well. But then we have kids in the background at their place and kids in the background at my place. But, you know even then that's great because they realized that you are a person and have a life.

Prior to the start of classes he had four hours of instruction on how to use the technology, what to wear, best place to sit, the basics of videoconferencing. During the training, he was given the opportunity to try out the computer, document camera, and the controls for moving the cameras at his site. However, there was no opportunity to link up with one of the remote sites to get an idea of what it would be like to teach. This was one of the two areas of the training he felt needed to be strengthened. The other dealt with the instructional design component. Information on and assistance in designing or converting the course material so he could use the various peripherals with the system was lacking in his view. He indicated that he had been told that a group from Australia had spoken at a teleconference and they said "their instructors need something like four

hours of preparation time for one hour of videoconferencing lecture time to develop material for a new course. And these guys had been trained in designing courses.” He went on to comment, “We were offered the job in August, end of July. So we were kinda thrown in with no time to convert your lectures to take advantage of the technology. And, even then, ignorant that you should even be doing that.” It was his belief that if he had been given more time and guidance for preparation, he would have been able to put the technology to great use. “Boy, if we had known back in May, and if they could have paid us over the summer to get ready. But why should they pay us to develop this when [they] don’t pay other instructors to develop the courses they teach?” Although he felt he made use of some of the peripheral equipment to enhance his teaching, he stressed that in teaching English,

so much of your time is spent with marking – grading papers. Even if you mark at the rapid rate of 30 minutes per paper, with six sets of 750 word essays and 35 per set, that is taking up a lot of time. You don’t have the time left over for lecture preparation. So you’d want to do your fancy visual lecture type preparation in July and August. And of course you aren’t being paid yet. Even if you are on full-time, you have to be publishing, research, research, research. So I would like to see the university get more of an attitude, let’s pay this person for lecture preparation time.

In describing how he planned and organized his course material for teaching in the traditional classroom, he indicated that his department granted the instructors a fair amount of flexibility in how they did that. There was a list of novels, poems, and short stories that instructors have to select from and guidelines on how many of each they should cover throughout the year. From there, each instructor was on his/her own. The amount of preparation time that he required for his traditional classes was

described as minimal because he had been teaching the course for so many years.

However, he felt it was important for him to set the stage for the material that will be covered. "I like to play around with the idea that when they are watching me, they are reading a text. So, I'm a text. So I do things with my clothes and stuff." This was another area where he demonstrated his ability to be flexible with using the technology even though he felt he was at a disadvantage because of his lack of training and preparation. He indicated that it was important for an instructor to admit to the students that he/she is fallible. "You know things are going to happen and you are going to be embarrassed, so just call a bug a bug. I'm very at ease with stuff like that and I know some of my peers aren't." He suggested that when something goes wrong to "throw a bit of humour at it" and then offered an example of how he handled a situation.

I had my mute button on and I didn't realize it. So I was chatting away for seven minutes or five minutes and the students were trying to get my attention; but I was looking down at the machine. And so finally we realized, I realized what was going on and I looked up and said, "So that's the most important thing I want you to know for the final exam. If you know it, you will do well." You have to be very comfortable; you know, not sweeping things under the carpet. By doing this, your students have a sense of co-operation and that you are fallible. If you are the kind of instructor who is expecting to walk in there and be perfect, you are going to be a nervous wreck.

In contrast, he felt that the majority of the students were very comfortable using the technology and learning in the distance environment. He described how "one day they all dressed up [at one of the sites] and came on camera all with hats on. So they had a silly hat day." However, he felt that a more important indication of how comfortable they felt was the amount of interaction that took place.

I thought I was going to have to be 95 percent lecture because it was going to be so hard to have classroom discussion with all this pushing of buttons and things. It has been just the opposite. They feel more comfortable. The class discussions have gone better than in the conventional classroom.

Even though he felt there were better discussions taking place in the videoconferencing class, he later described a technique he used when studying a novel that did not work well.

This week we have been doing a novel and I have been reading out some passages for like maybe 10 minutes. So we would assume . . . you have this sense of "Have they gone. Is there anyone out there?" Once or twice this year literally I've said, "Someone please say something. I just want to know that you are there." It makes you feel very unusual.

He corrected this problem for the next class by preparing specific questions to initiate students' comments.

One of the activities that he noticed occurring quite often with his videoconferencing groups that did not happen in the traditional classroom was small group discussion before someone answered a question.

Sometimes what you will see are the four or five students at a site discussing. Before they hit the mute, they're saying, "What do you want to say?" And there is a class dynamics that is created amongst those people that is terrific. Then they push the button and one of them says what they are doing. And that has turned out very well.

His explanation for why this interaction was so good was, "I think it has something to do with, at each site there are only two or three other people present and they don't feel so intimidated by a mass of 40 or 240 students." He did indicate, however, that there was a problem at one site with a group of students talking about non-course issues during the class and disrupting others. This site was not one that provided any comments

nor did he scroll through the sites as he was teaching, so he never saw them on screen to observe what was happening. This type of situation has happened in his traditional classes, and he was usually able to handle it by just looking at the group. This was not the case in the videoconferencing class.

You can't obviously use things like looking over to the corner of the classroom where the conversation is taking place and is being disruptive and just letting those students know with your eye contact that you have a problem. So, I'll use my eye contact to get people to be quiet if they are having a genuine conversation. I don't mind if people just lean over and ask a question. So, I have never been that kind of an instructor to say anything in the class about that for the last few years. Instead, I'll take the students after class. . . . Sometimes you can get that job done just with your eye contact and obviously that is not available on this system. And you don't have the opportunity to pull someone aside after class and say, "You know, Julie, you and Evelyn are always talking and it has really become a problem; so, please stop." So that opportunity isn't there.

Interrupting students when they ask questions or provide input is "one of my big problems as an instructor." It was also a problem he felt the videoconferencing experience helped him overcome to some extent in all his classes.

So a student will begin to answer and my mind will take off and I can see some neat ideas and I'll say, "Oh ya! and do you see that you could ..." and I have had to really control that. This is wonderful. I can't interrupt. I have to push a button. I have to . . . So it is easier for me to hear the full response from the student and they don't feel cut off.

In closing comments about his experience, he stated that not having students in the same room as he was did not create the problems he initially

anticipated. "I don't feel it is a big issue not having bodies in the room. I don't feel it's a big issue that the bodies are at different sites. We still have, it's one of the warmest classes I have ever had." He also like the flexibility and variety the technology gave him.

I like the technology in the classroom because you can go to the document camera, to the thing you have on your overhead, to what you have on your computer screen, to your main camera, to your auxiliary camera and all you are doing is hitting buttons. I've seen some literature that suggests that no matter how eloquent, moving, compelling a lecture is, if you lecture for more that 15 minutes, people tune out. So this helps provide variety.

As for suggestions for helping first time instructors, his priority items were "designated time before the course begins to prepare the instructors with the technology and to give them some time, paid time, to convert their lectures to this kind of course delivery." He did not, however, feel that more time on how to use the system itself was needed. Instead, he emphasized the need for conversations that included information about "here is how the classroom changes and here's how you may need to convert your material."

Instructor D

This instructor has been teaching for the Faculty since 1983, and for three years prior to that she taught at another post-secondary institution. She had taught a variety of undergraduate third and fourth year and graduate level courses. The majority of these courses were full-year courses and included a clinical component. For the past year and a half she has dedicated all her time to three research projects that were approved in 1995. She viewed her return to the classroom in January 1997 as a positive change because as she said, "I like teaching. I don't mind teaching at all." What she was concerned about was the time required to complete her research, prepare for two new courses, and learn how to use the videoconferencing system.

Most of the undergraduate courses in the faculty had enrollments between 40 and 90 students, and the graduate ones between 5 and 12. The videoconferencing course, which was a third year undergraduate course and a pre-requisite to another course in the post-basic program, had 20 students between three sites. The other new course she was teaching was at the graduate level and had five students.

In describing her classroom style, she indicated that she taught "in a way that I know my students. I tend to be fairly relaxed with students and tend to do a fair amount of talking but I tend to get them talking in class, too." In her smaller classes, especially at the graduate level, she would know all her students. She clarified what she meant by "teaching in order to know students" in relation to the larger classes of 60 or more. "You get to know some of them. You get to recognize them; you know them to see for the most part. But, no you wouldn't get to know all of them." This, however, was not a concern for her.

One of the factors that she used to determine the format her teaching followed was not so much the size of the class, but rather the maturity of the students. She saw graduate students as willing to take responsibility for

their own learning and to come to class prepared. "Students don't take on that responsibility in the undergraduate courses. They expect you to teach it to them. It would have been wasted time if I had expected them to come in prepared to discuss the material." Because of this difference, her undergraduate courses, no matter how many students, tended to be lecture focused with some student interaction through her use of questions or those generated by the students; graduate courses were all seminars with discussion led by her or one of the students. She had used group work occasionally in the undergraduate courses for case analysis, and although she felt it was worthwhile, there were problems finding space for the break-off groups in larger classes. During our initial meeting, she saw this as a strategy that could probably be used for her videoconferencing class. However, when the course was finished, she had not done this. Her reason was that it would have been

too cumbersome. When I have done case studies before in (my traditional) class, I have always divided them into groups... Usually a maximum of 4 or 5 students work on a case study. So if we were to do that, I would have been concerned about doing it with me not physically there. Part of what I do when I do case studies in the larger group and divide the students into smaller groups is that I go around to the smaller groups. I wouldn't be able to do that.

She did, however, use a fair number of videos in most classes in an attempt to generate discussion. "It's not that I use them for every class or a long part of any class; but sometimes they are things that you can sorta spin off of very easily. The video that is, because it is just right there." This strategy, however, was one she was not sure would work in videoconferencing because of the need to book additional lines and not knowing what the quality of transmission would be like. In contrast, she did not use a lot of examples. "I don't tend to use a lot of examples.

Personally, as a student, I don't like hearing a lot of examples. So I don't tend to automatically use a lot until I see that the students need them."

Teaching via videoconferencing was a totally new experience for her. Not only had she not used videoconferencing before, but also she had never taught the course. The concept, however, was not new to her because members of her faculty had been using videoconferencing for the previous year. From conversations she had with one individual who had taught the course she was going to be teaching, she developed some concerns about the technology. She commented,

The faculty person who taught this course last year told me she tried everything she could and they [students] just hated it; they hated the technology. She had the worst teaching evaluations she has ever had. She said it did not work well at all from her perspective; the students did not like it.

She admitted that at the time of that discussion she had not yet seen the classroom or anyone teach using the technology; but she could relate to the students. "I wouldn't like it. I know that, and I can certainly see why the students didn't like it. It would be very difficult to sit there for a few hours and watch somebody talk." This initial reaction of hers was later reinforced during her course when one of the instructors from the other sites was teaching. "I certainly found it hard to keep attention when people were teaching from the other sites. . . . I just found it tedious. And I know from what my students said, they did too."

The conversations she had with two other faculty, prior to attending their classes, also caused her concern. Both individuals had experienced technical problems, and while one person had been able to get the students at the sites involved in discussion, the other person had not. These concerns did not disappear after she had attended each class. In fact, she came away with others.

I guess in terms of sitting in on these two people's . . . one wasn't a good one to sit in on because she had a guest and the guest was at the other site and just lectured to the students. There wasn't much in the way of participation at all. I didn't see much opportunity where interaction could be. It gave me an opportunity to see what happens with guest speakers, and I'm concerned with that.

Although she had these concerns, time constraints did not permit her to meet with any of the instructors who had or were presently using the system or with the distance education trainer who had assisted the other instructors in preparing for this new teaching experience. Her introduction to how to use the control panel and the other peripherals came on the first night of the class when the videoconferencing technician went over everything with her. As for preparing the course materials, she commented that she had not asked for any input from the other faculty because

I've taught for a long time and I have ideas of how to put course material together. And to be perfectly honest, I was one step ahead of the students. I couldn't have put the course material together any differently than going through what other people who have taught this course have done and trying to figure out how it would fit into the compacted time.

As for the preplanning activities for the course, such as the course outline, readings, teaching assignments, and guest speakers, she used the same procedures as in the regular courses she co-ordinated. "I've worked with teams on this faculty for a long time, and I have been course leader for a long time." The only difference was that the other two faculty members were at the remote sites and that meant that discussions took place over the phone, in faxes, and through e-mail as opposed to in-person meetings. "But the process is the same as what I have done here in terms of trying to communicate, trying to be sure everybody buys into the course outline, that sort of thing."

When team teaching on campus, she indicated that she would generally have a meeting about once a month with the entire faculty. Until now, all of the courses she taught were

nine credit courses that have lots of hours of lectures and clinical. So the faculty were dealing with the students clinically in small groups. I saw them in the big class and had my own clinical group often. They were much more complex courses.

For the videoconferencing course, she did not maintain that type of communication process. Although she indicated that the previous instructor held teleconferences the day after each class, she hadn't done that.

I don't have the time. I'm not here. That's reality and so we haven't done that. So we have probably communicated less as a faculty team than the others. I haven't talked to them always every week. But, if they have concerns, they phone. I phone every once in awhile to see if there is anything. . . . See with this type of course I don't think there is the need to meet like there is with the other types of courses I've co-ordinated. There are all sort of issues in the clinical courses that come up. And they are all nine credits.

In determining the division of teaching assignments, which is the responsibility of the course leader, she indicated she "deliberately gave the people at the other sites lectures that did not have as much content in them and they could possibly do in the time allotted." Her reasoning for this was

because I am course leader, partly. I didn't know who they were. I know there have been issues in terms of the quality of content at the other sites, and I didn't know whom I was teaching with. So I gave them their share of stuff to do, but it wasn't, they didn't do nearly as much as I did.

Later in the discussion she commented again about the two instructors who were teaching with her.

I had two of the best people at each site teaching this course. So that was not an issue. . . . They could have taught it. We could have done it individually at each site and it would have been fine in this course with the people who were teaching it.

When asked why she had divided the teaching load like she did, she did not directly relate this decision to using the videoconferencing system; but she felt that it did play a part. The two faculty members at the remote sites were teaching other heavy courses, and it was her belief that that combined with learning how to use the technology would be enough for them. One of the individuals, however, had team taught the same course last year using videoconferencing and had just completed teaching a different one using it.

In planning the classes, she indicated that she kept control of the first three classes and that this was no different from any of the courses she coordinated. "I usually do the first block so I get to know the students, who they are, where the issues are at the beginning of the term." With this in mind, she indicated that she had not put much content in the first class because it was really an introduction to the course explaining why it was being offered at this point in the program, what would be covered, the idea of team teaching, and then an hour off-line to get to know each other at their sites. She hoped this would give everyone, including herself, a chance to get comfortable with the class arrangement. By doing this, however, she was actually using two classes for the introduction since the course was taught one day per week for 3 hours as opposed to two days per week for 1 1/2 hours each. After that class, the format changed to include 2 hours of on-line lecture or guest speaker followed by an hour seminar conducted independently at each site to discuss the new material. This she pointed out created another problem. This problem, however, was not related specifically to videoconferencing, but rather to the timetabling of the course.

As previously mentioned, the on-campus course was offered twice a week for 1 1/2 hours each. By teaching the course one night a week for three hours, with only two hours for presenting new material, "we have to get a lot of content through in that first couple of hours." In addition, there were several days that they would not have a class because of some events and the last class had to be the final because of the university policy.

We don't have a lot of time. . . . Our options would be to videoconference for the whole three hours and not have any seminars; but the students prefer to have the seminars, and I prefer to have them.

The reduced number of hours made it difficult for her to develop the course in a way that was really the same as the on-campus course. "We are not talking about a course that is easy to put into that small bit. It hasn't been developed for that." When asked about the possibility of changes, she commented,

Maybe I could change some of the course; there are a few things I would eliminate, but not much. So, it could be done differently another time; but I think there are also some things that have to be covered in class and it is hard to get it done in the time given.

In her view, the use of seminars was "a better teaching strategy" than straight lecture. However, when asked if she would have included the seminar session if the course had been taught in the traditional classroom, her response was, "Probably not because there would just have been me," implying that if it had been in the traditional classroom, she would have had 90 to 100 students. She went on to indicate that

Personally, if I didn't have to videoconference and I had a small group like I did here of nine, I would do the whole course by seminar. I wouldn't lecture at all.

She felt that the students probably got more out of the seminar aspect of the course than the two hours of lecture "because all the application was

in the seminar. We mostly did case studies in the seminars.” Although each site was to deal with the same material during the seminars, she was not sure what was actually happening at the other sites. The results on the mid-term take home led her to believe that the same emphasis was not being placed on certain concepts. In particular, there were several cases on the mid-term “where people gave situations and examples and made judgements that I felt were really judgmental comments about situations that I find quite unacceptable.” In an attempt to explain this, she suggested, “it also could be a personal thing about me that came through in the seminars that didn’t in the other two sites.” She indicated that she stresses the importance of avoiding judgmental calls and questions her students’ reasoning with phrases like “What makes you say that?” or “Is there another way of looking at that?” She noted that she does some of this in her lectures.

I’m being very careful when I do my lecture content of trying to discuss things in a way that’s not judgmental and to be quite explicit about saying it is easy to make judgements on some of these situations, but we have to ... But that kind of teaching is better done, I think, in the seminars, in the discussion with the students.

She indicated that this concern might have been overcome if she had had the opportunity to go to the other sites for one class each as she had hoped to do. This would have given her a better feel for the students. “That could have been done if I had fewer things to do. Realistically that is never going to be an option probably without substantially taking away time that I probably will never have.”

She went on to further describe the importance of the seminar hour, this time from her campus-site students’ point of view.

My students have actually indicated, because they know people here taking the other course where, in fact, it is straight lecture, and they mentioned to me that they felt really hard done by for the first couple of weeks when they realised it was videoconferenced. But, then later,

they felt it was an advantage being in the small group and having the seminar.

Throughout our conversations when she referred to the students, she continuously referred to the students at her site as “my students” and those at the remote site as “the students”.

In looking back at her visits in the fall to the other instructors’ classes, she indicated that she found the teaching environment to be more contrived and awkward than she thought it would be. “I’m used to being close to my class and having a lot of back and forth dialogue and you can’t do it in the same way in videoconferencing particularly when you have two sites at the other end.” The items that surprised her most were that she could not see both remote sites on the screen at the same time and that the visual reception was worse than she expected. She compared the visual reception to the telehealth technology that she had seen in use. “The telehealth system is superior. The picture is far better; sound’s far better; there is no time lag.” Because of these concerns, she realised that she would have to make some changes in the way she normally conducted a class.

In our initial meeting she commented, “One of the issues I did notice was that you cannot see the facial expressions on the students. You cannot pick up the early clues that they don’t understand or that they are disengaging that you would in a face-to-face classroom.” She indicated that as an observer it was “really obvious and pretty far along by the time I picked it up.” As the instructor, she felt she would be even slower in picking up these clues because she would be “dealing with all the content and everything rather than just observing.” This was an issue that she never worried about in the traditional classroom because she was able to see clearly the expressions of her students. “I can see when they are puzzled.” She did feel, however, that having students at her site would help her pick up these clues earlier. But “it is going to be a different sort of a way of

doing that," and this would require changing some of the ways she usually taught.

I think, possibly by asking really thought-provoking questions throughout will help. When I do my preparation, I tend to just do an outline if I know the content really well. If I don't know it really well, which I don't with this, I will tend to have more information written down that I can refer to. But I tend to be fairly "play it off the cuff" in terms of asking questions and involving the students. I don't usually have that in my lesson plans. I think I'm probably going to have to build those in, those questions, so that I am very conscious that I do that.

In order to do this, she said she would have to plan in a different way, but was not sure what that would involve. "What that means, until I get into it, I'm not really sure. But I think that questions are going to have to be more interesting and reflective so to pull people in, in a way that is different." This, however, is something that she did not do.

I ended up not doing that. Probably should have. But I never had the time. For the most part, the content that we were presenting took the time that we had for the videoconference. Discussion would have meant eliminating content.

This did not however appear to be a problem when she taught in the traditional classroom setting. If the students got into a good discussion, she would let it continue and postpone the remainder of the lesson until the next class. Although she felt that class discussion was a good learning tool, she *did not think it would work in the videoconferencing class*. "Everyone I have talked to said you can get good discussion when you are only videoconferencing to one site. If you are videoconferencing to more than one site, it is much more difficult." In addition, she said time did not permit this in the videoconferencing class.

As mentioned previously, the idea of eliminating content or expecting the students to read it on their own was not a possibility for her. "They have to cover all the material to meet the requirements of the course, and I know from past experience that beginning degree students don't do all the readings." She said that she knew for a fact that a lot of the students in this course weren't doing their readings. "I know from my own students. They would say that there were too many readings and a lot of them were trying. . . . My students were probably representative - carrying full-time jobs, have a family, and taking courses" which she admitted would be no different if the course had been taught in the traditional classroom. She indicated that in general these students were mature "copers". "Nobody is going to carry a full-time job and have family, and come and do courses unless they do well with coping. I don't have anybody at this site, for example, that does not have the ability to do that. . . . I have several who are good candidates to go on to graduate school."

Asked about interacting with the students at the remote sites, she explained,

Nobody interacted. If I asked if there were any questions and didn't specifically say, "Are there any questions at site A?" or "Are there any questions at site B?", I got no response at all. So I had to specifically cue which site was to respond.

If someone did stop her, it was usually to ask her to repeat something because the sound was bad and they could not hear. Occasionally she would be able to read the cues from her students that someone had a question or wanted to say something and she would stop. But, she couldn't see the students at the other sites to read these cues, and the other instructors seldom indicated if there was a question. She justified this with "But you know, part of the thing is the lag time. By the time you hear it, you are already talking about something else." If there were questions, however, she stated that most of them came from the site where the

teaching was taking place. Her students, she felt, “were pretty good about asking questions actually. Even when they were being taught from the other sites.”

Although she indicated that the situation was the same when the other instructors were teaching, she did mention that one instructor was able to get the students at all sites involved.

One person did and what she did was give the students questions a week ahead that they were to use when they did their readings, and then she would specify which site these questions were to be answered from. That worked OK, and the students, I think, didn't dislike it.

She immediately clarified that this strategy would not have worked for her because “I was never more than a week ahead in my prep.” Next year, however, she felt things would be different because she had now taught the course. She did point out,

the other thing you have to keep in mind is that at the other two sites that is what the faculty do; they teach. That's their job. That's it. OK. That's not my job; that's part of my job. The people I have worked with have been really good this year. But, keep in mind their job is to teach. That is just part of mine. And I have limited time for it.

Asked about her plans for teaching the course next January, she indicated that the format would remain the same – two hours of videoconferencing followed by an hour seminar. The first thing she mentioned that would be changed was the format for the mid-term exam.

I'll keep the mid-term questions because they were good.... But I won't do them as an exam. They will be assignments and they will be on the course outline so they will know from the first day that they will have to do them.

Another change she was planning to make dealt with the guest speakers. Because it was her belief that undergraduate students did not think the content presented by guest speakers was important, she was going to do more of the content on her own. She mentioned the students' lack of attention to one particular speaker.

I had a guest speaker because it was her area of expertise and it was not mine for a very important part of the course. And I think the students didn't take it seriously enough. . . . I can tell from the mid-term exam that they hadn't clued that this particular content is fundamental to understanding the entire course. So I will do that section in more depth.

The only other change she thought she might try was generating questions the way the instructor from one of the sites had done. Her plan was to develop a question for each site to respond to; but, rather than have the questions "very concrete from the readings" like the other instructor did, she would ask questions that would require the students to think more.

In a final reflection of how the course went, she stated "To me it hasn't been a disaster; it's just not the best way. I feel I have made good connections with my students here, and I hope that that has happened at the other two sites. And with the faculty there, it probably has."

Instructor E

In contrast to the other instructors in this study, both the course content and the videoconferencing teaching environment were familiar territory for this individual. She had taught the course seven times before, six in the traditional classroom and once by videoconferencing; and, in describing her first experience teaching via videoconferencing, she indicated, "We went in thinking that we would teach it like we would teach a traditional class. Boy, were we wrong!" She went into the course this year determined to overcome the obstacles of the previous year.

This was a required first year course that provided an introduction to the profession, its history, and issues. The traditional classroom setting had 50 to 60 students and was taught 3 hours per week. The instructor described the teaching style as ". . . a combination. There's lecture because of the numbers; but there is also a lot of break up into groups for discussion and then bring it back." Because there are so many issues in the profession and they are all new to the students, the instructor commented that

It's nice for them to be able to come and talk after class and come up to my office. It's the first time they are hearing about a lot of these issues . . . and it's nice to be able to help them with one-on-one contact.

This type of interaction allowed her to get to know all her students, which was something she considered very important for an instructor to do. In fact, she indicated that she had taught the same course immediately after the videoconferencing one and knew all the students within the first month. This was not the case with the videoconferencing class.

In the videoconferencing class there were three sites: the instructor's site with no students and two remote sites with a total of 40 students. Each remote site also had an instructor in the classroom. The course was part of the nursing degree curriculum and therefore, the lead instructor and co-ordination had to come from the university. The fact that the instructors

at the other sites were qualified to teach the course did not matter. What this did allow, however, was for these individuals to do some team teaching and to deal with issues that were specific to their region of the province. But at the same time, she indicated that this set-up was one of the main reasons she felt that 'getting to know her students' was hindered.

They had instructors at the other sites on site and that makes a real big difference because they can go to the instructors there. And they really viewed, I think, their instructors at their home site as their actual professor. Where I was a professor, but not. Something like a visiting professor. Like a voice from out and beyond.

Although the course was offered twice a week (90 minutes each), she only had the students for one class. The other class was taught by the instructors at the remote sites and was used to review/discuss the content from the full class session or to cover content specific to each site. The format had been the same the previous year, with one exception. Because of a conflict with the videoconferencing bridge, it was only possible to have the three sites connected for an hour; so, she would alternate. "One week I would spend my last 20 minutes with one site and then the next week with the other site." She used the time for discussion and questions. There was very little interaction with the groups as a whole that year.

We used the time for discussion and questions; and, actually, that was good. That was quite enjoyable because we were looking at smaller numbers of students. They were way more likely to talk to me. Not only did this give her an opportunity to get to know the students; it also got her out of the lecture format. Because the distance teaching environment was new to everyone that year, she indicated, "I found we were slipping further and further into lecture style format. So that 20 minutes was good for more exchange."

This year she had the bridge for the full 90 minutes, and therefore, did not have the opportunity to spend the time with the individual sites. She could have scheduled it; but, as she indicated a number of times

We did things so differently this year that the lecture format was just so much less of an issue. . . .We structured in a lot more group work, you know, question periods, like things where they would have to talk to each other from site to site.

Even with the changes and reduction in lecture time, she still did not feel that she knew the students. "If I passed one of the students on the street, I probably wouldn't know them. So, that is something I wish that I had done better."

Preparation for any course was a "last minute" thing for her, and the first year she taught via video was no different. She used the same techniques.

There is all the background work, of course. I gather my stuff and I would prepare a lecture, some case studies, maybe some newspaper articles, something that related to the topics and then I would take it from there.

She indicated that it did not take long before she and the other instructors realised that what may have worked for them in the traditional classroom was not going to work in the videoconferencing one. This new environment required the instructor

to be a lot more organised. You can't just go in and wing it. Course outlines should be made. Good visual structure is needed. Guided note taking in a lecture is a must to reduce student anxiety of worrying about missing important notes.

Some of these items could have been dealt with in the previous year's course if the instructors had been given training in the use of the system and instructional design. "I didn't get any training on the equipment or a chance to work with it until after the class started. But I don't find technology

difficult. I worked in ICU, so this is easy. It's just a matter of pushing a few buttons." She indicated that they probably would have done "a whole lot more work but none of us knew that it was going to be done this way until summer and by then you are on holidays." As for instructional design support, her response was, "That would have been really nice to have. We didn't have any orientation when I taught it the first year. We learned as we went."

One of the things the three of them learned was that you couldn't count on the class running every day.

We had problems with the bridge; we had some problems this year but they were short lived and solved quickly. Last year we lost entire class days. That made us realise that we had to do some changes to our planning; the instructors at both sites would always have to have a back-up plan. So that added extra preparation time for them because they had to have a whole class ready to go.

She provided the other instructors with the necessary materials for the planned class, and that meant that she had to be planning a week ahead to be sure that they had the materials in time. Initially they tried sending the material as e-mail attachments. However, some people "had trouble receiving attachments. So to do an attachment over the e-mail, what they had to do was go and get somebody from their computer services to retrieve it. . . . That was just too much of a hassle, so we just didn't bother with it." Instead, they used the fax machine, which didn't always work either.

The three of them were determined to totally revise their teaching methods, and her description of their planning for this year was

It was more; it was more. And a lot more thinking was involved because we had to really sit down and think 'how are we going to make this better because we don't want it the same'. Not the way we did it the first year.

They began by talking about what they didn't like, and "we all had a pretty good idea of what we didn't like. We didn't like all the lectures and lack of exchange." They also knew what they wanted. "We wanted to increase student input; do something other than just lecturing the same way; resolve the problem the students had with note taking anxiety and the feeling of disconnectedness." This determination, availability of time, and desire to help others led to making some "real significant changes to the way we did things."

She explained that she and the other instructors took on this task as they would a research project.

We did a lot of evaluation from both students and faculty. We interviewed other faculty members to talk about their experiences with it because we were also preparing something for a paper presentation at a conference. So we did a paper on the different teaching methods and advantages and disadvantages, and some recommendations. So through all that work we also came up with a whole lot of other ideas. We got into literature and actually read about videoconferencing finally. So we did a lot of other work looking at videoconferencing itself and then from all that we were able to do a lot more work in planning.

One of the teaching strategies she read about was to put together a panel of experts, at least one at each site, to discuss/debate an issue as it relates to their region. This was something all the instructors thought would work, and it did.

I think the use of the panels was probably the biggest from both a change in teaching strategies and success rate that we made this year. We brought in things that we could get different experts on or different things that reflected the nature of the community that we wouldn't have had otherwise.

During the panel sessions, the students took an active part in the discussions and were able to relate specifically to the issues in their own region. This, however, was not the case when an individual was invited to speak on an issue that was more focused. The resources available to the students at the two sites created a challenge because “the libraries in both places aren’t as well stocked.” To help the students prepare for discussions on particular issues, the instructors were required to send out copies of newspaper and magazine articles.

This became a challenge because they don’t get the same news coverage and for this course, that was an issue. . . . The newspaper became like a daily resource and students up there didn’t have that and I could really see the difference because I was teaching this course in the traditional class setting at the same time. I found that my students here were a lot more informed about what was happening in health care in Alberta and in Canada than the students up in the two northern colleges.

In her traditional class, she had the students read both Edmonton newspapers to do a comparison of how the issues were reported. She commented that “the whole slant in the editorial columns was fascinating” and created some very interesting discussions in class. When asked why she did not have the videoconferencing class do the same assignment, her response was

They just don’t have the access to the papers. I’m sure they have the newspapers up there; but, it’s not easy for the students to get access. . . . I’m sure the Journal was available but it’s not like it is being delivered to your home every morning.

Even though she appeared to understand the students’ situation, she still found it “frustrating because when it came to having the speakers come from the health authorities, they couldn’t ask them questions as well because they didn’t know the issues well.” She did, however, state “that’s

not really a videoconferencing issue, but I think it might be something with distance education. And, I didn't realize it until the very end of the course this time."

One of the features of the videoconferencing technology that both the instructors and students found annoying was the ½ to 2-second audio delay between when a person speaks and when it is heard at the other sites. Although it became less of an issue as the course progressed, it was felt that the delay inhibited spontaneity and interaction between the sites. Also, problems with the audio at some sites made it difficult for students to be heard and frustrated them when they tried to ask a question. As a result of these issues, the students directed their questions to the faculty member at their site. She either dealt with the questions personally or redirected them over the system so everyone could be involved. In an attempt to overcome these problems,

we did a lot more purposeful questioning. That exchange made [discussion] a necessary part of class. The delay became a non-issue once we started doing it all the time. They didn't interrupt that much more; but we scheduled in [questions] and stopped much more frequently so it didn't matter. The delay became a non-issue once we started doing this all the time.

As for the quality of the audio system, both remote sites restructured their classrooms so that the microphones were more accessible to the students. The seating arrangements were also changed to allow the camera to be focused on a specific student or group of students during discussions. Although some students initially indicated they did not like to see themselves on the screen, this eventually became a non-issue like the audio delay.

In comparing the atmosphere of her videoconferencing classroom to that of the traditional classroom, she indicated that it was "very lonely." As indicated earlier, she missed the direct interaction with the students. However, when asked how she would feel about having students at her site

as well as the remote sites, she thought "it would be harder." She indicated that one person she spoke with described her experience as being "multi-tasked".

It was necessary to teach the material, manipulate the control pad, use the document camera, and attend to students at distant sites and students at her own site. It was easy to get lost in the process. She always felt like she was ignoring somebody – either her students or those at the remote sites. The students also commented that the instructor tended to focus on the monitor and the students at her site felt ignored at times.

She explained that because of these comments, she would prefer not to have students at her site even though she missed the personal contact. "Even though they say that women are good at doing several things at once, I really think all this would be stretching this ability to a degree."

In closing, she commented, "one of the things that just finally hit me is that we are just going on about all these negative things. It was actually a student who said to me, 'But, you know, as far as distance education goes, this is the best.'" She further suggested that,

We are making an unfair comparison. Some how we have to get to people and say, "Yes you have done traditional, but this is a totally different thing. You cannot compare them." If you are going to compare, look at your traditional classes and compare them to whatever you do face-to-face. But if you are looking at videoconferencing, only compare it with anything else that would be at a distance – correspondence, teleconferencing, Internet. I think videoconferencing for distance education is good. It gives you lots of possibilities.

She did close by saying,

I prefer the traditional classroom; there is no doubt about it. However, I found the videoconferencing to be really interesting and challenging

to do. . . . I found the experience really quite rewarding mostly because of the work with the other faculty members and the opportunity to work hard to make something better and to have actually made it somewhat better.

Conclusion

Although I mentioned at the start of this chapter that each instructor's experience was somewhat unique, there were major topics that began to develop as I read and re-read the stories – preparation of instructors, planning and instructional strategies, site issues, and issues identified by instructors.

Chapter Five discusses these themes as they relate to the instructors in my study. This information is then used to provide suggestions for course development, teaching strategies, and instructor training that will allow the effective use of videoconferencing as a delivery mode to meet the educational needs of the adult university student.

CHAPTER 5

REFLECTIONS AND RECOMMENDATIONS

This last decade in particular has witnessed rapid changes in the workplace. Adult learners, faced with the likely obsolescence of their knowledge and skills, are putting increasing pressure on post-secondary institutions to provide effective “just-in-time” training opportunities that will allow them to remain where they live and retain full-time employment rather than having to relocate. Administrators, faced with meeting these demands while coping with shrinking resources, have sought out technological solutions (Chute, Hancock, and Balthazar, 1991) partly in response to the decrease in telecommunication costs and the improvements in technology over the last ten years. Compressed videoconferencing, which allows two-way audio and video to be transmitted between two or more locations, has become an accessible mode of delivery for many post-secondary institutions. However, the implementation of compressed videoconferencing has brought with it other recommended changes; some in response to the possibilities and constraints of the technology and some due to the influence of new learning theories such as constructivism. Authors who support these recommendations believe that instructors, students, and administrators need to view the educational process differently. They recommend that instructors using videoconferencing for the first time receive training before they begin teaching and that they need to understand and use new methods of instructional design that take them beyond information-giving to an interactive exchange with students (Williamson, 1996). They suggest that instructors must change their way of designing and teaching courses if they wish

to secure a place in the classroom of the future[. They] must first understand these technologies and the environment they are about to enter. They must step from the traditional classroom into the video world,

accepting and adapting to its unique requirements. (Ostendorf, 1997; p. 51)

What is not clear in the literature is what this training should consist of, how effective the training is, and how the training and subsequent teaching are influenced by the instructor's expectations of videoconferencing and prior instructional experiences.

Overview of Study

My research study focused on instructors who were using compressed videoconferencing as a delivery mode for the first time. The purpose of the study was to obtain an understanding of how these instructors viewed their experience and what recommendations for other instructors could be drawn from these experiences. Five research questions were used to guide the study:

1. What types of preparation did first-time instructors require in order to teach comfortably using videoconferencing technology?
2. What instructional planning and teaching strategies did these instructors use in the videoconferencing classroom and how did these compare with their traditional classroom strategies?
3. How did the instructors' perceptions of their teaching in a videoconferencing environment compare to that of their traditional classroom?
4. What configurations – physical and human resources – at the specific locations were most helpful?
5. What issues and problems did the instructors identify?

My participants in this qualitative study were five instructors who were involved in two different projects. Three instructors were part of a pilot project between the university and Northern Alberta colleges to determine the viability of such a partnership. The other two instructors were part of an on-going program that was in its second year of using compressed videoconferencing. The use of videoconferencing technology as a teaching

tool was new for all but one of the instructors in this study. All were trained on similar equipment by the same person. The one instructor who had previously used the technology described herself as a beginner and, therefore, was able to discuss her experiences as such as well as provide a look at the next step in the process. Two instructors who taught within the same program had students who were taking other videoconferencing courses; and three instructors had some of the same students.

Through a series of audio-taped interviews, the instructors described their views of their experiences with videoconferencing. They described the type of preparation to teach a videoconferencing course they had received; how the instructional planning and teaching strategies they had used compared to what they used in their traditional classroom; and how their perceptions of their teaching in a videoconferencing environment compared to those of their traditional classroom. The tapes were transcribed and the transcripts verified by the instructors. Notes were also taken during the on-campus video-conferencing classroom visitations, while viewing the videotapes of classes, and as I went through the various documents received from the instructors. The data were then coded and categorized and the findings provided as five separate stories of the instructors' experiences.

Discussion of Findings

Based on their descriptions in the original transcripts and my field notes, I identified five major topics related to the research questions. These were the preparation of instructors, course planning and instructional strategies, student interaction, conditions at the remote sites; and issues identified by the instructors. Each topic is discussed in relation to related literature and research.

Preparation of Instructors

“Just go in there and teach the way you have always taught. There isn't any difference between traditional classroom teaching and teaching at a distance” (Cyrus, 1997b, p. 15). According to Cyrus, this statement captures

the assumptions made by poorly informed administrators and instructors, and leads to the transferring of the same instructional strategy used in the traditional classroom to the distance classroom. Cyr's further commented that, "institutions that perpetuate this attitude and do not provide training for distance learning instructors will not survive in the growing student consumer market" (p. 15). Writers seem agreed that training is essential for effective videoconferenced instruction. However, while some detail an extensive program of instructor development, others contend that knowing how to use the technology is sufficient and dispute Cyr's contention that transferring strategies is poor instruction.

de Cicco (1997) agreed that instructors require training in the use of the technology. He recommended "a minimum of one day's introduction to the system and its features, plus a further half day for live practice" (p. 14). For these writers, the emphasis is on becoming conversant with the technology. The training program that was available to the five instructors in my study was offered by the same individual and varied from 45 minutes to 4 hours; two instructors attended a 4-hour session together, while the other three received individual training. Two of these instructors received their training the hour prior to their first class. During the training sessions, the trainer explained how the technology worked, the function of the buttons on the console, and how to operate the peripherals, i.e., document camera, computer, auxiliary camera, and VCR. Everyone agreed that the console was self-explanatory and took no time to learn. However, when asked how often they used the various features available, i.e., browsing through the sites; accessing the document camera, VCR, or computer; or changing the focus of the main camera at their site, only two of the instructors indicated that they had done so. One of these was Instructor E, and she admitted that when she taught the course the previous year she seldom used the console. However, in an effort to improve the quality of interaction and learning for

the students, she and her two co-instructors knew they had to incorporate more variety and that meant using the peripherals and therefore the console.

Moore and Kearsley (1996) have pointed out that because videoconferencing instructors have the advantage of being able to see the students at each of the sites and of the students seeing them, part of their preparation should be on the development of an awareness of their on-camera image, eye contact, voice, clothing, and movement. The major portion of the five instructors' training sessions focused on appearance and movement for best visibility on camera. The instructors were also given handouts on what to wear and how to best position themselves in front of the camera when they were not sitting. Although they indicated this information was helpful, they all felt that the handouts would have been sufficient. This was similar to the type of training Weber and Lawlor (1998) reported that faculty at three institutions in Pennsylvania received in preparation for providing continuing education seminars using compressed videoconferencing to nurses in rural areas in Spring 1995. Weber and Lawlor (1998) noted that

Faculty were encouraged to present their content as they would in a traditional classroom, with attention to the differences in preparing camera-ready visuals to augment audio content, positioning oneself relative to the camera, slowing and limiting body movement for effective interactive delivery, and discussing options should equipment failure occur during the presentation. (p. 162)

Hiel and Herrington (1997) conducted a study to identify training required to effectively use videoconferencing technology for a variety of activities at a Texas Agricultural Research and Experiment Station in South Texas. They conducted interviews with the directors and instructors to determine plausible uses and limitations of the Trans Texas Videoconferencing Network (TTVN) to offer university courses, continuing education and staff development, and administrative activities. One of the

areas they discussed in their findings dealt with the use of the technology and the training needed to effectively use it. It was felt, by those using the technology, that “the knowledge required to effectively use the TTVN equipment is not very great; but, it does require an introduction and some practice” (p. 4). However, it was also noted that individuals “who are not teaching a regularly scheduled class, are not confident of their mastery of the technology” (p. 4).

In contrast, Clay (1999) reflects the views of many authors who believe that the most important area administrators need to focus on if they want to offer successful distance education programs is the training and support for their instructors.

Many educators have reached a level of understanding and experience in which they are highly confident in their ability to deliver quality instruction. When they are faced with adopting techniques that seem to curtail their abilities to immediately interact with students and require the utilization of new technologies, they are understandably fearful that their instruction and subsequent evaluations will suffer. (p. 1)

According to Clay, as instructors begin to consider teaching videoconferencing courses, or any distance education courses, there are four developmental stages they go through:

- a. Awareness: A search for an understanding of what distance education is and specifically, what is involved in teaching by videoconferencing. To assist at this stage, workshops are needed to ensure the instructors’ questions are answered.
- b. Consideration: An assessment of the drawbacks and benefits, availability of technology and curriculum design assistance, and an opportunity for hands-on-practice is sought.
- c. Implementation: The instructor is provided with one-on-one intensive training and course development support. “If assistance . . . is lacking, many instructors will fail to go on. . . . The [amount of training required]

will vary greatly among instructors, and may range from a few days to several years" (p. 3).

- d. Innovation: Instructors experiment with and implement new teaching methods that may be adopted by others.

At the start of my study, only Instructor E was beyond the awareness stage; she could be considered to be in the implementation stage because of her previous experience and determination to design a successful course. The other four accepted their teaching assignments with minimal understanding of distance education in general, and specifically what was involved in teaching using videoconferencing technology. Because of the short time between being asked to teach and the start of classes, Instructors A, B, and C did not spend time learning about distance education. Instead, they began preparing to teach without the intensive training recommended by Clay. Instructor D, who knew in September that she would be teaching a videoconferencing course in January, did not make time to take advantage of the steps in these stages. She did all her course planning the week prior to classes. Even through these four instructors would be classified in the implementation stage because they were teaching and therefore, designing course material, none of them obtained the one-on-one intensive training and course development support recommended by Clay.

Clay saw training as instructor development and as an on-going process that required a "well-planned, proactive distance training and support program" (p. 1) to assist instructors in gaining confidence with their new teaching environment and to help them realize the potentials distance education offered them and their students.

Distance instruction represents a tremendous change in the role of instructor. In the distance environment, the instructor shifts more toward a mentor or facilitator role. This requires a great deal of communication, usually through the use of technology. The use of technology, which may

be poorly understood by many faculty, results in a substantial increase in the time required to develop and deliver a course. (p. 2)

She pointed out that “Experience shows that training simply won’t ‘take hold’ unless support is ongoing, with job-embedded opportunities for practice” (p. 4). She indicated that on-going training was not only needed because instructors forget what they have learned, but “the technology changes as do student and faculty needs” (p.4).

Betts (1998) believed that “faculty play an essential role in the implementation of distance education and technological change” (p. 1) and to determine the validity of this contention, she conducted a study of 532 faculty and seven deans at The George Washington University, Washington, DC in Spring 1998. Her main objective was to find out what influenced faculty to participate in distance education courses; however, she was also interested in the recommendations faculty had regarding faculty development programs. Of the 154 responses, three general recommendations emerged:

(1) faculty would like support for course development (e.g., financial, administrative, and technical support); (2) faculty are interested in seminars and workshops that focus on skill development, the use of new technologies, designing courses, teaching strategies, and on the educational merit of distance education techniques (e.g., hands-on training, coaching, access to technology, tutorials, guided practices, and pilot tests); and (3) faculty would like release time for training. (p. 3)

Both Clay and Ostendorf (1997) have identified what they see as essential components of a training program. Ostendorf suggested that instructors must have:

- a. An understanding of how teaching via videoconferencing differs from commercial television and the traditional classroom.
- b. A general introduction to the technology that will be used and the specific role the instructor has in the videoconferencing classroom.

- c. An understanding of the system capabilities, the demographics of the students, the electronic tools available, and the necessity for distance education courses to have direct learner involvement and participation throughout the lesson before designing the course.
- d. Training and practice to achieve mastery with each of the teaching tools and thereby be free to focus on the subject matter and students.
- e. Mastered unique facilitation skills to ensure that all students can participate in interaction and other involvement activities equitably and with ease. (pp. 51-52)

Clay's list of minimum training requirements is similar. It includes sessions on how distance instruction ties in with the institutional mission, distance learning technology and its impact on learners, fundamentals of and assistance with course development and adaptation, techniques for encouraging interaction, development of back-up and contingency plans, and copyright and other policy issues. Ostendorf concentrates on an understanding of the videoconferencing system and the particular issues concerning student interaction. Clay's list goes further in including assistance in course development and in requiring that instructors must have opportunities for addressing concerns and have access to administrative and support services (p. 4). Both lists include references to enhancing student interaction and participation.

In my study, the actual training sessions were short and limited in content and did not include discussion of issues involving student participation. However, the trainer did sit in on several of each instructor's classes and was available outside class times to assist with the technology and provide ideas on how it could be used. In all cases, the instructors turned down any outside help. One reason given was lack of time to meet with the trainer and prepare new material; however, it did not appear to be the main one. Every one of the instructors had taught several courses a year for at least four years, and therefore, did not see any need for assistance in designing or teaching a course. As one individual put

it, "I probably wouldn't have taken much advice." In addition to not asking for outside assistance, none of the instructors made time after their initial training session to practice or experiment with the technology prior to or during the term/s their courses were offered since they found the technology easy to use.

In comparing the training requirements suggested by these authors to the training received by the five instructors in my study, it is evident that further training was required. Instructor E validated this by taking it upon herself to research the use of videoconferencing, talk with other instructors to obtain suggestions, experiment with the technology prior to teaching her second course, and asking for assistance in developing course materials and using the peripheral technology available to her. However, these researchers all assumed interested faculty who in hindsight desired more preparation. Four of the five instructors in this study were generally unwilling to devote more time to training, at least initially, suggesting that their assumptions about teaching as a generic skill overrode specific questions about the technology. We need to know more about how to approach and work with first-time instructors without either scaring them off or adding immeasurably to their workload.

In describing the levels and type of training required by videoconferencing instructors, Betts (1998), Clay (1999), de Cicco (1997), Heil and Herrington(1997), and Ostendorf (1997) also reinforced the need to assist instructors with their instructional planning and teaching strategies to ensure a student centred learning experience. Again, this assumes that instructors have some knowledge of and support this orientation. As the next section makes clear, their philosophies of teaching strongly influenced their perceptions of videoconferencing.

Course Planning and Instructional Strategies

Willis (1995) indicated that in order to meet students' needs in the distance education environment, the instructor must establish an environment of comfort, openness, interactivity, experiential learning, and opportunity for critical

thinking and that instruction should include a variety of presentation methods, short instructional modules, and extensive supplementary materials. In discussing their views on instructional planning, and the strategies they used, the instructors in my study linked their videoconferencing experiences to those in their face-to-face classes. Given Willis' emphasis on interactivity as an aspect of instruction, the instructors' views on student participation and involvement are also included under this topic.

Course design

One of the first aspects of course planning is to know your context and that of your students. Instructors D and E were familiar with the concept of distance education because their program had been using audio and audiographic conferencing technology to deliver courses for a number of years. They also had had the opportunity to speak with faculty who had previously taught distance education courses. However, both admitted that their discussions with other faculty focused specifically on videoconferencing and that the majority of the feedback was negative.

Instructors A, B, and C had no distance education experience, and all admitted that until this project, they thought distance education meant "learning by correspondence." The use of technology to teach was not a new concept to them; however, they viewed technology as an additional tool to be used in the traditional classroom. Because of this, they were totally unaware of the specific concerns of distance students, and therefore, of how to design a course to meet those needs. These instructors were also at a disadvantage because they did not have the opportunity to talk with experienced distance instructors and learn from them even though this project was taking place on the same campus and at the same time as Instructors D and E were teaching.

One piece of course design advice that might have assisted them was encapsulated by Bivens and Chute (1996):

Presenting a learning program via two-way videoconferencing requires a modified approach to generate learning success. It is often assumed that since you are still in "real-time" with the participants that your

face-to-face presentation skills will be enough. Excellent face-to-face facilitation skills are necessary, but the presenter must go beyond these skills and incorporate new ones. (p. 4)

Miller and Padgett (1998) suggested that a technologically enhanced learning environment could have a positive effect on the learning outcomes of distance education students. However, they pointed out that

a major problem in the design of distance education and technologically supported education is that sometimes we simply will try to apply the traditional pedagogical tools into a technologically enhanced environment in order to deliver distance education. (p. 1)

They went on to propose that a positive distance learning environment could not be created by attempting to “force-fit” traditional face-to-face teaching strategies into a technologically supported environment without redesigning course materials and content with the distance learner in mind. Bilton-Ward's (1997) discussion of how traditional lessons need to be modified for the videoconferencing environment agreed with their view. She stated that in order for instructors to be effective, they “must master strategies that are unique to designing and delivering instruction through videoconferencing technology” (p. 13). She further commented that effective videoconferencing instructors must first be

effective teachers with an adequate knowledge of the content and the ability to accommodate the various learning styles of the learners. They should be well informed about modern pedagogical principles and be able to translate those principles into practice. . . . Effective teaching reflects careful planning of objectives, instructional approaches, and evaluation as well as familiar with the needs and knowledge base of the audience. (p. 13)

In my study, the five instructors had been teaching within the post-secondary environment for a number of years and felt they already had a good understanding of various teaching strategies and how to use them. Although they had done some teaching during their graduate work, none of them had

taken any teaching methodology or instructional design courses or seminars and did not see this as a hindrance to their teaching. They based their approach to teaching on two factors—how they had been taught in their post-secondary classes, and how they liked to be taught. They viewed the key element for teaching success to be content expertise, i.e., their responsibility was to ensure the students had a thorough background in the subject so they could advance to the next level. Seldom receiving any negative feedback about their teaching, student marks being within the required range, and being asked by administration to teach a course again were indications to these instructors that they were doing a good job and hence must be using appropriate teaching strategies.

Everyone indicated that in their first year courses they tended to lecture more than they would in a senior level course. Some of their rationale for this included:

- a. Most first year classes had 50 or more students and that made anything other than lecture difficult.
- b. The subject matter was new to the students, and therefore, they would not have the background necessary for discussions.
- c. These courses laid the foundation for future courses, and because of the quantity of material to be covered, there was little time for anything but lecturing.
- d. Undergraduate students were not perceived to be mature enough to read material prior to class, so discussions would be a waste of time; "They expect you to teach it to them."

Course development

Instructors A, B, and C planned their courses alone. Two were able to use materials they had developed for their equivalent campus course, while one who had accepted the assignment at the last minute had to use the textbook and outline which had been put together by the initial instructor. He was not happy with this situation since this required him to ensure that he was comfortable with

all the content in the survey course and hence limited his opportunity to develop specific resources to enhance his lectures.

Within the faculty where Instructors D and E taught, the use of team planning was quite common, and both instructors had been members of such teams for a number of years. The format used in the traditional setting was to have one individual act as the course leader and be responsible for compiling and obtaining consensus for the course outline, assignments, etc. Each team member was responsible for teaching a section, and everyone met at least once a month to discuss the progress of the course and students. Because of the varied backgrounds of the faculty, this approach was effective in giving the students different perspectives of concepts and experiences. This same format was used for the videoconferencing courses but Instructor D did all the planning with minimal input from her remote site colleagues since she intended to do the majority of the instruction. Instructor E held regular audioconferenced meetings with her team colleagues and they spent quite some time discussing what strategies would be most effective in involving students.

All the instructors in this study had developed materials, assignments, and exams for the courses that they taught in the traditional classroom and were happy with the results they achieved. Since their training sessions did not include a curriculum design component, the instructors began with the assumption that what worked in their traditional classes would also work in the videoconferencing class. All but one quickly identified that changes were required. However, without previous training in curriculum design, they did not know how to go about making changes, and there was no curriculum designer available to assist them. The individual who did the initial training and whose area of expertise was the technology not curriculum design, was also responsible for training other distance education instructors on campus as well as developing training modules and, therefore, had limited time to spend with them.

Instructor A admitted that he entered the videoconferencing course with no intention of changing the way he designed or taught the course. Any type of curriculum design training would have been a waste of his time because, in his

opinion, it was a university course, and therefore, it should be taught exactly the same as his classroom courses. However, the other instructors made reference to their lack of awareness of what could be done to enhance course material and pointed out that this was a weakness in the training they had received. The majority of the instructors also suggested that instructors should be given paid release time to develop and/or improve curriculum for courses that are to be taught in a distance format. Dooley (1996) pointed out, however, that unless there is some type of team approach, the instructor ends up being content specialist, curriculum designer, and technology specialist, and these expanded roles have not always resulted in new approaches to teaching.

Instructional strategies

A study by Gehlaug, Shatz, and Frye (1995) looked at how instructors at Ohio University used different instructional techniques in courses offered through interactive television (videoconferencing). The four most common techniques were lecture, group discussion, overhead lecture notes, and overhead transparencies. The instructors indicated that other techniques were seldom used and ranked the four most effective methods as lecture, videotapes, overhead transparencies, and slides. They did indicate that there was a need for classroom interaction, sensitivity to the needs of the remote students, pre-planning, organization, and familiarity with the technology. The findings seem to indicate that the instructors tended to rely on traditional lecture methods even through they felt that other methods might be more effective. Gehlauf, Shatz, and Frye summarized their findings by emphasizing the need for hands-on training and assistance with designing new teaching techniques as being essential for any distance education instructor.

To obtain an understanding of the range of strategies used by the instructors in my study, I asked them to describe the instructional strategies they used in their traditional classes and then to describe the changes they made for their videoconferencing classes. In general, the use of the illustrated lecture, with occasional questions from students was the most common format. Their

compiled list included the following: lecture, discussion, group work, videos, overhead projector, blackboard, case studies, and guest speakers.

Overhead projector. Of Instructors A, B and C, none just lectured. One used the overhead projector to write all his notes for the students rather than the blackboard because he preferred to face the students while he talked. Even though his initial description of his teaching style suggested that he moved around a great deal, he later clarified that this only took place at the start of each class. Once he started lecturing, he sat beside the overhead projector, which was equipped with an acetate roll, and wrote notes as he talked. The other instructors also used the overhead projector but only as a tool to highlight specific points. They used the board to write on and brought prepared transparencies to emphasize particular points. In fact, one instructor indicated that because of the nature of his course, there were very few videos or films available for teaching purposes so he had compiled a set of transparencies with cartoons, maps, and paintings that he used to highlight specific topics. He would leave them on the projector as he roamed around the room discussing their contents.

Videos and films. As for using other instructional tools, only one of the instructors in this study viewed them as a waste of time. In his opinion, videos and films were only for instructors who were worn out; he never had time to cover all the necessary material. He did suggest that the videos might be helpful for the students but they would have to access them outside of class. He felt that the information he presented in class and the textbook were all the students required to pass the multiple-choice exams that his Department used. In contrast, another instructor used videos in most of her classes to generate discussion. She didn't necessarily show the complete video; rather, she would show a segment and have the students discuss it. She found that using a video to introduce a concept was a beneficial learning tool for the students. However, she did not use a lot of examples when discussing a concept because, as a student, she 'didn't like hearing' them. But she did not discourage students from providing examples that were relevant to the topic being discussed.

Small group work. The format of Instructor D's undergraduate courses was lecture with the occasional question being asked by her or one of the students. She had used group work a couple of times. However, the problem of finding rooms for the break-off groups, in her opinion, was not worth the few benefits the students would obtain because "undergraduate students could not be expected to come to class prepared to discuss issues."

Instructor E described her approach to teaching as a combination of lecture and small group discussions. She used the lecture format to present the theory and foundation the students needed to understand the many issues within the profession. To provide additional background about what was happening in the profession, the students were required to read related articles in both the local newspapers. She used the small break-off groups for the students to discuss the issues and then report their findings to the class for further discussion. She found this combination, plus the occasional guest speaker, to be very effective. In addition, the feedback she received from the students on the course evaluations indicated that they also found the course format very beneficial to their learning.

Guest speakers. Instructor E used guest speakers to enhance the students' learning experiences in her course. Since the course was offered at three sites, each site hosted a speaker who had been pre-arranged during one of the team planning sessions. The only negative to using speakers was their inexperience with the videoconferencing environment. However, Instructor E indicated that they learned from the first speaker that it was necessary to give the speakers clear information about the classroom set-up and to give them an opportunity to see the room prior to class.

Team-teaching. One major difference between the courses of Instructors A, B and C, and those of Instructors D and E was that for D and E, there was a qualified instructor present at each remote site during their classes. This extended their team planning to a potential team teaching opportunity although that had not been part of the original course design used in their on-campus courses. In some aspects this worked well, i.e., the last hour was used for off-

line site discussions about what had been discussed in the class and therefore, provided the personal contact the students needed. On the other hand, it did not give all the instructors an opportunity to get to know the students at the remote sites. In the case of Instructor E, there were no students at her site so she did not have an opportunity to meet with any students. It also left the students questioning the rationale behind the teaching structure. If the instructor at their site was qualified to teach the course, why did they have to use the videoconferencing technology? Because of underlying political issues, answers to this question were not forthcoming and led to a certain amount of tension from the students. Instructor D was not as positive about having alternate instructors. She commented that her reaction to a session where an instructor at one of the remote sites taught was that she "found it tedious" and so did her students. She did not make any attempt, however, to inquire as to why this was or how it could be avoided.

Team teaching, however, does provide a variety of opportunities for both instructors and students. Martinez and MacMillan (1998) offered a seminar, January to April 1998, in American politics to provide third year Political Science majors at the University of Calgary a better understanding of U.S. government issues through interactions and discussions with political science students in a senior colloquium at the University of Florida. They referred to this United States Information Service (USIS) funded project as a joint seminar because there were students and an instructor at each site. In addition to planning and technology issues, they also had to deal with a time difference. When the decision to run the project was made, the course was already scheduled from 4 p.m. to 7 p.m. in Calgary, which meant it had to run from 6 p.m. to 9 p.m. in Florida. This created a problem with enrolment because the students were not used to evening classes.

Like the courses taught by Instructors D and E, this course consisted of on- and off-line discussions. The first hour was used to either discuss material that was applicable to only one class, or more commonly, background material as preparation for the videoconference. . . . When the videoconference began, we introduced ourselves to the students in the

other campus, and then asked the groups to report on their speculations about the causes and consequences of divided government. . . . The final hour was used to debrief the videoconference, and to prepare students for readings in the forthcoming week. (p. 5)

Martinez and MacMillan found the coordination of scheduling, recruitment, and distance education resources challenging, and like the instructors in my study found the development of class assignments, discussion topics, and common readings time consuming. However, they were successful in obtaining interaction with and among the students during their hour session and the students' group presentations. They contributed some of this success to the development of a common web page and an e-mail discussion list. These allowed the students to interact outside class and to collaborate on their group presentation.

In summarizing the results of the project, they believed that they made strides towards their goal of providing students with a better understanding of the U.S. political system. As for the use of videoconferencing to offer team-taught courses that generated student interaction, both the instructors and students viewed it as a success. "Every student who responded to the USIS evaluation request said that they would take another joint course employing distance education technologies if one were available" (p. 10).

Jewett (1998) described another team teaching experience that offered a Master's in Social Work between Cleveland State University and the University of Akron. The instructors in his study expressed concerns similar to those of Instructors D and E. However, Jewett did not make a comparison between the traditional classroom and the videoconferencing classroom. Instead, he compared videoconferencing to other distance education situations, and in doing so made a positive case for its use.

Using videoconferencing to share a degree program between two campuses has some interesting consequences that often don't hold in a "distance education" situation. Since the courses are shared between two campuses, there is no "remote site" where students take a course remote

from a campus. A more accurate description is a “sending” or originating campus and a “receiving” campus. At whichever site a student happens to attend the course, the student is always in a campus environment with access to faculty advisors, a department chair, library resources, and the full range of student support services that are typically available on a campus. Since both sites send and receive, all students at each campus experience both the live classroom (when the course originates from their campus) . . . and the receive classroom (when the course originates from the other campus). (p. 11)

Although various instructors described using these instructional strategies, they were most often referring to their on-campus classroom. Instructors A, B, C and D generally confined their videoconferencing classes to a combination of an illustrated lecture using the overhead projector or graphics computer and document camera and some time for answering student questions. Instructors D and E involved some guest speakers. Instructor E, partly as a result of her previous experience, used team teaching and student small group work to encourage interaction and active learning.

Student Interaction

All the instructors stressed that, for effective learning to take place, the students needed to take part in class discussions and question the concepts and issues that were presented to them. Therefore, everyone considered interaction to be an essential component of teaching and were in agreement with Brundage and MacKeracher’s (1980) comment in their report on adult learning:

We believe, furthermore, that learning occurs not only as a result of the learner’s activities but also as a result of the interactivity between teacher and learner, between teaching and learning. The most appropriate behaviour in such interactions is interdependence, with teacher and learner learning from and teaching each other. (p. 2)

All the instructors suggested that the amount of classroom discussion that took place was really dependent on the size of the class. Because first year classes tended to be quite large, there was a tendency for the students to just sit

and listen. All of them said they encouraged the students to ask questions or provide comments during the lecture, but this seldom happened unless the topic was considered to be a "hot issue." One instructor described how he chose to face the students while using the overhead projector. He therefore had visual contact with the students and this allowed him to use facial movements and expressions to get his point across and at the same time to read the students' non-verbal messages of confusion, understanding, or boredom. He felt that his ability to do this was probably the reason there was little need for the students to ask him questions. Two others suggested that the lack of discussion in their classes was because first year students did not have the necessary background in the subject to skilfully ask questions or make comments. Two instructors encouraged discussion: one expected that sustained student-teacher and student-student interaction would occur because it happened in his traditional classes; the other planned for small group work and designed activities which required students to interact and then report back to the class.

However, there was a difference between what the instructors described as interaction in their traditional classrooms and what they expected to occur in the videoconferencing classroom. In all cases, except for graduate seminars, the major portion of the interaction they described taking place in their traditional classrooms was instructor generated, i.e., generally the instructor asked a student a question and the student responded and occasionally one student responded to another. They felt comfortable with the level of student involvement and extent of questions and comments generated and classified this as being at a good level of interaction. They expected the same to occur with and among students in their videoconferencing classrooms. In the majority of the courses, some instructor-initiated interaction was taking place but the instructors seemed unaware of the need to help students recognize new conventions for turn-taking in videoconferencing from a number of sites. As a result, when the instructors realized that they were unable to achieve a sustained level of interaction spontaneously and that to generate discussion would require pre-planning, most blamed the technology. They felt it was not worth the time to do

the planning since the interaction was not essential to the course design. Instead, they lectured and stopped occasionally to see if anyone had a question or comment. In fact, of all the concerns expressed by the instructors about their experiences, the extreme difficulty in obtaining interaction could be ranked number one.

Lehman and Dewey (1998) believed that, "by its very nature, videoconferencing lends itself to two-way interaction and to the use of visuals. Its potential for interface with a wide variety of other technologies and media expands the interaction capabilities" (p. 228). In their description of the necessary areas to be considered in preparing videoconferencing courses, they identified preplanning, development, design, management, assessment and follow-up. At the centre of all these was the use and selection of appropriate interaction. Mitchell (1993) commented that it is common for instructors to blame the technology when the level of interaction they expected did not occur. He stated that,

The mention of video these days is usually accompanied by the attribute of "interactive" as though it was an intrinsic and natural feature of the technology. This is grossly misleading. The technology of videoconferencing is no more interactive than that of audio-conferencing or computer conferencing. Interactivity is achieved through deliberate design and operation of control by the presenter with the voluntary contribution of the participants. (p. 75)

Wagner (1997) suggested that to effectively design an interactive learning experience, the instructor must first determine the goals and objectives of that experience. She stated that,

it is both far more appropriate and effective to begin the process of selecting the strategies and tactics needed to achieve the desired ends of the learning experience, for the specific audience at hand, given the specific conditions likely to be encountered in a given setting. In this way, interaction can serve as an outcome of clearly conceptualized, well-designed, and well-developed instruction and training. (p. 25)

In an attempt to determine "how far videoconferencing technology could be "pushed" towards the ideal form of interactivity" Burke, Lundin, Daunt (1997) conducted a pilot project involving a group of students in a Master of Education course at Queensland University of Technology. The feedback from this project was similar to that presented by Lehman and Dewey (1998):

videoconferencing allowed the lecturers to go a long way towards replicating the on-campus interaction which is often lacking in distance education programmes. Of particular interest was that the technology did permit the full engagement of these students as adult learners in an approach based on critical reflection, deep learning and metacognition (i.e., to think critically about their own views), and where this reflection leads to improvement of learning. . . a very high level of spontaneous interaction, comparable in effect to the on-campus situation, can be achieved and students at this level are able to maintain that interaction for long periods of time. (Burke, Lundin, and Daunt. 1997, p. 351)

Hiel and Herrington (1997) also found that instructors viewed interaction with and among the students in class as important. However, they included a different level of interaction as also being essential—the personal contact with students that takes place outside class time.

The majority of the instructors in my study commented on their need to get to know their students. Many of them mentioned getting to know students during office hours and that talking with students after and before class was an important part of their teaching style. For instructors A, B and C who did not have any local site assistance, students were expected to place long-distance calls to them during posted office hours. Most reported few or no calls and only one instructor who encouraged students to phone at other times had much success in generating student-initiated calls. Instructors D and E who had co-instructors at the local sites had a different problem. Students did not call them because they could seek information from the local instructor. The lack of these other interaction patterns may go some way to explain some of the instructors' frustration concerning student involvement and interaction.

Student feedback

In their traditional classes, the instructors relied on a number of situations to help them determine the students' level of understanding or interest in the course, e.g., non-verbal messages during class time, extent of involvement in class discussions, and quality of assignments and exams. As for determining the students' level of interest in the videoconferencing classes, they all relied on two indicators—lack of negative response and assignment or exam results. Although they could see the students on their TV screen, they did not feel it was possible to read non-verbal messages. This was due partly to the full site image they used most often where students' general actions were clear but their facial expressions were hard to read. From my observations, in two situations this was because the instructors seldom looked at the screen while teaching; Instructor A's focus was on the overhead projector and Instructor D's was on the students at her site. Seldom did any of the instructors switch from site to site or change the image from full classroom to individual student. This lack of roaming and zooming limited their opportunity to pick-up on students' non-verbal messages.

None of the instructors made any compensation for the conditions under which the courses were being offered. These were university courses and, therefore, all university regulations must be followed. In preparing their course content, some of the instructors were aware that for the pilot project to run, the university had relaxed its minimum enrolment criteria, and hence some sites had students who did not meet all the entrance requirements. This was not true for Instructor C, who undertook the course at the last minute. Instructors D and E knew that their students met the University's entrance requirements. If the students did not do well on an exam, it was assumed to be because they had not done the necessary work to pass. All the instructors in the project believed that many of the students did not have the necessary academic foundation to take their courses; hence, they were not surprised to discover that some students were not passing and did not try to discover what could be done to help them. This may also have been an artifact of the pilot nature of the courses offered by Instructors A, B and C. For Instructors D and E, the question of student

preparation was more complex since their courses were part of a program. For those students, at least there was local site assistance.

In analysing the experiences of the instructors in my study and the findings of other researchers related to instructional planning and strategies, it is evident that being able to use the videoconferencing technology is only part of what makes a successful learning experience. The ability to present a course that is well organised, appropriate to the learning context, and interactive is essential to meeting the educational goals of the learners. To do this, requires training, practice, time, and for some instructors, a complete revision of their teaching methods. Simply applying basic videoconferencing technology to traditional teaching methods is likely to result in inappropriate and ineffective learning environments.

Conditions at the Remote Sites

In videoconferencing, the physical conditions, human resources, and number of participants at each remote site are important considerations in designing instruction. For the participants in my study, Instructors A, B, and C were relatively unaware of the circumstances at each site. They tended to focus on their teaching and did not make many comments about the various sites. Instructors D and E were aware of the locations and contexts of their sites and through interactions with their co-instructors had opportunities to learn more about the specific students and the physical conditions at the sites. However, perhaps because there were people who were responsible for these locations, they too focused very little on issues surrounding the sites. From the instructors' conversations, I identified two remote site topics, one related to the students and the other to the site configuration and technology.

Student characteristics

For all the instructors their relations with the students in their courses proved problematic. As identified earlier, Instructors D and E shared their students with the on-site instructors. This meant that students sought advice and assistance from these people rather than from them and this made their coming to know the students and hence their ability to encourage interaction more

difficult. Some students in both instructors' courses were resentful that they had to take a videoconferenced course when they thought their on-site instructors were capable of offering the same content. In addition, Instructor E found that she did not have a good understanding of what it meant to live in these locations and expected students to have access to media that were unavailable in a timely way outside the urban centre. This caused some tension as she initially interpreted their lack of information as reflecting poor preparation and weak academic ability.

While students of Instructors D and E were taking their courses as part of a program, students of Instructors A, B, and C were part of a pilot study to test the feasibility of offering university-level courses to remote communities. The local site coordinator did not participate in any courses. The majority of the students at these sites were Aboriginal and while most met all the university's entrance requirements, some did not. However, they were encouraged to enrol to see what was involved in taking university courses. Although the three instructors involved in the pilot project knew they would have Aboriginal students in their classes, they had not been given any information about the students' culture, academic ability, or preferred learning styles. One instructor did not see this as a necessity. He felt that since they would not be given any special consideration if they were on campus, they should not receive any under these conditions. However, all three commented that these students were too quiet; did not want to answer questions or took too long to answer; and would bring their children to class. Although one instructor mentioned that he found the children to be a distraction, another indicated that when he saw children in class, they were always sitting quietly in an area away from the students. Had the instructors been given some background about the Aboriginal culture and the need for planned participation in videoconferencing, they may have been able to better understand why the students reacted as they did. Instead, all three ignored those sites unless the students initiated discussion, which seldom occurred. Instructors D and E found that without deliberate planning which involved students in reporting back to the total class, their students also declined

to voluntarily ask or answer questions. Their access to a local person who was familiar to them proved to be an added barrier.

None of the instructors had ever taken any type of distance education course, and therefore, had no first-hand experience of what it meant to participate as a distance education student. They all appeared to be working under the assumption that the learning needs of these students were no different from those in the traditional classroom.

Although four of the instructors had not been involved in distance education prior to this study, most of them had heard negative stories about other people's experiences. Without having the possibility to talk to people who had had positive experiences or at least be given examples of positive experiences, they were not surprised when things they tried did not work. For at least one of the instructors, the self-fulfilling prophecy occurred. She did not think the teaching experience would be enjoyable for her or the students and she did very little preparation or revision to her traditional teaching methods in an attempt to make it an enjoyable experience. The end result was she was not happy and neither were her students.

Site arrangements

Much has been written about the most appropriate configuration for a videoconferencing site (Roberts, 1998). In this study, the arrangement of the classrooms varied from site to site. Some rooms had tables arranged in a U-shape so that students faced each other and turned at a 45 degree angle to watch the screen at the open end of the U. Others were regular lecture rooms with long tables in parallel rows so that students sat facing the front of the room where the screen was. One site had very few students and so they sat around a table in front of the screen. In all situations, when the camera was focused to include all the students, the groups, which varied in size from 5 to 15, tended to appear as tiny images on the screen. Since neither the instructors nor students zoomed in on a student or group of students, the small scale of the image meant that they had limited visual contact with any student. In addition, since the camera was set to continue to transmit an image of the last speaker's site until

someone from another site spoke, those sites with students who did respond tended to be the ones the instructors saw most frequently.

For Instructors D and E, there was an added element – their co-instructor at each of the remote sites. In each of these situations the remote site instructor sat at the front of the class and operated the control panel. There was a tendency for the students to focus on their site instructor rather than the TV screen. Both Instructor D and E indicated that they found this disturbing because the students did not appear to be paying attention to what was being taught.

Technology. The instructors spoke about two concerns associated with the particular videoconferencing technology. They felt that the location, type, and number of microphones at the sites made it awkward for students to take part in discussions. Some of the sites had push-to-talk microphones, but did not have one available for each student. This meant that the microphones had to be passed around when someone wanted to speak, adding to the time it took to respond or ask a question. The students at the other sites also shared microphones; but to use them, the mute button had to be deactivated from the console. This meant that someone had to be appointed “keeper of the console”. For the courses taught by Instructors D and E, the “keeper” was the instructor at the sites. For those at some of the course sites for Instructors A, B, and C, it was whoever sat beside the control panel, and in some cases, no one would.

Although all instructors found the time lag and audio problems to be frustrating, they all admitted that after awhile they became non-issues. In fact, one individual commented that at the end of one class he asked the technicians, who had just stopped by, if they were using better telephone lines because the time lag was no longer there. Their reply, he explained, came with a big smile: “It’s still there; you just don’t notice it any more!”

For the instructors in this study, issues of the technology or even of the configuration and co-ordination of students at the remote sites was not of particular importance to them. Only Instructor E sought to devise an instructional plan that would actively involve the participants at the remote sites. She

explained that her previous experience had been much like that of the other instructors with a focus on her own teaching rather than on the students.

Issues Identified by Instructors

I asked the instructors to identify which issues had been problematic for them. They identified lack of time and the loss of a personal relationship with their students. In reviewing their transcripts, it seemed that behind this inability to see all the students and conceive of them as a single class, was the sense of a loss of control.

Lack of time and information on how to prepare

Time to prepare new or revised instructional materials was something the majority of the instructors identified as a concern because it was not available. As part of their regular teaching assignments, two were teaching new courses and were having problems staying ahead of the students. Two were teaching courses for other post-secondary institutions and because of timetables and travel time were not often on campus, and one was completing several research projects and was on a number of committees. The only instructor who had time for curriculum development was Instructor E and that was because she made the time. She indicated that she knew "the importance of preparing the course materials well in advance. We knew what happened last time, and it was not going to happen this year. We were going to be organized." Instructor C came to this realization after a couple of months of teaching; but was "not sure why things were not working or how to go about changing them." Without the availability of a curriculum support person, he used

the 'trial and error' technique. Sometimes things worked; sometimes they didn't. The problem I had was that I never really knew why. Having someone, who had a background in designing courses, to toss around ideas with would have been a big help to me.

Gant's (1998) study at the Department of Defense, the Defense Intelligence Agency/Joint Military Intelligence College in the USA focused on the unique characteristics of instruction that influence quality of a videoconferencing course. Her findings related to instructor training and need for adequate planning

time concluded that videoconferencing instructors must receive training in the operation of the technology and the design and development of course content. They must also be given the opportunity to practice teaching within the videoconferencing environment in order to develop the necessary teaching skills. To do this effectively, Gant acknowledged the necessity of planning time. She described some of the videoconferencing instructor's responsibilities as having "to prepare the telelecture, develop the student guidebook, develop visual aids and graphics, manipulate the technology, move around the classroom to use a different technology and simultaneously manipulate the master podium control buttons" (p. 7). Although the instructors in her study, as in my study, had previous teaching experiences, she emphasized that the "procedures and operations [for a videoconferencing course] take more preparation time when compared to the traditional class" (p. 7). This statement further reinforced that of the instructors in my study and those of writers such as Burke, Lundin, and Daunt (1997), Clay (1999), de Cicco (1997), Hiel and Herrington (1997), Hill (1998), Jewett (1998), Kaufman and Brock (1998), Lehman and Dewey (1998), Martinez and MacMillan (1998), Miller (1998), Sankar, Ford, and Terasse (1997), and Weber and Lawlor (1998). Learning about the technology not only needs to be placed in a classroom context involving the remote sites but it also should involve information about planning for this environment and time to practice. In my study, because the technology was simple to operate, the instructors felt at least initially that they were adequately prepared. Generally, they did not know that they needed to re-conceptualize the classroom experience for students and plan to realise this design as one aspect of their teaching.

Inability to monitor student activities

The feature the instructors were unable to put in the background and which all admitted was definitely an issue, was their inability to see all of the students at the same time, an issue the majority considered to be essential. Without this, they indicated that it was almost impossible to view the students as one group as if they were in the traditional classes.

Several reasons were given for needing the visual contact: reading students' non-verbal messages to determine their "understanding, confusion, or boredom"; feeding off students' enthusiasm and energy; and monitoring what was taking place at each site. The use of non-verbal feedback and the occasional interruption to have a sentence repeated were ways the instructors monitored the students' understanding and involvement in their traditional classes. In the videoconferenced courses, they found that they had been fooled by the slogan of two-way interaction and that in fact they had to physically switch among sites to see students. This brought with it an intentionality that instructors did not have to reveal when they seemed to be merely looking at while talking to their on-campus classes. Further it required them to not only be conscious of what they were saying but also at the same time to be able to manipulate the console switches smoothly and not to visually react to what they saw at an individual site.

Some instructors spoke about the importance to them of the energy generated by their interaction with the students. This non-verbal feedback was essential, they felt, in helping them remain motivated and in turn motivate students to stay on topic and interested.

Monitoring students for misbehavior was another concern. Some instructors believed that unless they had continuous visual contact with all students, the students could be involved in activities unrelated to the course. They were concerned that when they saw students talking together that this was unconnected to the course since they were supposed to be paying attention to the instructor. Some feared that students would walk out of class if the instructor could not see them. Those expressing these concerns indicated that similar activities occurred in their traditional classes; but they were able to control the situations through visual or verbal cues. One instructor admitted that his reasons for needing the visual contact were based solely on his needs in his traditional classroom and he had not taken time to consider if it was essential to the students' learning.

This lack of personal contact with students created a sense of depersonalization for the instructors. One described his experience to be “like teaching to a silent film.” What he wanted was “a blackboard in a classroom with living people.” Another two compared their experiences to that of a character on TV; they were there to perform, and the students had the power to ‘turn them off’ if they wanted. One instructor did have students at her site. In a sense, her need to know her students was met by having the students at her site. She relied on their verbal and non-verbal feedback in determining if the students’ learning needs at the other sites were being met. Instructor E indicated that she found it quite lonely without students at her site and missed the out-of-class conversations. She did not, however, want to have students at her site. Her initial reasoning dealt with the need to manage the technology and flip back and forth between two sites without having students actually watching her. Once she began planning for the second course, she found literature that presented the advantages and disadvantages of having students at the teaching site and decided it would be best for her not to have students with her.

One instructor had planned to use some small group break-off discussions in order to give the students an opportunity to work in groups and then share their ideas with the other sites. In her traditional classes, she herself would join each group to give them ideas and ensure they were on topic. Because she thought that she would not be able to do this with the videoconferencing groups, she decided to omit the group work. Although she had co-instructors present at each site, she did not think that the time spent on the activity would be as fruitful if she were not able to monitor and intervene in the discussions in each group.

The inability to view all sites at the same time became a specific problem for some instructors during the administration of exams. Prior arrangements had to be made to have someone supervise. This meant relying on someone at each site to remain in the room for the total exam period. For Instructors D and E, this was not a concern; but it definitely was for the others. In most cases, a non-instructional staff member was assigned the task of distributing, supervising, and collecting the exams. Problems with this procedure were discovered on separate

occasions by two of the instructors. As they browsed through the sites during an exam, they realized that no one was supervising the students at one site. The only explanations they received for this situation were that the individual who was to supervise had another task that took priority, and “the students were adults, so why did they have to be supervised.” Concerned that this situation might occur, Instructor C did not use unannounced reading quizzes. Although he believed that these quizzes were a good tool for assessing a student’s comprehension of a reading assignment, he would not administer them without prior arrangements for someone to be in the rooms.

The instructors in this study found their inability to read all the students’ expressions while lecturing to them was a major drawback in helping them stay engaged and enthusiastic about their teaching. Although they taught large classes of over 100 students, they were comfortable that they picked up sufficient cues from those students they were able to see clearly to be able to sense when students were bored or didn’t understand their explanation. The screen with its full class format showed only one site at a time. Because of this, they all felt that they were potentially missing important cues. None of them felt comfortable enough during their first course to manipulate the console and select sites. Instead they depended on the audio cues to follow the discussion and change the site automatically. This is one aspect of videoconferencing that should be included in any training program and instructors should have an opportunity to work with people at a number of sites so that they can experience for themselves the issues involved in working among a number of different locations.

The instructors’ concerns about planning and lack of time were not identified until they had finished teaching. This raises questions about how best to introduce instructors to videoconferencing and, in particular, the importance of placing planning in the context of the videoconferencing environment.

Conclusions

Although the experiences of the five instructors in this study have unique characteristics, the findings of this and other studies presented similar concerns. A central concern for most instructors was the need for both

instructional design and technical support to assist them in preparing effective and interactive student-centred learning materials. Key to developing the materials was adequate release time and the opportunity to practice teaching prior to entering the videoconferencing classroom. Both of these were not available to the three instructors in the pilot project because of the short time between project approval and start of classes. In addition, the instructors did not spend a great deal of time in preparation because they viewed this as a one-time only activity. In contrast, the other two instructors were teaching courses that would be taught via videoconferencing again and both knew in advance that they would be teaching the courses. However, only one of them did any pre-planning and preparation and that was because of what she described as "her previous bad experience".

This suggests that following the advice of those who say that it is sufficient to provide an introduction to the technology was inadequate. At the same time, the instructors identified their own unwillingness and/or understanding of the need for a different form of planning from that that had been successful for them in their previous courses. Hence, the advice of Clay (1999) and others for a more integrated approach to training would seem more suitable. For the instructors in this study, the most crucial element of the training would be to help them realise their responsibility for the complete videoconferencing environment and to understand the constraints of the technology in replicating the opportunities present in a face-to-face classroom. Although videoconferencing is touted as a highly interactive system, it depends on the pedagogical orientation and actions of the instructor as to whether this is to be realised. For some of these instructors, providing them with the technical knowledge about how to switch among sites, and even the pedagogical knowledge about how to engender student interaction, would likely be insufficient if they were not in

agreement with this form of learning and had time to practice it. As one instructor commented, "I probably wouldn't have taken much advice."

The importance of the personal pedagogical orientation and preferred instructional strategies was also clear. These instructors worked from their conceptions of teaching and determined their own barometers for their success based on idiosyncratic characteristics. Instructors A, B, and C used their own experiences as students and prior experiences such as drama to develop their personal philosophies. The teaching orientations of Instructors D and E were strongly influenced by the norms of their students' profession and the orientation of their Faculty, which stressed the importance of excellent interpersonal skills. In the absence of any other information, the instructors designed courses that were very similar to their other university courses in terms of course design and instructional strategies. If anything, their uncertainty about how to transfer some of their preferred strategies into a videoconferencing environment meant that they used fewer strategies in their videoconferenced courses. And despite having the services of the trainer available, their own lack of knowledge about course design meant that some *did not know what to ask or felt uncomfortable acknowledging that despite being chosen because they were good instructors they did not know what to do.* Any planned change to post-secondary instruction will need to take this into consideration in designing training programs.

The importance of explaining the entire videoconferencing environment and the instructor's responsibility for it was made evident through these instructors' general lack of understanding of the functions and personnel at the remote sites. While this can be partly explained by the pilot nature of some of the courses, it also speaks to a lack of recognition that distance learning requires an infrastructure just as much as classroom instruction. One additional insight is the importance of working through the presence and functions of co-instructors. Instructor D, in particular, found herself in a tense situation between the students' perceptions of their local instructors as

experts and her sense of unease with this assessment. Because she did not work through this situation beforehand, she found that these unstated resentments affected her ability to interact with the students. In addition, having students present with her at the broadcast site who often became the focus of her attention further exacerbated the situation.

The issues raised by the instructors themselves—the lack of time and information and their inability to monitor students—are indicators of the difficulties faced by instructors who expect to transfer their teaching from one environment to the other, a position reinforced by the lack of any formal training program. These instructors did the best they could in situations that were much more difficult than they expected. Some decided to teach as they always did and did not worry about the students being different or at a distance. One didn't expect the course to be a success and managed to prove this expectation.

In much of the literature on training programs there is an expectation that the instructors are excited about using videoconferencing and anxious to expand their pedagogical repertoire. The varying expectations of these five instructors should serve as a warning that such an assumption is unwarranted. In addition, neither is past teaching excellence an accurate proxy for willingness to risk. Nor can it be assumed that the experience of videoconferencing will ensure that instructors will be more interested in adapting their teaching. Instructor E's positive orientation for change seemed to be very different from that of other colleagues in her Faculty who had experienced videoconferencing.

Thus, although the study found much in common with prior research, the experiences of these five instructors have raised questions about the advice available in the literature. In the end, any training program that does incorporate flexibility to accommodate the individual circumstances of each instructor is likely to be completely successful.

Recommendations for Practice

Is videoconferencing a viable delivery mode for teaching adult students? The answer to this question is "yes" if all the following recommendations are put into place.

1. **Faculty ownership:** Because the quality of the teaching and learning experience lies in the hands of the faculty, they must believe that any changes made to the method of delivering a course must be in the best interest of the students. Unless they have had an opportunity to take part in the discussions about the adoption of the technology in their unit and are kept informed of decisions that are being made, the potential for resistance, resentment, and ultimate failure is high.
2. **Faculty perception of why they have been chosen:** It is very important that faculty understand that there are criteria to be met before being scheduled to teach a videoconferencing course. These criteria include: being considered by students and peers as an excellent instructor; and the obvious, an expert in the subject content; and willingness to try something new with the understanding that a training component plays a major role initially and an on-going role as long as the individual is using the technology.
3. **Training and time:** Without a comprehensive training program in place and faculty release time to take the training and develop the curriculum, both faculty and students are likely to be unsatisfied and unlikely to succeed. A training program consisting of three major components – how to use the technology, how to design the curriculum to take advantage of the variety of instructional strategies available using the technology, and on-line practice – must be in place prior to implementation of course offerings. An element of training that must be included when working with beginning distance education instructors is the understanding of what it means to be the distance education student. To obtain this understanding, the initial stages of the training program

need to take place with the faculty at a remote site so they are the distant students. They must also practice teaching to one another using the technology and revised curriculum. By doing this, they become comfortable with the technology, have a support system in place, and develop a true understanding of what it means to be on both the teaching and learning side.

4. **Matching individuals:** In all institutions there are those faculty who are willing to try anything, i.e., 'early adopters' and those who are not unless cajoled, i.e. 'late adopter'. In some situations, the 'early adopters' are admired and able to influence others to follow; in other situations, they are resented because they are encouraging a change that may impact on how someone else must teach. By understanding an individual's orientation to teaching in general, and teaching with distance education technology in specific, it is possible to develop a form of peer mentorship to assist one another throughout the whole teaching experience.

There is no guarantee that there will not be problems if these recommendations are followed. However, it is guaranteed that failure will result if they are not. Advice to any administration contemplating implementing technology supported distance education: **IF YOU ARE NOT WILLING TO FOLLOW THESE FOUR RECOMMENDATIONS, DON'T DO IT!**

Recommended Research

To assist the beginning videoconferencing instructor and to provide further assistance to those already using the technology, additional research is recommended in the following areas:

1. How can instructional strategies be used separately or in combination with one another to effectively teach in the videoconferencing classroom?
2. How can an instructor organize and effectively use collaborative teaching models within a videoconferencing environment to enhance the learning experiences of students?

3. What impact does the number of sites, configuration of sites, and availability of technology at sites, have on the quality of teaching and learning?
4. Will the use of other technology such as web sites and e-mail influence student interaction?
5. What types of student supports systems need to be in place to meet the students' needs.
6. What impact does the administrative infrastructure have on instructors' attitudes to teaching a distance education course?

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