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Using Interactive Desk-Top Videoconferencing as a Distance Learning Tool for Program Development and Support: An Ethnographic Case Study of Two Family Literacy Sites.

Geetanjali Soni
Louisiana State University and Agricultural & Mechanical College

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USING INTERACTIVE DESK-TOP VIDEOCONFERENCING AS A DISTANCE LEARNING TOOL FOR PROGRAM DEVELOPMENT AND SUPPORT: AN ETHNOGRAPHIC CASE STUDY OF TWO FAMILY LITERACY SITES

A Dissertation

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by
Geetanjali Soni
B. Sc. , Calcutta University, 1986
M. Ed. , Tulane University, 1992
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TABLE OF CONTENTS

ABSTRACT

This ethnographic study provides a description and analysis of the use of videoconferencing to teach an eight-week parenting class to parents enrolled in two family literacy programs. It describes the sites, details interactions that take place during videoconferencing, and investigates parents affective response to the technology. Data were collected through participant observation, interviews, video-recordings, and questionnaires.

Results indicated cross-site differences in the existing program, in affective responses of users, and in interactions during the technology-mediated classes. Findings showed that the parenting classes were successful. Factors that influence effectiveness of videoconferencing instruction are discussed. Results indicated that technological factors such as quality of transmission, organizational factors such as frequency of exposure, and contextual factors such as receptivity affected videoconferencing. Instructional methods and techniques that work well in videoconferencing and the teachers' suggestions for future uses of videoconferencing are presented. A frame-work for interaction analysis examining direct and indirect effects of the mediating technology on interaction is presented. Effects of videoconferencing on technology-centered interactions, student-centered interactions (amount, participation, type, responsivity, attention, and affective engagement) and pedagogy are examined. Implications for theory, practice, and future research are presented.

CHAPTER 1:
INTRODUCTION

Overview

In the past decade, telecommunications technologies and computer-based networks have become more affordable, powerful, accessible and user-friendly (Wagner, 1994). This has allowed for greater flexibility in their use in education. Educators and policy-makers are increasingly attempting to use these technologies to create effective learning environments to help meet some of the challenges unmet by traditional forms of education. National efforts in increasing the use of telecommunications and networking in education are evident from commitments like building the National Information Infrastructure, [NII]. The NII is the Clinton Administration's vision of a web of communication networks, computers and databases connecting all of the nation's classrooms by the year 2000 (United States Congress, Subcommittee on Telecommunications and Finance, 1995; U.S. Dept. of Commerce, National Telecommunications and Information Administration, 1996). The Telecommunications Act of 1996, passed by the 104 Congress also has special significance for the growth of educational telecommunications. Telecommunications service providers are now required to provide telecommunication and information services to public or nonprofit schools and libraries at discounted rates (Milone, 1996; Baime, 1996).

One area in which new technology offers exciting possibilities is in reaching learners at locations, which because of geographic isolation or lack of human and financial resources, are not well served by the traditional educational infrastructure. This area is broadly termed "open" or "distance" education. Distance education is defined as the process of providing instruction when the learner and the instructor are separated by physical distance and where some form of technology is used as a medium to bridge this distance (Willis, 1994).

Distance education has existed since the 1800s. However, the technologies supporting it have evolved from mail-based correspondence; through the use of radio, telephone, audiotape, television, and videotape technology; to the modern multimedia technologies like videoconferencing (Brown & Brown, 1994). Videoconferencing uses a combination of media to permit real-time, audiovisual, communication. The integration of computer and video technology in the form of digitized video, and the availability of high-density communication lines such as ISDN (Integrated Services Digital Network), have made desk-top computer-based videoconferencing a workable reality. Unlike room-based videoconferencing which requires specially equipped conference rooms, desk-top conferencing allows participants sitting at their individual computers to communicate through audio and visual signals as well as share graphics and text.

One specific use of distance education in which videoconferencing is employed is in reaching students and educators in rural areas. Typically, because of factors like geographical seclusion, poor infrastructure and low income, rural educators and students face a shortage of resources and academic isolation (Gal, 1994; Stern, 1994). Though distance education has been used for the provision of institutionalized, systematic and large scale education to students in remote areas for a while, in recent years more institutions are incorporating this technology into their fold to provide a variety of resources to rural areas (For examples, programs for education of rural educators are described by Knapczyk, Brush, Champion, Hubbard & Rodes, 1993; Gal, 1993).

Previous research indicates that regardless of the technology supporting it, distance learning *is* an effective way of reaching learners in remote areas (Schlosser & Anderson, 1994; Russell, 1992; Whittington, 1987). However, since educational use of telecommunications in general and videoconferencing in particular is relatively new, research in the use of videoconferencing for education is sparse and hence there is no existing theory of practice. There is a need of rich descriptive and exploratory studies to build a research base and to provide the first step toward building such a theory. As Bowen (1994) puts it,

> Because of the lack of basic descriptive research, it is difficult to assess the effectiveness of telecommunications projects. We need to know what effective use of telecommunications looks like, what contexts encourage it, and what conditions

> discourage participation or lead to exchanges that participants find unsatisfying. (p. 115)

This study is an ethnographic case study that aims to help fill this very lacunae. Its purpose is to provide description and analysis of the use of videoconferencing at two family literacy sites. It strives to explore and describe how telecommunications is used to ameliorate the problems of isolation and lack of resources at the two chosen sites; to gather reflections from those involved; and to describe the interactions that allow for effective use of this media in order to guide future attempts at such telecommunications use.

Rationale

Importance of Telecommunications in Education

Educational Challenges in Today's Communities

Rural areas in developed countries and developing countries both face the problem of inadequate educational infrastructure and limited financial resources (Stern, 1994; Smith & Curren, 1989). Historically, one of the results of rapid industrialization and economic development was the breakdown of the traditional agricultural economy and the mass migration of the rural population to cities and the subsequent centering of economic growth around the urban metropolises. As a result, today there is a lopsided distribution of infrastructure including educational facilities between urban and rural areas. This is true, today, in developing countries such as India

and China (Smith & Curren, 1989) as well as rural areas of countries like the United States of America (Stern, 1994). Among the problems faced by education systems in these regions is the shortage of experts, lack of training facilities, organizational support, access to educational facilities and lack of resources (Stern, 1994; Smith & Curren, 1989).

Some selected findings of *The Condition of Education in Rural Schools*, a report published by the U.S. Department of Education, Office of Research and Improvement (Stern, 1994), help to highlight the condition of rural education in this country. The findings of this report indicate that:

- Rural America is economically diverse, but the shifting employment has caused significant levels of poverty, with many rural citizens ill-prepared to meet the challenges of the modern economy (p. 3).
- Teachers and principals in rural schools are younger, are less educated, and receive lower pay than their nonrural counterparts (p. 3).
- Rural teachers limited access to continuing educational and professional development opportunities. This contributes to the lesser professional preparation of rural teachers (p. 33).
- Both lack of availability of qualified teachers for rural schools and a high attrition rate plagues rural education (p. 34).

In addition, teachers in rural settings often report isolation, lack of resources and opportunities for professional development (Gal, 1993).

Though distance education and telecommunications hold special promise for rural education and education in developing countries, it has its benefits in urban societies, too. The increasing demands of the workplace, the need for provision of specialized training to a small number of nationally and internationally dispersed workers, reduced educational budgets, need for time flexibility and the cost-effectiveness of minimizing travel time are factors that encourage the use of telecommunications in urban settings. Today, about 38% of educational telecommunications projects cater to urban users (Wilkinson & Sherman, 1991).

Financial and/or human resource shortages can thus make the provision of adequate educational facilities a challenge. Traditional means of education cannot meet the demand or the required cost-efficiency. New solutions need to be found and new telecommunications technologies provide new promise.

Promise of Telecommunications for Education

Some advantages of telecommunications technology that hold special promise for education are:

- Mass-media technologies make it easier to reach a large number of people. This is especially important when scarce funds make reaching a large number of people simultaneously important.
- Communication between geographically distant areas is easily established removing the isolation.

- Telecommunications and computer technology can be used to overcome limitations of physical space or capital by allowing electronic sharing of data bases and other information.
- New technology provides easy access to large amounts of data and information, as a result an information democracy is established.

Thus, the continuing development of new telecommunications technologies and the decreasing cost involved in supporting such facilities is providing educators with an increasingly effective way of reaching a larger number of learners providing them with access to academic resources and knowledge. Apart from a way to provide equal educational opportunities to all geographical areas, distance learning also holds possible answers to the problems of meeting the increasing demands of the workplace and stretching scarce financial or human resources available for education to the maximum. Other motivation for exploring distance-learning are time-tailoring and flexibility (Collis, 1993).

Relevance of Family Literacy

Family literacy is an intergenerational approach to solving the problems of poverty, dependency and undereducation. Family literacy programs view educationally disadvantaged parents and their children as a learning unit and cater to the educational needs of both. The benefits of such an approach are twofold: "As they improve their own life chances

through increased education, caregivers also improve the chances that their children will be successful in school" (The Office of Technology Assessment, 1993, p. 38). Such a dual emphasis on literacy is important because research shows that the mother's education influences her child's literacy development and school achievement (Gadsden, 1994; Office of Educational Research and Improvement, 1993; Sticht, 1988). The family component of these programs is beneficial to adults in their role as parents (National Center for Family Literacy [NCFL], 1996; Lord, 1994; Abt Associates, 1991) which helps them better focus on literacy preparation. Evaluation research has documented that family literacy programs are effective in preparing preschool children for academic and social success, improving parenting skills, bettering parents' basic education skills, improving parent-child interaction, and helping parents gain motivation (e.g., Brizius & Foster, 1993).

As with other educational settings, telecommunications technologies can be used to deal with some of the problems and needs of adult literacy programs. Technology can help (a) to recruit and retain learners, (b) to meet instructional needs, (c) in staff development, (d) in assessment and evaluation of programs, (e) to link literacy and social services, and (f) to coordinate between programs (U.S. Congress, Office of Technology Assessment, 1993).

Purpose of the study

The purpose of this study is to provide a detailed description and analysis of the process of using desk-top videoconferencing as a tool for providing additional resources to two rural family literacy project sites. This study strives to explore and describe how telecommunications is used to ameliorate the problems of isolation and lack of resources at the two chosen sites, to gather reflections from those involved, and to describe the interactions that allow for effective use of this media in order to guide future attempts at such telecommunications use.

This research consists of two ethnographic case studies. Two sites were selected for study to see similarities and differences in the assimilation and use of videoconferencing equipment within similar family literacy programs. An attempt is made to describe each case in sufficient detail, providing contextual and situational particulars that will enable readers to make future comparisons.

I use Stake's (1994) definition of the case study, where the case is the unit of the object of study and not a methodology. As a methodology I have used mainly qualitative methods based on the ethnographic tradition. A few quantitative measures have been included to triangulate the qualitative methods. The three traditional tools of qualitative research namely, participant observation, interview and analysis of written artifacts (Patton, 1990) are the main means of data collection for this research.

The primary purpose of this study is not verification of hypothesis, but provision of rich description, often called "thick description" (Geertz, 1973), of technology in action. It is descriptive and exploratory in its purpose. This research approach is especially appropriate for investigating interactive videoconferencing as the use of this form of educational telecommunications is relatively new and lacks basic descriptive research (Bowen, 1994). This research will contribute toward forming a theory of practice for computer-based videoconferencing.

Thus, the purpose of this study is to provide a detailed description and analysis of the process of using desk-top videoconferencing at two rural family literacy project sites. It aims to explore and to analyze the interactions that take place during use of this technology as well as to document the reflections and responses of the users. Data for this study were collected through participant observation, interviews, video and audio-taping of videoconferencing classes, evaluation forms (for each class) and questionnaires.

Research Questions

Though there were some broad questions guiding this research at the offset, it was designed to be inductive in nature and was recursive (LeCompte & Preissle, 1994) in design as the questions guiding the study were subject to revision during the course of the research. At the onset of the research the following questions guided this study:

1. What are the teachers' expectations regarding videoconferencing and how do these change?

    (a) What is their attitude (before and while using) videoconferencing?

    (b) What resources do they expect to receive through videoconferencing?

2. How and for what purpose is the technology used?

    (a) How do the participants actually use the technology? What types of interactions take place during its use?

    (b) What is the purpose for which telecommunications technology is used?

    (c) Does it promote teacher education or training?

3. What contribution does videoconferencing make to the program?

    (a) What is the effectiveness of different forms of online communication?

    (b) What conditions encourage effective videoconferencing?

    (c) What are the main skills acquired during the program?

    (d) What impact does telecommunications have on the functioning of the family literacy program?

Revised Research Questions

Over the period of the study, the direction of research evolved due to changes in the nature of the videoconferencing sessions that were offered.

Investigation of the needs of the adult literacy program by the program administrators revealed the need for support for parents involved in the family literacy program, over and above what was being provided by the teachers involved in the program. The researcher's early observations and interviews with the teachers also supported this conclusion. The parents involved in this family literacy program were so often grappling with issues such as depending on government aid, raising children as a single parent, dealing with high frustration levels and other such "nonliteracy" issues, that one of the main expectations that teachers at the two sites expressed was receiving help in dealing with these issues. As a result, an eight-week course on parenting was the first class to be offered through the videoconferencing equipment and this became the main focus of this research. The primary focus of the study, thus, shifted from teachers as the users of the technology to parents as the users of the technology. During the five months of the study, the teachers at the two sites used the equipment mainly to keep in touch with the program administrators and the researcher. The revised set of research questions that emerged were:

1. What is the attitude of teachers toward the incoming technology and what resources do they expect to receive through videoconferencing?

2. Are the teachers' initial expectations met during the course of the program? What are their suggestions for future use of the videoconferencing?

3. How do the parents use the technology? [Note: Provide rich, "thick" description of videoconferencing in use. Include analysis of the interactions that take place. Build from this into existing theoretical framework for interaction analysis]

4. What is the affective response of the parents toward the classes and mediating technology? How do thesse change over the eight weeks of classes?

5. How effective is the videoconferencing course on parenting?

(a) Is there any change in the parenting stress level as measured by the Parenting Stress Index?

(b) What is the effect of the sessions as judged by student and teacher responses?

Rationale for Qualitative Research

The most compelling reason for using an ethnographic case study approach to conducting this research is the nature of the phenomenon under investigation. Desktop videoconferencing as a form of distance education, is a new technology, and very little research exists on its use. To better understand this new technology descriptive, exploratory research is required. Descriptive research helps to document process details and helps to identify the salient behaviors, events and beliefs in a particular setting. Exploratory research extends this description by establishing themes, categories, patterns, and relationships within the observed phenomenon

(Marshall & Rossman, 1995; Yin, 1989). Marshall & Rossman identify the purposes of exploratory research as:

-to investigate little understood phenomena

-to identify/discover important variables

-to generate hypotheses for further research (p. 43).

Since videoconferencing uses in education are still in their infancy, this kind of investigative research is necessary to understand the particular situation under study, as well as to determine the course of future research.

A second reason for using a qualitative research approach in this study is the desire to investigate "technology in use." This involves a holistic study of the complex interactions of users, task and technology. The phenomenon of interest in this study is not technology *per se*, but its use with real people, in real situations, in the meeting of real needs and solving of real problems. Furthermore, since the research site is an external, pre-existing family literacy program, experimental manipulation is not possible and a naturalistic approach is preferable.

This study also investigates the incorporation of technology into an existing program, and the changes that it brings. Such a study is most suited to the in-depth, longitudinal nature of qualitative research.

Inquiry Paradigm/Theoretical Stance

An inquiry paradigm can be described as the researcher's basic set of beliefs that underlie the design and execution of any form of disciplined

enquiry (Guba, 1990: Kuhn, 1970). Guba (1990) divides the paradigm underlying research into three components. These three components are:

1. Ontology: This determines that is the nature of the "knowable" and asks "What is the nature of reality?"

2. Epistemology: This establishes the nature of the relationship between the knower and the known.

3. Methodology: This deals with how to go about finding out knowledge or the systematic procedure of data collection and analysis.

Such an inquiry paradigm helps define the theoretical framework underlying qualitative research design and analysis. Using this framework I would describe the ontology underlying this research, as relativist-constructivist. This stance believes that we each have our own interpretation of the world and hence any research study is a personal, yet thorough reconstruction of reality. The epistemology underlying this study is subjective. I believe that the influence of myself as the researcher, cannot be totally divorced from my research. The method of research is qualitative, based in the ethnographic tradition.

Limitations of the Study

To reiterate, this study is largely my personal interpretation of the family literacy programs and the technology implementation at the two sites. I have attempted to be thorough and address issues of creditability and validity, yet I believe the researcher cannot be truly divorced from her/his

research, and my presence at the sites influenced my findings. Also, as is the case with most qualitative work, the small sample size of this study does not lend itself to generalizability. Rather, what the study aims to do is to provide a detailed description of the cases and the research procedures so that comparability is possible. Another limitation of the study is that practical limitations (of time, [wo]man power and energy) restricted the focus of the study to (a) an in-depth look at the questions outlined above, (b) two sites.

Quantitative data in this study were collected to supplement the findings of the qualitative study and judge the effectiveness of the parenting classes. The small number of students at each of the two sites, aided by a high attrition rate severely limited the usefulness of the questionnaire data. Additionally, small sample sizes did not allow the use of any inferential statistics.

CHAPTER 2:
REVIEW OF RELATED LITERATURE

This chapter provides a review of the literature related to use of distance learning technologies in education. The first section briefly traces the historical development of distance learning and defines distance learning in the modern context. This section also contains a review of the research that confirms the effectiveness of distance learning. The next section discusses the importance of interaction in learning and describes the increasing interaction supported by the new technologies of today. It also reviews the literature on assessment of interaction in distance education. The third section reviews some educational programs involving earlier forms of interactive telecommunications[1]. Section four reviews' examples of videoconferencing, in particular. Section five examines the concept of family literacy. Finally, the last section reviews qualitative research methodology in an attempt to define the ethnographic case study.

Distance Learning

History and Definition

Simply put, distance learning or distance education is the process of connecting learners in areas that are not well served by the traditional

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[1]*Telecommunications* is the science and technology of transmitting information as words, sounds, or images, over distance as electromagnetic signals. See Appendix A for a list (and glossary of terms) of commonly used forms of telecommunications in education.

educational infrastructure (because of geographic isolation or lack of human and financial resources), with remote resources. Delling (cited in Keegan 1986) in defining distance education writes

> Distance education (Fernunterricht) is a planned and systematic activity which comprises the choice, didactic preparation and presentation of teaching materials as well as the supervision and support of student learning and which is achieved by bridging the physical distance between the student and the teacher by means of at least one appropriate technical medium. (p. 58)

Following a review of definitions of distance education, Keegan (1986, p. 49) lists the main characteristics of distance education as:

- the quasi-permanent separation of teacher and learner
- the influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services
- the use of technical media; print, audio, video or computer, to unite teacher and learner and to carry the content of the course
- the provision of a two-way communication so that the student may benefit from or even initiate dialogue
- the quasi-permanent absence of a learning group... so that people are usually taught as individuals and not in groups, with the possibility of occasional meetings for both didactic and socialization purposes

Thus, broadly, distance education is the process of providing instruction when the learner and the educator are separated by physical distance and/or time and where some form of technology acts as a medium to bridge this distance.

Today, enormous ambiguity and dissonance exists in the literature on distance education. The changing nature of technologies supporting distance education and the evolving social and educational contexts within which it is used, necessitates a new perspective on distance learning (Garrison & Shale, 1990). A brief look at the history and evolution of distance education, helps illustrate this necessity.

Modern day distance learning has its roots in correspondence studies which first developed in the 1800s. Correspondence studies relied mainly on printed materials and a series of written interactions between the tutor and the student (Brown & Brown, 1994). Subsequent development led to the incorporation of media other than print into these "correspondence studies"; better categorizing them as "distance education" or "telelearning" projects (Kember, 1995). Distance education has been widespread in many countries around the world. The British Open University started in 1969 was the pioneering institution for distance education. Today "distance" or "open" education institutes are prevalent globally existing in societies as diverse as China, Australia and South Africa (Brown & Brown, 1994) and has established itself as an effective way to reach a large body of learners.

In the United States correspondence education existed in the late 1800s. In the 1920s educational institutions constructed radio stations to air educational programs and by the 1930s experimental television teaching programs were being developed at universities like the University of Iowa, Purdue University and Kansas State College. College courses were made available through broadcast television in the 1950s (Buckland & Dye, 1991; Schlosser & Anderson, 1994). Subsequent development of satellite technology further helped the rapid spread of instructional television. In 1988 the U.S. Office of Education Research and Improvement began a grant program called the *Star Schools Grant Program* that gave schools funding to develop, implement and promote distance-learning at the K-12 levels. This helped link many schools all across the country electronically. The emergence of satellite, fiber-optic, compressed video, and broadband digital technology furthered the mushrooming of numerous distance education programs all over the country (Brown & Brown; 1994). Today, these projects provide a variety of educational programs, ranging from the offering of tele-instructional classes for adults and children; regional, national and international student collaboration projects and teacher support networks (Jordahl, 1995).

The evolution of distance education worldwide can be viewed along three dimensions. These are illustrated in Figure 2.1.

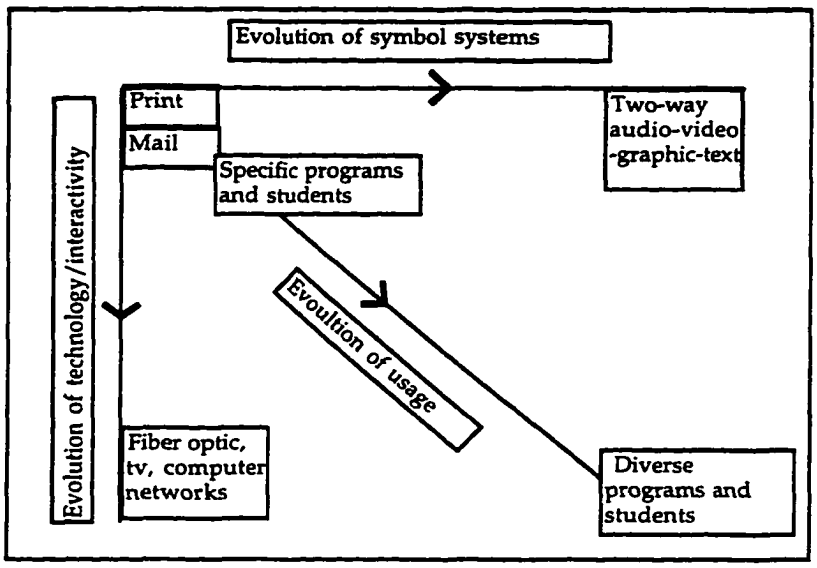

Figure 2.1 Evolution of distance learning.

First, technologies supporting distance learning have evolved from a primary reliance on mail-based correspondence to include the use of radio, telephone, audiotape, television broadcasts, videotapes and modern multimedia[2] communication technologies like videoconferencing and computer-networking. Second, these newer technologies not only allow communication to use multiple symbol systems, but also allow the learner and the instructor to be increasingly interactively involved in the learning

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[2] Considerable confusion exists regarding the terms *technology, media* and *symbol systems*. *Technology* can be described as a rigorous, planned method aimed at achieving a desired end. If this end is mass communication then this communication technology is called *media* (e.g., print, radio). Communication is achieved through a set of culturally defined and accepted *symbol systems* (e.g., audio and visual symbols). Media, therefore, comprise of one or more symbol systems and a physical technology for transmission.

process. Early mail based correspondence studies resulted in one-way communication, separated by a time lag. Subsequent use of telephone lines increased the amount of interaction possible and allowed synchronized communication. Interactive distance learning systems today include systems that allow audio only, graphic only, audio with built in graphics, one-way video and two-way audio or full two-way audio and two-way video communication. Videoconferencing technologies allows synchronized rather than asynchronized communication, and allows people geographically separated to see and hear each other.

The educational uses of telecommunication technologies are also becoming more diverse. Decreasing costs, simpler infrastructure and operational mechanics are allowing for this flexibility in usage. From the earlier, institutionalized, systematic and large scale production of distance education, more mainstream and traditional institutions are incorporating this technology into their fold (Garrison & Shale, 1990). These changes are embraced by Garrison & Shale (1990) who characterize the process of education at a distance by the following criteria:

> 1. Distance education implies that the majority of educational communication between (among) teachers and student(s) occur noncontiguously.
> 2. Distance education must involve two-way communication between (among) teachers and student(s) for the purpose of facilitating and supporting the educational process.
> 3. Distance education uses technology to mediate the necessary two-way communication.
>
> Garrison & Shale (1990) p. 25.

Existing literature uses terms such as distance-learning, distance-teaching, telelearning, teleteaching, outreach education synonymously with distance education (Willis, 1994). In this study, "distance learning" is used rather than "distance education" or "distance teaching", to refer to the videoconferencing classes that are a part of this study. This is done (a) for the sake of consistency, (b) in an attempt to manifest my belief that effective education involves a learner-centered, constructionist and interactive approach and (c) because the videoconferencing classes researched in this study used the distance technologies more for informal learning than the development of large-scale, systematic education.

Presently, apart from the desire to provide equal educational opportunities to all areas, the challenge of meeting the increasing demands of the workplace given the reduced financial and human resources available for this purpose, is fueling the exploration of distance learning (Willis, 1994). Other motivations for exploring distance learning are time tailoring and flexibility to learner characteristics (Collis, 1993).

Effectiveness

Though the use of computer-based videoconferencing in education is new and has no real research base, there is now considerable research on other forms of distance education such as instructional television, audio conferencing and satellite delivered broadcasts (Threlkeld & Brzoska, 1994; Schlosser & Anderson, 1994).

Research on the effectiveness of instruction delivered via distance education almost overwhelmingly finds it to be as effective as similar instruction delivered through traditional face-to-face teaching. (Russell, 1992; Whittington, 1987). Russell (1992) writes:

> ...no matter how it is produced, how it is delivered, whether or not it is interactive, low-tech or high-tech, students learn as well as their on campus, face-to-face counterparts even though students would rather be on campus with the instructor if there was a real choice. (p. 2)

Schlosser & Anderson (1994) conducting a review of distance learning also forward the view that students perform as well in a distance learning environment as a traditional environment.

Comparisons between the effectiveness of various media, though the dominant theme in distance education (Threlkeld & Brzoska, 1994), are meaningless (Solomon & Gardener, 1986). Continuingly findings indicate that the medium itself does not *determine* effectiveness of instruction (Clark, 1983; Solomon & Gardener, 1986; Whittington, 1987) and effectiveness is influenced by a variety of factors such as specific content, pedagogical objectives, characteristic of users, technology costs etc. (Norenburg & Lundblad, 1987). Instead of blanket attempts to determine the superiority of one technology over the other, what is a more meaningful research focus is a focus on *the content of the communication* itself. This can determine how the characteristics of a medium can be used to maximize effectiveness of instruction (Whittington, 1987). As Shale & Garrison (1990)

stress, the "most important feature for characterizing distance education is not its morphology, but how communication between teacher and student is facilitated" (pg. 31).

Interaction, Learning and Telecommunications

Interaction and Learning

Two-way communication or interaction is fundamental for establishing an effective learning environment. Theories of developmental psychology (e.g., Miller, 1983); learning and cognitive theories (e.g., Bigge & Shermis, 1992; Driscoll, 1994); instructional theory and design (e.g., Duffy Lowyck & Jonassen 1991); and communications (Daly, Friedrich and Vangalasti, 1990), all stress the importance of interaction in the creation and sharing of knowledge in both teaching and learning (Bigge & Shermis, 1992; Driscoll, 1994). Garrison (1990) argues for the importance of interaction by saying:

> ...education, whether it be at a distance or not, is dependent upon two-way communication. There is increasing realization in the educational community that simply accessing information is not sufficient. In an educational experience information must be shared, critically analyzed, and applied in order to become knowledge. (p 13)

Interaction and Distance Learning

Distance learning is characterized by the use of technical media (be it print, audio, video or computer) to unite teacher and learner. Modern technology such as videoconferencing, up-front seems to promote

interaction by allowing the real-time exchange of audio, video and textual information. The debate on whether the medium affects the message rages on (Clark, 1983; Kozma, 1994) and the results of research are paradoxical (Hillman, Willis & Gunawardena, 1994). Though the technology supporting/carrying instruction may not *determine* the effectiveness of instruction (Russell; 1992); this technology itself is not neutral (Norman, 1993). As Donald Norman succinctly puts it, "Each technological medium has affordances, properties that make it easier to do some things than others" (p. 244). The modern telecommunication technologies, with their real-time exchange of audio, video and textual information, seem to "afford" interaction.

The fact that technology does affect interaction is supported by research. Adams and Hamm (1988) for example, show that technology affects the interaction of its user particularly if the user is not familiar with that technology. Hillman, Willis & Gunawardena (1994) support this view.

Operationalizing Interaction

Moore (1989) identifies three components of interaction: learner-content interaction, learner-instructor interaction and learner-learner interaction. Moore further elaborates that interaction between the learner and the content, be it in text, audio, graphic or video form, is a self-directed intellectual activity that "results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind"

(p. 2). Learner-instructor interaction can include the presentation of information, demonstration of skill, practice of skills, evaluation, counsel, support and encouragement. Learner-learner interaction can be alone, in group settings, and with or without the presence of the instructor.

However the evidence that technology does affect interaction adds an additional dimension to the definition of interaction as based on nontechnological environments. Hillman, Willis & Gunawardena (1994) suggest the addition of a fourth element of interaction, Learner-Interface interaction, which they define as:

> the interaction that occurs when a learner must use these intervening technologies to communicate with the content, negotiate meaning, and validate knowledge with the instructor and other learners (pg. 31).

Hillman, Willis and Gunawardena also point out that it is important to distinguish between this fourth mode of interaction, "and the use of an interface as a mediating element in all interaction."

Wagner (1994) recommends the use of the Interactive Information Transport Model in Figure 2.2 to conceptualize the mechanics of interactive telecommunications. Wagner (1994) points out interaction itself is a multifaceted and often ambiguous concept and researchers need to delimit and operationally define this construct. Researchers need to distinguish between interactions that are a property of learning events and delivery system interactions that are a property of the media. Wagner suggests that

interaction is an attribute of effective instruction and *interactivity* is an attribute of modern telecommunications technologies. "Interactivity may eventually be viewed as a machine attribute, while interaction may be perceived as an outcome of using interactive delivery systems" (pg. 26).

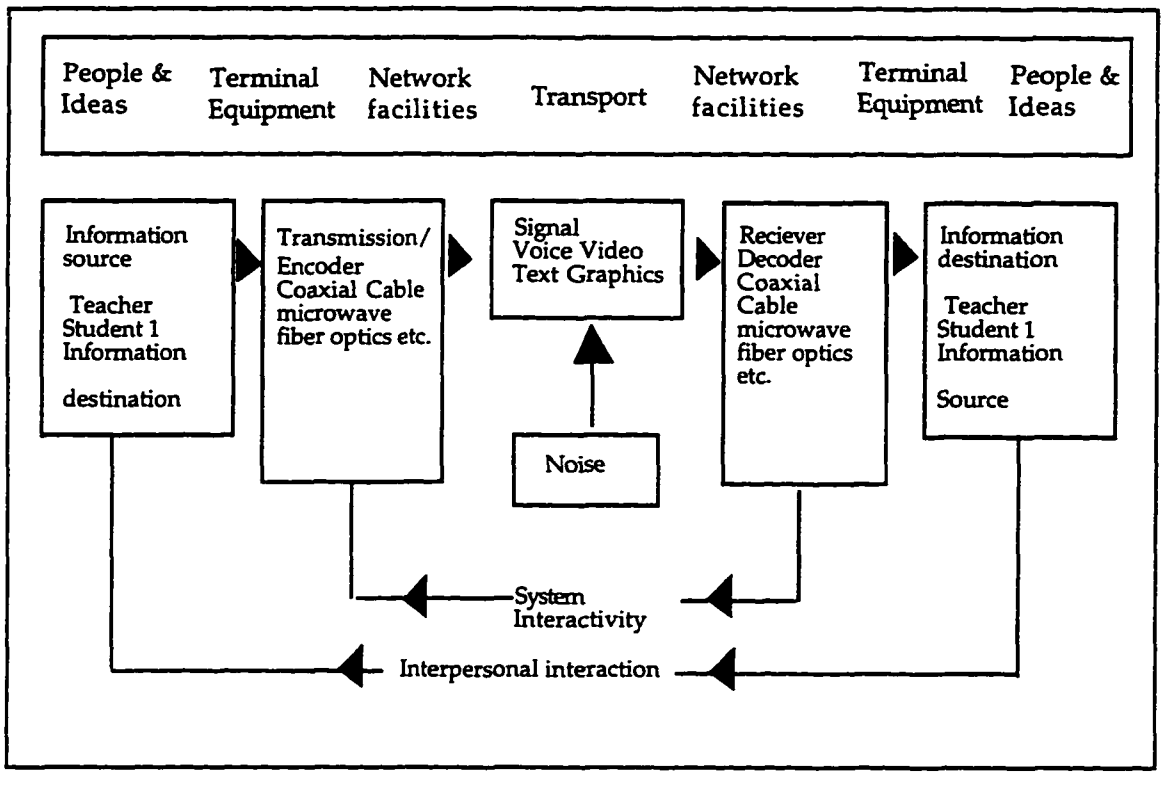

Figure 2.2 An Interactive Information Transport Model (Wagner, 1994, p. 25)

Examining existing research in distance education in order to determine how the concept of interaction has been operationalized, shows that little consistency is evident in the way this construct is defined and measured. Interaction as a variable in distance education research studies is

often looked at only in terms of frequency. Van Haalen & Miller (cited in Main & Riise, 1995), for example, measured interactivity in a satellite broadcast program on basis of telephone logs, recording calls from student to teacher. Other researchers such as Gunawardena, Anderson & Lowe (1996) see interaction much more holistically and develop a model for the analysis of computer-mediated-conferencing (CMC) which incorporates both qualitative and quantitative analysis this on-line interaction. Analysis of frequencies of messages, content analysis of generated transcripts, and participants' self report of satisfaction are the three aspects that this model concentrates on. In this model, the authors focus content analysis on units that have cognitive or metacognitive content and develop a five-phase evaluation model. The five phases developed are (a) Sharing/comparing, (b) Dissonance, (c) Negotiation, (d) Testing constructs and, (e) Statement or application of newly constructed knowledge.

This model builds from Henri's earlier model (cited in Gunawardena, Anderson & Lowe, 1996) which divided content analysis into content reflecting, participative dimensions, social dimensions, interactive dimensions, application of cognitive skills, and, application of metacognitive skills.

In a much needed attempt to develop a taxonomy for research on interaction in distance learning (Main & Riise 1995) identifies six categories of interaction. These are:

1. Amount:This can be measured in terms of frequency and length.

2. Type: This could be, learner-content interaction, learner-instructor interaction and learner-learner interaction. Type can further can be differentiated by initiator of the interaction.

3. Timeliness: Measured on a scale from zero to real time.

4. Method: Whether interaction is verbal, visual, or text.

5. Spontaneity: Judges whether interaction is ad hoc or planned.

6. Quality: Analysis of quality of interactions focus on (a) intensity: routine; interested; emotionally involved, (b) relevance: professionally related subject matter or personal, (c) depth: trivial to substantive, d)formality and, (e)opportunity: ability to interact when desired .

Thus a review of the literature on interaction analysis indicates that though there is a consensus among researchers about the importance of interaction in learning, there is considerable variation in the way various researchers define and operationalize interaction. It appears that due to the variety of educational settings and technologies falling under the umbrella of distance learning, a single framework for interaction analysis is not appropriate. However research suggests that it is necessary for researchers investigating interaction to consider the technology-user interface interactions along with other types of interaction such as learner-content and learner-instructor interaction. Main & Riise (1995) list a taxonomy for

analyzing videoconferencing interactions provides a useful base for further developing a model of interaction

Due to its newness, research on the advantages of videoconferencing usage in education is still scarce. However, some precursors of this technology have been used for educational and training purposes and have illustrated the benefit of interactive communication. Research on audio-teleconferencing (Garrison, 1990); computer-conferencing (Cheng, Lehman & Armstrong, 1991; Gal. 1993) and use of audio-graphics (Knapczyk, Brush, Champion, Hubbard & Rodes, 1993) indicate both that it is effective as a means of learning and that users display a positive attitude toward using it. In general education systems that provide high levels of interactivity have been found to best meet instructional needs (Hackman & Walker, 1990).

Attitude Toward Technology

Though a review of the literature on distance learning suggests that achievement is not affected by the medium of communication, it also indicates that students *prefer* face-to-face communication to distance communication (Schlosser & Anderson, 1994. Russell, 1992). Russell (1992) writes that "students would rather be on campus with the instructor if there was a real choice."(p. 2)

Most of these reviews deal with earlier forms of distance learning like television broadcasting. As mentioned earlier, new digital technologies of today create an environment that is both interactive and allows

communication through multiple symbol systems (visual, text, audio, and graphic). Research on more interactive forms of distance learning such as audio-teleconferencing (Garrison, 1990); computer-conferencing (Cheng, Lehman & Armstrong, 1991; Gal. 1993; Gunawardena, Anderson & Lowe, 1996) and use of audio-graphics (Knapczyk, Brush, Champion, Hubbard & Rodes, 1993) indicate both that it is effective as a means of learning and that users display a positive attitude toward using it. At present the best that can be said is that reliable conclusions about preference cannot be drawn (Main & Riise, 1995).

Successful use of any new technology can be expected to be dependent on the attitude and receptivity of the users toward the technology and the organizational and external support received by the users. The research on acceptance and success of educational innovations shows that effectiveness depends on variables at two levels, the personal and the organizational. At the personal level, anticipated benefits and efficacy (the belief that one can successfully perform required actions (Bandura, 1977)) are important determinators of the effectiveness of an educational innovation. At the organizational level support and training are key factors for successful use.

In a comprehensive review of the literature on teacher receptivity to system-wide change, Waugh & Punch (1987) identified six variables that research indicated affected receptivity to change. These were (a) basic attitudes to education, (b) alleviation of fears associated with change,

(c) practicality of the change, (d) perceived expectations and beliefs about the change, (e) perceived school support, (f) personal cost appraisal for the change.

The considerable research base that exists on attitude toward technology and successful integration of technology in education (Gressard & Loyd, 1986; Loyd & Gressard, 1986; Savenye, 1993; Koontz, 1992; Metu, 1993; Hunt & Bohlin, 1993; Cambre & Cook, 1985; Delcourt & Kinzie 1993), supports the claim that user attitude is important. "Attitude" however, is a difficult construct to measure and different researchers have defined, and hence measured it, differently (Savenye, 1993). A review of the research on attitude of teachers toward technology (in particular toward computers) shows that studies on attitudes toward computers focus on one or more of the following components: anxiety, confidence and liking and perceptions of usefulness. Gressard &Loyd's computer anxiety attitude scale, (Gressard & Loyd, 1986; Loyd & Gressard, 1986), a commonly used Likert type scale, for e.g., subdivides attitude into these four components. Cambre & Cook (1985) focus on anxiety alone. Saveyne (1993) focussed on liking, value for education and society, anxiety, confidence and perceptions of gender appropriateness. Delcourt & Kinzie (1993) subdivided attitude into: comfort/anxiety and usefulness and measured self-efficacy (defined as confidence to perform a specific task) separately.

These studies all show that a positive attitude is a result of expectations of professional gain, familiarity with, and access to, technology (Johnson, 1987). Other factors that are necessary for successful implementation of technology by teachers' include extensive practice, individualized attention, voluntary participation and a comfortable, non-threatening atmosphere (Schrum, 1993).

Interactive Telecommunications in Rural Program Development [3]

The previous sections provided a definition and short history of distance education and reviewed research regarding effectiveness of, and attitudes toward, distance learning technologies. This review indicated that although earlier technologies were effective forms of communication, increasing interaction can be beneficial. This next section explores specific use of telecommunication technology, both videoconferencing and its precursors, for provision of resources to rural areas, in more detail.

Typically, because of factors like geographical isolation, poor infrastructure and low income, rural educators and learners face both a shortage of resources and academic isolation. To make effective changes in rural education it is necessary to reach educators and learners in those areas. Even in urban areas, telecommunications can be used as a cost-effective, and

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[3] See Appendix A for details on the various forms of interactive telecommunications used in distance education

rapid way of keeping educators in touch with each other and the latest developments in the field of education. In order to meet their educational challenges, school personnel need access to information about new teaching practices and innovations to carry out their job effectively (Knapczyk, Brush, Champion, Hubbard & Rodes, 1993). A major challenge for rural schools is to minimize the travel time and costs associated with getting outside experts for staff development (Keegan, 1989). Telecommunications can be an effective tool for provision of educational resources. This fact is illustrated by numerous studies, some of which are detailed below.

Knapczyk, et. al. (1993) at Indiana University report on a project that uses audiographics for the development and support of rural teachers. Audiographics allow the two-way transmission of graphics and text across telephone lines between teachers who remain in their school and university experts. It is interactive and allows users at the different sites to annotate images on their computer screens and the annotations appear on the other sites' screens. Knapczyk, et. al. report that:

1. A distance education link between rural schools and the university is an effective, reliable, inexpensive and versatile way of bridging the distance to outside experts.

2. It is important to promote ownership of the training, so that the staff views the activities as important and interesting. Activities should match the needs and interests of the teachers.

3. Activities encouraging teachers to apply concepts immediately to real life situations are most effective. Follow-up sessions and feedback is necessary.

4. Telecommunication can be used to increase collaboration between the staff.

The Wintrop College Telementoring, Teletraining, Tele-communication Project used networking (or computer conferencing) to provide inservice training to rural teachers in early-childhood-special education in rural South Carolina (Kendall, 1992). Kendall reports that evaluations by external consultants revealed that participants perceived competency in the use of computers and their ability to use and understand research information improved significantly after the year long telementoring sessions. Analysis of utilization logs also showed that most common reason for using the facilities provided was to contact the staff at the university center. Participants in the program also found it to be relevant and user friendly. In an overall evaluation of the program (Kendall, 1992, p. 45), indicated that the program was effective in, (a) helping practitioners learn new information, (b) utilizing scarce resources efficiently, and, (c) empowering students to learn for themselves. Additionally, the time-flexibility provided by computer-conferencing is also beneficial to educators. Other staff development programs confirm the success of the use of computer-conferencing for teacher development (Gal, 1991, Dillon, 1991).

Videoconferencing Projects

The type of videoconferencing that is the most prevalent in distance-education today is through satellite link. Satellite connection allows full motion video to be transmitted one-way. Some degree of interactivity is usually obtained through two-way audio linkages. Examples of such videoconferencing for staff development include those at the Oklahoma State University, and the TI-IN Network Texas (Baker, 1987). Fully interactive videoconferencing is less prevalent, though some innovative programs have used this form of video conferencing for teacher education. The *Jelling State Teacher Training College,* Denmark was the site of one such project (Pjengaard; 1992). Pjengaard analyzing the use of room based videoconferencing during the student-teaching phase of teacher education reported that the presence of a "Big Brother Effect" or embarrassment in front of a video camera, did not really pose a problem and after a while all concerned were quite impervious to the existence of a camera. Pjengaard's findings also indicate that videoconferencing is an effective way for teacher educators to oversee and interact with student-teachers in their classrooms.

The *Institute for Small and Rural Districts,* established by the Florida Department of Education also used videoconferencing to overcome time and distance restraints and provide training to special education providers in Florida's 27 small school districts (Chancey, 1995). As Chancey reports, the project was successful in providing statewide training of special educators and

in the sharing of resources and best-practice information. Evaluation of the project reported that videoconferencing was cost-effective and efficient. Users also reported the benefits of reduced travel-time. One finding importance for practice was that users found that a printed resource manual, which supported the videoconferance content, to be very important for the success of the training.

A statewide electronic network linking teachers and educators has been set up in Wyoming in a large scale collaboration between the University of Wyoming College of Education, the State Department of Education, school districts, business and industry (Yocom & Whitson, 1995). This network uses digitized, compressed video communication to deliver a coaching/mentoring model for teacher education. Since this project is a pioneering use of videoconferencing in teacher education, it is reviewed in somewhat detail. Yocom & Whitson report that student evaluations of the project centered around two areas: teaching techniques and the technology/distance aspect. As far as teaching techniques were concerned, participants reported positive reactions to: use of visuals, role playing and the instructor's humor and flexibility. On the negative side it was felt that compressed video teaching seemed "canned", lecture presentation did not work well, more timely feedback was needed, and, interaction was difficult over the equipment. In addition, remarking on the pluses of the distance/technology aspects, students felt that the technology, (a) had the potential for statewide course

delivery and made access to university courses easier, (b) was a great way to meet new colleagues, (c) was a real time saver (no travel), and, (d) was preferred to audio-conferencing. The negative aspects of the technology included: difficulty of face-to-face interaction, time wasted due to technical delays, frustration with technology, and bad time-management by instructors (Yocom & Whitson, 1995, p 269-70). Yocom & Whitson also report that:

> From the instructor viewpoint . . . pluses included the challenges of a new technology, the fun of learning about and using a new technology, the quick comfort level instructor's felt with the technology, time and cost savings for distance delivery of courses, and the ability to expand the variety and number of outreach courses. Instructors identified several drawbacks as well . . . intimidation using the new technology, difficulty developing interpersonal relationships, an inability to cover sufficient material in each session, and some difficulty being spontaneous. (p 270.)

Overall, the program reported success with both the teachers and the instructional staff reporting satisfaction.

Other researchers have used the terms *telementoring* and *teletraining* to describe types of the use of telecommunication networks. As Kendall (1992) explains:

> Telementoring is the process of utilizing a telecommunication network between an institution of higher education and public schools located in rural areas. The faculty provides support in assisting the administrators with problem solving related issues; in providing research information and training practices to the teachers , in keeping educators updated regarding educational opportunities, resources, services, legislation and conferences... Teletraining is the process of training educators in their respective fields...to deliver instruction and research to educators in rural areas. (p 42.)

Some effects of the use of videoconferencing in education are illustrated by a pioneering project at the University of Ulster, Northern Ireland. Since 1990, this project, has used live, interactive videoconferencing to reach students at diverse locales (Abbott, Dallat & Robinson, 1995). Abbot et. al.'s five year study puts forth some salient points for future users of educational videoconferencing to keep in mind. Abbott, Dallat & Robinson report:

1. Tutors and students both showed enthusiasm about the technology though there were misgivings about perceived inadequacies in training in the use of the technology as well as the effectiveness of the equipment. Technical malfunctions were treated with toleration (p. 78)

2. Erratic sound quality was at times abysmal causing teacher and student frustration. It could inhibit discourse as well as put stress on tutors in sustaining interaction.

3. Teachers were worried about their teaching style becoming more didactic. Teaching was modified in attempt to balance levels of dialogue, structure and learner autonomy. Teaching styles were more affected than learning styles. Seminars, written handouts etc. were incorporated into teaching in attempts to make communication interactive (p. 79).

4. Induction to the technology through a face-to-face meeting which familiarized the students with the technology, as well as established a firm basis for the course content was deemed useful (p. 79).

5. On going use of the project led to the development of "a triple pedagogy of short illustrated presentations by the tutor, group work on-campus and cross-campus interaction" (p. 80).

6. On-site cohesiveness was strong. Inter-site cohesiveness was less, but grew as confidence with videoconferencing and hence students' willingness to interact grew (p. 81).

7. Savings were considerable in terms of travel time and fatigue (p. 81).

8. Learning outcome was impressive with a 100% examination pass rate (p 81).

Another study of a prototype virtual classroom tested by the Anderson Center for Innovation in Undergraduate Education also reported both excitement and intimidation by users (Wilson & Mosher, 1994).

In conclusion, research on use of videoconferencing indicates that:

1. Increased interactivity is one of the biggest benefits of videoconferencing.

2. Content of telecommunications can be designed to promote both training and education.

3. Effectiveness of materials conveyed through telecommunications is more or less the same as face to face communication.

4. Telecommunications can be used to overcome isolation, limited resources and lack of professional development opportunities through,

(a) access to university based area-specialists, (b) access to information and resources, regional, nationally as well as internationally, (c) development of collaboration between rural educators at diverse sites (communities of practice).

5. New users of the technology are enthusiastic though intimidated and apprehensive.

Family Literacy

Family literacy is an intergenerational approach to solving the problems of poverty, dependency and undereducation. Family Literacy Programs view educationally disadvantaged parents and their children as a learning unit and cater to educational needs of both.

The concept of family literacy is based on the idea that child and parent education is linked in many ways. Research on both adult education and early childhood programs indicates that the mother's literacy is one of the most important factors influencing children's motivation to acquire, develop and use literacy (Gadsden, 1994). A mother's level of education is also one of the most important factors influencing children's school achievement (Office of Educational Research and Improvement [OERI], 1993; Sticht, 1988). The level and nature of parent-child interactions are also critical factors in a child's literacy development (Gadsden, 1994; OERI, 1993). The link between parent and child is an important one for adult literacy too. Research indicates that even for parents wanting to better their education,

the demands of parenting often outweigh their commitment to gain access to literacy programs (Abt Associates, 1991).

Parents also are often motivated to improve their own literacy in order to be able to help their children in school (Powell, 1991; Lord, 1994; National Center for Family Literacy [NCFL], 1996). Adult learners have also identified their need for skills that help them better fulfill their responsibilities as a parent ((Lord, 1994; National Center for Family Literacy, 1996).

The Office of Technology Assessment (U. S. Congress, Office of Technology Assessment [OTA], 1993). reports the benefits of such an approach are twofold: "As they improve their own life chances through increased education, caregivers also improve the chances that their children will be successful in school" (p. 38).

One of the most widely known Family Literacy program models is the *Kenan* model implemented by the National Center for Family Literacy [NCFL] (Gadsden, 1994). NCFL (1994) states that the prime goal of this program is, "...to break the inter-generational cycle of undereducation and poverty by improving parents' basic skills, their children's preliteracy and school readiness skills, and the overall quality of parent-child relationships" (p. 10).

Parents who have not completed their high school education, and their 3- and 4-year-old children, attend the program together. The program

has four components, namely; (a) Early Childhood Education, focussing on developmentally appropriate cognitive and psychomotor learning for the children; (b) Parent Literacy Training, where parents participate in adult education classes; (c) Parent Time which is designed to foster peer support and focus on general parenting issues like dealing with behavior problems; and (d) Parent and Child Together time where parents and children interact together (NCFL, 1994).

Evaluatory research has documented that Family Literacy programs are effective in preparing preschool children for academic and social success; improving parenting skills; bettering parents' basic education skills; improving parent-child interaction; and, helping parents gain motivation, skills and knowledge for employment or further education (Brizius &Foster, 1993).

Adult learners in literacy preparation programs are from many different backgrounds, and have a diverse range of lifestyles, experiences and skills (U. S. Congress, OTA; 1993). Researchers and practitioners however indicate that certain characteristics are more predominant among these learners (Lord, 1994). Some characteristics of learners's in adult basic literacy programs as stated by Lord (1994) are:

1. Adults with learning needs do not necessarily want instruction; the greater the need, the more likely they do not want to join the program.

2. The most powerful motivators for parents to enrol in a program are the desire to get a job and the desire to teach and help their children.

3. These adults usually have low self esteem, and to compensate for this they often overcompensate by developing unrealistic goals.

4. These adults have a higher-than-average tendency to be overcome by frustration and have a deep fear of failure.

5. Adults with learning needs are very often faced with challenges and diversions, mainly from the home environment which adversely affect their ability to stay focused on instructional goals.

Computer and telecommunications technologies can be used to deal with some of the problems and needs of adult literacy programs. Technology can help (a) to recruit and retain learners, (b) to meet instructional needs, (c) in staff development, (d) in assessment and evaluation of programs, (e) to link literacy and social services, and (f) to coordinate between programs (U. S. Congress, OTA, 1993). For example, a problem faced by centrally developed programs, like the one developed by the National Center for Family Literacy, is that teacher support and provision of resources to the program at the local level is difficult (Brizius & Foster, 1993). Teachers' receive training from the National Center for Family Literacy, but provision of continued support, additional resources, and sharing of ideas, between programs is difficult, expensive and time consuming. This problem of isolation is even more acute in rural areas,

which due low levels of income and literacy are especially need such projects. Telelearning networks like the ones in this study are one possible way of alleviating these problems.

Qualitative Research

What is broadly called the field of qualitative research is a large and varied body of work that includes within its fold research and research strategies from disciplines like anthropology, sociology, psychology, history and education.

Certain issues characterize research as qualitative. In more detail qualitative researchers usually believe in the:

- Naturalistic perspective: Naturalists believe in a non-manipulative study of real-life situations within the context in which they occur. Guba (1978) identifies naturalistic inquiry as a discover oriented approach that is characterized by a lack of predetermined constraints on output and one that minimizes investigator manipulation of the context. Naturalistic inquiry is a design choice and not a choice regarding the kind of data (qualitative or quantitative) to be collected (Patton, 1990). Moreover, naturalistically collected data are not viewed as "fixed" given but are seen as arising from the interaction between the inquirer and the data source. (Lincoln & Guba, 1985)
- Inductive analysis: Patton (1990) describes an approach to be inductive "to the extent the researcher attempts to make sense of the

situation without imposing preexisting expectations to the phenomenon or setting under study. Inductive analysis begins with specific observations and builds towards general patterns" (p. 44). Qualitative methods are oriented towards immersion in details of data, from which patterns and categories are drawn out.

- Holisticity, context-dependence and uniqueness: Qualitative research emphasizes on understanding the phenomenon as a whole and not simply as a sum of its parts. Patton (1990) explains "In contrast to designs that manipulate and measure the relationships among a few carefully selected and narrowly defined variables, the holistic approach gathers data on multiple aspects of the study in order to assemble a comprehensive and complete picture of the social dynamic of the particular situation or program" (p. 50).
- Inductive, flexible research design: Qualitative researchers believe in the evolving nature of research design. In order to avoid preconceptions and bias, researchers allow the initial period of data collection to guide the emerging design of their study. There is a large variation in the amount of pre-planning suggested and undertaken by qualitative researchers - views range from those who think of pre-planning being "inconceivable" (Lincoln & Guba) to others who considerable desirable and unavoidable (Miles & Huberman,1994).
- Use of multiple types of data and data collection strategies.

Assuring Credibility of Qualitative Research

Traditional, quantitative research has established four criteria for rigor that, adapted, can be used to judge the credibility of qualitative research. (Miles & Huberman, 1994; LeCompte & Preissle, 1993; Guba & Lincoln, 1981). These are elaborated below:

Reliability

External reliability is the extent to which a study can be consistently replicated. This criterion is adapted to *confirmablity* in qualitative research (Guba & Lincoln, 1981; Miles & Huberman, 1994). LeCompte & Preissle (1993) write "external reliability addresses the issue of whether independent researchers would discover the same phenomena or generate the same constructs in the same or similar settings," (p. 331). Strategies for enhancing external reliability include: (a) clearly stating researcher's role and status (b) description of informants, (c) delineation of social, physical and interpersonal contexts in which data is gathered, (d) specification of analytic constructs and premises and (e) clear presentation of data collection and analysis procedures (LeCompte & Preissle 1993).

Internal Reliability is the *audibility* of the data (Guba & Lincoln, 1981; Miles & Huberman, 1994) or "whether the process of study is consistent, reasonably stable over time and across researchers and methods" (Miles & Huberman, 1994, p. 278). LeCompte & Preissle (1993) suggest that ways of increasing audibility of the study include the use of; low inference

descriptors, i.e. rich primary data or "thick description" (Geertz, 1973); multiple researchers; peer examination; and/or mechanically recorded data.

Validity

Internal validity concerns the *credibility* or *"truth value"* (Guba & Lincoln, 1981). Three techniques that Patton (1990) enumerates to enhance the integrity of analysis are: Testing rival hypothesis, searching for negative cases and triangulation. Triangulation includes the use of multiple methods of data collection, dependence on multiple sources of data, long-term or repeated observations and/or multiple researchers (Patton, 1990).

External validity usually refers to the degree of generalization that can be applied to the findings from one study. Given the context-bound, holistic nature of qualitative research, such context-free generalization is a contradiction of terms (Guba & Lincoln, 1981). Better criterion to apply to qualitative research are *translatability* and *comparability.* Comparability requires that the design and parameters of a study are defined in sufficient detail to allow other researchers to compare it with other studies and to address related issues. Translatability is the specification of theoretical underpinnings, definitions and techniques so that others in the field can access and understand the study (LeCompte & Preissle, 1993). Comparability and translatability and can be achieved through detail description.

Below, I detail two particular forms of qualitative research which have contributed to the inquiry paradigm of this research.

The Case Study

Case study research is used extensively in anthropology, psychology, sociology, history, law and medicine. It is used for purposes as diverse as clinical diagnosis, description, professional training, policy making and theory construction (Hamel,1993). Like the term *qualitative research* the omnifarious nature of the term case study has led to the existence of considerable ambiguity regarding its meaning (Ragin & Becker, 1992).

Case study research has often been used synonymously with naturalistic enquiry, phenomenological approach and qualitative research. Alternatively, other researchers have used case study to refer to a research strategy (Denizen & Lincoln, 1994; Yin, 1989), a research method (Hamel, 1993), or a unit of study (Stake, 1994). Yin (1989) writes that a case study:

> is an empirical inquiry that investigates a contemporary phenomenon within its-real-life context when the boundaries between the phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. (p. 23)

Case study research includes both single and multiple case studies. Case studies can be qualitative or quantitative (Stake, 1994; LeCompte & Preissle (1993): naturalistic or in experimental laboratory settings (Yin, 1989): descriptive, exploratory, explanatory, or evaluatory (Yin, 1989).

The above review of case studies indicates that case studies are varied in their theoretical base and in the methodology employed. What is most consistent among the definitions of case study advocated is the unit of study.

This view is expounded by Robert Stake (1994) who defines case study "not as a methodological choice, but a choice of object to be studied". Personally, I find this the most useful definition of the case study. This study can be defined as a case study which uses the methodology of ethnographic enquiry.

The Ethnographic Tradition

The ethnographic tradition has its roots in cultural anthropology, especially in the works of Malinovsky. Derived from the greek *ethos* - or race, people or cultural group and *graphia* writing, ethnography literally means writing about people. Ethnography is both a process as well as a product (LeCompte & Preissle). Ethnographers seek to study three fundamental aspects of human experience. These are (a) what people do --- cultural behavior, (b) things people make and use -- cultural artifacts, and, (c) what people say -- speech messages (Spradley, 1980). The primary data collection methods used by ethnographers are participant observation, interviews and artifact analysis.

LeCompte & Preissle (1993, p. 42-45) describe four selective dimensions along which they describe five strategies for ethnographic analysis. These dimensions are:

1. Induction to Deduction. This dimension refers to the role of theory in analysis. Deductive analysis aims to collect data to verify or falsify some existing "a priori" hypothesis (based on existing theory) whereas

inductive analysis begins with the data, from which categories and theories are determined. (Theory generation is based on data collection as opposed to data collection being based on theory.

2. Generation to verification. Generative inquiry hopes to discover constructs, patterns and categories from a given set of data, whereas verification tests hypothesis developed elsewhere.

3. Construction to enumeration. In constructive analysis units of analysis are based on observations, i.e. on data collected. In enumeration data are slotted into previously defined units.

4. Subjective to objective. This does not refer to the researcher's objectivity or subjectivity, but rather to how the conceptual categories are arrived at.

The five strategies for analysis that LeCompte & Preissle(1993) list are analytic induction, constant comparison, typologiacal analysis, enumerative systems and use of standardized observational prototypes. Most researchers would list the last three more as conventional rather than qualitative research(Lincoln & Guba, 1985). Classical ethnography falls in the inductive, generative, constructive-subjective end of this continuum.

Defining the Ethnographic Case Study

Because of the in depth focus on a particular culture, group or set of people an ethnography IS a case study, albeit a particular type of one. Not all case studies are ethnographies; as data collection methods inconsistent with

ethnographic enquiry (such as administrating multiple measurement instruments) may be used to investigate the case.

An ethnographic case study can then be defined as a subset of case studies. Certainly this is not a new concept in case study research, just an attempt to clarify some of the ambiguity that exists in the use of ethnographic studies and case studies in educational research. Many researchers have meant the term case study to refer to qualitative (a.k.a, naturalistic, a.k.a. ethnographic) research. Orum, Feagin, & Sjoberg (1991) for example define a case study as "an in-depth, multifaceted investigation, using qualitative research methods, of a single social phenomenon. The study is conducted in detail and often relies on the use of several data sources." (p 2). Within the qualitative methods proposed to study the case, Orum, Feagin, & Sjoberg list ethnography, life history and social history. Adapting, Orum, Feagin, & Sjoberg definition, I would define the ethnographic case study as: "an in-depth, multifaceted investigation of a single social phenomenon, using ethnographic methods."

CHAPTER 3:
RESEARCH DESIGN & METHODOLOGY

The purpose of this study is to provide description and analysis of the use of videoconferencing at two family literacy sites. Its aim is to describe the family literacy program at the two chosen sites, to explore how videoconferencing was used and to gather reflections from those involved in order to guide future attempts at such telecommunication use. This chapter details the research setting, the data collection methods, instruments and measures used, and the data analysis methods used in this ethnographic case study.

Research Setting

Case Definition

A *case* refers to the unit of study and hence necessarily has boundaries, it is a "functioning specific" (Stake, 1994) or a "bounded system" (Miles & Huberman, 1994). In this study, each unit of study comprises the implementation and use of videoconferencing into the family literacy program at a particular site. Each case in this study, hence, includes the teachers, parents at a site and their interaction with the university-based instructor through the desk-top videoconferencing technology. In this particular study, the first case consists of the Family Literacy Center at

Nazaire, the tele-learning links with the university and the users of the technology. In the second case the Family Literacy Center at St. Lincoln is considered.

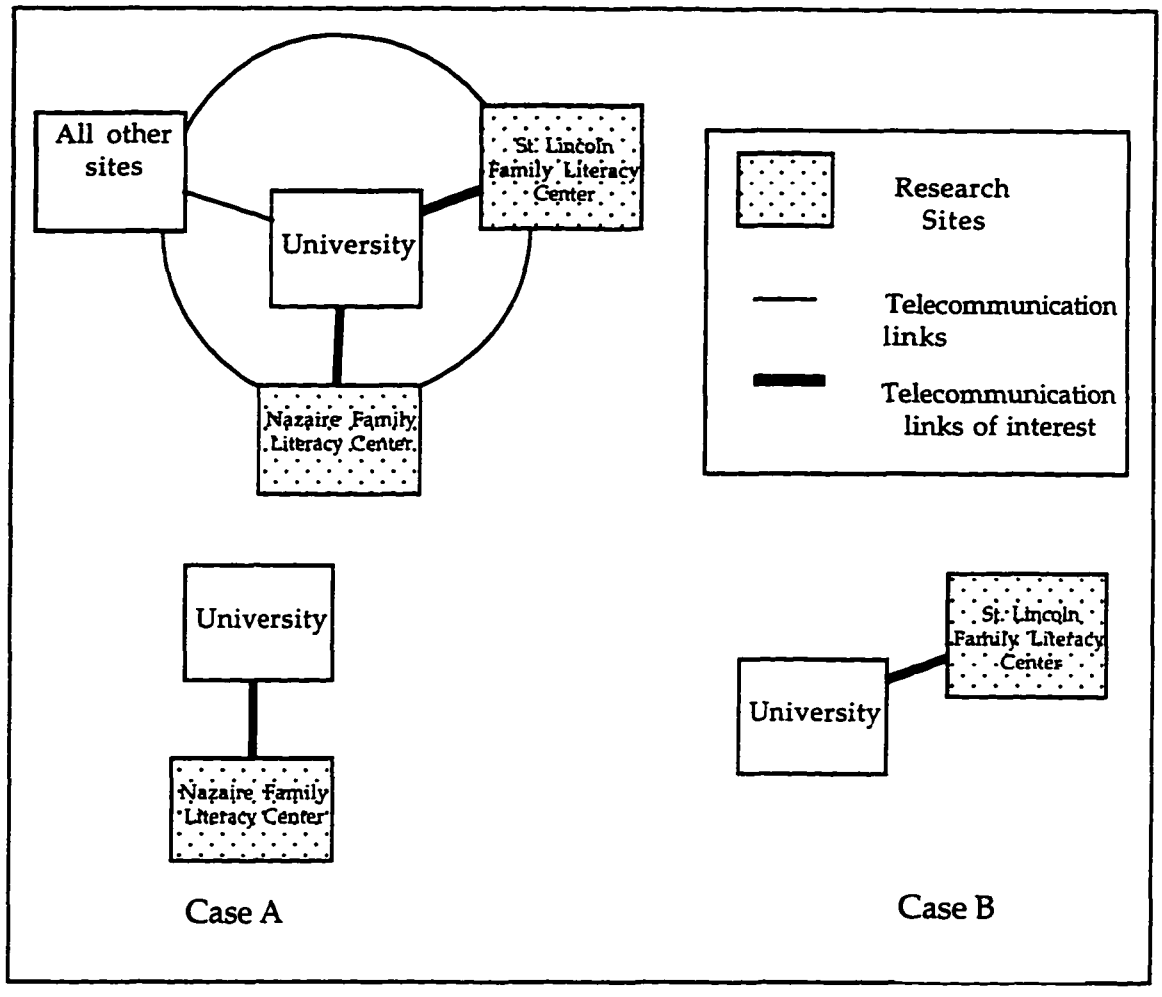

Figure 3.1. The research case.

Case Selection

The two cases chosen for observation as a part of this study are a part of a statewide tele-learning network that is in the process of being

established. Due to the ongoing nature of this larger project only a limited number of sites were operational during the time of this study. At the start of the study four sites were already on-line, and three more were scheduled to go on-line shortly. These two sites in the study were chosen on the basis of the following criteria:

1. Since the researcher wanted to observe the process of implementation and use of the technology, it was important that the chosen sites had not yet used the tele-networking equipment. Hence **implementation timing** was one selection criterion.

2. As the earlier literature review shows, distance education and telecommunications hold special promise for areas not served by the existing educational infrastructure. Hence existing **program infrastructure** was used as a selection criterion.

3. The family literacy sites in this telelearning network were spread all over the state. Hence **accessibility** was also used as a selection criterion.

4. Among the sites available, two cases in this study were chosen on a **dimension of contrast.** These two were chosen as they embodied important differences in the settings, yet had enough similarities in order to make comparisons.

Dimensions of Contrast

One of the chosen sites is rural and the other semi-urban. Though the same family literacy program is run at both the sites and the parents are

from similar economic backgrounds, the urban site has a more developed infrastructure and support system. The table below illustrates the main dimensions of contrast between the two sites.

Table 3. 2

Contrasts Between Sites

	Site A: Nazaire	Site B: St. Lincoln
Population	16, 609 [a]	1,253 [a]
Setting	Adult education center	Elementary public school
Number of graduates from program	Approximately 10 a year	None
Number of years in operation	Three	One and a half
Availability of resources	University Public library	Attached to Elementary School
Computer use by students	2 hours a week since start of program	First visit to computer lab: March

Note. [a] Census Bureau report (U. S. Department of Commerce, 1990) defines places with population > 2, 500 as urban.

Case A: Nazaire Family Literacy Center

This site is located in Nazaire, a town with a population of approximately 16,600, in the northern part of one of the southern states of the nation. This family literacy center is on the premises of an adult

education center. As this is a family literacy program, parents and their children enroll together. The students in this program came from the economically and socially disadvantaged population of Nazaire.

At the start of the study there were 12 parents, all single mothers, and all except one, African-American, in the program. The adults are in the age group of 19-34, the children's ages range from under a year to four. All the families are on government assistance and attendance to this program is mandatory for those enrolled in order for them to receive their weekly welfare check. Most parents come from the public housing projects on the west side of Nazaire.

The mothers are here at the adult literacy center to prepare for and take their GED, the high-school graduate equivalency degree. Parents enter the program with an education level ranging from the eighth to the eleventh grade. Lack of motivation, responsibility and self-esteem and problems of single parenthood are frequently seen in this population.

The staff associated with the program consists of an early childhood teacher, an adult education teacher, a teacher's aide and a parent advisor.

Case B: St. Lincoln Family Literacy Center

St. Lincoln is a small town with a population of just over 1,200, and is located in the center of the state. The family literacy program at St. Lincoln is affiliated to the local public elementary school. Here too, parents and their children enroll together in the program and come from the

economically and socially disadvantaged population of St. Lincoln and its suburbs.

At the start of the study there were 10 parents, all single mothers, and all African-American, in the program. The adults are all in their mid twenties except for one who is a grandmother at 49. The children are four or five years old. All the families are on government assistance.

Low literacy and poverty are intrinsic problems in this community too. St. Lincoln is very much the small rural town where everyone knows each other. Students do not live in public housing projects, but mostly in small, single, houses around the area. Participation in this program is not state regulated but voluntary.

Videoconferencing: Technology and Lesson Content

Desktop Videoconferencing

Desktop videoconferencing uses a standard personal computer, which has been fitted with a special videoconferencing card, connecting cables and a small camera. Unlike the type of videoconferencing most prevalent in distance-education today, which is through satellite link, desktop videoconferencing uses **compressed digital technology.** Digital videoconferencing is available today as room-based or desk-top systems. Unlike room-based videoconferencing that requires specially equipped conference rooms, desk-top conferencing allows participants sitting at their

individual computers to have real-time, video and audio communication with each other.

Compressed Digital Technology

Digitizing technology transforms video images from analog formats to digital formats (like computer files). This digitization is done by a coder/decoder or a codec (the codec also compresses the data). Digital video can not only be manipulated easily on computers, but can be transmitted through telephone lines or fiber optic cables. The speed of transfer of information is controlled by the bandwidth (measured in bits/sec). The problem with digitized video is that the resulting files are very bulky leading to very slow communication. Commonly, two methods are used to solve this problem. First, communication channels with more bandwidth than telephone lines (such as Ethernet and Integrated Services Digital Network [ISDN]) are used. Second, files are compressed into smaller packages for storage and transmission. Data compression techniques have the same effect as increasing the bandwidth of the communications channel. These two techniques together are used to increase the speed of information transfer giving a faster "frame rate." The quality of the video image is largely a function of frame rate. Higher frame rates mean that the video picture of the other person is less jerky and more fluid (Hudson, 1995; Galbreath, 1995).

The simplified mechanics of desktop videoconferencing are shown in Figure 3.3.

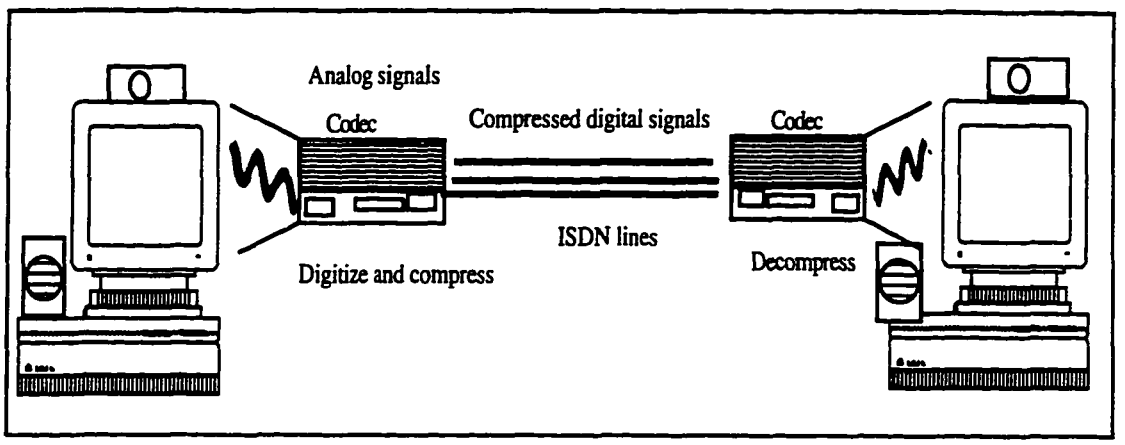

Figure 3. 3. Desktop videoconferencing technology.

For this particular study, desk top computers with video-cameras and videoconferencing software, and dedicated ISDN lines were used to communicate between the sites. Whereas the university site and the site at Nazaire used AT&T, 386 computers, St. Lincoln used a Macintosh Centris. Video communication was established using AT&T Vistium Personal Video 1300 software. The AT&T Vistium Personal Video 1300 is based on open industry standards H.320 series of video conferencing and switched digital communication standards and as a result, it is compatible with other H.320 standards based systems.

The Telelearning Network

The Telelearning Network, of which these two sites are a part, is a collaborative project set up by the State University, the Governor's office of Rural Development, the State Department of Education, its statewide Office of Title 1 and five parish school systems in a southern state. This network uses computer-based full motion videoconferencing technology, described above, to link various institutions around the state.

Video Conferencing Sessions: Course Content

Eight classes on parenting skills stretching over a period of 10 weeks were taught by a professor from the university-based site. Classes met once a week, for a duration of one hour, with a break for Easter. The main focus of the course was on parenting skills. The instructor for the course was Dr. Bird.

Speaking on the content of the course, Dr. Bird explained that one of the key issues that he dealt with was child discipline and alternatives to physical punishment. Describing the course and the philosophy behind his teaching Dr. Bird said:

> I think that one of the main problems in the black society is the physical violence: and now guns are readily available. So what I have been communicating in these eight weeks is alternatives to violence. You could say that this is a class in effective discipline. I am modeling things, giving them information about what I think they need.
>
> My philosophy or perspective behind it is that parents are an oppressed group in society... Part of the reason is that they are doing incredibly challenging work and they are not compensated for it; they are expected to do it on the side; they are isolated; they are blamed;

> they are not given support. In terms of the women I am working with in these centers, their lives are very hard. They have many burdens. They are poor. They are black, so they have to deal with racism, with class issues. They have not necessarily had a lot of education. Many of them became parents at very young age, when they weren't really wanting to be parents. The goal of the class was to create a safe enough environment where this could be acknowledged and talked about. So I wanted to do was to create a safe enough environment where I could give them some information about parenting. Since I knew I was only going to have them for eight weeks, I wanted to put in place some structures that can be carried on after I left.

The same instructor taught the course to parents at both the sites. Classes were taught every Thursday, from 12:30 to 1:30 p.m. at Nazaire and from 1:30 to 2:30 p.m. at St. Lincoln.

Data Collection Procedures

Data were collected in three main phases; (a) the *pre-technology* phase, (b) the *technology-in-use* phase, and, (c) the *post-teaching* phase. During the pre technology phase of the data collection, site visits were made. Because the sites were a considerable distance away, and I wanted to observe during various stages of the day, all day visits were scheduled. Observations and interviews took place during breakfast time, lunch time, on the playground as well as in the classrooms. During the technology-in-use phase and the post-teaching phase, most observations and interviews were done over the videoconferencing equipment. Video-recordings of the teaching sessions were also made.

The Data Collection Planning matrix (adapted from LeCompte &Preissle, 1993, p 51) shown in Table 3.4 was used to help organize data collection. This matrix evolved as research questions guiding the study evolved.

Table 3.4

Data Collection Matrix

Phase When	Question	Kind of Data What	Source Whom	Site Where	Method How	Purpose Why
Pre-tech	Attitude towards technology?	Qualitative	Teachers	Site 1 Site 2	Interview Observations	Judge initial attitude
	Resources expected through v-c?	Qualitative	Teachers	Site 1 Site 2	Interview	Judge needs
	What is the fam. lit. program like?	Qualitative	Teachers Parents Children	Site 1 Site 2	Observations Interviews	Description of existing program
Tech in use	What is attitude of users?	Quant. Qualitative	Parents	Site 1,2	Eval. forms Videotape analysis	Attitude patterns
_____	How is vc used?	Qualitative			Videotape analysis	Interaction analysis
Post teaching	Effect on parenting skills?	Quantitative	Parents	Site 1, 2	PSI	Effectiveness
	Affective response to technology & classes	Qualitative Quantitative	Parents	Site 1, 2	Interviews Evaluation sheets	Attitude
	Effect on the program?	Qualitative	Teachers	Site 1, 2	Interviews	Effectiveness

Researcher's Role

During this study, at different times, my degree of involvement and type of participation varied. Spradley (1980) contrasts researcher participation along a continuum as shown in Figure 3.5 below.

DEGREE OF INVOLVEMENT	TYPE OF PARTICIPATION
High	Complete
	Active
	Moderate
Low	Passive
(No involvement)	Nonparticipation

Figure 3.5 Type of participation. Spradley, (1980), pg. 58.

This continuum can be used to assess my degree of involvement during each phase of the study. Before the implementation of the technology, in the *pre-technology* phase, my role was that of an observer to try and assess the program into which this technology was to be introduced. During this phase my involvement was in the form of day-long site visits. At both sites, my initial presence was received with enthusiasm by the teachers and a degree of guardedness by the parents. Initially, my role was that of a passive observer. As I spent more time at the sites, and was accepted more openly by the students, through continuous interaction, conversations and interviews my degree of involvement increased.

During, the *technology-in-use* phase, I was involved as an *active* participant in the project. Due to my role as graduate assistant to the professor coordinating and spearheading the University's involvement with this project, I was actively involved in this phase. My contact with the two sites during this phase and in the *post-teaching* phase was mostly through the videoconferencing equipment. Using Spradley's frame work, my degree of involvement can be indicated by the shaded areas in Figure 3.6 below:

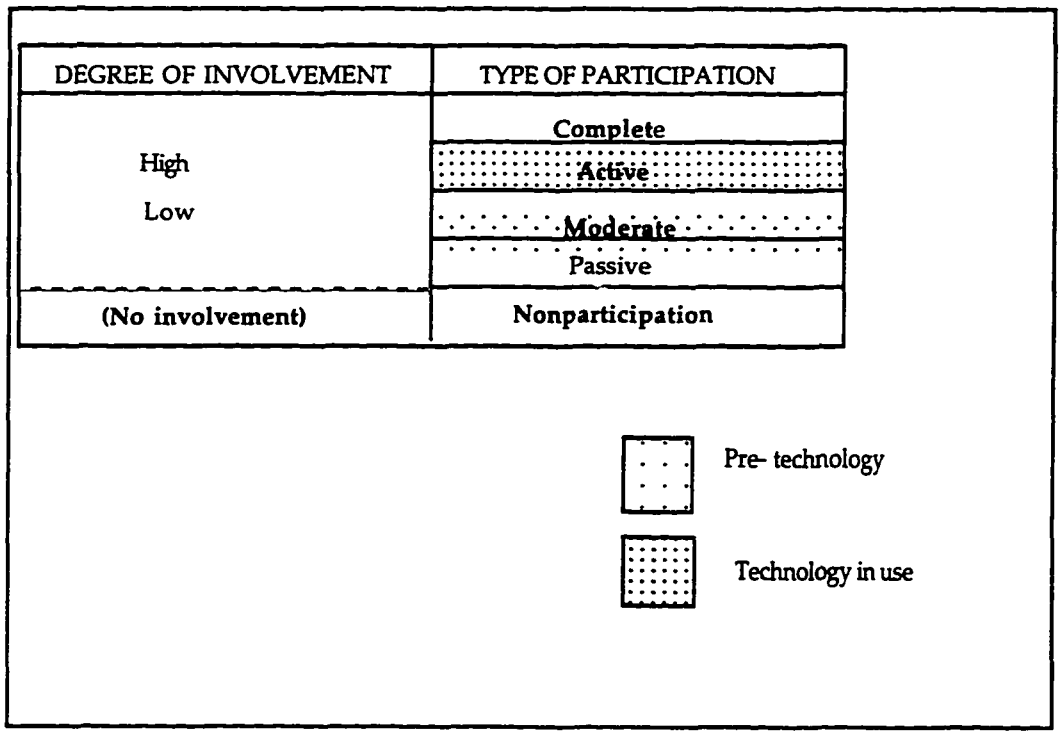

Figure 3.6. Researcher's role

Research Time Schedule

The time span of this research is indicated in Figure 3.7.

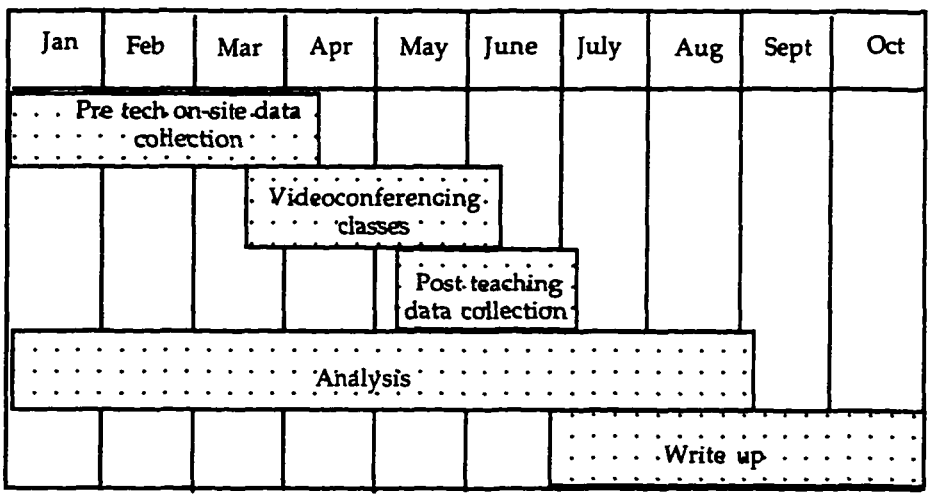

Figure 3.7. Time line of research.

Data Collection Methods

In Chapter 2, I defined the ethnographic case study as "an in-depth, multifaceted investigation of a single social phenomenon, using ethnographic methods." The data for this study were largely collected using ethnographic methods. To contribute to the multi-faceted nature of this research, some quantitative data were collected to support some aspects of the qualitative data collection.

Ethnographic Methods

Ethnographic data collection methods included participant observation, interviews with teachers, parents and the instructor and video-recordings of the classes.

Participation Observation

Participant observation, the primary data collection methodology used by ethnographers (Spradley, 1980; Lecompte & Preissle, 1993; Patton, 1980) comprised the main form of data collection. Spradley defines the process of participation observation as one in which the observer, (a) has a dual purpose, both to engage in the activity and observe oneself and others; (b) overcomes selective awareness and is explicitly aware; (c) uses a "wide angle lens" and takes in a broader spectrum of information (d); is an insider and outsider simultaneously and; (e) keeps a record. During my visits to the sites I attempted to fill these roles. As mentioned earlier, my degree of participation varied both within and between data collection sessions. During some sessions, I took a more passive or naturalistic stance and in others a more active one. This factor influenced the depth and detail of field notes collected during each session. Condensed notes taken during the session were expanded at the first possible time and entered into the computer program QSR NUD•IST (1995).

Interviews

In addition to participation observation I used formal and informal interviews to help data collection. Key informants (Spradley, 1980), namely, teachers, parents and the instructor were interviewed both face-to-face, and through videoconferencing.

I used a combination of informal conversational interviews, general interview guides and standardized open interviews (Patton ,1990). The first method involved informal questioning during the course of ongoing conversation. The second form of interviewing involved determining the issues to be discussed beforehand. In the standardized interview a structured interview guide, in which a set of questions were arranged and worded beforehand, was used. Though most of the interviews were of the first two types, to maintain consistency across the sites, structured interviews were used for the post-teaching parent focus groups and the pre and post teacher interviews. (See appendix B for interview questions).

The key informants in this study were the teachers and parents involved with the family literacy project at each of the two sites, and the university-based instructor.

Video & Audio Taping

All the videoconferencing classes, eight one hour sessions at each of the two sites, were video and audio recorded. Due to technical malfunctioning, data from two classes at Nazaire were not usable.

Quantitative Methods

Two quantitative instruments were used for data collection.

The Parenting Stress Index (PSI)

The PSI, Parenting Stress Index, is a measure of parental stress and anxiety (Abidin, 1983). In this study, a portion of this instrument was used as a pre-post measure of intervention effectiveness. The complete instrument includes six child domain subscales, which are the parents' perceptions of six child characteristics; (*adaptability, acceptability, demandingness, distractibility, reinforces parent and mood*) and seven parent domain characteristics (*depression, attachment, restrictiveness, sense of competence, social isolation, relationship with spouse* and *health*.) (Abidin, 1983). For the purpose of this study all six child subscales and the first five parent subscales were used. Parent *relationship with spouse* and *health* were considered outside the scope of this family literacy intervention and hence were excluded. Examples of questions from each of the sub-scales used in this study are provided below:

Child characteristics

Adaptability (31-41): Compared to the average child, my child has a great deal of difficulty in getting used to changes in schedules or changes around the house.

Leaving my child with a baby-sitter is usually a problem.

Acceptability (21-27): My child doesn't seem to learn as quickly as most children.

My child doesn't seem to smile as much as most children.

Demandingness: (42-49)
When my child cries it usually lasts:
1. less than 2 minutes,
2. 2-5 minutes,
3. 5-10 minutes,
4. 10-15 minutes,
5. more than 15 minutes.

My child seems to be much harder to care for than most.

Distractibility: (1-9)
My child is so active that it exhausts me.

My child will often stay occupied with a toy for more than 10 minutes.

Reinforces parent: (10-15)
My child rarely does things for me that make me feel good.

Most times I feel that my child likes me and wants to be close to me.

Mood: (16-20)
My child seems to cry or fuss more-often than most children.

When playing, my child doesn't often giggle or laugh.

Parent characteristics

Depression: (57-83)
When I think about the kind of parent I am, I often feel guilty or bad about myself.

There are quite a few things that bother me about my life.

Attachment: (61-67)
It takes a long time for parents to develop close, warm feelings for their children.

I expected to have closer and warmer feelings for my child than I do and this bothers me.

Restrictiveness: (68-74)	Most of my life is spent doing things for my child.
	Since having this child I have been unable to do new and different things.
Sense of competence: (28-30,51-61)	Being a parent is harder than I thought it would be.
	I often have the feeling that I cannot handle things well.
Social isolation: (91-96)	I am not as interested in people as I used to be.
	Since having children I have a lot fewer chances to see my friends and to make new friends.

Psychometric characteristics

Validity of the PSI was established by the fact that (a) a careful analysis of the test content was made to ensure content validity, (b) teachers in the program and the program supervisor were consulted to determine the appropriateness of the test items, and (c) previous research establishing the validity of the test was examined (Loyd, 1983).

Reported alpha reliability coefficients (internal reliability) for each of the subscales used, range between .66 and .97. Child domain, parent domain and total score alpha reliabilities were reported as .89, .93 and .95 respectively (Loyd, 1983). Additionally, test-retest reliability scores of .82 (child domain) and .71 (parent domain) (Burke, as cited in Loyd, 1983) and .77 (child domain) and .69 (parent domain) (Zakreski, as cited in Loyd, 1983) were reported. The same instrument was used as a pre- and post- measure.

Scoring.

Pre and post PSI tests were scored according to the instructions in the manual, to obtain the six child subscale and five parent subscale scores. Child and parent domain scores were obtained by adding the subscales in a domain. The total score was obtained by adding the two domain scores.

Session Evaluation Form

A researcher-developed, 10 item instrument was used to measure the parents' reaction to each session attended. This instrument was developed to measure (a) reaction to technology and, (b) reaction to content matter presented. The instrument was developed after a through literature review. Items from the questionnaire can be divided into two groups, those dealing with the videoconferencing technology in particular and those dealing with class content.

Technology related questions: The following questions related to videoconferencing:

1. I felt comfortable talking over the computer
2. I think the sound and picture quality were good enough for this purpose
3. Videoconferencing is appropriate to use for a discussion like this
4. I would like to participate in more videoconferencing sessions in the future
5. I would rather have had this discussion face-to-face with the presenter

Content of class related questions. The following questions related to the content of the class:

1. The purpose of the conference was clear
2. The discussion was interesting to me
3. The presenter was clear and easy to understand
4. I feel I have gained information that will be useful to me
5. The conference was informative

Data Analysis Procedures

Qualitative Analysis

Analysis was done by systematically searching through and arranging field notes, interview transcripts and written artifacts in an attempt to "make sense" of them, discover themes and formulate hypotheses. Analysis of the data was both inductive and iterative. Preliminary data analysis at the start of data collection helped focus data collection, narrow observations and refine the research questions. Two groups of qualitative data were analyzed for this study. First, observation and interview data were analyzed with the help of a software package for qualitative data analysis, QSR NUD•IST (1993). Second, each of the hour-long video recordings of the videoconferencing classes were analyzed based on an inductive framework for interaction analysis and with the help of researcher generated scoring sheets. These procedures are detailed below.

Data Gathered Through Observation and Interviews

For each of the two sites, expanded field notes and transcribed interviews were entered into QSR NUD•IST (1993). A set of codes was used to break this data into units and to classify or categorize these units. NUD•IST was used to code and categorize data, and to arrange them into taxonomies for closer scrutiny and meaning generation. Some of the broader, first level codes or "cover terms" (Spradley, 1980) were developed "a priori" on the basis of the research questions, but were refined and expanded as analysis proceeded. Later codes were derived from or "grounded in" the data. Chunks of text were indexed under relevant nodes in NUD•IST. Coding was iterative. Text coded under a particular category (or node) was continuously recoded and reindexed, resulting in growth and refinement of the taxonomic or node tree.

Conclusions were drawn through the search for patterns, attributes and detailed scrutinizing of the categories and their contents. Miles & Huberman, (1994, p 245) "tactics for generating meaning" were used while analyzing the data. These include (1) noting patterns and themes, (2) seeing plausibility, (3) clustering, (4) comparing and contrasting, and (5) noting relationships between variables. To help in organization and meaning making the following tools were used:

1. Memos were made directly into NUD•IST as well as into the researcher's notebook. Memos were jotting about sudden insights, plans for

the next steps, "things to do" and "things to remember" attached to the relevant segment of text.

2. Periodically text indexed under each node in NUD•IST was printed out. Marginal notes were made in the margins of printed text. These notes were a useful way of early coding, as well as jotting down reflections on analysis, methods etc. that come to mind while reading this text.

3. Visual data display strategies in the form of taxonomic boxes and trees, (Spradley, 1980) and matrixes (Miles & Huberman, 1994) were used to derive meaning.

As a final step in the analysis, comparisons and contrasts were made between the two cases in the study. Until this final stage of the analysis, an attempt was made to treat each site as a complete entity, each with its own emerging categories. At this final stage, a critical look at the findings of the twin ethnographies was taken in an attempt to discern both what was common to both cases and what is unique.

Analysis of Video Tapes

Analysis of the video tape recordings was done in two phases. A preliminary video analysis sheet with data codes was developed by the researcher, based on review of earlier research on interaction analysis. In phase I, two scorers (to avoid researcher bias, and establish inter-rater reliability) viewed and coded segments from each of the hour-long classes. At this stage one hour of video-recordings, from each site were analyzed.

(8-minute segments from each of the eight classes at St. Lincoln: 10-minute segments from the six classes Nazaire). These segments were chosen at random from each of the hour long classes. The tapes were also viewed in a random order. During these observations, emerging themes and categories were noted. One scorer was blind to the identity of the sites which were scored in a random order.

On the basis of the themes that emerged through coding in phase I, a revised video analysis sheet with refined codes was developed. (See Appendix C.) In phase II, a further two hours of video recording from each of site were analyzed on the basis of the revised coding sheet. Again, two coders viewed the tapes and individually recorded their observations. Data from these coding sheets was then entered into a matrix (code X classes) in order to observe themes and facilitate meaning making (Appendix E).

Quantitative Analysis

PSI Analysis

Data from the PSI was analyzed using SAS on the mainframe. Since the sample size was limited, only descriptive statistics were compiled. Means and Standard deviations were calculated for the subscales, domains and the total stress scores.

Evaluation data

SAS was also used to compile the mean response scores on each of the 10 items in the evaluation questionnaire. Questions were clustered into

two constructs for analysis and line graphs were constructed using Microsoft Excel to display the class mean for each question over the 8 classes.

Establishing Credibility of Findings

Though this research is my interpretation of videoconferencing use at the two family literacy sites, a conscious attempt was made to establish the credibility of this research, and to verify findings. The issues of confirmability, auditability, translatability/comparability and credibility were maintained by the following strategies.

1. Clearly stating my role at different portions of the research.

2. The use of detailed or "thick" description. In-depth descriptions of the sites are provided so the reader is able to infer the basis of conclusions as well as to compare with other sites.

3. Clearly specifying data collection and analysis procedures.

4. *Credibility* or "truth value" (Guba & Lincoln, 1981) was maintained by various forms of triangulation. Triangulation was achieved through:

(a) use of multiple methods of data collection: Data was gathered through on site participation observation, individual interviews, focus group interviews, video-recording of the videoconferencing sessions, evaluation questionnaires and the use of a pre-developed instrument.

(b) dependence on multiple sources of data. Data was collected from the parents at each site, teachers' as well as the course instructor.

(c) repeated observations were made at varied times of the day at the two sites.

(d) researcher triangulation was done by having a second person code and categorize portions of the interview and observation data. Additionally, two researchers coded the videoconferencing videotapes in order to avoid researcher bias.

Ethical Issues

Prior to the study, teachers and parents at both sites , (and the school principal at St. Lincoln) were informed in detail about the content, methods and aims of this project, and their consent was obtained. A letter, detailing the purpose of this study and requesting their participation was given to the parents. (See appendix D). All parents indicated that they were willing to participate in the research. (Signed consent was received.) In the final report for the sake of confidentiality and privacy of those concerned, **all names, including those of individuals, and places have been changed.**

CHAPTER 4:
FINDINGS AND DATA ANALYSIS

In this chapter each of the two family literacy sites in this study are described in detail and the use of videoconferencing at each of these sites is analyzed. Though the research questions posed in chapter 3 guided the data collection and analysis, a chronological approach is used to organize the results. The first section describes each site at the beginning of the study. The next two sections deal with the *technology-in-use* phase. In these sections (a) the interactions that occurred as a result of technology mediated instruction, and (b) parents' affective responses are discussed. The final two sections look back and reflect on the videoconferencing classes. In all sections each site is addressed individually and then a cross-site comparison is made.

In the Beginning:
A View of the Two Family Literacy Sites

An ethnographic account is presented below to describe each of the two sites before the start of the videoconferencing classes. Data for this section were gathered through site visits, interviews and observations.

Case A: Nazaire Family Literacy Center

Geography, Setting and Community

Nazaire, located in the northen part of a southern state of the country, is a town with a population of approximately 16,600. Situated on the historic

Rose River, in the eighteenth and early nineteenth century it was an important trading center. Today, it is chiefly an agricultural community and is on the tourist map as a site for historic old homes and plantations. It also is the site of a regional university.

The 1990 census describes the community as 52. 5% female, 47.5% male and 49.9% African American, 48.7% white. Other minorities are few, forming only about 1.4% of the population. (Bureau of the Census, U.S. Department of Commerce, 1993). Roughly 58% of the African-American population in this community falls below the poverty line and the community is plagued by problems like high violence and high rates of diseases such as venereal disease. "Even though Nazaire is small, we have all the big town problems" says Joyce, the teacher's aide in the Even Start classroom. Similar to other parts of state, Nazaire has the problem of one of the lowest literacy rates in the nation. Like a large portion of the South, Nazaire is largely segregated, with the families in the program coming from the housing projects, located across the river on the west side of town.

The Nazaire Family Literacy Center

The Nazaire family literacy center is housed in an adult education center located in the eastern side of Nazaire, about three miles from the tourist center of the city. To get to the adult education center one drives on Keller, past the newly opened WalMart, the new pride and social center of Nazaire, and a small shopping center, into a fenced area. Within this area,

two buildings built perpendicular to each other, frame a parking lot. The neighborhood is middle-class though there are no signs of prosperity and the buildings in the area wear a patina of age. Two desolate looking cinema halls and a newish looking apartment complex are located across the street.

A big sign in the near empty parking lot proclaims "GUN FREE AREA." The Even Start classroom and the adult education classroom (run by a multipurpose agency that conducts adult preparation classes on a contract basis in three parishes) that together constitute this family literacy program are housed in the rear building. Signs saying "Project Independence," "Even start," and "Head start" are posted on the main door that opens into a long corridor, leading into classrooms on either side. The door at the far end of the corridor opens into a small gymnasium through which a fenced playground, complete with child-sized equipment and sand pit, is accessible.

The two classrooms are located across the hall from one another. This allows parents to easily look in on their children. Apart from the family literacy program, this adult literacy center also houses an adult education class run by the local school board (enrollment 30 adults), a school board run Project Independence class (10 adults), a Parish Police Jury Head Start classroom (17 students) and an elementary, special education classroom (10 students). The premises are owned by the school board and are leased out to agencies that run these programs.

The Staff

The staff is comprised of Cathy Potter, the early childhood teacher; Cynthia Dupre, the adult education teacher; Joyce the teacher's aide; and May, the parent advisor.

Cathy, 43, Caucasian, energetic and unendingly enthusiastic about her involvement in this program, has a Master's degree in Early Childhood and a Reading Specialist's degree. She is in charge of the Even Start classroom. Having taught for 22 years, she says that "finally I am able to do what I have always wanted to do," namely work with this population of parents and their children. She describes her job as "working with parents on parenting skills while teaching their children in the Even Start classroom." In the Even Start classroom, Cathy is assisted by Joyce, a young African -American. Both Cathy and Joyce are from Nazaire and have been associated with the program since the very beginning, three years ago.

Cynthia, 38 and Caucasian, is the adult education instructor. She says that she finds herself in this job simply by chance. With a degree in business, Cynthia found herself with this job, "when at the last minute the assigned teacher backed out."

Finally, there is Miss May, the parent advisor. Miss May, herself from the community, works closely with the parents, dealing with any needs that they may have. "If they need a doctor, health unit assistance, I find them whatever services they need and I go out on home visits." May spends an

hour a week with the parents in parent discussion time dealing with issues of everyday existence. "Parents start depending on us for all sorts of things" she adds. All four have been associated with the program since its inception, three years ago. Before the inception of the program Cathy, Joyce and May attended a week-long training workshop on family literacy.

The Students: Parents and Children

The Family literacy program draws its students from the economically and socially disadvantaged population of Nazaire. This is one of two such family literacy programs in the county. The other program is a part of the vocational education center and caters to parents who are attending trade school. Most of the parents come to this program through Project Independence. As this is a family literacy program, parents and their children enroll together. When I first visited Nazaire there were 12 parents in the program. All were single mothers, and all except one, African-American.

The adults are in the age group of 19-34, the children's ages range from under a year to four. All the parents are on government assistance and attendance to this program is mandatory to receive the weekly welfare "paycheck." Most parents come from "across the bridge," from the public housing projects on the west side of Nazaire; an area plagued with poverty, disease and violence. Poverty, lack of education and government dependency for many of the women in the program have become an

intergenerational cycle difficult to break. Speaking of the absence of a goal or dream for themselves or their children, Cathy says,

> I think that they do not know anything than what they have seen their mother do -- and their grandmother do. Kind of a circle they cannot get out of. Some of them want better, but some of them don't know that there is anything better out there for them. They want it but they do not know what to do to get it.

The mothers are here at the adult literacy center to prepare for and take their GED, the high-school graduate equivalency degree. Teen pregnancy and pressing economic and social pressures are among the main causes of them having dropped out of school earlier. Parents come into the program at education levels ranging from the eighth to the eleventh grade. The family literacy program aims to go beyond the issues of teaching reading, writing and arithmetic to issues extending into the social and home background of the participants. Lack of motivation, responsibility and self-esteem, problems of single parenthood and childrearing are the "biggest ones we have to deal with," say Cathy and Cynthia. Cathy elaborates

> I think right now in adult education they need those life skills, that's what they are needing the most. Even in the Even Start classroom I try and give them parenting skills. That is not a part of my job ...as we do have a parent component, but there have many times I have talked to them and offered them advice about being a good parent. For some of them, where else would they get it? Some of these people do not get this at home. Or they get a negative experience rather than a positive.

Joyce adds that they make many home visits."[It] Gives us a better idea what's going on with little Jonathan. When he comes through the

door you don't know if he has been up all night because they had a shooting next door."

A Typical Day

Every morning, vans pick up the parents and children and they make the 15-20 minute ride across the river that divides town. The adults have their own classroom while the children are in the Even Start room. There is a special Infant Start for the even younger children. Parents are free to visit their children anytime, but must spend an hour each day in PACT (Parent and Child Together) time, interacting and playing with their children. The parents and children arrive between eight and eight thirty. The children are fed breakfast (and lunch) at the center; parents either bring something from home or pick up something on the way to school. Parents and children spend most of the day in their separate classrooms, except for the hour a day parents have to spend in PACT time with their child. At 1:30, the parents collect their children from across the corridor and the vans take them home.

The Adult Education Class

On my first visit, Miss Cathy walks me over to the adult education room. The class is housed in a long room with a door at either end. At the far end Cynthia, the adult education teacher sits at her desk, typing on the computer. The room's only printer is on her desk. A line of windows light up the room. Computers are placed on the long, narrow tables running

along the walls. These computers are dinosaurs with no hard drives and are set up for a few tests and games. There are also two relatively new IBM machines in the room. I ask Cynthia whether the parents like to use the computers. She says, "They hate to use them (indicating the old machines) but sometimes I make them." In the center of the room there are rows of tables and chairs for the parents. There is little on the walls except for a large bulletin board bearing a scroll for each GED graduate from the program. A small collection of books fills the book case next to the teacher's desk. There is a copy machine in the room. The blackboard on the far wall behind the teacher's desk has the day's timetable on it:

9:00 - 10:00 Math.
10:00 - 1:00 Literature
11:00 - 12:00 Language
12:00 - 12:30 Lunch
12:30 - 1:30 Social Studies

Not much direct teaching is done in class. Parents work on their own on photocopied exercises; the subject of study is determined by the schedule on the chalkboard. On being asked whether she ever teaches to the class as a whole, Cynthia replies that "No, I am not supposed to. This is an individual preparation program for the GED exam and the learners are adults who can work on their own." Each student takes the TABE (Test for Adult Basic Education) every six weeks, and based on their score on that test receives a prescription. Cynthia shows me a prescription which lists the scores received, the areas of weakness, and enumerates a series of exercises

from the text book that should be completed before the next TABE, in six weeks. The TABE booklets are published by McGraw-Hill (Sweetland & Keyser, 1991), who also provide the software that spits out this prescription. Visits to the adult room are remarkably unvarying:

> When I enter, it is 8:30 a.m. The parents are still eating their breakfast in small groups around the classroom. The teacher, Cynthia, is at her desk working on attendance records. At a few minutes after 9.00 a.m., she looks up and reminds the parents (who are still eating, and talking among themselves) that it is time to work. Most open a book and work on their assignment. Parents do not have their own copy of the book, but use the copier in the room to make copies of the exercises they want to work on. Students seldom come up to the teacher to ask for help or direction. As I walk around the room, one of the parents raises her head from the table and yawns out that she is bored. "We have to work on our own, all day. I wish the teacher would teach." During the rest of the day, the scene is little different from before. The parents are at their desks, the teacher at hers. Some work at their desks, others stare vacantly ahead. Two sit and talk and giggle at the table. I ask Cynthia what she does if some parents choose not to work. She says she does not do anything. "They are not children," she feels, and should take the responsibility for their own studies. If the student is uninterested or is disruptive to others, "I just have them got out of here," Cynthia adds.

The only changes in this routine are the daily PACT time, which the parents spend in their child's room; lunch time, when parents are free to leave the premises for a half hour; and later, the videoconferencing sessions.

My subsequent visits confirm the air of disinterest, ennui and sometimes thinly veiled hostility that seems to pervade the room. Two factors are key to this, parents are here because they have to come to get their

welfare checks, and there is discontent among the parents on how the adult education class is run.

They say I have to come...

First, the parents are in the program because of parish requirement rather than by choice. A certain minimum attendance is mandated in order for the adults to receive their welfare checks. These parents also harbor a distrust and suspicion toward all government mandated policies. This feeling of having to be there and not wanting to, is evident in both the adult education teacher's conversation and the parents' remarks.

Ly'rasha, 22, single handedly bringing up a 5-year-old, a 3-year-old and a 5-month-old, is direct and tells me,

> You had to come or you would not receive any assistance. I am coming because my worker said I had to. I don't enjoy coming but come anyway, since they say I have to come...I can think of a lot of things I can be doing besides coming here every morning.

Stella, 30, and a mother of three, adds, "The faster they teach us the faster we **get out** from here -- leave from here."

Cynthia, the adult education teacher explains that not all parents have this negative attitude to the program:

> You could have come a year ago and got a totally different reaction. We have a set of parents now, who are not really into what they are doing. They are here because they have to be. The whole program, they are here because they have to be in order to keep their check. I have only two or three in the classroom who are here because they want to get their GED, the rest of them are here because they have to be, to keep their check coming.

This attitude, coupled with the troubled and unsettled histories of the participants, presented the problem of irregular and sporadic attendance throughout the research period. On one of my visits only four adults were present. "Monday's," Miss Cathy explained, "Are bad days, as are rainy days and cold days."

We are not all supposed to know everything

Second, there is an enormous gap between the teaching philosophy and what the adults feel that they need. Speaking of her adult education class, Cynthia says:

> They need to be responsible. They are not even responsible for bringing in their own pay checks. They are not showing a responsibility in their education. They want me to sit up there and tell them word for word what they need to know, instead of picking up a book and reading it for themselves. They want you to hand it to them. And like teachers have told you a thousand years, you cannot bore a hole and pour it in, they have to go there and get it for themselves.

The parents, on the other hand, feel that "the teacher needs to teach." A visibly irritated Rachel says, "It's not like we are going to know when we just look in a book. You know? Open the book and pop in your mind!" Others endorse this view:

> Teach to class, examples and stuff like that. That's what will work in here.
>
> Ya. We are not all supposed to know everything! We all know everything!
>
> If we knew it all, we would not be here.

The administrators of this class see the program as an individual preparation program for the GED exam, where the learners are adults who can work on their own. Cynthia says that she is not supposed to teach and that parents who are not up to certain level of preparedness have no place in her program. She says that often she has made a petition to the board and parents who are not up to level or are uninterested are directed to a program more suited to them.

These differing agendas of the teacher and parents and the feeling of lack of ownership of their participation in the program made itself felt in the apathy, ennui and guardedness with which the parents conducted themselves in this classroom.

The Even Start Classroom

> It is free play time. Two boys are playing in the block area. Little Larquita, one of the four 2-year olds, romps around the room on a wooden stick riding horse; a big Stetson that dwarfs her face on her head. Joyce and Cathy watch over, chit chatting with the children as they play. After a while free play time is over and the children gather on the rug for song time. There is a happy energy in the room, the energy of the children is contagious, and all dance to the record player, which is playing, calypso-based children's songs. "Everybody, get the rock and roll in your arms" [rapid arm shaking, dancing] Apart from Chris, who shyly looks at me from the corner of his eye, the children dance with gusto, "No one is watching you" assures Miss Cathy, and he hesitantly joins in the dance. Cathy and Joyce dance along with the children.

The children's Even Start classroom is located across the corridor from the adult education room. Compared to the rather bleak exterior and

unadorned corridors in the building and the adult education room, is a burst of color. It looks very much like any other preschool class with colorful posters on the wall and child-sized furniture. The room is divided into different activity centers; the listening/music center, the reading center, the dress-up area, the block area, the housekeeping area, the art center and the computer area, which has one computer. At the rear of the room a door opens into a small room that has the sand and water tubs. The videoconferencing computer occupies a corner of this classroom. A routine day is divided into times for various activities such as art, music, outside play, center time and nap time.

On a normal day there are 12 children, including four 2-year-olds. "Sure keep us on our feet," Cathy tells me. The teachers' feel that having so many 2-year-olds is tough. They have to water down their curriculum to include the little ones and it is difficult to have a range from two to five in the same room. On occasion a university student-teacher comes in and works with this class. Children who are under the age of two or who are not "potty trained," are in the Infant Care room.

...Love them and ... speak kind[ly] to them.

The Even Start classroom extends beyond preparing the children for school. Because of the program is a family literacy program, the teachers work closely with the parents making frequent home visits and often addressing broader issues related to parenting. Social and economic factors

lead to an absence of a value for education, ill preparedness for becoming a parent, and an absence of hopes and dreams for themselves and their children among many of these parents. Speaking of her involvement with the parents in the program, Cathy says,

> I am not sure that some of the parents have a hope or dream -- that is what we are trying to instill in them. But there are some mothers, that state the mistake that they made by dropping out of school and are trying real hard to continue now and I think that they will want their child not to do what mama did.
>
> Some parents -- you can tell the children that have been nurtured--and some, even to this day, they are [their children are] four years old, and we still have to teach then how to love them and how to speak kind to them... So I think they need to know that they need to be encouragers at this time.

Extent of Technology Use

A majority of the staff and all the parents have very little prior experience with computers. Of the four staff members in the program, only Cynthia the adult education teacher professes feeling comfortable with computers and uses hers "all the time." In her classroom, the six Apple I computers, ("all they do is math, language and reading exercises") are used an average of two hours a week by each student. The computer in the Even Start classroom is set up with games "on whatever unit we are teaching" for the children. Cathy explains that "it is always up for an hour a day during learning center time so they [the children] are free to go at will to the computer."

Preview of Videoconferencing Classes

The videoconferencing equipment which consists of a desktop computer, a small video-camera mounted on top of the monitor, and a sound activated microphone are placed on a low table in the corner of the Even Start classroom. Low book cases separate this videoconferencing area from the rest of the children's room. Chairs for the parents are gathered from around the room and are placed about three-feet in front of the camera, approximately four to a row. Since this is the children's room, these chairs are low and child-sized. As there are three, or four rows of chairs, the rear row is quite far from the monitor.

At the start of the study, the equipment had already been installed in the Even Start room, but had not been used. The teachers at Nazaire, especially Cathy and Joyce (perhaps because the equipment was installed in *their* room) received the videoconferencing sessions with great enthusiasm seeing it as having great, but as yet undefined uses. Cathy enthused,

> I love it. I think it is going to be great. Great for me, for Cynthia, great for the ladies. The ladies are interested in it and I think we are going to have a lot more learning things going on in our classroom because of it.

When asked what sorts of resources they would like to receive via this equipment, the two teachers did not have many concrete suggestions. The teachers felt that the ones who would benefit most from the resources that could be provided by videoconferencing were the parents. Cynthia, the adult education teacher, felt that the adults did not have much interaction

with the computers and it would be nice if programs could be offered for them.

In summary, at Nazaire the apathy in the adult education classroom was striking. The parents were unwilling to be in the GED preparation course, and actively voiced their dissatisfaction with teaching in the program. There was also a lack of connection between the family literacy program and the adult education class and fragmentation in implementation of the family literacy program was apparent. The teachers in the Even Start program and the parent advisor were more involved with the "family" aspects of the program whereas the adult education teacher concentrated on the GED preparation. This is perhaps a result of the fact that two agencies, an adult education agency and the even-start program collaborate on this project.

Case B: St. Lincoln Family Literacy Center

Geography, Setting and Community

The town of St. Lincoln is a tiny dot marked only on detailed maps. Lying in the south-central region of one of the southern states, it has a population of approximately 1,200. Located on a picturesque bayou, and first settled in about 1800, it was once a thriving commercial center. The bayou, formerly the channel through which shipments were brought in, is now navigable only by pirogues. Warehouses that served this once busy little port now lie in ruins dotting the bayou front. The center of the town has

the city hall, police station, church and the local elementary and high schools. The town boasts of a number of sleepy looking cafes and antique shops and eagerly looks forward to the small dribble of tourists that come its way. A local resident described it as, "known as the antique head quarters. Lot of tourists come here and most of the people here work hard to keep it as such. They like the image of it being a historic or antique town." There are very few local businesses and most people have to leave town for employment. Many residents work in the nearby cities.

The 1990 census describes St. Lincoln as 54.3% African-American, 45.3% white. Other minorities are nonexistent (listed as three). (Bureau of the Census, US Department of Commerce, 1993). About 58% of the African-American population in this county falls below the poverty line. Despite the problems associated with poverty, St. Lincoln remains, as a town resident put it, "a large neighborhood."

> It is the type of town that most people would dream of living in, because you don't have to lock the doors at night. Your children can pretty much play where they want to, and everyone knows each other. They are always looking out for each other's children. It is small enough to know each person's history.... I wont say that poverty is not here, but it is a small enough town where people will not allow you to starve. Everyone knows each other. It is like a large neighborhood. A village.

St. Lincoln Elementary and Family Literacy Center

The family literacy program at St. Lincoln is affiliated with the St. Lincoln public elementary school. Two classrooms, one for the adults and

one for the pre-k children, have been set apart by the school especially for the program.

St. Lincoln Elementary is situated on Main Street, as just about everything in St. Lincoln is. A "U" of buildings that includes the school cafeteria, library, gymnasium and computer room is surrounded by bare fields. On my first visit to St. Lincoln, as I parked my car, I felt a dozen sets of curious eyes on me. Even the teacher in the facing classroom paused mid-lesson to direct a look and a friendly wave at me. Visitors to the school are rare (especially one so foreign-looking) and obviously welcomed. When I walked to the principal's office to introduce myself and to get directions to the family literacy classrooms, the school principal, Mr. Bernard came out to meet me, to tell me he was delighted by my interest in their program, and to walk me over to meet the two teachers who ran the program. Since it was a Friday, the parents were off and the teachers (who usually had the day to plan for the rest of the week) spent the day showing me around the school.

St. Lincoln elementary has 265 students at present. Mr. Bernard, a well spoken and suave middle-aged African-American, has been the principal here for seven years. He is assisted by a faculty and staff combined of 45, 18 of whom are classroom teachers. Describing the ethnicity of the school, Mr. Bernard remarks that they have a "melting pot here." The students are 15% white and 84-85% African-American. The teachers, four of whom are male, are ethnically equally divided. The school building which

formally housed Dunbar High School then Catabla Elementary has been St. Lincoln Elementary for six years now. It has grades K-7 along with pre-k and adult education

This is only the second year of the adult education program. Last year there were between 12 -15 parents in the program, though none were successful in completing their GED. The two classrooms devoted to the family literacy program are along one end of the school and are located next door to each other. Teachers and principal both try to integrate the adult literacy program into the school. The family-literacy pre-k class often visits the 'regular' pre-k and activities such as watching movies and field visits are planned together. Considerable success has also been achieved in making the parents in the adult education classroom feel a part of the school community. Parents often take part as parent volunteers in classrooms and on field trips and are active in school functions such as basketball games and homecoming.

The Teachers

There are two teachers and an aide in this program. Sheila Frederick, and the teacher's aide, Ms. Moser, run the pre-k classroom. Anita Alexander is in charge of the adult education room. Ms. Frederick, a young African-American is one of the program pioneers. She went to a training workshop at the National Council for Family Literacy headquarters in Louisville, KY, before the start of this center, two years ago. She trained the

then adult education teacher who has subsequently left. Ms. Alexander joined the program at the start of this academic year and has been trained by Ms. Frederick. This is Anita's first experience teaching adults, having taught young children before. She is a "local girl" from St. Lincoln itself and has the advantage of being able to fully relate to her students, many of whom she has known for years and some of whom went to school with her. Ms. Frederick says it is a real advantage having someone who is from the community who can identify with the adults in the program. "I felt that a person from the community, to come back into the community, would work much better than somebody from the outside." As the family literacy program is integrated into the school, other facilities like the cafeteria, gymnasium and school library are available.

The Students: Parents and Children

Similarly to Nazaire, this program also draws its students from the economically and socially disadvantaged population of St. Lincoln and its surrounding areas. As in other family literacy programs, here too, parents and their children enroll together. While the mothers are here to prepare for their GED, the children are in pre-k. At St. Lincoln the program has incorporated an "adopt a child policy." This is only the second year of operation of the program and no parent graduated last year; as a result the child(ren) of parents in the program moved on to kindergarten. Parents who wanted could "adopt a child" and continue in the program. When I

first visited St. Lincoln there were ten parents, all African-American, in the program. Two of the parents dropped out shortly, leaving the program enrollment at eight.

Most of the ladies are in their mid-twenties and have between one and five children. The exception is Miss Bessie who at 44 is a grandmother and mother of nine. All the mothers are on government assistance and all, except Sonya (who is married) are single mothers. Participation in this program is voluntary and the parents here recognize the worth of a good education and have strong personal reasons for being here.

A Typical Day

Parents and their children either walk to school or come in on the school bus. They arrive between 8:00 and 8:30 every morning in time for breakfast. The school provides breakfast and lunch for both the parents and the children. They eat together in the school cafeteria after which the parents and children go to their separate rooms, meeting again for lunch and PACT time. The two rooms are located side by side, along a covered walkway, facing the playing fields. Parents and children stay in school till the end of the school day at 2: 45 p.m.

The Adult Classroom

The parents room is arranged with the teacher's desk in front, facing two long tables for the parents to work on. Behind the teacher's desk is a book case with the TABE test booklets and other books. There are two

whiteboards, one in front of the student's tables and one on the back wall. A rack of magazines and books is placed in one corner of the room. One of the two long walls has windows that face the outside; the other is covered with softboards. The softboards are bare except for the daily timetable and classroom rules and regulations. Similar to Nazaire, the parents' day is divided into segments. The timetable details a routine day:

8.00-8.30	Arrival
8.30-9.00	Breakfast
9.00-10.10	Reading
10.10-10.30	Break
10.30-11.05	Social Studies
11.05-11.50	Math
11.50-12.20	Lunch
12.20-1.00	PACT Time
1.00-1.45	Parent Discussion
1.45-2.20	Break
2.20-2.45	Interest reading
2.45-3.00	Departure

During the subject times the parents either work individually, or have a whole class lesson with the teacher. I notice that Ms. Alexander prefers to go sit at the head of one of the two long tables rather than stand and teach from behind her desk. Approximately every six weeks the students take practice TABE tests. Ms. Alexander grades these tests and then has individual conferences with each parent to discuss their achievement and difficulties.

Good rapport exists between the parents and the adult education teacher. Ms. Frederick explains this is because Anita, herself a young

mother, is a local person, the same age as most of the parents. She has grown up and lives in St. Lincoln and has known many of the parents for a number of years and is familiar with their background.

The parents are here in the program of their own free choice and their motivation to get their GED is high. Parents value the opportunity to be here because they see this program as a second chance, realize the value of an education in today's society, want to end government dependency,and want to set a better example for their children.

A second chance.

Since participation in this class is not state mandated, but voluntary, most of the parents are here because they see this class as another chance at getting an education. Tracy, for example, tells me that she felt that she had made her mother feel disappointed and miss many things like seeing her graduate, so she welcomed this additional opportunity. Cher and Donna, both of whom live in St. Lincoln, come from strong families who believe in education. They had attended school till the 12th grade and then dropped out due to pregnancy. They see this class as a second chance. Similarly, Tanya says her mom and dad had high expectations from her. She was also a teen age mother -- but that "did not stop the life that I wanted, but put a little delay on it." Sonya, who describes herself as very religious and with "a strong moral," says that this class is a godsend to her, "to make a wrong right."

If you don't have an education . . .

Most of the parents in the program realize the importance of an education in today's world and the disadvantage that they are in because they dropped out of school. Miss Bessie says, "And I also know that if you don't have a education you cannot get a good job. I would not be job marketable." Sonya, adds, "Now you need a GED just to serve burgers."

Explaining why she had enrolled in the program. Lequita said, "[In] My family, I and my sister are the only one that did not go to school. And that is kind of hard. They kind of look down on me... Makes you feel bad because you are the only two that did not accomplish something."

We all have to make examples for our children.

Miss Bessie, the oldest of the group, is an inspiration to all associated with this program. She comes from a family that does not value education too much, "Get out and make money or get married" is what everybody did. She is intent on instilling a value for education in her children and grandchildren, but feels that she "could not be much of an ideal for them, give them an importance for education, " when she did not have one herself. In the same vein, Sonya remarked "We all have to make examples for our children. "

...so that I don't have to depend on government dependence.

The parents at St. Lincoln are also motivated to attend this program because of a strong desire to get off welfare and be self-sufficient. Very

strong sentiments regarding government dependence were expressed by the students. Lora, for example, says:

> ...I do want to continue to get my GED, it is very important because I am on welfare and it really - I don't like to be on welfare because it is so much hassle. It is better to finish school, get you a job, have a family. Because on welfare you have to explain your business to total strangers and I do not like that at all . . . its like you living in your house with your kids and they know all your business. You can barely make it on welfare. That's why it is very important for me.

Tracy says she cannot wait to finish so that she can go on to get a job, so that "I don't have to depend on government dependence. Instead of no monthly income, I can have like a weekly pay and a savings account, and things like that." Tanya she tells me she hopes that finishing the program will mean that she can get a job. "Welfare is not good. It is a handicap." She complains that it is not enough and barely pays for one bill. She says her electricity bill last month was over a hundred dollars and the check did not cover it. "We need more." Tanya wants a job so that she can get a better life and can "pay the bills and have some left over to get other things." The hope that their children are never on welfare and grow up to be self-sufficient and educated, and that they never have to "go through the things I had to" is often voiced.

Not doing enough.

Though parents are in the program by choice and want to get their GED problems of low attendance, flagging motivation and self esteem are

seen. It is also hard for them to accept the amount of work and time that completing the program will require.

Attendance at the program is very sporadic. Economic and social problems, and the fact that attendance is voluntary, results in some parents attending class as little as once or twice a week. Motivation often lags and the frustrations of coming back to school often dishearten the parents, at times there is a perceptible lethargy in the adult classroom. Anita, the adult education teacher, feels that motivation is not a problem. In fact, parents are reluctant to do activities that are not directly result [i.e., test] oriented as they feel that this slows their progress. She says:

> This [class time] is it, most have little time to do any study at home because of family, housework etc. Sometimes there is resistance from other family members, boyfriends etc. - because of the feeling of being threatened by the student's attempt to further themselves. One boyfriend kept calling the student dumb, insisting that she would never be able to finish the program and pass the exam.

Anita agrees that the parents often feel frustrated by their pace of progress and says that a reason for a lot of drop outs was that the students felt that they were not "doing enough." It is hard for them to be a realistic judge of what passing the GED really involves when they first come to the program. One of the complaints that the students have is that the program takes too long. They do not want to take a year or two to finish. Anita often has to explain that it is a difficult proposition to try and accomplish two or three years of high-school work in three or four months.

The Pre-K Classroom

The children's room here is very much the typical early-childhood classroom, similar to that at Nazaire. Prefabricated, brightly colored posters and bulletin boards adorn the classroom walls. The room is divided into centers. There is the housekeeping, computer, reading, listening, writing, toy, art, and block area. Ms. Frederick tells me that attendance has been very low this school year as many children have been out sick. On a usual day there are not more than five or six children. The children's day is divided into activity times. Free-play, song-time and story-reading are interspersed with ditto-sheet based activities.

> The morning starts of with song time. The children stand in the center of the room on a large circular mat that has numbers on it and the alphabet around its edges. Children sing and do little exercises. Ms. Moser puts on the record player. I notice a sort of apathy in the room. The children seem to be going through the motions of the songs without much enthusiasm and energy. Ms. Frederick notices and remarks to me that today there is a particularly low level of energy. "Perhaps it has to do with the weather, or that only four of the usual eight kids regularly present are there, or perhaps it is because you are here."
> The children "march around the alphabet" and sing a couple of other songs before settling down to listen to Ms. Frederick reads *Morris goes to school,* a book that John has brought from home. She asks questions as she reads, drawing the children into the activity. After the story, the children go and get their crayons. Ms. Frederick hands them a ditto sheet based on the shape "square." Children color while the teachers around the group talking to the children about their work.

Extent of Technology Usage

Both teachers consider themselves to be comfortable with using computers, though no one had used videoconferencing before. Each of the two classrooms has a computer for the teachers and students to use. Though the teachers use the computers daily for administrative tasks, and the children use the computer in their room to play games, parents seldom use the one computer in the adult education classroom.

Preview of Videoconferencing Classes

At the start of my research at St. Lincoln, the videoconferencing equipment had not yet been installed at the school. Delays in laying the ISDN cable lines to the site delayed the installation of the equipment at the site, resulting in the building up of expectations and a feeling of frustration among the teachers. The eventual installation of the videoconferencing lines and equipment in the adult education classroom was welcomed with a sense relief that it was actually here. Like other happenings in this small community, the entire school was a part of this event. During my site visits, often other teachers in the school and parents would bring in friends, boyfriends and husbands to see this new "wonder of technology." Soon after the equipment was up and running Ms. Frederick's words were, "I'd like to see the staff's reaction. They don't believe it's finally here!" Mr. Bernard, the principal, beamed with pride as he told me about the technology:

> This is a real help to the students. Being able to tele-communicate with other schools. St. Lincoln elementary is one of the six schools in the nation to have this. We are real proud of it. We want to get the word out.

The parents reacted to the technology with comments like, "Amazing," "Nice," "Wonderful," and said that they were "excited to be a part of something new."

The videoconferencing equipment, which consisted of a desktop Macintosh Centris with a small video-camera and a sound activated microphone, was placed on table at the far end of the adult education classroom. Parents pulled up their chairs from the tables in the center of the room and sat in a group around the monitor. Since this group of parents was small, during a typical session, parents were not more than two feet away from the monitor.

Because of the isolation of the school, the novelty of a family literacy program in this area, and the fact that the program was in its very early stages, the teachers sorely felt the lack of facilities and resources at St. Lincoln. They viewed videoconferencing as a great potential help in overcoming these limitations. Ms. Frederick expected the it to help her by "exposing me to a variety of subjects that are not accessible to me and the school." Similarly Anita, the adult education teacher, felt that "It will allow an expert in an area that I feel I may be lacking, to give assistance to the students." Ms. Frederick felt that she would like the equipment used for the

parents to get information from different resources like the university. "These people once they have completed their GED will be looking for other avenues to go to. This equipment would -- could provide information." She also felt that they could benefit from seeing another group at PACT [Parent and child together] time, to get ideas from other people and learn from one another. "I'm overwhelmed! I can teach a lesson to another group. Just for a change of pace!"

On how he thought this would enhance the program, Mr. Bernard, the school principal said,

> Communicating with people, exchanging ideas, it is a learn from kind of thing. Learn from other programs. What we can do is learn from them. This is going to enhance learning, communication talking to one another, sharing. It is instant information, instant learning-a motivational tool in it self.

In summary, at St. Lincoln the family literacy program was closely linked with the school and was regarded as an asset to the community. The school was anxious to make a success of this still fledgling venture. The parents here were voluntary participants in the program, they wanted to finish the degree but were being held back by feelings of frustration at the pace of their progress, inability to attend frequently and an overall feeling of being a little at a loss at coming back to school after all these years. The teachers had some ideas as to the uses for which they would like to see this equipment used. The principal was enthusiastic and encouraging, but somewhat ambiguous about the potential of the videoconferencing.

Cross-Site Comparison

The observations presented above give the reader a sense of the programs at the two sites before the implementation of videoconferencing classes. Figure 4.1 summarizes salient differences between the two sites.

Table 4.1

Summary of Site Dimensions of Contrast

Domain	Dimensions of Contrast					
Site	Parent Partici-pation	Parent Feelings about existing program	Parent Motiva-tion	Excitement about forthcoming classes	Center Setting	Equipment placement
Nazaire	Manda-tory	Dissatis-fied	Low	Limited to Even-start teachers	Adult Ed. Center	Children's room
St. Lincoln	Volun-tary	Satisfied	High	Extended to school and community	Elem. Public School	Parent's room

In more detail, these are:

1. At Nazaire, the apathy in the adult education classroom was striking. The parents were mandated to participate in the program. As a result they were not very motivated and were unwilling to be in the GED preparation course. Many actively voiced their dissatisfaction with teaching in the program. At St. Lincoln, the parents were voluntary participants in

the program, they wanted to finish the degree and looked at the program as a fortunate opportunity to do so.

2. There was also a lack of connection between the family literacy program and the adult education class at Nazaire. Fragmentation in implementation of the family literacy program was apparent. The teachers in the even-start program and the parent advisor were more involved with the "family " aspects of the program whereas the adult education teacher concentrated on the GED preparation. This is a result of the fact that two agencies, an adult education agency and the even-start program collaborate on this project. At St. Lincoln, both the adult education and pre-k classes were integrated into the Family Literacy program.

3. While the advent of the videoconferencing sessions was regarded with enthusiasm by the teachers at both sites, the degree of excitement and anticipation was much greater at St. Lincoln. Here, the feeling of pride and excitement extended to other adults associated with the school. Teachers and parents not involved with the program and the school principal shared the excitement of the three teachers involved in the program. At Nazaire, by contrast, the excitement and enthusiasm were limited largely to the teachers in the Even Start classroom. The adult education teacher did not expect it to have much influence on her component of the program.

4. As the St. Lincoln Family Literacy center was a part of the local elementary school, it had strong ties with the school and its extended

community. By contrast the Nazaire Family Literacy Center was in a separate Adult Education Center.

5. The computer and video camera were installed in the adult education class at St. Lincoln, whereas they were placed in the Even Start room at Nazaire.

The above section described the two sites before the start of the videoconferencing classes. The following two sections describe the responses of the parents to the videoconferencing classes.

In the Midst of It All: Analyses of Videoconferencing Sessions

The videotapes of the parenting classes taught over the videoconferencing equipment were analyzed qualitatively. Groups of codes arising from the data were used to categorize and analyze the interactions in each of the videoconferencing sessions. The impact of videoconferencing was seen in three major domains. These were: technology-centered interactions, student-centered interactions, and effect on pedagogy or instruction. Each of these domains is examined below. The interaction observation summary matrix for each site is presented in Appendix E.

Technology-Centered Interactions

This domain deals with the direct effect of the technology on interaction. Technology's effect on group dynamics, nonverbal communication, and interface related functions were observed.

Effect on Group Dynamics: Student Leader

Nazaire.

Analysis of the sessions showed that one parent, Crystal, took it upon herself to be both facilitator of the discussion as well as chief mediator with the technology. Student-instructor interaction was often impeded by (a) the reluctance of students to partake in the discussion, and (b) problems caused by sound not carrying across, due to either bad transmission or distance of students from the microphone. Crystal was instrumental in attempting to maintain some sort of student participation by echoing or "miking" others' replies for the benefit of the instructor, replying for the group as a whole, or rephrasing another student's remark to help interpretation. This behavior was observed through all the sessions. It was particularly marked in the first two sessions and one session midway through the course. Additionally, it was seen that at times the instructor would explicitly ask Crystal to assume this role to help him hear students seated at the rear of the class. In the later classes, a couple of other students also started to take an active role, but right through the eight weeks of classes this propensity for one student taking on the group leader role was observed.

St. Lincoln

Analysis of the sessions showed that group dynamics were not affected in any perceptible manner. All students participated in the classes equitably, though the degree of participation varied as some parents like

Miss Bessie were more open and verbose and others were comparatively reticent and shy. From the start, there was no evidence of one student attempting to assume a dominant role or of students looking to one individual as the student group leader.

Non-verbal Communication

Nazaire.

It was observed that the demeanor of the students was very stiff during the first two sessions. Students were very aware of the camera and during the early sessions sat rigidly in their chairs and stared into the monitor. One factor that contributed to the discomfort of the students was the fact that the parents had to sit on small child-sized chairs. The videoconferencing terminal was in the children's Even Start classroom and these were the only chairs available. After the first two sessions students were much more relaxed in front of the camera. Analysis of kinesics[1] also showed that from the beginning students made use of specific gestures and expressions to communicate. Head nodding and shaking, use of hands while speaking, smiles, looking away from the camera and expressions of boredom were seen.

[1] Kinesics is the study of body movements, gestures, facial expressions, etc., as a means of communication.

St. Lincoln.

It was observed that the demeanor of the students was stiff during the first session, and they looked as if they felt awkward having to sit facing a monitor and speaking at the computer. This stiffness was not observed in the subsequent sessions. Parents' posture was more relaxed in the later classes. Analysis of kinesics showed that in the first two sessions, nonverbal communication was limited due to bad lighting at the remote site. In the remaining sessions, students made use of specific gestures and expressions to communicate. Head nodding and shaking, smiles, and laughter were often seen.

Interface Related Functions

Nazaire.

At the beginning of the first two sessions, a lot of time was spent rearranging the seating for the camera. During the first session the students displayed a shyness in front of the camera and an unwillingness to sit in the front row of seats. This resulted in the instructor having to constantly request students to move closer to the monitor. Often, less-than-optimal functioning of the technology lead to some specific forms of interaction. For example, bad sound and visual quality often resulted in constantly having to repeat statements. During the early sessions the instructor also spent time laying down the ground rules for speaking in order to facilitate video-interaction. Two main protocol issues were established: (a) Everyone

should start their sentence with, "My name is ..." This was done to give the sound activated microphone time to kick in, as well to establish who was speaking (in case the person was off-camera, or transmission quality was poor) and (b) to facilitate hearing, only one person was to speak at a time.

Technology also made its presence felt by making it more difficult to establish interpersonal relationships between the instructor and students. An example of how technology malfunctions made his job so much harder, is found in Paul Bird's, (the course instructor) description of the first session of videoconferencing. (This session was one in which getting simple replies from the students was like pulling teeth.)

> The hardest thing yesterday was that I made the mistake of asking people, "What are your names?" I could not hear [the replies] and they quickly got frustrated. This dumb white guy, he can't hear . . . and it took a long time for me to understand that the mike did not pick up every thing I said. . . . And there was one in particular, and you know, you get one person who is vocal and upset and it can quickly spread. And there is one person there . . . who got impatient and it spread like wild fire and so it was very very hard with the hearing.

This example illustrates how (especially in the early classes) the students did not quite understand that at times there was a media problem and saw the problem as the instructor's incapability or stupidity. In this group, where evoking student participation was already difficult, technology interruptions at time compounded these difficulties exponentially.

St. Lincoln.

During the first two sessions, the quality of visual transmission left a lot to be desired. The primary reason for this was that in order to see the instructor better, students had dimmed the light and drawn the blinds at the remote site. This led to the instructor having difficulty in determining who was speaking from the remote site, and nonverbal communication was totally lost. During the first session the instructor also spent time describing "ground rules for talking," similar to those at Nazaire. These rules were (a) everyone should start their sentence with, "My name is . . ." (This was done to give the sound activated microphone time to kick in, as well to establish who was speaking) and, (b) to facilitate hearing, only one person was to speak at a time. Except for a few instances of bad sound quality during the first two sessions, which resulted in both instructor and parents constantly having to repeat statements, mechanical mal-functions were few at this site. When they did occur, they were treated with good humor by the students.

Student-Centered Interactions

This domain deals with the indirect effect of the technology on students' interaction. Technology's effect on six features of interactions were examined. These features are amount, participation, type, responsivity, attention intensity and affective engagement.

The *amount* of interaction is a qualitative assessment of the frequency of interaction. Sub-categories included are *low, moderate, high,*

and *instructor elicited* (through techniques such as compulsory turn taking, or calling on students). *Participation* specifies whether *none, one, few, majority* , or *all* students interact. The *type* of interaction can be between students, *student-student;;* between student and instructor, *student-instructor;* or between student and instructional material, *student-material.* Student-instructor interaction can further be differenciated by initiation. This refers to who initiates a question, response or comment. *Responsivity* is the students' degree of elaboration of verbalization when asked a question or while initiating interaction. Responses could be *very elaborate, elaborate, terse,* or *no response. Attention intensity* refers to the students' degree of involvement in the class proceedings. Sub-categories of attention intensity are *passive listening, distracted, interested, attentive,* and *rapt* attention. Finally, *affective involvement* refers to the students' emotional engagement in the class proceedings. Examples are *excitement, impatience,* and *identification.*

Nazaire

Analysis showed that the amount of interaction in all the sessions usually ranged between low and moderate. The only session in which there was high interaction was in session three. In classes with an overall low level of interaction, high levels of interaction were found in the case of one student, Crystal, who as mentioned earlier, took on the role of the student leader and often monopolized discussions.

Participation was usually instructor elicited in that the instructor often had to employ strategies that would encourage (even compel) students to reply. Strategies that the instructor used for this purpose were (a) explicitly asking a student by name for her response, (b) repeating the request if the first attempt did not evoke a response, (c) rephrasing and re-asking the question, and, (d) asking a student to "pass the turn" to talk, after she had finished her response. Unless the instructor used these techniques participation was limited to one or a few of the students, the majority remaining either as passive listeners or totally removed and uninterested in the proceedings.

Since the instructor made use of instructional materials, in the form of booklets, only in the first session, student-material interaction was limited to this session. Student-instructor interaction formed the predominant type of interaction in all sessions. Overall very few examples of student initiation of discussion or student initiated remarks were seen. The exception to this was in the third class, where students initiated conversation more freely. One exception to this rule was Crystal (the "student leader") who often took the role of initiator. Student-student interaction was seen in session two through five, and was usually of the participative kind, where the students were discussing class related topics among themselves.

Responsivity (the degree of elaborateness of student responses) was terse in all the sessions except session three. Again the exception was Crystal who was very elaborate in her responses. In session three, students were much more verbal than usual.

Attention levels varied across sessions. In the first session, except for Crystal, the other students seemed distracted, and removed from the class proceedings. Many stared into the distance, others' attention seemed focused on other areas of the room. Crystal in all sessions was an interested participant, often listening with rapt attention to the instructor. In the other sessions, again excepting session three, the majority of the students took part as passive listeners. They followed the discussion, but usually did not contribute either verbally or through non-verbal gestures and expressions.

The most salient affective response shown by the students was empathy or identification with what the instructor was saying. Students expressed identification by nodding or voicing agreement, and sometimes giving personal examples. This was particularly apparent in the latter sessions. In the first two sessions some students displayed boredom. In the latter sessions students also displayed amusement and humor by laughing and smiling at the instructor's remarks.

St. Lincoln

Qualitative analysis of the amount of interaction over the eight classes showed that the amount of interaction ranged between moderate and

high. This largely depended on the instructional method (lecture, discussion, questionning etc.) chosen by the instructor for a particular segment. During instructor lectures interaction was low compared to discussion time.

As a rule, all or a majority of the parents participated in the interaction. At times this participation was instructor elicited, in that the instructor often asked a particular student for her opinion, or asked the students to take turns in answering a question.

The instructor made use of instructional materials, in the form of booklets, only in two sessions, limiting student-material interaction. Student-instructor interaction formed the predominant type of interaction in all the sessions. Examples of student initiation of discussion, or student initiated remarks were seen in all except the first session. For example, in session three one student, on her initiative, requested that the discussion be on a topic of her choice. From this it may be concluded that initial discomfort with the technology or the newness of the course, inhibited student initiation in the first class. The students soon became comfortable enough to initiate interaction. However student initiation of interaction was never very frequent and the instructor was always the main initiator of interaction. Only a few examples of exclusively student-student interaction were seen, though during discussion time, the students and instructor interacted as a group.

Students usually were elaborate in their responses. For example, clear expression and explanation was usually provided instead of terse one word replies. Students were also attentive in all the sessions, listening or participating in the ongoing discussion with interest. Eye contact was usually maintained with the instructor, and students were usually very attentive to the class proceedings.

As at Nazaire, the students often showed empathy or identification with what the instructor was saying. Parents used head nodding, verbal agreement and, at times, personal anecdotes and examples to indicate that they identified with the topic of discussion. In addition amusement and happiness were often seen in the form of laughter. On occasion embarrassment expressed through giggling or facial expressions was seen.

Pedagogical Impact

This component concerns the effect of the technology on the instruction itself. The instructional *method* and the *srategies* employed were two aspects of instruction examined. Instructional method refers to the procedure of presentation (such as lecture or questionning) of the instructional content. Strategies refer to teaching and communication techniques employed by the instructor.

Nazaire

Analysis of the instructional methods used showed that in the first two sessions the instructor attempted to combine *lecture* with *questioning*

and *groupwork*. These methods were met with varying degree of success and influenced the instructors choice of method for the following sessions. Groupwork, where the instructor gave the students an assignment and then left them to work in either small groups or as a whole group, was a disaster. Students flatly refused to work in pairs, saying that they preferred to work together. Whole-group discussions also were not successful. As there was no facilitator at the remote site, keeping students on task or even assuring that they began the assigned task was difficult. In the groupwork assignments during the first two sessions it was seen that a majority of the students just sat in their seats and stared off in the distance, while a few carried on a conversation that was not obviously pertinent to the task at hand. Groupwork was abandoned by the instructor in the following classes. Questioning and discussion worked a little better, but eliciting responses from this group of students was usually difficult. A notable exception was session three. Though the instructor continued with the use of questionning and discussion in all subsequent sessions in an attempt to maintain interaction, student responsivity was usually terse. The lecture format worked best with this group of students. Students maintained at least a passive interest in the class but at other times students listened with interest.

The instructor made use of different techniques or strategies in order to keep the students' attention and to maintain some degree of interaction

in the class. Techniques that were successful were (a) *repeating* and *summarizing* important issues in order to emphasize them, (b) *turn passing,* in which the instructor asked a student to choose who should speak next, (c) *use of humor* , (d) *personalization* or linking the lesson content with students' background experience and asking for individual's personal experience or opinion, (e) *naming* or directing a remark or question to an individual by use of name and (f) *using an ice-breaker* at the start of each session. This involved asking each student to respond to a question such as "What is your favorite food?" or "What was something that you really enjoyed doing this week?"

St. Lincoln

Analysis showed that the instructor was combined the use of lecture, questioning and discussion in all the sessions. Groupwork, where the instructor gave the students an assignment and then left them to work in a small group was seen only in session two. There were only three students in this session, and this method worked well with this small group, which appeared to be on-task. Lecture, questionning and discussion were used in the remaining classes. During instructor lecture, the group usually listened well. Questionning produced elaborate replies and discussions were most often participative, with majority of students sharing their view.

The stratagies that the instructor used to maintain attention and increase interaction were repeating and summarizing, turn passing, use of

humor, personalization, naming and using examples from his own life. In particular, naming, personalization, use of humor were used most often.

Cross-Site Comparison

The interactions at the two sites differed in many ways. Students were more much more willing to take part in the classes at St. Lincoln than at Nazaire. This attitude manifested itself in the form of greater participation in the videoconferencing classes and more interaction at this site. At Nazaire the seating arrangement and the number of students present resulted in some of the students being far from the microphone, which made transmission of sound and audibility a problem. This possibly discouraged participation even further. At St. Lincoln, by contrast much more interaction was seen. There were fewer students so all students could be close to the computer monitor and microphone. Due to the unresponsiveness of the group as a whole at Nazaire, it was observed that one parent took it upon herself to assume the role of group leader or facilitator. This was not evident at St. Lincoln where all or majority of those present in a class interacted. By and large student initiation was minimal at Nazaire (with the exception of the student leader). At St. Lincoln by contrast examples of student initiation were seen. A higher level of attention intensity was also observed among the students at St. Lincoln, when compared to Nazaire, where a majority of the parents were content being passive listeners.

At both sites students' made use of nonverbal communication, in terms of gestures and expressions, and though it took longer at Nazaire for the students to relax in front of the camera, eventually most students appeared to be relaxed during the classes. Emotional responsiveness was seen at both sites, though it was more positive at St. Lincoln. Table 4.2 sums up these contrasts.

Table 4. 2
Cross-Site Comparison of Videoconferencing Interaction Analysis

Domain	Dimensions of Contrast						
	Technology -Centered interactions		Student-Centered Interactions				
	Interface functions	Student leader	Amount	Partici-pation	Student Initiation	Respon sivity	Atten-tion
Nazaire	Sound problematic	Yes	Low/ Moderate	Few	No	Terse	Passive Listening
St. Lincoln	No problem	No	Moderate /High	All	Yes	Elabo-rate	Interest-ed

In the Midst of it All: Affective Responses of Parents

This section describes the parents' affective response to both the content and the technology of the videoconferencing class. Data were

gathered through interviews with the parents and teachers. Videotapes of the first and last classes at each site were also transcribed.

Nazaire

The parents at Nazaire were not favorably disposed toward videoconferencing course, specially at the beginning of the classes. The teachers reported a reluctance on the part of the parents to attend the classes, and during the classes this reluctance manifested itself in the parents' unwillingness to communicate and interact with the instructor. The Even Start teacher, Cathy, felt, "They would make sure that they were absent, most of them!" Similarly, the adult education teacher later told me

> It started off after the first day. "Let's see I don't think I will be there!" I did have a few conversations with a couple of them and [said that] it had to change. I made sure that it changed, and they started acting like they were supposed to.

Several factors contributed to this negative response. These were (a) the parents' predisposition toward the program itself (discussed at length in the first section), (b) the nature of the course content, and (c) discomfort caused by dealing with the technology itself.

I Don't Feel Comfortable

During the students' first use of videoconferencing, Rachel, a student, remarked,

> I don't know what to say. I don't feel comfortable. I don't feel comfortable with you there and I'm here. I could talk better face-to-face than I can with you there. I kind of feel

> uncomfortable ... I rather be with you face-to-face and talk to you.

Rachel was one of the students who seldom took part in any class discussions, interacting with the instructor only when he directly addressed a remark to her. After the last class she told me, "I was uncomfortable the whole time using it.... I would much rather talk to you all person-to-person than talk to you all over this machine."

After the first session, Cynthia, the adult education teacher, remarked, "They are just scared to death of talking to the computer. We need to get them more comfortable." Cathy, the other teacher, said

> Some of them felt very uncomfortable with it and a few of them talked to him quite a bit. I would say that probably 60% of the ladies, when they left here did not like it at all, I guess because they are not used to it. But I think that the more we use it the more comfortable they will become. I felt uncomfortable the first time I used it, too ...

Students' responses went through some degree of change over time. During the eight weeks of the classes, students had time to get familiar with the technology, and to establish a trusting rapport with the instructor. After the end of the classes, the students were unanimous in liking the classes. Their attitude toward the technology was mixed. Some student responses to the classes and technology at the end of the course, reflect their feelings:

> L'Tonya: My name is L'Tonya and I think that talking about the topic is good, like they [the others] say, but sometimes we rather that you be here so that we can see the expression on your face personally than just looking at the camera and seeing

> it. I was never uncomfortable. I guess I just like to talk, it does not matter how!
>
> Ivy: I liked the discussions, but I don't like the way we have them. We were not there talking face-to-face about the matter. I don't like the equipment for this topic. I don't like talking to you over the screen. I think it should be face-to-face . . . you are too far away.
>
> Justine:Well my name is Justine and I enjoyed doing it. It taught me a lot about children and their feelings that I did not know. It was just as good as being there.
>
> Stella: I have not been in this very much as I have been out but I learned how to discipline my children a lot better through it. I don't like the screen and you being there and me being here.

Though some students felt that there was really no difference in having the class by videoconferencing or face-to-face, others expressed frustration with the malfunctioning of the technology. One student said, "Sometimes you have to continue asking somebody what they said, sometimes that gets on my nerves because you got to keep on repeating what you said." Another added, "Sometimes it gets complicated and sometimes it gets cut off and you may not hear what I said."

Content of the Course

Though the parents never explicitly voiced it, some reluctance to participate in the course stemmed from the fact that it was a course on parenting skills and parental stress management which at the best of times are delicate and personal issues. The setting for this course made things

even more complicated. The parents in this program were all on welfare, and had to attend this (or similar) program to get their checks. This resulted in them being less-than-willing participants to start. Moreover, government dependence is closely linked to many sensitive issues like race and social standing. The instructor was white, male, middle-class, and from the "big city." The parents were female, African-American, from the lower income levels and from a largely rural setting. This resulted in making the instructor a real "outsider" for the parents. These factors compounded the difficulties of dealing with personal issues. Perhaps dealing with "safer" issues would have encouraged more interaction. Both the instructor and teachers voiced this sentiment. Describing the nature of the course and his feelings of having to teach it at a distance, Dr. Bird said:

> I think a lot of what I do involves creating an atmosphere of safety where people feel open to share and I think a lot of that does involve a face-to-face connection. That is why I am not sure that what I do lends it self well to this kind of teaching.

Cathy, the Even Start teacher, had a similar impression of how the course content affected the parents' reaction:

> I think that you have to offer different topics, get away from the discipline for a while. That is something that they are very negative about anyway, because they all have their own ways of tending to their children and they do not like the idea of somebody, who they don't know and who knows nothing about them, to come and tell them what to do. So if you get away from that, and get on something that they are more positive about you would get a better response, too.

As mentioned above, after the completion of the course, the parents were unanimous in saying that they liked the classes and learned a lot from them. This change in the parents' attitude was also evident to the teachers. Cynthia said that at first the parents did not like it at all, they were very uncomfortable, but it did get easier, and they did talk more. "Not that they were necessarily nicer, but they did talk, they did respond to him. I know it became easier for them to come in and become a part of it."

Figure 4.3 below sums up the reasons for the initial negative response of the parents.

Figure 4.3
Nazaire: Factors Resulting in Negative Affective Response

Factors attributing to negative affective response	
Pre existing attitude to program	Dissatisfaction Unwillingness to participate
Class content	Personal nature Felt intrusive Distrust of "Outsider"
Discomfort with technology	Strangeness Awkwardness

St. Lincoln

Analysis of the parents' affective response to the technology and videoconferencing classes showed that despite some initial discomfort with the technology, parents at St. Lincoln were mostly willing participants in

the videoconferencing classes and were favorably disposed toward the technology.

At First it Felt a Little Uncomfortable ...

At first the parents were a little apprehensive both about the video camera being present in their room and the "new" course to be offered. Describing the sentiments in the adults' classroom, where the equipment was kept, Anita the adult education teacher, said,

> At first it felt a little uncomfortable. It was like "we are talking to that machine and the camera is looking at us." They always wondered if the camera was on and I said that "No only when someone calls during the session is the camera on," so they felt a little uncomfortable about the camera. And they also said, "are they using us in some kind of study? Will they mention our names?" I said, "No the top priority is to help you cope with some family issues." So once they understood that, rather than thinking of themselves as some kind of subjects, when they got the idea that "hey these people would really like to help us and they are helping us cope with something," they felt more comfortable with it.

Anita also said that though there were times when the parents would rather be doing something else, most of the time they were ready for the classes because either they were anxious to pick up on some discussion they were having the session before or they just needed some time to talk.

> Usually after the sessions were over, they were a little bit happier and it brought them closer together. They would have little jokes among themselves and they would mention some things, not a whole lot, because I told them that this was their private time.

The parents all expressed their amazement and surprise at the way the technology worked and how clearly and easily they could communicate with a remote site. About half the students said that they had never felt uncomfortable talking over the computer, others felt that at first they were a little uncomfortable, but soon got used to it. One student, Tracy, said, "At first I was pretty much shy then I started opening up." Another student, Tanya, recounted, "At first I was uncomfortable with it because you wasn't there with me, but I got used to it over the sessions we had. I got used to it I got comfortable with it, after a while." On being asked what made her initially feel uncomfortable, she added, "It was like talking to a TV. I thought I was crazy or something. "

At the end of the eight weeks, no student reported feeling uncomfortable using the computer to communicate.

I can talk better

After the end of the classes, students felt that this mode of interaction was at least as good as face-to-face interaction. Bessie explains, "You can see who you were talking with. A lot of times when you are talking on the phone, you got to try and visualize it if you do not know what they look like. Here you know first hand who you talk to. You can see their reaction. Helps build communication." The students were very tolerant of the technical disruptions that they had had to deal with saying that problems

were not that frequent and "It can't be perfect." They all agreed that "communication was not really a problem."

An interesting issue that emerged was that some students said that they preferred this mode of interaction to meeting the instructor face-to-face. Tanya said that it made a big difference that the instructor was not present face-to-face with them, because it helped her to be more honest and to open up much more. "I disagreed with him a lot. I thought he may have hit me or something! Yes it was better. I think it was much better." Tracy expressed similar sentiments: "I agree with her because I feel very shy talking to people I do not know. And it felt like at a distance -- I can talk to them better than sitting face-to-face with them."

Independently, the two teachers expressed a similar sentiment. Both felt that, given the nature of the class, the computer videoconferencing facilitated rather than hampered interactions. Anita, the adult education teacher observed,

> Considering that he was a stranger -- because they had this, this monitor, between them -- they were able to keep some kind of barrier, not much of one, between them. If he was here, I don't know if they would have said as much as they did, because they probably would have been a little nervous because of his presence. But considering that he was coming in over the monitor, it kept that distance that made them comfortable enough to share. It did not come too close. Close enough, but not too close.

Ms. Frederick, too felt that the medium had allowed students to be more honest, saying,

> I personally feel that with it being on the monitor rather than face-to-face, they were more open. They were allowed to just express themselves as they wanted too, rather than - when you are person to person you have a certain repertoire [sic], you conduct yourself a certain way, your expressions are not as true, where here in a more relaxed environment, you tend to be more relaxed. Here they were in their environment and he came in to their environment through the monitor. I think they had the concept of "If we don't want to listen to him, we can always turn him off.

Content of the Course

Though the parents were willing to participate in the classes, they admit that at first they were a little chary and reserved. During the final class Bessie told the instructor,

> Believe it or not, I liked you over the computer, because in the beginning, I really did not think -- Another race of people, to tell us how to raise our children, how to help our children -- [laughs] you know what I mean!
> .... You know we come from different backgrounds, and you can't expect someone to understand our background if they have not been there, but a lot of what you said has made a lot of sense and I am willing to try it.

All the parents agreed that though initially they were a little shy and reserved, soon a feeling of mutual trust and sharing developed between the instructor and them and they found the course to be very enjoyable and helpful. Tracy and Tanya's words sum up the feelings voiced by all in the class:

> Tracy: I felt shy basically talking to a stranger, opening up to somebody you don't really know. I got to know him, it was easier to talk to him, he was a very nice and friendly person. He shares things with us and we share things with him . . . sometimes we'd get to laughing . . . the first time was more serious than when you just sit down to talk.

> Tanya: In the first session we had, I was sort of holding back my inner self, and basically towards the end I started letting out, every thing that was inside.

By the end of the eight weeks the students expressed the desire that they wished that the instructor could have been "right here with us." However, a majority of them believed that, initially, the distance due to videoconferencing had made them feel more comfortable with the course and some of the issues discussed, and had contributed to the building of trust with the instructor.

In conclusion, it can be said that at the St. Lincoln family literacy center, both the videoconferencing equipment and the course were well received by the parents. In the beginning some parents expressed a degree of shyness but this was soon overcome as they became more familiar with the instructor and the equipment. Additionally, they felt that the safety provided by the distance was crucial in building communication between the instructor and themselves.

Cross-Site Comparison

The affective responses of the parents toward the videoconferencing and the equipment were varied across the two sites. Table 4.4 provides a summary of contrasts. At Nazaire, the parents were never willing participants in the classes, whereas at St. Lincoln they started off willing to give the class and instructor at least a fair chance. At both sites, initially some students professed being uncomfortable with the fact that they had to

talk over the computer instead of the more conventional face-to-face communication. At Nazaire, for some students, this feeling of discomfort persisted to the very end of the classes; at St. Lincoln, by the end of the classes the students were either indifferent between face-to-face communication and computer videoconferencing, or expressed an explicit preference for the technology. At both sites, all concerned felt that the sessions had been worthwhile and had provided parents with useful information.

Table 4.4
Cross-Site Comparison of Affective Response of Parents

Do-main	Dimensions of Contrast					
Site	**Response to tech.**		**Response to class**		**Involvement in class**	**Effect of tech. on interpersonal relationships**
	Start	**End**	**Start**	**End**		
Nazaire	Uncomfort-able-Some Comfortable -Some	Uncomfort-able-Some Comfort-able-Some	Guarded, Unwilling to partici-pate	Guarded partici-pation	Unresponsive	Distancing
St. Lincoln	Uncomfort-able-Some Excited -All	Comfortable All	Guarded, excited Willing to partici-pate	Open willing	Responsive	Providing safety

In the Midst of It All: Session Evaluation Questionnaire

The data from the 10-item evaluation questionnaire that was given to the parents after each videoconferencing session was used to graph their responses over the sessions. Five of these items were technology questions and five related to the class content.

Nazaire

Table 4.5 shows the number of parents present at each session at Nazaire.

Table 4.5
Nazaire: Number Present at Each Session

Session	n
1	6
2	10
3	8
4	6
5	4
6	6
7	6

The mean response of the parents to each of the technology related questions, (measured on a five point Likert scale) is presented in Figure 4.6 .

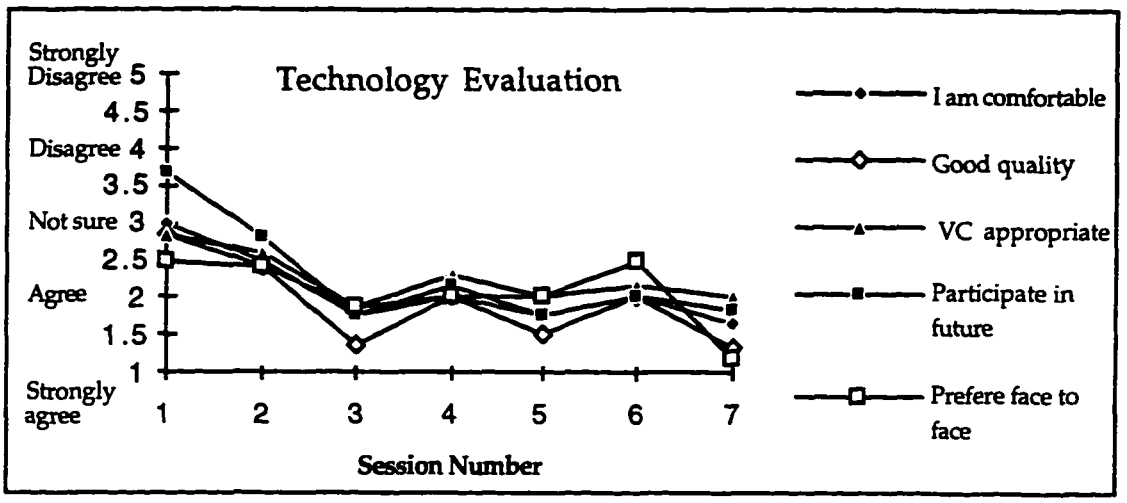

Figure 4.6. Nazaire technology evaluation.

Figure 4.6 shows that the parents started off with a higher mean response (indicating more negative feelings) to the questions relating to their feeling comfortable, the quality of transmission being good, videoconferencing being appropriate, and whether they wanted to participate in future. The degree of positiveness increased over the sessions. The last session responses are all positive ranging between *Strongly agree* and *Agree*. A similar trend is visible for the question asking whether they would prefer face-to-face classes. Students began the classes feeling that they would did not prefer face-to-face classes, but moved towards stating a preference for them.

Students' response to the course content, as measured by the questionnaire is shown in Figure 4.7.

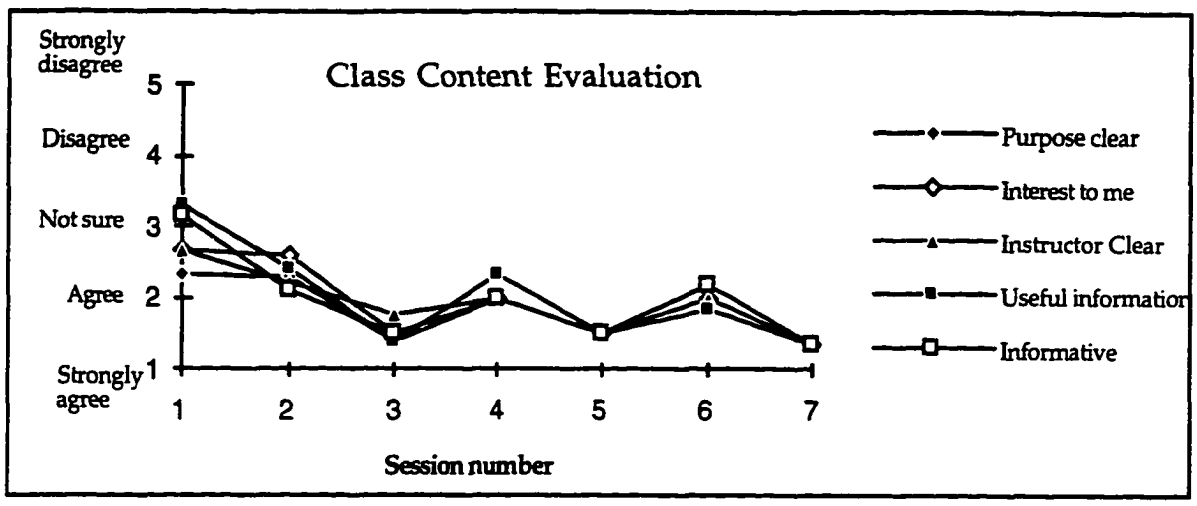

Figure 4.7. Nazaire class content evaluation.

Both the graphs for evaluation of technology and evaluation for the class content show very similar trends indicating that students overall affective response to both these issues is linked, and teasing one away from the other is difficult. Overall, at Nazaire a clear trend of an increasingly positive response is seen. These results are consistent with the findings from the qualitative analysis, which clearly showed that initially the parents were reluctant participants in the program, but grew to like it as it proceeded. The fact that session three was particularly successful, so obvious from the analysis of interactions, is also reflected in these graphs.

St. Lincoln

At St. Lincoln very few students were present at each session. Data from the fifth and sixth session were also unavailable. The table 4.8 below presents the number of students present at each session.

Table 4.8
St. Lincoln:Session Attendance

Session	n
1	4
2	3
3	2
4	2
5	2
6	3
7,8	_[a]

[a] Missing data

The graph of mean responses to each of the technology related questions over the sessions is presented in the Figure 4.9 below.

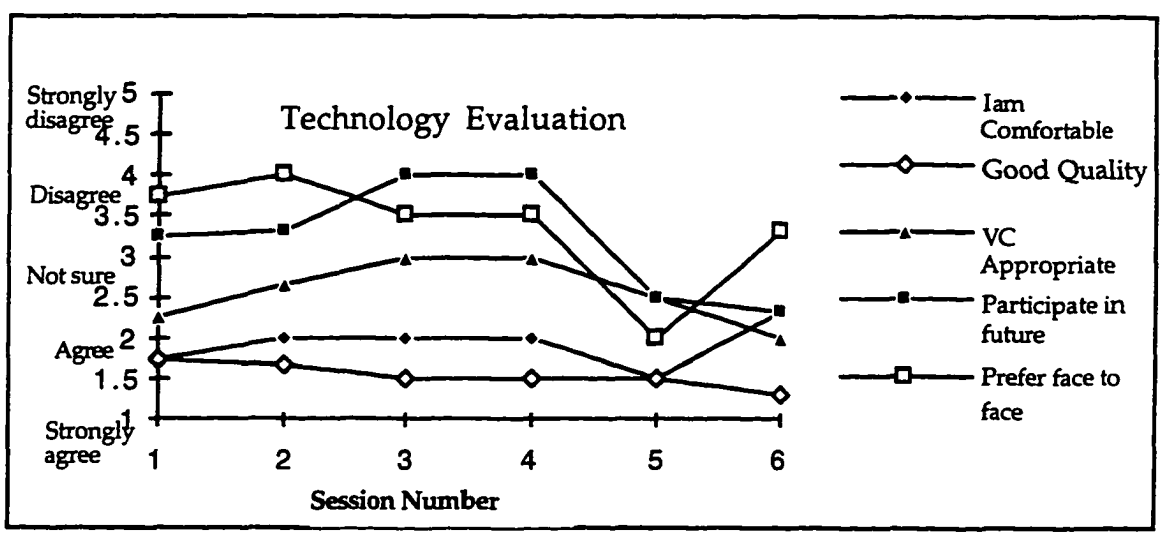

Figure 4.9. St. Lincoln: Technology evaluation

This graph indicates that the parents started off by being feeling comfortable with the technology, thinking that the audio-visual quality was good, and thinking it was appropriate for the parenting class. Their response to the first two questions did not change much over time. In all classes except the fifth, parents also disagreed that they would prefer face-to-face classes.

The response to the class content is presented in Figures 4.10 and 4.11. (Due to a high degree of overlap, a composite figure is not clear.)

These two figures show that the parents' responses to the content of the course did not vary much over the classes. Parents were positive about the classes from the beginning and remained so. These results are also consistent with the findings from the qualitative analysis.

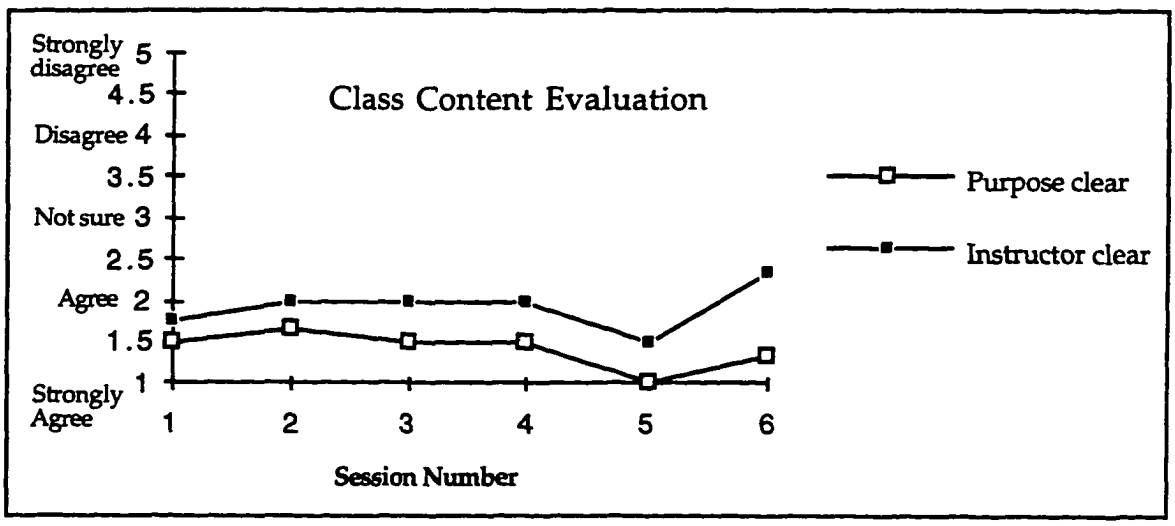

Figure 4.10. St. Lincoln class content evaluation 1.

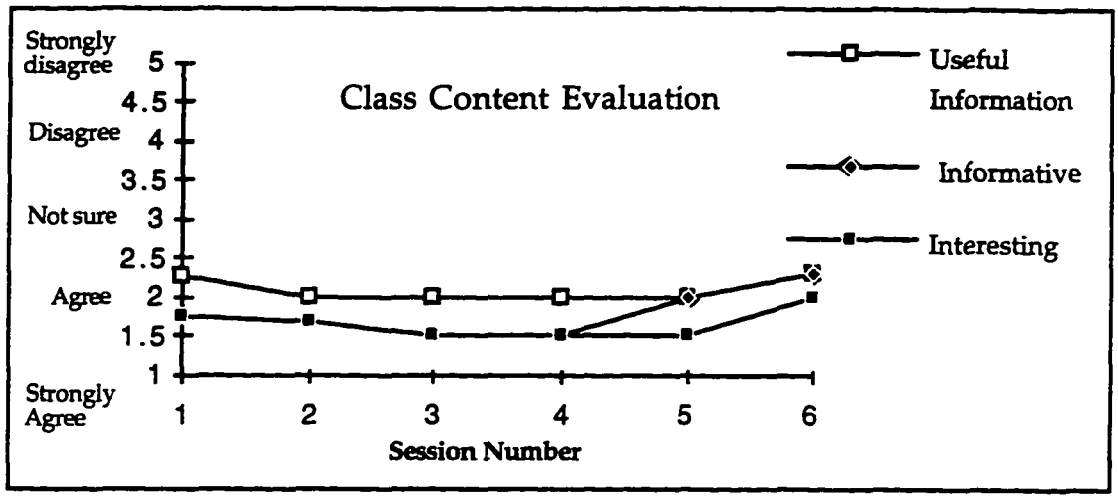

Figure 4.11. St. Lincoln class content evaluation 2.

Cross-Site Comparison

Examination of the mean response to the questions "I felt comfortable talking over the computer," "Video conferencing is appropriate to use for a discussion like this," "I would like to participate in more videoconferencing sessions in the future," and all the questions regarding the content of the class show that in the first few sessions, parents at Nazaire felt negatively about the class content and were uncomfortable with the technology. At St. Lincoln, by contrast, they started of with a more positive response. Additionally, at Nazaire, throughout the sessions the parents were more negative in their response to the above questions.

Comparing the parents at Nazaire and St. Lincoln on the response to the question "I would rather have had this discussion face-to-face with the

presenter" showed that parents at Nazaire indicated a preference for face-to-face communication.

The graphs also indicate that over the classes, there was a change toward a more positive response, among the parents at Nazaire. At St. Lincoln, by contrast, the mean responses generally showed less change. At both sites parents felt that the sessions had been worthwhile and provided parents with useful information

In Retrospect: Qualitative Analysis of Effectiveness of Sessions

This section presents parents' and teachers reflections' on the parenting course, after the end of the classes. Data were gathered through focus group interviews with the parents and teachers.

Nazaire

Although interaction by the parents during the videoconferencing classes was less than optimal, at the end of the eight weeks of the course, parents and teachers both felt that the program had been successful and had shown some visible results.

Teachers

The teachers felt a little disappointment at the way in which the parents had received the classes, but they felt that it had been beneficial, specially for building better parent child relationships. Cynthia, the adult education teacher, felt that the course content had been such that she saw

little effect in her adult education class but she had noticed that "as they went along they were more cooperative about going."

The other three teachers, who worked more with the family related component of the program, felt they had seen results of the program in their interactions with the parents. On being asked what she thought that the parents learned, Miss May the parent advisor said,

> Well if you ask them if they got anything out of it they will tell you, "Yes we learned a lot from it and we enjoyed it," but if you asked them what they learned specifically, they can't tell you. But I know that they got something out of it, because they talk about it, and they talk about some of the things that were talked about with Dr. Bird . . . about the different ways of discipline... That there is a different way other than, hitting, yelling or something like that.

Talking about the effect in the children's classroom and during PACT time Cathy said,

> I saw a lot of mothers come in with a more positive attitude. We have one mother in particular, that sometimes she was grouchy to the children and I saw a change in her. She has two children in the room, and I saw a change in her when she came in to do PACT time that she was a little bit more positive with the children.

A similar example was provided by Joyce the teacher's aide:

> There is one [parent] who always – when the children would sort of whine for her, she would always want to take them to the back room, to spank them and lately when she has come in with them, she has not been doing that. One day, she took her daughter to time out, and the child did not want to stay there. So she kind of sat beside her, and talked to her, while she sat in time out, instead of taking her into the bath room to spank her, which is what she had originally been doing to her. I have seen that change. And I have seen the difference in just the

> way she is handling her, she is talking to her more now than she is actually striking out.

By and large the teachers reported that when the parents came in for PACT time with their children (which is mandatory) they talked more with the children, played with them, and were more willing to "get on to the floor and crawl around" with them.

Parents

Rather contrary to my expectations, the parents reported that they enjoyed the videoconferencing sessions and found the content to be useful and meaningful. Justine said that she enjoyed the course and that it taught her a lot. Of the instructor she added, "I think he did pretty good. He gave his opinion and gave us a chance to give ours. He did not just say it and not give us a chance to say how we feel."

Similarly another student felt that "I think we had good communication with him because he explained a lot of things and he did not just give you a solution, but explained why he thought you should do things that way." Ivy added, " ... he even used himself and his children for examples for certain issues." Some parents' replies to what they thought they had learned, are presented below to help show what they got out of the course.

> Rachel: Really about children's feelings that I knew nothing about.

L'Tonya: I learned how to understand a child better, from babies to growing up.

Cynthia: I learned discipline without spanking.

Ivy: I learned that there were different alternatives in discussions where we talked about things such as discipline, punishment and the difference between discipline and punishment.

Justine: I learned how to deal with jealousy and sibling rivalry.

Stella: I have not been in this very much as I have been out but I learned how to discipline my children a lot better through it.

St. Lincoln

At St. Lincoln both parents and teachers felt that, on the whole, the videoconferencing classes had been beneficial.

Teachers

Teachers at the site felt that the classes had an impact not only on the parent-child relationships, but also resulted in the parents at the site feeling closer as a group. Anita, the adult education teacher, evaluated the effect of the classes by saying,

> Personally, I think it has had a positive effect on the parents ... They have enjoyed their session with Dr. Bird. It was like their own personal councillor and I was not involved at all. It was easier for them to talk to a stranger, they were more open to that person than they were to me, because I was from their background, and a lot of things they talk about, maybe they were ashamed. It was easier for them to talk to a stranger than it was to me. It also brought them closer as a group because they learned more about each other than they knew in the beginning, because in the parent discussion time, everyone was not apt to say anything because they may have been embarrassed but Dr. B., with his expertise was able to bring

> some things out and when the others saw each other share, they weren't so afraid to share... They became more affectionate toward each other, and toward their children too. With the hugging, and the I love you too and the kisses and everything, they became more affectionate.

Ms. Frederick too felt that she had seen a visible effect of the classes:

> I saw a change in the children, as far is it came to discipline. When they first came to school several of the children displayed a fear, like they were afraid that someone was going to strike them, they raised their arm - like protection. As the semester went on, I noticed that the parents spent a lot more time to talking to their children rather than spanking them and chastising them. The kids learned what time out was all about . . . I also noticed that the bond between the parent and the child grew a whole lot. They were looking forward to seeing their parent during lunch time, breakfast time and PACT time ...
>
> Lets say for instance, Tanya and Loretta. Loretta is a student in my room. When she first came to the class first, she was very babyish and she would cry every day. Only when Tanya would threaten to spank her, would she stop. But I noticed when time went on, she would still try the crying bit to get her mother's attention but instead of threatening to spank her, she would talk to her, and they would come to some sort of compromise, that look if you would behave today, we will go to McDonald's or something to that effect. Or this is not the way you should behave, this is school and you are here to learn. She would talk with her instead of taking her to the rest room to spank her....
>
> There was a closer bond. Not just the parent and child but also other parents and the other children. They became protective of each one. All these children -- it was like all of these children are our children, this is our family, so if one is straying another parent may pull her aside and correct him or show her the right way. It became one big family.

Parents

The parents agreed that the classes had helped them understand and communicate with their children better and had taught them about effective discipline. They also felt that it had helped them communicate with other adults a lot better and made them realize that they had each other as a "support group." Tracy's comments sum up the overall feeling in the group: "Some of the things that I liked was that he helped us get closer with our children ... and how we can communicate with one another." Tanya added,

> He helped me get along with my child much better than I ever was. Like he said we shouldn't spank our children. I laid of that a little bit. I wont say I completely stopped but I understand my son a little better. It also showed me how to express my feelings with other people . . . It has changed a lot, and I get along with people much better . . . You all did teach me how to communicate better with people.

Cross-Site Comparisons

Both at Nazaire and St. Lincoln, teachers and parents agreed that the classes had helped them better understand and relate to their children. The consensus suggests that providing alternatives to spanking as a form of discipline was the main contribution of the course. Whereas at Nazaire, neither the parents nor teachers mentioned any effect of the classes on the parent group, at St. Lincoln both the teachers and the parents believed that the videoconferencing classes had led to a stronger bond being formed within the parent group as well.

In Retrospect:
Results of Parenting Stress Index Questionnaire

The 89 item PSI questionnaire (Abidin, 1983), is divided into 11 subscales, six in the child domain and five in the parent domain. The same questionnaire was given to parents before the start of the parenting classes, and at the end of the eight videoconferencing classes with the intent of doing statistical analysis comparing pre and post scores. However, since the sample size at the two sites was small, and due to student attrition and sporadic attendance became even smaller, only descriptive statistics are provided for this data.

Nazaire

Table 4.12 depicts the mean scores of the parents on each of the six child characteristic and five parenting characteristic subscales of the PSI administered at the start of the program. These scores indicate that though all the mean scores, except for distractibility, fall within the normal range, the maximum scores in each category are usually at the crisis level (as specified by Abidin, 1983). The mean score for distractibility is higher than the normal levels. The standard deviations for the subscales range between 3.09 and 6.13. The domain standard deviations are 22.73 and 19.12, and the standard deviation in total score is 39.4, indicating great variation within the sample. The maximum and minimum scores within each subscale and domain also illustrate the amount of variance within the sample.

Table 4.12

Nazaire Pretest Descriptive Statistics

Variable	Mean	Std. Dev.	SampleRange	Normal Range[a]
Distractibility	28.17	4.15	23-38	19-28
Reinforces parent	9.50	3.09	6-17	6-11
Mood	10.00	3.49	5-16	6-11
Acceptability	12.58	4.44	7-23	8-15
Adaptability	26.92	5.73	16-34	19-28
Demandingness	18.42	5.13	9-26	13-21
Competence	19.75	6.09	11-31	22-34
Attachment	11.83	3.79	7-17	9-14
Restrictiveness	17.83	5.97	7-27	13-23
Depression	17.92	6.13	9-27	15-24
Isolation	11.58	3.63	6-16	9-16
Parent Domain	78.92	22.73	44-117	_[b]
Child Domain	105.58	19.12	69-141	78-114
Total Score	184.50	39.40	116-258	_[b]

Note. N=12

[a] Scores between 15-80 Percentile fall in the normal range (Abidin, 1983).
[b] Scores not applicable as entire instrument not used.

Table 4. 13 gives the same scores for the post test which was administered approximately 12 weeks after the pretest.

Table 4. 13

Nazaire Post test descriptive statistics

Variable	Mean	Std Dev.	Sample Range
Distractibility	25.33	3.12	22-31
Reinforces parent	10.56	2.56	6-14
Mood	10.11	2.32	7-14
Acceptability	14.00,	2.92	9-17
Adaptability	27.67	6.58	16-37
Demandingness	19.11	1.97	16-22
Competence	22.00	6.33	12-32
Attachment	14.22	3.08	11-20
Restrictiveness	15.44	4.19	7-22
Depression	16.11	5.19	9-22
Isolation	11.22	3.83	6-15
Parent Domain	79.00	16.46	45-98
Child Domain	106.78	12.84	80-125
Total Score	185.78	27.54	125-214

Note N=9

Table 4.14 can be used to compare the means and standard deviations on each of these scores in the pre and post tests. Though due to the small sample size, statistical tests of inference to see whether significant treatment effects exist are not meaningful, the means and standard deviations in the above table indicate:

1. There is not much change in the mean stress scores for either subscales or domains or the total score. Within the subscales, the score for distractibility, restrictiveness, depression and isolation fell marginally. The scores for the remaining subscales as well as the domain scores and the total

scores showed a slight increase. These increases are small and could be a result of random variation.

2. Decrease in the standard deviation within each subscale and domain as well as in the total score. The variance in the sample became smaller. The sample size also decreased, possibley explaining this decrease.

Table 4.14

Nazaire Pre and Post PSI Scores

Variable	Mean (Pre) N=12	Mean(Post) N=9	Std. Dev. Pre	Std. Dev Post	Normal Range [a]
Distractibility	28.17	25.33	4.15	3.12	19-28
Reinforces parent	9.50	10.56	3.09	2.56	6-11
Mood	10.00	10.11	3.49	2.32	6-11
Acceptability	12.58	14.00	4.44	2.92	8-15
Adaptability	26.92	27.67	5.73	6.58	19-28
Demandingness	18.42	19.11	5.13	1.97	13-21
Competence	19.75	22.00	6.09	6.33	22-34
Attachment	11.83	14.22[c]	3.79	3.08	9-14
Restrictiveness	17.83	15.44	5.97	4.19	13-23
Depression	17.92	16.11	6.13	5.19	15-24
Isolation	11.58	11.22	3.63	3.83	9-16
Parent Domain	78.92	79.00	22.73	16.46	_[b]
Child Domain	105.58	106.78	19.12	12.84	78-114
Total Score	184.50	185.78	39.40	27.54	_[b]

Note. [a] Scores between 15-80 percentile on the normative sample fall in normal range (Abidin, 1983).
[b] Scores not applicable as entire instrument not used.
[c] Above normal range.

St Lincoln

The pre-test means, standard deviations and sample range for subscale, domain and total scores are presented in Table 4.15.

Table 4.15

St. Lincoln Pretest Descriptive Statistics

Variable	Mean	Std Dev	Sample Range	Normal Range [a]
Distractibility	25.00	4.09	19-33	19-28
Reinforces parent	9.67	2.55	6-13	6-11
Mood	11.11[c]	3.98	6-19	6-11
Acceptability	12.44	3.94	8-18	8-15
Adaptability	31.22[c]	6.65	20-41	19-28
Demandingness	20.00	1.94	17-24	13-21
Competence	26.33	5.10	19-35	22-34
Attachment	15.22[c]	6.89	8-27	9-14
Restrictiveness	19.11	5.44	13-30	13-23
Depression	21.89	3.20	19-29	15-24
Isolation	14.22	1.92	11-17	9-16
Parent Domain	96.78	10.34	85-118	b
Child Domain	109.44	16.02	85-136	78-114
Total Score	206.22	25.19	171-254	b

Note. N=9

[a] Scores between 15-80 percentile on the normative sample fall in normal range (Abidin, 1983)

[b] Scores not applicable as entire instrument not used.

[c] Above normal range

These scores indicate that the means of the child adaptability and parent attachment subscales are outside the normal range. The maximum scores in each category are well above the crisis level (as specified by Abidin,

1983). The standard deviation within each subscale ranges between 1.92 and 6.8, the domains standard deviations are 10.34 and 16.02, and the standard deviation in the total score is 25.19. The maximum and minimum scores within each subscale and domain are provided to illustrate the amount of variance within the sample. Table 4.16 gives the scores for the post test which was administered approximately 12 weeks after the pretest.

Table 4.16

St. Lincoln Post Test Descriptive Statistics

Variable	Mean	Std. Dev	SampleRange	Normal Range [a]
Distractibility	22.75	2.36	21-26	19-28
Reinforces parent	9.25	2.36	6-11	6-11
Mood	14.00[c]	4.97	7-18	6-11
Acceptability	12.00	3.56	7-15	8-15
Adaptability	24.50	4.51	19-30	19-28
Demandingness	20.25	3.69	16-25	13-21
Competence	21.50	6.25	15-30	22-34
Attachment	14.75	5.44	7-19	9-14
Restrictiveness	15.75	1.50	14-17	13-23
Depression	16.75	4.27	12-22	15-24
Isolation	12.25	2.99	9-16	9-16
Parent Domain	81.00	18.17	58-97	-[b]
Child Domain	102.75	17.23	80-120	78-114
Total Score	183.75	35.25	138-217	-[b]

Note. N=4

[a] Scores between 15-80 percentile on the normative sample fall in normal range (Abidin, 1983)

[b] Scores not applicable as entire instrument not used.

[c] Above normal range

Table 4.17 compares the means and standard deviations on each of these scores in the pre and post tests.

Table 4.17

St. Lincoln: Pre and Post PSI Comparisons

Variable	Mean Pre. N=9	Mean Post N=4	Std Dev Pre	Std Dev Post	Normal Range [a]
Distractibility	25.00	22.75	4.09	2.36	19-28
Reinforces parent	9.67	9.25	2.55	2.36	6-11
Mood	11.11	14.00[c]	3.98	4.97	6-11
Acceptability	12.44	12.00	3.94	3.56	8-15
Adaptability	31.22	24.50	6.65	4.51	19-28
Demandingness	20.00	20.25	1.94	3.69	13-21
Competence	26.33	21.50	5.10	6.25	22-34
Attachment	15.22	14.75	6.89	5.44	9-14
Restrictiveness	19.11	15.75	5.44	1.50	13-23
Depression	21.89	16.75	3.20	4.27	15-24
Isolation	14.22	12.25	1.92	9.00	9-16
Parent Domain	96.78	81.00	10.34	18.17	-[b]
Child Domain	109.44	102.75	16.02	17.23	78-114
Total Score	206.22	183.75	25.19	35.25	-[b]

[a] Scores between 15-80 percentile on the normative sample fall in normal range (Abidin, 1983)
[b] Scores not applicable as entire instrument not used.
[c] Above normal range.

The table indicates that except for the subscale *Mood* the mean scores for all the subscales, both domains, and the total score has decreased, indicating a decrease in stress levels.

Cross-Site Comparison

Cross-site comparisons show that at St. Lincoln, parents had a higher pretest total stress score as well as higher stress scores in the parent and child domains than those at Nazaire. At Nazaire comparisons of these scores on pre and post measures indicate that there is very little change over the period of the treatment. The small change that occurs shows that some subscales, the domain scores, and the total score show a very slight increase in stress scores. At St. Lincoln there is a decrease in the total stress scores as well as the parent and child domain scores over the pre-post period.

In Retrospect: Suggestions for Future Use

After the videoconferencing course, the teachers had more concrete ideas about how they would like to see videoconferencing used in the future, then they had the initiation of the study, some suggestions put forth by the teachers' at the two sites are presented below.

Nazaire

Relating Courses Offered to the Parents' Lives "at the Moment"

Teachers felt that classes would be of more interest to the parents and therefore, would evoke better participation if they were closely related to personal and immediate needs of the parents. Joyce explains,

> I think a lot of times it has to do with what is going on in their lives at that time. If they are having a problem with the child, with the boyfriend or whatever. A lot of times if at a meeting you can get

> them to start talking about what is going on in their lives, at that time, it is more meaningful to them to talk . . . Like today it might be, Chris is not eating right. That might be a good time to talk about nutrition. But if it is a day when Chris is acting up and doing something else, then that would be a good thing to talk about.

In practice this implies having an area expert negotiate the course content through consultation with the parents and teachers. It also means weaving in the learners background and experiences into the discussions. In fact, Dr. Bird did this in his eight weeks of teaching with remarkable expertise, using the sharing of personal experiences and background, both his and the students, to build a feeling of trust and maintain interest and attention.

Linking Videoconferencing Courses With Ongoing On-Site Instruction

The teachers felt that it would be beneficial to use videoconferencing classes as an extension to some on-site seminar and workshops that are offered to the parents. Cynthia provided an example:

> We have a psychologist who is working with the state extension services. She is coming and doing 20 different parent meetings. If we see a lot of interest in a particular topic, it would be good if we let them [the program administrators] know, and they can double up on it, because it doesn't hurt to repeat things at all . . . bring the same type of thing back to them so that they can learn even more.

Similar to the first suggestion this too illustrates the need for administrators of courses offered through distance learning, to maintain an acute awareness of the background, social and psychological characteristics of the learners as well as keep abreast of their needs and requirements.

Accessing Local Resources

Meeting and learning from people from the surrounding communities or people from similar disadvantaged backgrounds was something that the teachers thought would be personally meaningful and motivating for the parents. A successful single parent for example. " If they are hearing it from somebody who has been through it themselves, they listen better, because they think, she has done it, she knows" said one teacher. Teachers' suggested meeting an author, specially a children's author, may get parents to read to their children more.

Communicating with Educators

Teachers felt that it would be of great help to them if conferences with another Even Start or family literacy program could be set up and they could "talk about some things that are going on with us and they can share some of the things that they are going through."

Teaching Adult Learning Skills

Cynthia felt that it would be useful to offer the parents classes on learning skills over the videoconferencing. "If this had been used educationally other than parenting skills, ... if they were doing, say school work on it, I think it would be great. I would like to get something like that in the classroom."

On the whole, at the end of the videoconferencing classes, the teachers expressed their satisfaction with videoconferencing and felt that most of

their expectations had been met, but felt that the technology had not been used to its fullest potential. Briefly, the teachers main sentiments are related:

> Cathy: Yes I think it has been very successful . . . we just think that we need to do it a lot more often.

> Joyce: I think it was a GOOD experience for all of them. And the first time you do anything, you are skeptical about it, but the next time it is a lot easier, and you are much more comfortable.

> May: I wasn't disappointed in the way that videoconferencing went. But I was just disappointed in the way that some of the parents acted ... Some of them were kind of ugly. They said ugly things and they did not answer him the way that they should have. They acted like teenagers, like kids would acted.

> Cynthia: I am kind of removed from the whole thing. My classroom is the adult education one and so I did not have any major expectations from it. I think it could be put to more use.

The parents felt that they would benefit most from classes that would help them do better in their GED, specially since they did not have a "chalk board teacher" and needed to "learn by ourselves."[2] They felt that their main concern at the present was to "work with ourselves, not the children." They said that they would really like to have classes about things like study habits and techniques to remember better.

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[2] A theme that emerges over and over again.

St. Lincoln

Self-Help or Life-Skill Classes Related to Parents Needs

Suggestions included workshops on topics such as substance abuse, teenage pregnancy and single parenthood. Both teachers strongly felt that parents in their program needed access to such resources, and that they themselves were not adequately qualified to provide the needed information.

Teacher Education and Development Programs

Both the teachers felt that providing college and other professional courses over the equipment would be very beneficial to teachers like themselves. Since St. Lincoln is academically isolated, taking higher education courses involves a lot of expense and commuting, and is therefor very inconvenient, specially alongside a full days job.

Communicating with Educators

The teachers also felt that videoconferencing was a potentially powerful tool in helping them establish communication with other practitioners outside the immediate community. Ms. Frederick explained:

> It would help me with communicating with different people and in getting different ideas from people. I would like to speak with other primary educators to find out what methods they used with their classes. You know even though you think that you are doing the best there is always room for improvement.

Similarly Anita felt that it would be very beneficial for her to be able to talk to other adult educators around the country.

Overall, though both teachers expressed satisfaction with the videoconferencing classes and felt that their earlier expectations had largely been met, there was a degree of disappointment in the amount of use the equipment had been put to. They wished that more use had been made of the equipment and more classes had been offered over it. The adult education teacher summed up her feelings:

> I was amazed. I still am about the technology. I had never seen this before. I certainly was not let down. I was more impressed than anything about the new technology of being able to talk to someone over the monitor. I do think it could have been used a little bit more. Rather than just having the sessions with Dr. Bird they [the parents] could get to meet other people. They could possibly observe or sit in on a class, on an actual class that is going on in the university.

Commenting on whether the videoconferencing had met her expectations Ms. Frederick said

> Yes and No. I thought I would have got more chances to meet other Pre-K teachers and to view other classrooms. On the other hand I was amazed and I still am. In one sense it is like a segment of star wars, where you can click a button and you are talking to someone 60 miles away and actually can see them. I would have liked to see it being used more as far as bringing more material to the adults. Dr Bird did well, but other expertise could have come through . . . I just felt that there should be a little more to it. But for the first year it did well.

Cross-Site Comparisons

At both sites the teachers' felt that the videoconferencing classes had been successful, but there was a feeling that the equipment was not being used to its fullest potential. Teachers felt that they would like to see more

courses offered for the parents, both on life-skills as well as on more direct adult literacy skills. They also felt that it would be beneficial for them to be in contact with other educators in similar programs. Additionally, the teachers at St. Lincoln felt that videoconferencing could provide them, as teachers, with much needed resources and could help alleviate some of the problems of isolation.

This chapter presented the results of the study in detail. Description of the two sites, as well as answers to each of the research questions posed to guide data collection and analysis were presented in depth. More detailed discussion of some of the issues presented here as well as an analysis of the factors that influence the effectiveness of instructional videoconferencing are presented in the next chapter.

CHAPTER 5:
CONCLUSIONS AND DISCUSSION

The purpose of this study was to provide a detailed picture of the experience of using videoconferencing at two family literacy sites and to gather reflections from those using the technology. Focussing on two sites, which were strikingly dissimilar in some respects, helped in comparing, contrasting, and drawing conclusions about the complex interplay of users, content and technology. In this chapter some of the results of the study are discussed further and conclusions are presented. Some implications of the research for current theory and practice are also addressed. Finally recommendations for further research are discussed.

Conclusions

Findings of this study indicated fundamental differences in the existing family literacy program between the two sites. At the Nazaire Family Literacy Center there was noticeable apathy in the adult education classroom. The parents were unwilling participants in the GED preparation course and were mandated by government policy to attend the program. They were discontent with the existing program and voiced their dissatisfaction with teaching in the program. Additionally, at this site, the family component of the program was run by the teachers in the Even Start room and appeared disconnected from the literacy preparation component.

At St. Lincoln, the parents were voluntary participants in the program and for a variety of reasons wanted to finish their degree. They viewed the program as a fortunate opportunity to further their education. There was also a discernible connection between the school, community and the program at this site. The family literacy program was regarded as an asset to the school and community. The new technology was regarded with palpable excitement by the parents and the school community.

Results also indicated that there were cross-site differences in the affective responses of parents and in their interactions during the technology mediated classes. Analysis of the video-recordings of the classes indicated that the parents at St. Lincoln were more interactive and participative than their counterparts at Nazaire. Amount of interaction, participation, student initiation, and attention intensity were all higher at this site. Parents at St. Lincoln also showed a more positive affective response to the technology and the course content, specially in the early sessions. Further discussion of these findings are presented in the sections below.

Setting the Stage: Receptivity to Technological Implementation

One of the conclusions of this study is that the initial receptivity to a new technological implementation affects the way it is used. *Receptivity* is the capacity of people to receive, take in, hold and accept (Mellencamp, 1994). There was a difference in the receptivity to the videoconferencing

classes between the two sites. This difference in receptivity can be tied to some salient differences observed between the existing family literacy programs at Nazaire and St. Lincoln at the start of the videoconferencing sessions.

The parents' receptivity to the new classes was dependent on both personal and organizational or structural factors. Personal factors such as control over participation, motivation to acquire literacy and life skills, perceived usefulness of the classes, and willingness to participate were seen as key in establishing the receptivity to the classes. Organizational factors such as extended support and enthusiasm of community, satisfaction with current program, placement of the equipment and teacher attitude were also instrumental in influencing receptivity.

Though little research on adult students' receptivity to technological innovations specifically exists, research on teacher receptivity to change (e. g., Waugh & Punch, 1987 ; Mellencamp, 1992) has similarly found that acceptance or rejection of a new implementation by teachers depends on two types of factors, organizational (or structural) and personal. The findings of this study extend these results to the receptivity of adult learners to new technology-based instruction.

Figure 5.1 shows the factors that led to a positive receptivity at St. Lincoln.

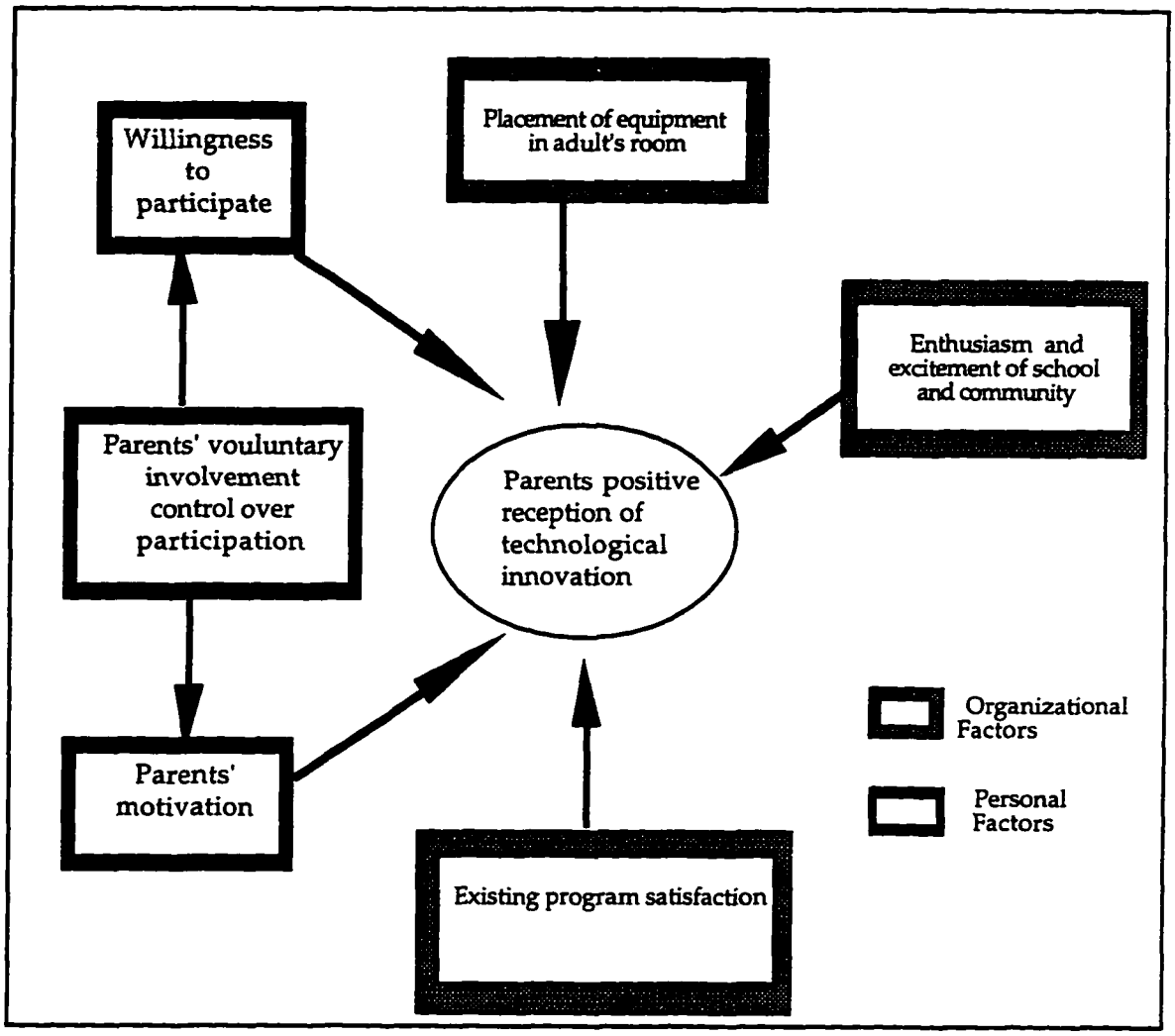

Figure 5.1. Factors contributing to positive receptivity to technological innovation.

Similarly, the factors that were responsible for a less enthusiastic reception of the parenting classes at Nazaire are shown in Figure 5.2 below.

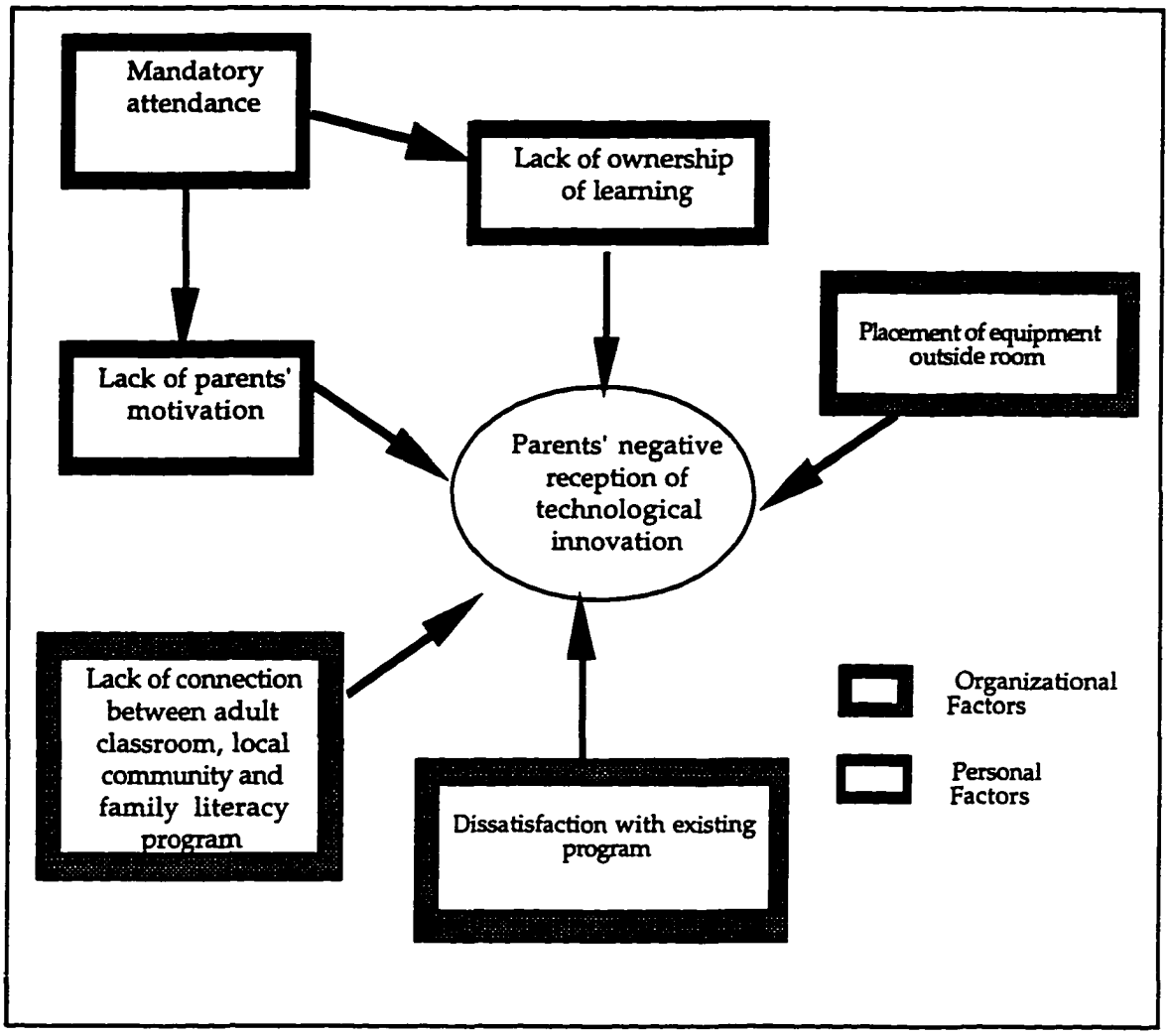

Figure 5.2. Factors contributing to negative receptivity to technological innovation.

Cross-Site Difference in Interactions

Some of the difference in interactions between the two sites during the videoconferencing classes can be explained by the differences in the receptivity to technology, as discussed above. Additionally, the overall higher interaction at St. Lincoln was also influenced by the fact that at this

site the number of parents was small. There were eight students in this program, but usually not more than three or four parents were present for class. This small number of students allowed for closer seating around the monitor which in turn allowed for better eye contact and sound transmission. More individual attention from the instructor and personalization of communication was also possible. At Nazaire the larger number of students present and the seating arrangement resulted in some students being far from the microphone. This made transmission of sound a problem and eye contact was impossible to maintain. This possibly discouraged participation even further. Additionally, the group size at Nazaire made it more difficult to for the instructor to give individual attention to each student.

Magnifying Differences

The results also indicate that having to interact through a technological medium magnified differences between instructor and students and created a psychological distance between the two, which influenced interactions. Moore calls this distance *transactional distance* and writes, "With separation there is a psychological and communications space to be crossed, a space of potential misunderstanding" (cited in Abbot Dallat & Robinson, 1995). Sociological differences like differences of gender, race, social standing and class between the instructor and the students were magnified, making interpersonal communication more difficult. Similarly

variations in student characteristics like openness, gregariousness, and extroversion were amplified making it more difficult for reticent and introverted students to establish communication.

Linking Qualitative and Quantitative Results

To triangulate findings, results of the affective responses of parents toward the videoconferencing classes were derived from qualitative analysis of interview data and quantitative analysis of data gathered through session evaluation questionnaires. The effectiveness of the parenting classes was also evaluated through qualitative analysis of interview data and quantitative analysis of the pre and post scores on the PSI. In this section the validity of findings are established through comparisons of the results obtained through both analyses.

Affective Responses of Parents

Affective responses of the students were evaluated by analysis of session evaluation questionnaires and the interview data. The results from both analyses support each other. Three examples illustrate this. First, qualitative analysis found that initially, parents at Nazaire felt negatively about the class content and were uncomfortable with the technology. By contrast, at St. Lincoln they started with a more positive response. This is supported by examination of the mean responses to the questions "I felt comfortable talking over the computer," "Video conferencing is appropriate to use for a discussion like this," "I would like to participate in more

videoconferencing sessions in the future,"as well as, all the questions regarding the content of the class.

Second, at Nazaire, throughout the sessions, the parents were more negative in their response to the above questions than the parents at St, Lincoln. In the qualitative analysis, too, it was seen that the parents at Nazaire were never very comfortable, interactive and participative in the sessions. Additionally, comparison between the parents at Nazaire and St. Lincoln on the response to the question "I would rather have had this discussion face-to-face with the presenter" showed that parents at St. Lincoln indicated a preference for videoconferencing. This is consistent with the qualitative finding that students at this site felt that having the classes through this medium helped them feel more comfortable and let them "talk better."

The graphs of the students' responses to the evaluation questionnaire show that over the classes, there was a change toward more positive responses from the parents at Nazaire. At St. Lincoln, by contrast, the mean responses generally showed less change; they started out and remained positive. Again, these results are supported by the findings from the interview data. The finding that at both sites parents felt that the sessions had been worthwhile and provided parents with useful information is also supported by both methods of analyses.

Effectiveness of Program.

Both qualitative and quantitative data also were collected to judge the effectiveness of the videoconferencing classes. Interviews showed that at the end of eight weeks of classes, parents and teachers both felt that the program had been successful. Both at Nazaire and St. Lincoln, teachers and parents believed that the classes had helped parents better understand and relate to their children and made them aware of alternative methods of discipline. Findings also showed that at St. Lincoln the videoconferencing classes led to a stronger bond being formed within the parent group.

The PSI questionnaire (Abidin, 1983) was given to parents before the start of the parenting classes and at the end of the eight videoconferencing classes with the intent of doing statistical analysis comparing pre and post scores. However, since the sample size at the two sites was small, and due to student attrition and sporadic attendance became even smaller, only descriptive analyses were done for this data. At Nazaire comparisons of these scores on pre and post measures indicate that there is little change over the period of the treatment. The small change that occurs shows slight increase in total stress scores (184.50 to 185.78) and in some subscale scores. At St. Lincoln there is a decrease in the total stress score over the pre-post period (206.22 to 183.75). These results do not indicate the effectiveness of the parenting classes. As these changes are not large and the sample size is small, the results from this questionnaire need to be interpreted judiciously.

The author also feels that a factor that may have been responsible for small changes in the PSI scores was the parents' attitude at the start. Though the PSI is an established instrument, the situational particulars of this study, such as the parent sample and the nature of the program setting, probably affected responses. The pretest was administered at the very start of the study. As the case study shows, initially the parents (at Nazaire) were not receptive to the program and were a little guarded and unforthcoming. The PSI questionnaire deals with sensitive personal and social issues and it can be expected that some reluctant parents were less than totally honest in their responses to the items. (Pre-test stress mean score for St. Lincoln were higher that Nazaire 206.22 vs. 184.50). Over the period of the classes the parents had eight weeks to establish a rapport with the researcher as well as the instructor and to see what this *new* program was all about, giving them a greater sense of trust and security. These feelings probably laid the ground for more honest responses in the post test. It is possible that this greater honesty resulted in higher stress scores in the post-treatment questionnaire, negating decreases in stress caused by the parenting classes. Little can be conclusively said on the basis of the PSI questionnaire and certainly no assertions about the effectiveness of the classes can be made on the basis of this data.

Implications for Theory

This research contributes toward building a theory of student receptivity to technology. Though considerable research exists on teacher receptivity to change and on teachers' perspective of technology innovation (Schrum, 1993; Mellencamp, 1992; Waugh & Punch, 1987) less is known about the effect of instructional change on learners, specially in adult basic education. The findings from this study contribute toward building such a theory.

A Framework for Interaction Analysis

This research also contributes toward theory of interaction analysis by developing a framework for interaction analysis (FIA). This framework was developed as a result of the inductive qualitative analysis of the data from the videoconferencing sessions. The FIA builds on earlier models of interaction analysis and helps toward the development and refinement of a structure for interaction analysis.

Researchers have developed various communication models to help interpret the influence of technology on instructional communication (Wagner, 1994). Wagner (1994) developed *The Interactive Information Transport Model* to conceptualize the mechanics of interactive telecommunications. Wagner's model distinguishes between interactions that are a property of learning events and delivery-system interactions or *interactivity*. Interactivity is a property of the technological medium and is

the level of interaction permitted by technology. Based on this research, Wagner's model is adapted in Figure 5.3 to help depict the effect of technology on instructional communication.

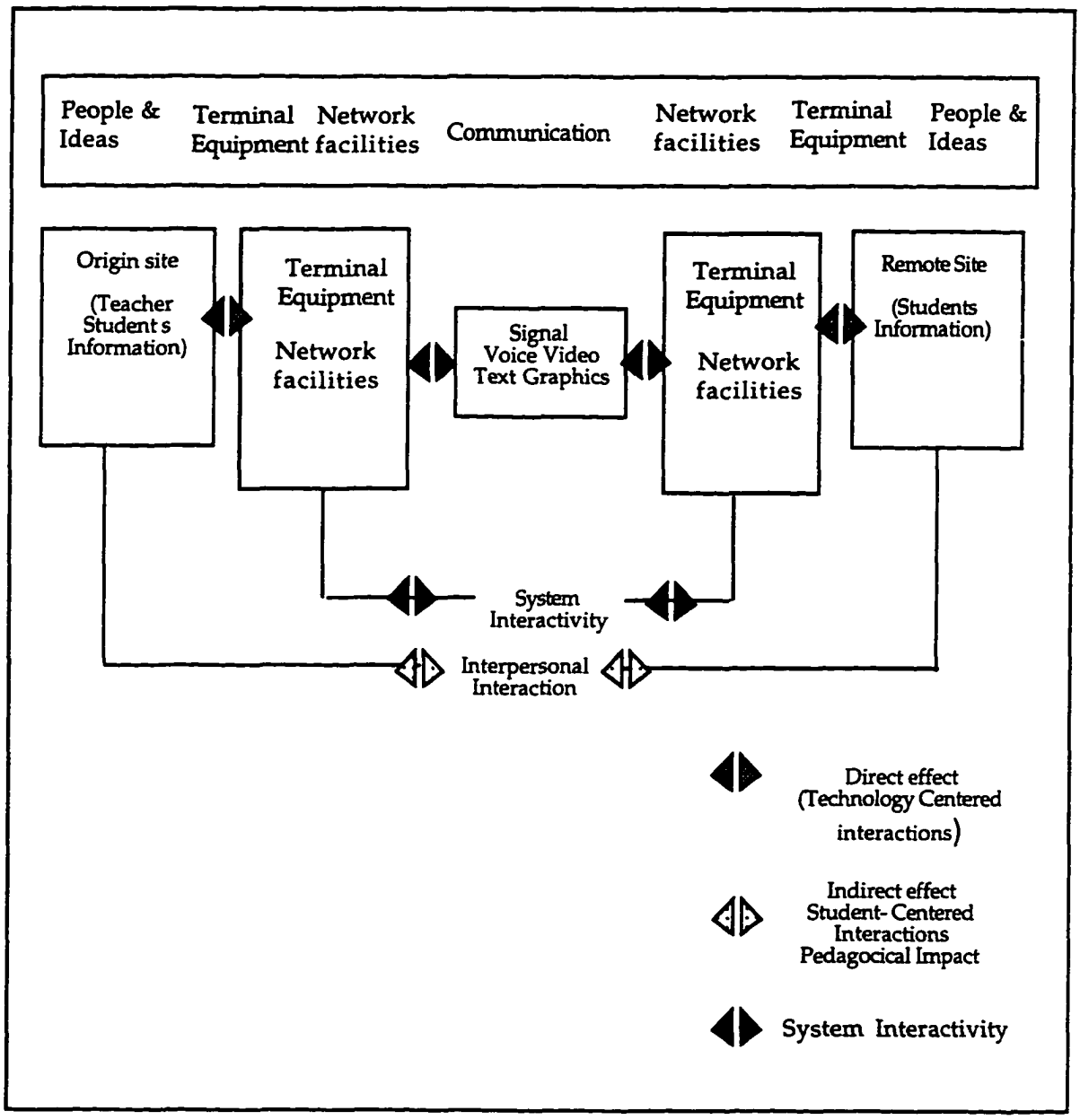

Figure 5.3. Interactive Communications Model (adapted from Wagner's (1994) Interactive information transport model.

This model has been adapted in two ways:

First, unlike Wagner's model which depicts interaction as unidirectional, interaction is depicted as reciprocal or bidirectional in the adapted model. *Interaction* is defined as the reciprocal action, effect, or influence of two (or more) objects (persons, materials, technology etc.) on each other.

Second, the author believes that the effect of technology on interactions can further be differentiated into interactions that are a direct result of having to deal with the mediating technology and the indirect effect of technology on interactions that are part of a learning event. The Interactive Communications Model in Figure 5.3 helps conceptualize interactions that take place in a technology mediated learning environment and illustrates the difference between direct and indirect effect of technology on interactions. The FIA, summarized in Figure 5.4, provides a means of examining these direct and indirect effects of technology on interactions further. In other words, the Interactive Communications Model is a model for viewing interactions that occur in a technology mediated environment: The FIA is a framework for analyzing these interactions.

The sections below describes the framework of interaction analysis in detail. A discussion of the development and significance of this framework is also provided. The FIA is summarized in figure 5.4

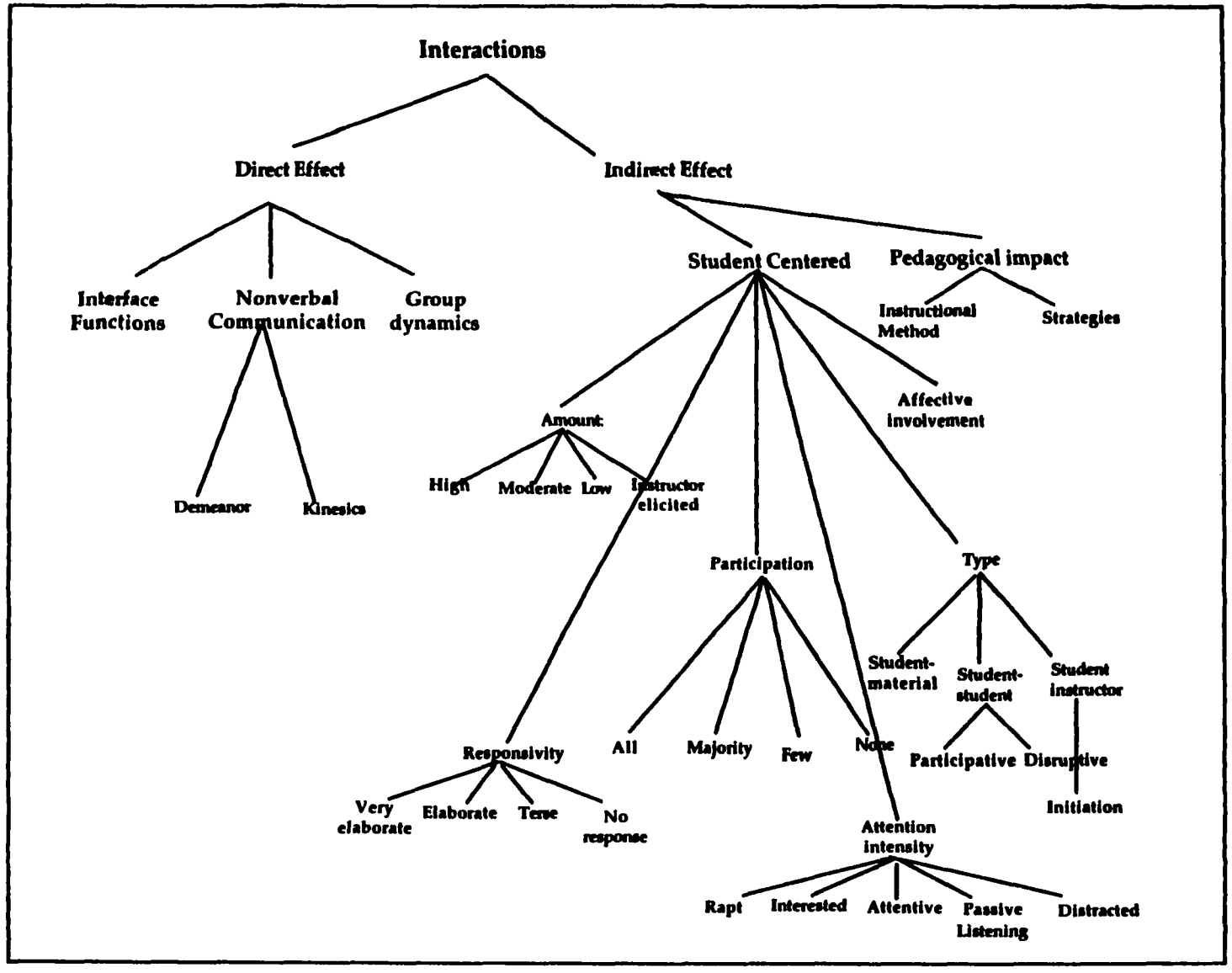

Figure 5.4. Framework for interaction analysis.

Direct and Indirect Effects of Technology

The author feels that it is appropriate to differentiate between direct and indirect effects of technology. Direct effects of technology deal with the learners' response to characteristics of the given technology. The direct effects of technology on interaction are similar to what Hillman, Willis & Gunawardena (1994) call learner-interface interaction, which they define as "the interaction that occurs when a learner must use these intervening technologies to communicate with the content, negotiate meaning, and validate knowledge with the instructor and other learners " (pg. 31).

When technology mediates communication between either (or all) student-instructor, student-content and student-student, its effect is felt on all these aspects of interaction.[1] In addition technology's effect is seen on instruction. Here the effect of technology is being felt *indirectly.* In this case the interactions under consideration are interactions with a third component *via* technology. The direct and indirect effects of technology are further discussed below.

Direct Effects of Technology:

Direct effects of technology can be analyzed by examining effect on group dynamics, effect on nonverbal communication and interface related interactions.

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[1] Moore (1989) identifies three components of interaction: Learner-content interaction, learner-instructor interaction and learner-learner interaction.

Effect on group dynamics.

One example of this, obtained from this study, is the propensity for one student to take on the role of the group leader. Findings showed examples of three types of group leadership behavior. These were *echoing* in which one student echoed the others reply, *replying for the group* in which one student took it upon herself to assume the role of the spokesperson, and *interpreting*, in which the student leader translated others' responses for the benefit of the instructor.

Effect on nonverbal communication.

A feature of videoconferencing is that it allows users to communicate through nonverbal means, in this case through body language. Findings of the study showed that*demeanor* or physical posture and *kinesics*:, the use of specific gestures, expressions etc. were used to communicate.

Interface functions.

These are technology related functions that a user must perform in order to use the intervening instructional technology. An example, from the findings of this study, was that bad sound often resulted in constantly having to repeat a statement. Other examples include seating readjustments and re-dialling because of technical interruptions.

Indirect Effects of Technology

Indirect effects of videoconferencing on student-centered interactions and pedagogy are discussed below.

Student centered interactions.

In this domain, technology's effect on six features of student interaction are examined. These features, amount, participation,type, responsivity, attention intensity, and affective engagement.

Amount is the qualitative analysis of the frequency of interaction. Results indicated that sub-categories include *low, moderate , high* or *instructor elicited* (through techniques such as compulsory turn taking, or calling on students). Participation determines whether *none, one,* few , *majority* or *all* students interact. Type of interaction as suggested by Moore (1989) can be between students, *student-student,* between student and the instructor, *student-instructor,,* or between student and instructional material, *student-material.* Student-student interaction is further differentiated into a) *disruptive,* (side conversations not pertaining to and detracting from on-going lesson) and, b) participative (discussions pertaining to lesson content). Student-instructor interaction can further be defined by initiator which refers to who initiation a question or comment.

Responsivity refers to the students' degree of elaboration of verbalization when asked a question, or while initiating the interaction. Results indicated that responses could be *very elaborate, elaborate, terse,* or *no response..* Attention intensity is the students' degree of involvement in the class proceedings. Sub-categories of attention intensity defined on basis of the research findings are *passive-listening, distracted , interested,*

attentive, and *rapt.* Finally, affective involvement refers to the students' emotional engagement in the class proceedings. Examples are *boredom, excitement, amusement, impatience,* and *empathy.*

Pedagogical impact.

This domain concerns the effect of the technology on the instruction itself. The instructional *method* and the *strategies* employed are two aspects of instruction that can be examined. Instructional method refers to the procedure of presentation (such as lecture or questioning) of the instructional content. Strategies refer to teaching and communication techniques employed by the instructor.

Whereas the use of a particular instructional method or technique is instructor determined and depends on other variables such as instructors teaching style, content of course, audience, etc. , these choices are influenced by the mediating technology, and this framework provides a useful tool in isolating these issues in order to help determine effectiveness.

Development of the FIA

This framework developed from an attempt to answer the question "What interactions take place as parents use the technology?" Video recordings of the videoconferencing classes provided direct, concrete evidence of exactly what transpired during the classes. What was required was a) a model conceptualizing interaction in telecommunications mediated communications and b) a framework to operationalize and

analyze interaction. This research integrated and expanded earlier research in both these areas to provide a detailed framework for analyzing videoconferencing instruction.

A preexisting model for interaction analysis was not used in this research. Rather as this research was designed to be inductive and iterative: the FIA is an outcome of this study. This research is an example of moving from an inductive process to a deductive one. In Phase I of analysis of the video conferencing sessions, the FIA was inductively developed. In Phase II of the analysis, this framework was applied.

Aspects of interaction identified by Moore (1989) (learner-content interaction, learner-instructor interaction and learner-learner interaction) and Hillman, Willis & Gunawardena (1994) (learner-interface interaction) and the model proposed by Main & Riise provided a useful starting point for building this framework. The first step in developing this framework was to develop a set of data codes based on reviews of earlier research on interaction analysis. In Phase I of the analysis, portions of video-recorded classes were then viewed, with the purpose of testing the appropriateness of these codes as well as noting emerging codes and categories. A revised framework for analysis was developed on the basis of this phase of analysis. Finally, in Phase II, further segments of the video-recording were scored on the basis of this new framework, in order to analyze interactions during the videoconferencing classes.

Contributions to Interaction Analysis Theory

This framework expands upon components of interaction delimited by other researchers. One shortcoming of existing research is that no integrated framework for the analysis of videoconferencing exists. Moreover, the amount of interaction is usually measured quantitatively in terms of frequency or length of dialog; the author believed that this was not appropriate for a qualitative study. Additionally, no specific criteria for determining quality of interactions has been established.

This research provides an integrated structure for interaction analysis. As detailed above, Wagner's model for conceptualization of interactive telecommunications is expanded to include the reciprocal or bidirectional nature of interaction and to differentiate between indirect and direct effects of technology on interaction. The FIA provides a way to qualitatively analyze interactions that occur in a technology mediated environment. This framework encompasses analysis of the direct and indirect impact of technology. This research also documents the process of building an inductive framework for interaction analysis.

Implications For Practice

Results of this research show that videoconferencing was a successful means of reaching adults at the two family literacy sites. Findings indicate that at both sites parents and teachers believed that the parenting classes had provided useful information. Additionally, parents who initially had

negative responses to the classes, in a relatively short span of eight classes, indicated a change toward more positive responses. This finding is important given the large number of undereducated adults in this country. Results indicate that videoconferencing is an effective way for adult basic education programs to reach these adults.

The research also demonstrated that some instructional methods and teaching techniques work well in the videoconferencing environment and help students feel at ease with the technology as well as elicit better interaction. These findings indicate that one way of tackling the problem of lack of resources in adult literacy and other programs would be to have a few experts skilled in videoconferencing instruction share their expertise with a widely dispersed audience, through videoconferencing.

Though this research has focused on the learning and instructional effectiveness of desktop videoconferencing, this technology is also a cost effective way of reaching these parents. A detailed cost-benefit analysis is not within the scope of this study, but findings from this study indicate that this technology is financially viable. Desk-top videoconferencing systems of the type used in this study consist of adding a peripheral card, a video camera, a microphone, a speaker and software to a personal computer. These systems are inexpensive compared to the room-based video systems (which involve $20,000-plus costs) and usually range from $3000 to $5000 per set up. Other than the equipment costs, the primary expense involved are

the use of the communication lines and costs of the instructor's time. With the rapid development of communication networks, transmission media such as ISDN are becoming more and more affordable, especially for educational use. Legislation like The Telecommunications Act of 1996, by which telecommunications service providers are required to provide telecommunication and information services to public or nonprofit schools at discounted rates make these technologies even more accessible to educators. This equipment also requires no specialized technical staff to operate. At present ISDN systems are limited by the fact that they require expert installation and ISDN lines have still not been laid in many parts of the country. Other costs of the program was the instructors remuneration.

Against these costs, the benefits of this program were many. Videoconferencing allowed a university-based expert on parenting to share his expertise with parents at sites which due to their rural setting did not have ready access to such resources. Research in adult basic education has demonstrated the link between teen-pregnancy and undereducation and the need that adult learners have for parenting skills. The teachers at the two family literacy sites expressed the need for this class. Alternatives to using videoconferencing for providing this class would be to arrange face-to-face instruction at the sites, to have parents travel to facilities that could provide similar instruction, or to use some other form of technology such as videotapes or internet to reach these parents.

If these resources were to be provided in person, it would have involved travel time and travel expenses (milage, hotel, meals etc.) as well as costs in terms of fatigue. The round-trip time between the university site and St. Lincoln is three hours (excluding instruction time) and a trip to Nazaire would have involved an overnight stay by the instructor. Videoconferencing allowed the instructor to teach the class at two locations without having to leave the university site. Additionally, videoconferencing allowed this instruction to be delivered directly to the parents in the existing family literacy programs, circumventing problems associated with them having to go elsewhere to receive this instruction. Logistical problems of travel expenses, time organization, as well as arranging for day care for the children while parents took time to attend class were avoided. Videoconferencing also allowed real-time interaction. Given the low levels of motivation and receptivity of the students, this interaction with the instructor allowed course-content to be tailored to the parents interests and needs and helped maintain interaction and elicit greater participation. Additionally, unlike technologies like e-mail, videoconferencing is very user friendly and easy to operate and does not need users to be computer literate.

The ethnographic case studies presented provided a detailed description and analysis of the use of videoconferencing in order to explore the use of a new telecommunications technology at two sites. It is hoped

that this description and analysis, along with the reflections of teachers and students involved, provide a guide for effective use of this media and future attempts at such telecommunication use. In particular, implementors of distance learning programs need to consider the technological and organizational factors that influence the effectiveness of videoconferencing instruction during the planning and implementation of such programs. These are discussed in the section below and summarized in Table 5.5.

Factors Influencing Effectiveness of Videoconferencing Instruction

Focussing on two sites, which were strikingly dissimilar in some respects, helped in comparing, contrasting, and drawing conclusions regarding factors that affect videoconferencing instruction. These factors can be divided into technological factors, contextual factors and organizational factors. Differences of gender, race, age, social standing and education levels between the students and the instructor also influence establishing an interpersonal relationship at a distance and hence the effectiveness of videoconferencing instruction. The interpersonal communication skills of the instructor are also important in non face-to-face teaching. However, detail analysis of these factors is outside the realm of this study.

Technological Factors

Technological factors deal with mechanical aspects of technology. The quality of transmission, users' proficiency, and the physical setup at the remote site are technological factors that influence videoconferencing

instruction. The transmission quality affects the clarity of sound and picture, which understandably effects on the flow of the lesson. Lighting, weather conditions, and sophistication of the equipment are key factors effecting the quality of the transmission. Results showed that during sessions where the ISDN transmission was bad, the functioning of the class was negatively affected. In these sessions, audio disruption, sound lag, and having to hang up and redial not only disrupted the flow of the instruction, but also at times led to the building of frustration among users.

Users' proficiency, familiarity and degree of comfort with the technology also affects the classes. Results showed that over the period of the study, the disruptions caused by lack of hearing and mis-communication decreased as users learned what communication techniques worked well and what did not. Moreover, once the initial camera-shyness and awkwardness were overcome, the parents were more relaxed and used more forms of nonverbal communication. This is in keeping with Adams & Hamm's (1988) finding that technology affects the modes of interaction of its users, especially when it is unfamiliar to them. Burge & Howard (1990) also found that students reported that increased familiarity, from continued use, allowed them to feel comfortable with technology .

The number of students and the seating arrangement at a site are instrumental in determining the quality of the interactions. With the type of equipment used in this study the optimal number of students at a site was

between two and six. Results indicated that a larger number of students presented three main problems. It resulted in uncomfortable crowding. Students at Nazaire often complained of feeling cramped up of "having to crowd up together so that you can be seen on the screen." It also made it difficult to establish eye contact between students and instructor. Additionally, it resulted in bad audibility. Students sitting in the rear rows often could not be heard by the instructor over the sound activated microphone, which was placed next to the computer monitor.

Contextual Factors

This research emphasizes that the context of technology use is instrumental in determining its effectiveness. As discussed in detail earlier, factors such as the indigenous characteristics of the two sites, control over participation, student motivation, etc., affected student receptivity. Student receptivity in turn affected the way the technology was used at each of the two sites.

Organizational Factors

These factors concern the way videoconferencing instruction is designed and implemented. Results indicate that frequency of exposure, course content, availability of a pre class face-to-face meeting affect videoconferencing instruction.

The fact that videoconferencing was a new experience for all the parents had an affect on the overall effectiveness of the classes. This is

supported by the fact that at Nazaire parents became more receptive to the classes over a period of time. Results of the session evaluation questionnaires from Nazaire indicate that parents themselves reported that they viewed both the technology and the class content more favorably over time. The parent advisor at Nazaire also remarked

> I think that if we have meetings with them over the computer, we should do it on a regular basis. Meet with them at least once a week for 10 to 15 minutes, to keep them in touch with it. Because if they go two or three weeks or months without talking to anybody ...they... are not that comfortable with it... [And] shy away from it.

This study also revealed that content of the course is an important variable influencing parents affective response to the classes. The personal and sensitive nature of this course, led the parents to begin the course on a note of guardedness and apprehension. The teachers, instructor and some of the parents voiced this sentiment.

Conclusions about the importance of a pre-class face-to-face meeting are ambiguous. Whereas the instructor and teachers at one site and felt that it would have been beneficial to have a face-to-face meeting between the parents and the instructor, prior to the start of the videoconferencing classes, at the other site, this was not expressed. A teacher at Nazaire believed that such a meeting was important because

> then they feel that they know the person, because, if they just meet them over the computer, then that is just like seeing them on TV... you are not real to them. Not only is it not real, it is like this person has taken the time to physically come here, introduce themselves, and we know that he can't do it every week but at least, he made that

one first effort. And now that he has made the effort, it is our turn to make ours.

At the second site parents and teachers both felt that the distance provided by videoconferencing contributed to the success of the class, given the nature of the course. Other researchers like Hillman, Willis & Gunawardena (1994) and Abbot Dallat & Robinson (1995) advocate the use of an introductory, informal session, the purpose of which is largely for users to familiarize themselves with both the technology and the instructor in a non-threatening environment. A summary of the factors that were found to influence videoconferencing instruction is presented in Table 5.5.

Table 5.5

Factors that Influence Videoconferencing Effectiveness

Technological	Quality of transmission	Lighting Weather Equipment quality
	Users proficiency	
	Physical setup	Number of students Seating arrangement Location of equipment
Contextual	Receptivity	Student control over participation Student satisfaction with existing context Characteristics of context
Organizational	Frequency of exposure	
	Course Content	
	Preclass face-to-face meeting	

This research also demonstrated that some instructional methods and teaching techniques work well in the videoconferencing environment and help students feel at ease with the technology as well as elicit better interaction. Some techniques that work well in retaining the attention of the students and drawing the reluctant participant into ongoing interactions are (a) *repeating & summarizing* important issues in order to emphasize them, (b)*turn passing* in which the instructor asks a student to choose who should speak next, (c) use of *humor*, (d) *personalization* or linking the lesson content with students' background experience and asking for individual's personal experience or opinion, and (e) *naming* or directing a remark or question to an individual by use of name.

Some methods that do not seem to work well in mediated communication. Results showed that when questions were directed at the students in general, either no one took it upon themselves to answer or the same students took on this responsibility, effectively monopolizing the interactions. Assigned group work was also not successful. With no facilitator at the remote site it was difficult to keep students on task. Maintaining discussion was also difficult. Unless questioning or other techniques were used to elicit student response, discussions are difficult to start and maintain. Comeaux (1995) in her research on interactive videoconferencing came to similar conclusions.

Suggestions for Future Research

Since this study was exploratory in nature, a number of themes that emerged from it suggest questions that need to be examined further. Further research is suggested in three broad areas: the use of instructional videoconferencing in general: use of videoconferencing for adult basic education: and research in interaction analysis.

Further research is required to verify the findings on factors that affect students' receptivity to technological innovations. Additionally, researchers need to determine how instruction should be designed to be sensitive to students' receptivity. Research examining factors that influence videoconferencing is also suggested. Research under more controlled experimental settings is necessary to further understand the effect of technological and organizational factors on videoconferencing instruction.

Findings from this study also suggest that psychological, sociological and demographic characteristics of students and instructors, and the compatibility between these, may influence interpersonal relationship at a distance. More research is required to verify this. Questions that need answers include, "How do ethnic and gender differences between student and instructor affect interpersonal relationship at a distance? Are these factors that need to be considered while designing videoconferencing instruction?"

Studies to determine effective environment for using video-conferencing with undereducated adults are suggested. Alternative environments include community centers, churches and schools. We need to determine what resources these adults need and how videoconferencing can best provide these. Other questions that need answering include, "How can interaction be encouraged?" and "How do different instructional methods and techniques facilitate interaction?" Future research using the Framework for Analysis developed in diverse settings are also suggested.

Summary

This study provided a detailed description and analysis of the process of using desk-top videoconferencing at two family literacy sites. It explored and described how telecommunications was used at the sites, gathered reflections from those involved, and described the interactions that took place during videoconferencing, in order to guide future attempts at such use. In this study a framework for interaction analysis was developed to help better understand the interactions that occur in a technology mediated environments.

An attempt was made to describe each case in detail, providing contextual, and situational particulars that would enable readers to make further comparisons. In this study, my aim was to maintain focus not on technology *per se*, but on its use with real people, in real situations, in the meeting of real needs, and in solving of real problems.

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APPENDIX A:

Telecommunications in Distance Education

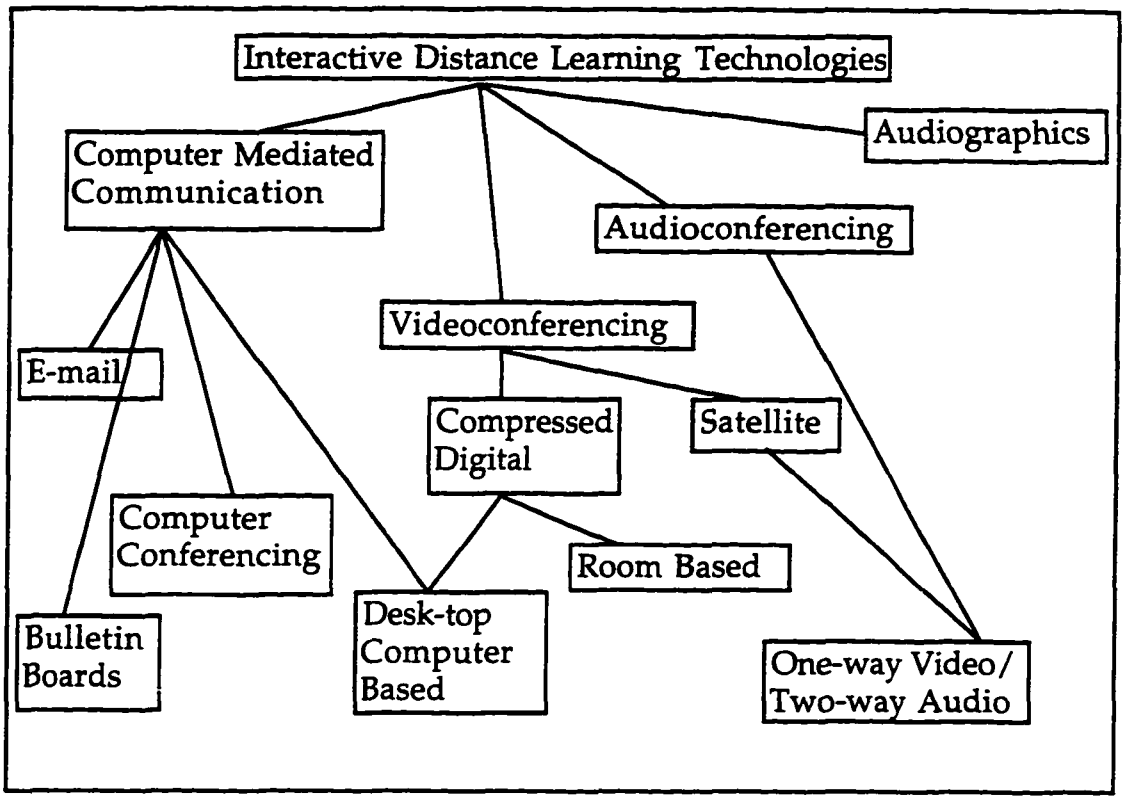

Figure A.1: Interactive technologies available today for distance education.

Glossary for Figure A.1

Analog: Continuous wave-form representation of data that varies by time and intensity (such as light and sound).

Audio-conferencing: Simple phone lines connect three or more people at two or more sites.

Audiographic: Combines voice transmission with transmission of pictorial or electronic data through telephone lines.

Bulletin boards: Electronic sites where text, graphics, public domain software etc. can be posted for general access.

Computer conferencing: Allows the sharing of text and graphic messages between computers using phone lines, modems and telecommunication software programs. Usually refers to communication between specified groups.

Computer mediated communication: A generic term that covers all communication via an electronic screen.

Digital: Representation of data in binary form. Information is coded in discrete steps of one or zero.

E-mail: Electronic transmission, distribution and delivery of text and graphics via-computers over local and global networks.

Integrated Services Digital Network (ISDN)): Digital phone line, circuit switched.A standard ISDN connection can provide 128 kilobytes per sec of bandwidth.

APPENDIX B
Focus Group Questions

Parent Focus Group Questions

The focus of the questions is to help determine the affective response of parents towards a) the classes and b) the mediating technology.

Question 1. For the last 9 weeks you have been using this equipment to have class. Now that you have used it for a while, can you tell me what your feelings about using it are?
{ Expand to ask specific likes and dislikes}

Question 2. What were some of the things that you thought made it hard to have class in this manner? And what is particularly nice about it?

Question 3. How did you feel when you were talking to the instructor over the computer? Do you think you got a chance to talk over the computer as much as you would have liked to?

Question 4. Did you find that these classes were interesting and that you learned some things useful to you? If I ask you to tell me one thing that you learned about that was most useful for you, what would that be?

Question 5. Overall, how did you like the way the instructor presented the classes? How do you think that the instructor could have made the classes better?

Question 6. Do you think that it is a good idea to offer more classes through the computer? How do you feel about taking part in another class over the computer in the future?

Question 7. How do you think that this is different from meeting a person face-to-face?

Question 8. Now that we can get somebody to sit here, so many miles away and talk to you, or teach a class, is their any particular class you would like to take?

Question 9: Any other questions, suggestions or comments?

Post Questionnaire For Teachers

1. How do you think that the presence and use of the video equipment has had an impact on the program? Or do you think that it has had any impact on the program?
Do you think that there has been any impact on the children and the parents?

2. In your view, what has been the students reaction to using this technology?

3. What was their reaction to the classes? Did they talk about it at all.

4. Now that you have a better idea what this technology can do, what in your opinion is the future role of such technology in a classroom such as yours?

5. What are some of the ways you expect video-conferencing to help you as teachers?

6. I will ask you to look back to the beginning , when the technology was first introduced. What were some of the expectations at the beginning, and now.

APPENDIX C

Video Scoring sheet

Session No Tape no: Coder G M

No of Students present Time segment

Technology-user interface: Interaction/communication:

Code	Sub-code/Comment	Code	Sub code/Comment
Having to repeat:		Amount	Low Moderate High
Leader	Replies for Echoes Interprets	Participation	None Few Majority All Instructor forced
Nonverbal Com.	Gestures Expressions	Type	L-L Participative Disruptive L-I
Mechanics		Student Initiation	Yes No
		Responsivity	Very elaborate elaborate terse No resp
		Attention intensity	Distracted Passive Listening Interested Rapt
		Emotional response	

Instruction

Instructional Format	Lecture Discussion Questioning Group work
Techniques	

APPENDIX D

Consent form

January 21. 1996

Dear Parent,

As you may already be aware the XXXXX Family Literacy Center will soon be making use of computer video-conferencing in order to provide new and exciting opportunities to you and the teachers in your program. In order to see the effectiveness of this new method, we would like your help in a study being conducted on the benifits of video-conferencing. We would like you to complete two questionnaires over the next few months and to allow the researcher Geetanjali Soni from Louisiana State University, who will be working under the direction of Dr. James Garvin, access to your files.

There are no risks associated with participating in the study. The information provided by you will be seen only by the researcher, and complete confidentiality will be maintained by not using any names in the final report. If you for some reason do not want to participate, please indicate so below and we will honor your request. We are looking forward to working closely with you in the days ahead.

Respectfully,

Geetanjali Soni James Garvin

I _____ AGREE to participate in the above mentioned research.
Your name

Signature _____ Date _____

I _____ DO NOT AGREE to participate in the above mentioned research.
Your name

Signature _____ Date _____

APPENDIX E

Interaction Summary Matrices

Nazaire Videoconferencing Classes Interaction Analysis

Nazaire: Technology-Centered Interactions Summary Matrix

Code	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
Mechanics	Time arranging for camera Repeating	Time arranging for camera	None	None	None	None
	Repeat	Repeat	Repeat	Repeat as those at back cannot hear	None	None
Leader	Replies for (R) Echoes (E)	Replies for Echoes	None	Replies for	None	Replies for
		Replies for Echoes	Replies for	Replies for E Inst asks Interprets	None	None
Demeanor	Stiff	Stiff 2 Relaxed	Relaxed	Relaxed	Relaxed	None
		Stiff	Relaxed	Relaxed	Relaxed	Relaxed
Kinesics	Gestures (G) Emotions (E) smiles	E:smiles, looking away	G:Nodding arm waving	G:Nodding E:smiles, looking away	G:Nodding arm waving	G:Nodding
		G:Nodding E: bored looks	G:	None	G:Nodding arm waving	None

(appendix E con'd.)

Nazaire: Student-Centered Interactions Summary Matrix

	Session 1	Session 2	Session3	Session 4	Session 5	Session 6
Amount	Moderate	Moderat e,Moderate-High one	High	Low-Moderate	Moderate - High	Low
	Moderate	Low , Moderate-h one	High	Low-Moderate	Moderate	Low -Moderate
Participation	Inst. elicited	majority	all	One Crystal	All Inst elicited	One
	Inst elicited	Few	All Inst elicited	One Inst elicited few		Inst elicited
Type	L-I, L-M	L-I, L-L P	L-I, L-L P	L-L P, L-I	L-I, L-L P	L-I
	L-I	L-L P L-I	L-I, L-L P	L-I		L-L D
Student initiation	Once a impatient"lets get started'	3 students Crystal, nk, caro	Yes lots	Crystal	Crystal	None
	-	Crystal	yes	None		None
Responsivity	Terse	Elab-some terse-some no resp-some	Very elab	Crystal elab	Elab some	No resp/terse
	One elab Terse rest	terse	elab	terse		Elab Crystal terse
Attention	One rapt distracted	Interested most	Interested/rapt	Passive listening Crystal interested	interested	Passive listening
	Passive listening	Passive listening distracted	interested	Passive listening		Interested/ passive listening
Emotional	Impatient	Id, boredom-a few	Empathy identification	Id, amusement	Id, empathy, amusement	Id, empathy, amusement Crystal
	identification	boredom	Amusement,id	None		None

(appendix E con'd.)

Nazaire: Instructional Impact Summary Matrix

Code	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
Format	Questioning Round Robin	Lecture, questioning, grp work -disaster	Discussion questioning	Lecture, questioning	Lecture, questioning	Lecture
	Questioning	lecture	Lecture, discussion, qn,Round Robin	Lecture, questioning		Lecture, qn
Technique	Repeating, Humor,Icebreaker	Summary, humor,naming, personalization	humor,naming, personalization	Humor,summ, personalization		Naming
	Repeating, humor,naming, personalization	Personalization (inst's experiences)	Turn pass, humor, naming, ice breaker	Naming, personalization	Turn pass, humor, naming, personalization	Turn pass, personalization

(appendix E con'd.)

St. Lincoln Videoconferencing Classes Interaction Analysis

St. Lincoln: Technology-Centered Interactions Summary Sheet

	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
Mechanical functions	Repeats Bad Lighting	Repeats "Can You Still See Me?'	None	None	None	None	None	None
	Repeats Bad Lighting Time lost-Sound Confusion about who Is who	None	Repeats Sound Cutting Off	None	None	None	None	None
Leader	No	No	No	No	No	No	No	No
	No	No	No	No	No	No	No	No
Demeanor	Stiff	Relaxed	Relaxed	Relaxed	Relaxed	Relaxed	Relaxed	Relaxed
	Stiff	Relaxed	Relaxed	Relaxed	Relaxed	Relaxed	Relaxed	Relaxed
Kinesics	Lost Bad Light,Smiles	Nodding	Fidgety, Nervousness, Nodding	Expressions	Expressions, Nodding	Gestures, Expressions	None	Expres-sions Nodding
	Lost Bad Light,Smiles	Expressions, Laugh, Smile Nodding	Gestures, Hand-Raising	Expressions	Nodding	Gestures, Expressions		

(appendix E con'd.)

St. Lincoln:Student-Centered Interactions Summary Matrix

Code	Session 1	Session 2	Session3	Session 4	Session 5	Session 6	Session 7	Session 8
Amount	High	High	Moderate	High	Moderate High One	High	Moderate	High
	Mod.	High	High	Mod.-High	High	Mod.-Low Listening)		
Participa-tion	Majority	All- Inst. elicited	All	All	Both	Majority	All	All Inst. elicited
	All- Inst. elicited	All -Inst elicited	All, Inst. elicited	All Inst. elicited	Both	All		
Type	L-I	L-I L-L P	L-I L-M L-L P	L-I	L-I	L-I	L-I	L-I
	L-I	L-I,L-M	L-I	L-I	L-I	L-I		
Student Initiation	No	Yes	Yes Chooses Discussion Topic	Yes	Yes	Yes	No	Yes
	No	No	Yes	No	No	Yes	Yes	No
Responsiv ity	1 Very Elab. Elaborate	Elaborate	Elaborate	Elaborate	Elaborate	Elaborate	Elaborate Listening	Elaborate
	Elaborate	Elaborate	Elaborate	Elaborate	Elaborate	Elaborate		Elaborate
Attention	Interested	Rapt/Interested	1 Distracted Rest Interested	Interested	Rapt	Interested	Listening	Interested
	Interested	Interested	Interested	Interested	Rapt	Interested	Interested	Interested
Emotional	Humor Happiness	Identification(ID) Amusement, Happiness	Identification	Amusement Happiness	Identifica-tion Engross	Identifica-tion Excitement	-	-
	Interest	Amusement identification Embarrass	Amusement, Identification Happiness	Humor, Embarrass	Identifica-tion Anxiety, Amusement	-		

(appendix E con'd.)

St. Lincoln:Instructional Impact Summary Matrix

Format	Discussion, Qn	Lecture, Discussion, Qn, Groupwork	Lecture, Qn	Discussion, Qn,	Lecture, Qn	Lecture, Discussion, Qn	Lecture, Qn	Lecture, Qn
	Qn	Lecture, Discussion, Qn,Round Robin	Lecture, Discussion, Qn,	Lecture, Qn	Lecture, Qn	Lecture, Qn		
Tech-nique	Naming, Praise Uses Self As Eg	Summarizing Uses Self As Eg	Naming, Personaliza-tion	Humor, Icebreaker,	Naming, Uses Self As Eg	Naming	Icebreaker	Naming, Persona lization,Turn Pass, Summary
	Repeating Naming	Turn pass, Naming Personaliza-tion	Naming, Personaliza-tion Humor	Naming, Personal-ization	Naming, Summary Uses Self As Eg	Naming , Personal-ization, Turn Pass	Naming, Personal-ization	Naming , Personalization, Turn Pass

VITA

Geetanjali Soni was born in Calcutta, India on January 27, 1965. She received a bachelor of science degree in economics from St. Xavier's College, Calcutta University in 1986. She then worked as a coordinator for New Wave Educational Resources (Calcutta) for four years. Geetanjali received a university academic scholarship to begin her graduate studies at Tulane University, New Orleans in the fall of 1990. She was awarded a master's degree in education in May 1992. While at Tulane University, she was a teaching assistant in the Department of Education. She entered the doctoral program at Louisiana State University in the fall of 1992, specializing in educational research and technology. While at Louisiana State University, she was a graduate assistant till May 1996. In September 1996, Geetanjali joined the Louisiana State Department of Education in Baton Rouge.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Geetanjali Soni

Major Field: Educational Research

Title of Dissertation: Using Desk-Top Videoconferencing as a Distance Learning Tool for Program Development and Support: An Ethnographic Case Study of Two Family Literacy Sites

Approved:

Susan Kim MacGregor
Major Professor and Chairman

John M. Larkin
Dean of the Graduate School

EXAMINING COMMITTEE:

Charles Tuddle

Abbas Tashakkori

Robert Matthews

Sue Kane

Date of Examination:

Oct. 30, 1996