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ELEMENTARY SCHOOL USE OF  
INTERACTIVE DISTANCE LEARNING

by  
Linda Spano

A Thesis

Submitted in partial fulfillment of the requirements of the  
Master of Library Science Degree  
of  
The Graduate School  
at  
Rowan University  
May 9, 2000

Approved by:

Professor

Date Approved: June 14, 2000

## ABSTRACT

Linda Spano. Elementary School Use of Interactive Distance Learning. 2000.  
(Under the direction of Dr. Holly G. Willett, Program in School and Public  
Librarianship).

In an attempt to discover how distance learning (interactive videoconferencing) is being used in elementary schools, this study was designed to identify the enrichment and remedial applications of distance learning and assess its effectiveness as an instructional tool. Information was gathered using a questionnaire that consisted of 24 multiple choice and open-ended questions that was sent to 100 interactive distance learning coordinators in New Jersey, Massachusetts and Pennsylvania. Forty-seven coordinators responded to this survey, for a response rate of 47%. The majority (95.7%) of respondents rated interactive distance learning as a very effective or effective instructional tool. The most frequent enrichment applications for distance learning technology were virtual field trips, advanced level courses and sharing of projects among students in different schools. Remedial applications of distance learning technology included remedial instruction for math and homebound instruction. Distance learning coordinators reported that introducing students to new experiences, supplementing the school's curriculum, providing instruction in classes not offered, and student or staff training in technology were the most valuable aspects of distance learning.

## MINI-ABSTRACT

Linda Spano. Elementary School Use of Interactive Distance Learning. 2000.  
(Under the direction of Dr. Holly G. Willett, Program in School and Public  
Librarianship).

This study surveyed interactive videoconferencing distance learning coordinators in New Jersey and Pennsylvania to discover how interactive distance learning technology is used in elementary schools for enrichment and remediation and to assess their opinions of its effectiveness as an instructional tool.

## ACKNOWLEDGMENTS

This research project could not have been accomplished without the support of my family who endured my agonies of indecision and ignored my inattention to details, my thesis advisor, Dr. Holly Willett, whose guidance and affirmation were always just an e-mail away, and, most of all, to my thesis class colleagues whose humor, intelligence, professionalism and unwavering encouragement made this endeavor a milestone of my education.

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## **Chapter 1 - Discussion of the Problem**

### **Introduction**

Many proponents see interactive distance learning (IDL) as “classrooms without walls...class size without limits...teaching that transcends space and time...” (Minoli, 1996), while others believe that IDL is the answer to many of the problems that face education today, such as educational inequality, shortages of qualified math and science teachers and the isolation of the classroom from other learning environments (Harry, 1993). This study pinpointed the role of IDL in elementary schools, pointed out the benefits of IDL and the possible obstacles to its growth, and suggested possibilities for establishing networks or refining existing networks.

### **Statement of the Problem**

Presently, schools are competing for the interest of learners with electronic forms of recreation such as television, computers and video games. To meet the needs of students, education has to become less lecture-oriented and more learner-oriented. Technology provides students with ways to make learning meaningful, and the implementation of distance learning has the potential to motivate them to engage in a wide range of learning activities. School boards are recognizing the benefits of technology and some have made funds available for distance learning centers where students can videoconference with other students, teachers or experts in their fields of interest.

While it is difficult to predict the future of technology, it is even more difficult to predict future uses of technology in education. Research on the future uses of technology should begin with an exploration of its current uses, with an emphasis on innovative programs. Researchers can then develop frameworks for the implementation of innovative



programs and examine possible barriers that might lead to difficulties or failure. Educators can then use this research to make decisions about how technology fits into their curriculum.

Educational media specialists (EMS) have seen their roles as information specialists and consultants become more and more intertwined with technology. Online catalogs and encyclopedias, Internet research on computers in the media center, and networking with worldwide databases have completely integrated technology into the school's library program. Small schools, lacking the funds to support technology coordinators or computer technicians, have assigned technology and computer functions to the media specialist. Therefore, interactive distance learning activities more and more are part of the expanding job responsibilities of many educational media specialists and fall within their bailiwick.

Partners in Distance Learning (PDL), a consortium of over 200 schools in New Jersey, Massachusetts and Pennsylvania, obtained grant funds from the federal government in 1996 for the purpose of purchasing distance learning equipment for schools at a considerable discount. This program was designed to improve educational opportunities for students through the use of interactive distance learning. While large sums of money have been spent on the acquisition of distance learning equipment and many hours of educators' time allocated to the promotion of its use as an educational tool, no formal evaluation of its use has been undertaken. Given that no formal evaluation has been conducted, this research investigated the frequency and types of instruction presently being delivered through interactive distance learning.

### **Purpose of the Study**

The objective of this study was to answer the following question: "How do elementary schools use interactive distance learning?"

### **Theoretical Framework**

Distance education originally began to be utilized in the form of correspondence study in the United States in 1890. By the 1900's distance learning was being used

extensively in universities in the United Kingdom, the United States and Japan (Curran, 1997). American public schools offered high school credit courses to adults which are similar to adult basic education courses of today. Educational radio emerged in the years after World War I, and in the 1950's educational television was introduced. The primary reason for distance education during this time was to provide educational opportunities to people who had previously been without them such as women and rural students (Mood, 1995). Before 1969, distance learning had become quite prevalent in higher education in many countries. However, 1969 marked the development of the second phase of distance learning with the founding of United Kingdom's Open University, which was ". . .important in raising the profile of distance education, effectively bringing . . .(it) closer to the center stages of higher education (Curran, 1997). The original purpose of distance learning was to ". . .extend the university and overcome its inherent problems of scarcity and exclusivity, . . .not to challenge or change the structure of higher learning" (Hall,1995). In recent years, the United States has continued to be a leader in distance education with the emergence of audio and computer conferencing and the use of videoconferencing by means of satellite, microwave, cable and telephone. Improvements in telecommunications such as fiber optics, standardization of transport and asynchronous transfer mode (ATM) have been instrumental in building the broadband infrastructure which is necessary to reduce the costs and provide the technology to make IDL affordable and available to schools. Since the early 1990's, local exchange carriers have offered an expanding range of services to support videoconferencing by increasing the integrated services digital networks (ISDN), thereby promoting interest and activity in telephone-based education. Finally, the Communication's Act of 1996 made \$20 million in federal funds available to educational institutions to support the development and implementation of technology in America's classrooms.

### **Definition of Terms**

For purposes of clarification, and because the term "distance learning" or "interactive distance learning" can refer to a variety of learning environments, in this study it is defined as two-way audio and videoconferencing via a dial-up telephone call with the

teacher and student separated by a distance. “Elementary school” is defined as a school that educates children prior to secondary school. Elementary schools may consist of grades kindergarten through eighth grade, or any combination of grades from Kindergarten through eighth grade, i.e. K-2, K-4, Grades 3, 4 & 5, K-6, K-8, 6-8 or 7 and 8.

### **Research Questions**

The inquiry of this study was focused on the activities elementary schools provide through interactive distance learning. Some of the questions which this study addressed were: What classroom activities do schools provide using distance learning? What subject areas are offered through distance learning? What amount of time does the school spend in offering distance learning activities to students per week? To what extent is distance learning used for remedial and enrichment purposes? What problems has the distance learning teacher experienced using the distance learning system? What problems have the distance learning students experienced using the distance learning system? To what extent is the distance learning system used for staff development activities? To what extent is the distance learning system used for virtual field trips? To what extent is the distance learning system used to communicate with experts in a field of study? To what extent do parents and/or community organizations outside the school use the distance learning system? How does the distance learning system vary as a function of school enrollment and grade level of students?

### **Variables**

Variables in this study included the individual respondent’s attitude toward technology, socioeconomics of the school population, amount of money budgeted for distance learning, attitude of school’s administration toward distance learning as an instructional tool, amount of training of distance learning coordinators, compatibility of equipment and connection with other schools. The findings of this study may have significant benefits for the PDL Consortium, state education officials, elementary school administrators, classroom teachers and elementary school students.

## **Methodology**

In this study the researcher conducted a survey of the elementary school IDL Coordinators in the PDL Consortium. Over 200 schools are presently members of the Consortium, but respondents sought were confined to IDL Coordinators in one hundred elementary schools. A self-administered questionnaire was mailed to IDL Coordinators in the winter/spring of 2000. Follow-up telephone surveys of non-respondents and follow-up letters were employed. All respondents were fully informed of the purpose of the survey, and the respondents' names as well as their school names were kept confidential and anonymous. A cover letter to this effect accompanied the questionnaire.

## **Data Analysis**

The data collected was reported in percentages and/or means based on the number of questionnaires returned. Some of the items on the questionnaire generated open-ended responses and these were reported in narrative form.

## **Conclusions and Recommendations**

This study attempted to explain how distance learning was used in New Jersey and Pennsylvania elementary schools during the 1998-1999 school year. Distance learning provides a link between the teacher, the student and the larger world. Few studies have been conducted regarding how elementary schools are using interactive distance learning. The findings of this study may have significant benefits for the PDL Consortium, state education officials, elementary school administrators, classroom teachers and elementary school students.

A description of the survey and analysis of the data collected resulted in the researcher making various conclusions concerning the uses of interactive distance learning and its present uses in elementary schools. Based on these conclusions, and the findings of the study, additional issues emerged which would benefit from further study. The researcher discussed the implications of the data and suggested areas for further research.

## **Organization of the Remainder of the Study**

Chapter Two is a review of the literature on the history and role of technology in distance education, an overview of the theory supporting distance education and an examination of how distance education is utilized in education. Chapter Three describes the procedures used to conduct the study, the sample and population to be studied and the instrument used to collect data. Chapter Four reports, organizes and analyzes the data accumulated from the data collection instrument. Chapter Five summarizes the findings of the study, makes conclusions drawn from the data in an effort to substantiate the hypothesis of the study and recommends areas for further research into distance learning.

## **Chapter 2 - Literature Review**

### **Introduction**

A review of the literature was conducted to locate journal articles, research reports and books which focused on the utilization of distance learning in education. The purpose of this was to develop a theoretical framework for this study. The literature reviewed is divided into three sections: the history and role of technology in distance education, distance education theory and distance education practice.

### **History and Role of Technology in Distance Education**

Although technology will never take priority over educational objectives, it should be accepted that distance education could not exist without technology, whether it exists in print or telecommunications or is computer based. Therefore, any understanding of the theoretical foundation of distance education must begin with an understanding of technology as a means of “. . .integrating and unifying technological structures and educational processes” (Garrison, 1989).

Distance education is rooted in a long-standing history which dates back to correspondence courses established at the University of Chicago in the United States in 1890. The founding of the United Kingdom’s Open University in 1969 introduced a mixed-media approach to education. Students were sent audio and visual materials which were supplemented with radio and television broadcasts. A tutor was assigned to each student who assisted the student over the telephone and in group sessions in the evenings and on weekends. In the early 1980’s the Adult Learning Service (ALS) of the Public Broadcasting Service (PBS) brought together local public television stations and higher education institutions to make college credit courses available through television to adults. The primary purpose of distance education at this time was to provide educational

opportunities to people who had previously been without them such as rural students and women (Mood, 1995).

The 1980's witnessed an explosion of telecommunications technologies which expanded the possibilities for distance education such as cable television, microwave, slow scan television, satellites and microcomputer networking. Further advances in telecommunications such as fiber optics and asynchronous transfer mode (ATM) have been conducive to building the broadband infrastructure which is necessary to making these IDL technologies affordable to school districts. Since the early 1990's, local exchange carriers have broadened their range of services to support videoconferencing by increasing the integrated services digital networks (ISDN) which can support data-oriented and video/audio oriented distance learning applications (Minoli, 1996).

Spurred by government and education interests in upgrading educational requirements for students to include technology for workplace-readiness skills, the Telecommunications Act of 1996 provided \$20 million in funds to finance the development and implementation of technology in United States classrooms.

### **Distance Education Theory**

While almost every attempt to define distance education refers to a separation of the teacher and the student, there are many perspectives as to how this is achieved. Michael Moore describes his theory of distance teaching as “. . .that family of instructional methods in which the teaching methods are executed apart from the learning behaviors. . .so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices” (Moore, 1990). Moore emphasizes the importance of the teacher's instructional methods, and reinforces the relationship between the student and the teacher. Moreover, by emphasizing teaching methods, he allows for the inclusion of methods based on new technologies.

Keegan synthesizes and identifies three theories for distance learning education: theory of autonomy and independence, theory of industrialization, and theory of interaction and communication (Keegan, 1986). Holmberg, a proponent of student interaction, believes that a basic general assumption of learning is that it is “. . .primarily an

individual activity and is attained only through an internalization process.” This internalization process, or interaction, can best be described as a “. . .primitive theory of the style of guided didactic conversation.” Holmberg states several assumptions for the theory:

- the relationship between learner and teacher is central;
- emotional involvement between teacher and student contributes to learning pleasure;
- learning pleasure increases student motivation;
- student decision-making increases student motivation;
- increased student motivation increases learning;
- friendliness and access are key to learning pleasure;
- teaching effectiveness is measured by the amount of learning that takes place. (Holmberg, 1986)

Peters’ postulates in his theory of industrialization that distance learning could only exist in an industrial era. The purpose of distance learning in his view is to instruct as many students as possible regardless of time and location. This relationship between the technology inherent in a distance learning class and a student’s output is perceived as an advancement of technology, rather than student learning. Access to instruction is the driving motivation behind the industrialization theory. Other factors such as division of labor, mechanization, mass production, scientific control methods and standardization are also included in the development of his theory (Peters, 1988).

Garrison focuses on the quality of the educational process itself. Garrison bases his theory on the assumption that education is a two-way communication, and the nature and frequency of the communication between the teacher and student and student and student determines the quality of the educational transaction (Garrison, 1989). An inherent feature of distance education is that it satisfies the needs of the constructivist view of education in which the student builds his understanding of the material through interactive processes. However, it also addresses the demands of the constructivist theory of education in which the teacher provides a successful set of learning experiences, and incomplete or inaccurate performance by the student is corrected by feedback which brings



about the practice of only correct responses. The challenge of distance education is to establish enough learning support structures to enable students to engage with one another and with the teacher, thus permitting learning to be interactive and co-constructive (Renshaw, 1995).

### **Distance Learning Practice**

The history of instructional technology's effects on student achievement is long and varied (Cuban, 1986). Cuban identifies three latent forces which drive adoption of new technologies in public school classrooms. One incentive is the need to provide students with workplace-readiness skills which are necessary for their entrance into the work force. The second motivation is the enthusiasm for self-directed learning, which is made possible by machine-based learning. The third stimulation for new technologies is the desire for productivity, which envisions making public education more efficient. These three forces provide a strong support for technological change in education

With the adoption of any new technology into education, issues concerning how it will impact upon the learner are raised. Tait and Mills raised the following questions concerning the ethical considerations of imposing technological change on students:

Does the new technology bestow an added benefit upon the learners who use it relative to the modes of learning which the new technology displaces?

Considering the impact of the new technology upon an individual learner. . . , is it ethical for an educational institution to promote such. . . methods of learning? (Tait & Mills, 1999, p. 123)

Hundreds of studies have been conducted regarding how much better one instructional technology is over another. Schramm reviewed dozens of research efforts into instructional technology and concluded that "learning seems to be affected more by what is delivered than the delivery medium" (Schramm, 1977). He believes that the type and form of instructional delivery is more important than the technology itself. Russell reviewed 214 research reports, summaries and papers in distance education which spanned the period from 1945 to 1995. Each of the documents reported no significant differences in learning between distance education media and traditional classroom interaction (Russell, 1996).

One issue that has been debated intensively in education is the extent to which educational technology influences learning. Clark stated that media “. . .do not influence learning any more than the truck that delivers groceries influences the nutrition of a community” (Clark, 1983). Clark further stated that any medium can be replaced by another form of media and will produce the same results. Although he acknowledges that media are important in developing meaningful learning experiences, he maintains that powerful instructional methods are the key to implementing the learning process. Kozma agreed with Clark in theory, but suggested that media may not have been proven to influence learning, but that the type of media used “. . .constitutes a separate variable that, given advances in sophistication, will directly influence learning at a future time” (Kozma, 1994, p. 11)

Jonassen, Campbell and Davidson agreed with Clark in principle, but they take a different approach to the issue of media. They argue that learning should be considered “situationally dependent, with the learner having . . .constructivist potential” (Jonassen, Campbell & Davidson, 1994). Rather than focusing on media and the tools associated with technology, research should focus on the learner. Media are not responsible for learning; learners are. Media environments can, at best, make learning slightly easier or harder.

Distance learning instruction allows students and teachers access to learning resources which they may otherwise not have. The effects of classroom activity on student achievement, and the impact of learning technology on student achievement, take place after delivery. Delivery and access must be kept separate in evaluation efforts (Clark, 1987). Thus, most evaluations of distance learning focus on either the participant’s reaction to the instructional delivery or to the achievement of program objectives after delivery, such as student learning (Clark, 1987).

The distance learning format has created new opportunities to students for information gathering from a variety of educational settings. Collaborative ventures between school libraries and outside educational resources allow students the opportunity to construct learning environments where real searches can take place with people as well as books. Such educational settings encourage students to become self reliant and not limit themselves to adult interpretation of information.

School librarians may provide students with “emerging educational possibilities” by expanding the school library beyond the walls of the school (Veltze, 1994).

### **Theoretical Framework**

A review of the literature concerning distance learning education indicates that students learn regardless of the method of delivery of instruction. Though distance learning offers many benefits to students, its effect on students in the elementary school is not quite clear. Is distance education a valuable tool in elementary schools, and does it offer benefits not available to students through any other sources? This thesis will attempt to find out who uses distance learning as an instructional tool and how it is used with elementary school students. A study that explores these questions could provide insight into how distance learning can be effectively implemented to offer a range of educational resources to a variety of learners and perhaps encourage schools to purchase and employ distance learning technology.

## **Chapter 3 - Methods of Study**

### **Introduction**

This chapter describes the general procedures used in the study. The information includes a review of the purpose of the study, a description of the design of the study, the sample and population to be studied, the instrumentation and the data collection and analysis plan.

The literature on interactive distance learning (IDL) in education is focused primarily on its uses in high schools and colleges and universities. Information concerning the implementation, management, training and assessment are outlined; however, viewpoints differ greatly on the value of IDL in education. Further, the profile of student IDL learners in elementary schools varies from that of high school or college students in areas such as age, stages of development, interests, and emotional maturity. For these reasons, a study which examines the uses of interactive distance learning in elementary schools will present another perspective on the variety and perceived value of its use.

### **Design of Study**

This study was designed to gather the opinions and experiences of a group of IDL coordinators in elementary schools in the Middle Atlantic region of the United States through a self-administered questionnaire. There are two reasons for this method of study. First, it reaches the greatest number of respondents in a short amount of time, and is an efficient means of collecting a large amount of information (Babbie, 1998). Second, since this study was exploratory in nature, the questionnaire was designed to collect data that can be interpreted both qualitatively and quantitatively.

## **Sample and Population**

The Partners in Distance Learning (PDL) is a distance learning network whose members use interactive video conferencing technology. Current membership includes approximately 200 public schools in Pennsylvania, New Jersey, New York and Massachusetts. This consortium consists of schools that not only have compatible technology but are committed to mutual support and sharing of resources. The survey described in this chapter was sent to distance learning coordinators in 100 elementary schools that are members of this consortium. Since at least one of the philosophical principles espoused by this organization includes using distance learning technology to offer programs and services to students which were not previously possible, the schools receiving this survey have a vested interest in the data which is collected. It was hoped that this would result in a stronger response ratio than would be obtained by a random sampling of elementary schools that are not a part of the PDL consortium.

## **Instrumentation**

The questionnaire was developed with the objective of determining how distance learning is currently being used in elementary schools. It examined the methods of instruction delivered via distance learning, the subjects studied, the amount of time devoted to IDL activities, its use as a tool for remedial and enrichment opportunities, the type of IDL equipment and connection being used, any problems which were experienced using the IDL system, the role of the distance learning coordinator, the amount of training received by the IDL coordinator and the use of IDL equipment by organizations outside the immediate school staff and administration. Questions were included in the instrument which attempted to address the variables inherent in a survey of interactive distance learning coordinators such as: the attitudes of IDL coordinators and school administrators toward distance learning as an instructional tool, the amount of funding allocated for its use, and the perceived effectiveness of IDL as an educational tool. A section was also included which queried respondents on the age level and size of the school's student population to provide a subset of descriptive data that was used to ascertain whether those factors have an impact on the study.

Questions which involved an open-ended response such as a description of a use of IDL in the school that the respondent felt was unusual or innovative were embodied in the survey for the purpose of discovering creative methods of utilizing IDL technology. Finally, the respondents were given the option of obtaining the results of the survey by providing their name and the address of their school.

### **Data Collection and Procedures**

A self-administered questionnaire was mailed to respondents requesting a description of IDL use in elementary schools in the winter/spring of 2000. Follow-up telephone surveys of non-respondents were conducted or follow-up letters mailed to obtain the greatest number of responses.

All respondents were fully informed of the purpose of the survey and the names of the respondents and their school names were kept confidential and anonymous. A cover letter detailing this accompanied the questionnaire. (See Appendix)

As responses were received, they were checked off a tally sheet to identify which schools had responded. A percentage of usable surveys was calculated. On a second tally sheet, the answer to each question was recorded, as well as any comments made by the respondent. This master tally sheet of responses to questions was then organized into tables for each individual question, and the number and percentage of responses was noted. The data collected was reported in percentages and/or means based on the number of questionnaires returned. Analysis of data included the use of a frequency distribution and numbers of responses which were converted into percentages and represented in tables where possible. The remainder of the data, the open-ended responses, were reported in narrative form. The data was analyzed to allow breakdowns of responses by school size and population. Allowances were made for incomplete or blank answers in analyzing the data by individually calculating for each question the total number of usable answers. Information was provided regarding the percentage of usable answers for each survey item.

## **Data Analysis**

Although quantitative analysis was useful in this study, comments from the distance learning coordinators were instrumental in determining areas in which to focus the qualitative analysis. Similarities and differences were noted. From this data positive and negative attitudes were determined, advantages and disadvantages of various aspects of distance learning were examined and studied for possible conclusions, and opinions of IDL coordinators were considered in making recommendations for areas of further study.

## **Chapter 4 - Presentation and Analysis of Data**

### **Introduction**

This chapter contains an analysis of the data reported by distance learning and classroom coordinators of videoconferencing activities. One hundred surveys were mailed to distance learning coordinators in elementary schools who are members of the Partners in Distance Learning Consortium to determine the ways in which distance learning was used in their schools. Thirty were initially returned. A follow up mailing and follow up telephone calls resulted in the receipt of an additional 21 questionnaires, for a total response rate of 50.4%. Two of the surveys were returned unanswered because the schools were secondary (grades 9-12) schools. One survey was returned unanswered because distance learning had not been implemented in the school yet. Usable surveys totaled 47 for a response rate of 47%. Twenty-five distance learning coordinators represented New Jersey, one represented Massachusetts, and 31 represented Pennsylvania. Responses to questions in the survey instrument are presented in percentages and/or means, based on the number of questionnaires returned. Data has been organized in the order of the the research question format from the survey instrument. It should be noted that throughout this section, the number of respondents varies for each item in the survey instrument. Some respondents did not answer every question on the survey, and others did not check all of the possible responses in a question. Comments from respondents are included at the end of the chapter.

### **Distance Learning Coordinator Responses**

Table 1 illustrates the various ways in which distance learning activities were delivered to students. Virtual field trips were the most common type of instruction, but advanced courses, activities with other classes and staff development occurred almost as frequently. Other types of instruction that distance learning coordinators offered were round table discussions (1) and special events (unspecified) (1). See Table 1.



Table 1

Types of Instruction Delivered Via Distance Learning (n=47 )

Type of Instruction	<u>Schools</u> <u>n</u>	<u>Schools</u> <u>%</u>
Virtual field trips	40	85
Courses	26	55
Staff development	24	47
Activities with other classes	26	55
Author sharing	5	11

Note: Respondents checked as many as applied to them.

Distance learning was offered in almost all subject areas, but especially in math, science and social studies; middle school math students were offered advanced level courses by videoconferencing with high school math classes, and students took virtual field trips in the science and social science fields of study.

Table 2

Subjects Offered Through Distance Learning (n =47 )

Subjects Offered	<u>Schools</u> <u>n</u>	<u>Schools</u> <u>%</u>
Language Arts	15	32
Social Studies	18	38
Art	11	23
Library	6	13
Math	21	45
Science	15	32
Music	5	11
Foreign Languages	4	9

Note: Respondents were asked to check all of the answers that applied to them.

There was a wide variation in the amount of time distance learning equipment was used in the schools surveyed. One school's distance learning coordinator utilized distance learning only one hour per month, while another used it 20 hours per week. The DL coordinators that utilized distance learning equipment more frequently offer their students advanced or remedial courses on a regular basis for a set amount of class time each week. See Table 3.

Table 3

Amount of Time Spent on Subjects Offered Through Distance Learning (n =47)

Number of Hours	Week <u>n</u>	Month <u>n</u>	Year <u>n</u>
1	0	2	0
3-5	14	0	0
6-8	4	0	0
10	2	0	6
20	0	0	7
50	0	0	2

Note: Respondents were asked to indicate how many hours were spent offering distance learning activities to students per week, per month or per year.

Only seven respondents reported using distance learning for remedial education purposes, and in those cases, remedial math classes were being offered to students. One district uses distance learning for homebound instruction.

Enrichment classes were offered via distance learning in 40 of the schools, and most enrichment activities included virtual field trips, as well as advanced courses, Think Day team competition, and class exchanges of ideas and discussions with outside experts, such as authors or scientists

Table 4

Distance Learning Used for Remedial or Enrichment (n=47)

Programs	<u>Schools</u> <u>n</u>	<u>Schools</u> <u>%</u>
Remediation	7	15
Enrichment	40	85
Both Remediation & Enrichment	7	15

Note: \*Percentages add up to more than 100% because all of the schools that use distance learning for remediation also use it for enrichment.

Distance learning rooms were being utilized for distance learning activities in 27 schools, media centers were being used in nine schools, classrooms, each equipped with ISDN lines, in nine of the schools, the computer lab in 10 schools, and one school had a technology center which included distance learning equipment. Nine schools reported

using distance learning equipment in their classrooms as well as the distance learning room, the computer lab or the media center.

Forty-five of the respondents believed that their school’s administration was very positive (35) or positive (10) in their attitude toward distance learning. Only two schools surveyed felt that the school administration was neutral in its attitude, and no one indicated negativity on the part of the administration toward distance learning for instructional purposes.

In 47 of the schools surveyed, 31 respondents reported that funds were budgeted for distance learning activities in amounts ranging from \$1,000 per year to \$20,000 per year. Only six schools reported that there was no money in the school budget for distance learning activities, and two schools indicated that funds were available for distance learning field trips on an as-needed basis. On eight of the surveys, there was no answer for the question of whether or not funds were included in the school’s budget.

The majority of respondents who returned surveys indicated that their school’s training of choice for distance learning was workshops (18) and in-services (27). Teacher training of other teachers (3), reading material (12) and college or university classes (6) were also utilized to a lesser degree. See Table 5.

Forty of 47 respondents believed that they were sufficiently trained to conduct distance learning activities, but a few (3) felt that additional practice was necessary. Of the seven respondents who did not feel that they were sufficiently trained, one respondent expressed a need for assessment of the distance learning activity, and another said a better accommodation of individual students’ learning styles was needed.

Table 5

Type of Training Provided for Distance Learning Activities (n=47)

Type of Training	<u>School</u> <u>n</u>	<u>School</u> <u>%</u>
In-services	27	57
Workshops	18	38
Reading material	12	25
College/university classes	6	13
Teacher trains	2	4

Note: Respondents were asked to check as many answers as applied to them.

In addition to using distance learning equipment with students for instructional purposes, some schools reported that their distance learning equipment was used by administrators (22), board of education members (5), parents (4) and community organizations (8). One school allows the Educational Technology Training Center of Atlantic County, New Jersey, to utilize their distance learning equipment to conduct workshops for distance learning coordinators in Southern New Jersey.

Table 6 provides a summary of distance learning coordinator roles. Respondents were asked to check how often they performed each role. Almost all distance learning coordinators reported attending Consortium meetings and reporting the information to the teachers as one of their primary responsibilities. Most distance learning coordinators list program development, usage coordination, and equipment operation as expected duties in their positions. A few also indicated that staff training was a requirement.

Table 6

Roles of Distance Learning Coordinators (n=47)

Activity	<u>Often</u> <u>n</u>	<u>Sometimes</u> <u>n</u>	<u>Never</u> <u>n</u>
Supervise class	24	8	5
Coordinate usage	31	6	2
Operate equipment	28	9	2
Watch broadcasts	24	10	3
Attend DL Consortium meetings	40	0	7
Program development	31	4	1
Staff training	6	2	0

Note: Respondents were asked to check as many answers as applied to them.

With one exception, respondents rated the instructional value of distance learning activities as very effective or effective. The one exception rated the value as somewhat effective.

The uses of distance learning varied. Distance learning coordinators were asked to provide some of the most innovative ways in which distance learning was utilized in their schools. Only 31 distance learning coordinators responded to this query. Some respondents offered more than one innovative use of distance learning in their schools.

Table 7

Distance Learning Uses (n = 31)

Uses of Distance Learning	# Schools
High school geometry classes	2
Math remediation classes	2
Distance Learning Consortium meetings	5
Communicating with students from other schools	11
Spelling Bee/Geography Bee between schools	1
Constitution debate between classes	1
Art/Industrial Art link-up with other schools	1
Videoconferencing with students in Hong Kong	1
Camden College education majors observed classes and had a question & answer period	1
Workshop on core curriculum standards	1
Virtual field trips	12
Homebound instruction for students	1
Classes in sign language for deaf students	1
Visit to radio disc jockey to prepare students for public speaking	1

Respondents were asked to check the top three aspects of distance learning which they felt were the most valuable. Seven respondents checked only two aspects which they felt were valuable, and two responded with only one aspect which they felt was valuable about distance learning education. Many of the respondents believed that the most valuable aspects of distance learning education are its ability to introduce students to new experiences, supplement the curriculum with resources not available in the school, provide instruction in advanced courses not presently offered by the school, and provide technology training for students and staff members. One of the respondents valued the “cultural” experiences that distance education provided, one believed that exposure to advanced courses was valuable and two respondents felt that the ability of students to interact with other students was an important aspect of distance learning.

Table 8

The Most Valuable Aspects of Distance Learning (n=47)

Distance Learning/ Most Valuable Aspects	Schools	Schools
	<u>n</u>	<u>%</u>
Introducing students to new experiences	32	68
Providing instruction in classes not presently offered	18	38
Supplementing curriculum	29	62
Staff or student technology training	15	32

The uses of distance learning varied. Distance learning coordinators were asked to provide some of the most innovative ways in which distance learning was utilized in their schools. Only 31 distance learning coordinators responded to this query. Some respondents offered more than one innovative use of distance learning in their schools.

Average enrollment size of the 44 coordinator-responding schools was 903. The median enrollment of these schools was 850 students. Eighty-nine percent of the schools offering distance learning activities had an enrollment of 500-1500 students. Three respondents did not answer this question on their survey.

Table 9

Population of Schools (n = 44)

Population	Schools	Schools
	<u>n</u>	<u>%</u>
Fewer than 100	3	7
100 to 500	12	27
500 to 1000	9	20
1000 to 1500	18	41
More than 1500	2	5

The survey instruments were analyzed for information concerning grade levels of students most likely to participate in distance learning activities. The greatest frequency was in K-8 schools, which makes sense in light of some of the smaller school districts' inability to offer courses such as foreign languages and advanced math courses which are typically secondary level courses. See Table 10.

Table 10

Grade Levels of Schools Using Distance Learning  
(n=47)

Grade levels	<u>Schools</u>	<u>Schools</u>
	<u>n</u>	<u>%</u>
K-2	0	0
K-4	0	0
3, 4 & 5	1	2
3-12	1	2
K-6	10	21
K-8	24	51
K-12	3	6
6-8	5	12
7-12	3	6

Forty-seven distance learning coordinators responded to the question as to whether teachers had experienced any problems using the distance learning system. No problems were reported by 21% of distance learning coordinators in the survey instrument. Sixty percent of the problems reported for teachers described concerned technical difficulties involving the lines, connections or equipment. Additional problems described were: scheduling conflicts (four), lack of planning time (two), and meaningful integration of activity into curriculum (two).

Forty-four distance learning coordinators responded to the question as to whether students had experienced any problems using the distance learning system. The percentage of coordinators that reported experiencing no problems with distance learning and students was 48% (21 responses). Of those experiencing problems, loss of, or insufficient sound was reported to be a problem in 21% (ten responses) of the schools. Five respondents indicated that the students were unable to interact due to the size of the class. Other problems included: learning styles not conducive to environment (one), students uncomfortable with wait time of equipment (three), and problems with students not speaking loudly enough to be heard (four).

Distance learning coordinators held various positions in each of the school districts which responded. Full-time distance learning coordinators were more common in districts in which several schools utilized distance learning equipment.

Table 11

Position Held By Distance Learning Coordinators (n=47)

Position	Schools	
	n	%
Technology Coordinator	18	38
Distance Learning Coordinator	7	15
Media Specialists	5	11
Supervisor/Curriculum & Instruction	9	19
Principal	4	9
Teacher/Distance Learning Facilitator	2	4
Superintendent	1	2
Educational Consultant	1	2

The majority of distance learning coordinators (25) had 20 or more years of teaching experience, and 40 had one to five years of experience with distance learning equipment. Only two respondents had extensive experience in distance learning. One was an educational consultant with 9 years of experience and the other respondent was a teacher with 15+ years of experience in distance learning. Five respondents did not answer as to their years of experience in teaching or distance learning. See Table 12.

Table 12

Distance Learning Coordinators' Experience (n=42)

Experience (in years)	Teaching		Distance Learning	
	n	%	n	%
1-5	0	0	40	95
6-10	6	12	1	2
11-15	6	14	0	0
16-20	5	12	1	2
20+	25	60	0	0

Note:\*Percentages may be under 100% due to rounding.

Respondents were asked what type of equipment they used for distance learning instruction and what type of connection they utilized. The PicTel Swiftsite was the most frequently used equipment (28) and ISDN the connection named by most respondents (40). Tables 13 and 14 show the results of of these queries.



Table 13

Type of Distance Learning Equipment (n=47)

Equipment	<u>School</u> n	<u>School</u> %
PicTel Swiftsite	28	60
Tandberg	4	9
PicTel Venne 2000	6	13
PicTel 4500 Concorde	6	13
Intel ProShare	1	2
Satellite	1	2
Tandberg VC 7000	1	2

Note:\*Percentages may be over 100% due to rounding.

Table 14

Type of Distance Learning Connection (n=47)

Connection	<u>School</u> n	<u>School</u> %
ATM	4	9
ISDN	40	85
ISDL	3	6

Finally, respondents were asked to add comments on their surveys. These were open-ended and intended to gather information which was not included in the survey questions. Only four respondents included comments on their surveys. One respondent was delighted that students were awed and excited by distance learning technology. Another responded that a distance learning coordinator is necessary and important to develop and promote programs and maintain equipment to make the distance learning program effective. An additional comment claimed that the success of the distance learning activity depended on the teacher preparation of the students for the experience. Finally, a distance learning coordinator commented that the results of distance learning instruction can sometimes be excellent and other times, disappointing.

### Summary

The original intention of this study was to determine how distance learning is used in elementary schools. Overall, the advantages of distance learning outweighed the

disadvantages. Distance learning coordinators, as well as their schools' administrators, rated the quality of distance learning instruction as effective. The nature of the programming varied among school districts, but distance learning coordinators agreed unanimously that their students were being provided with opportunities through videoconferencing technology that they would not have experienced otherwise.

As indicated by this survey, distance learning technology can be a practical means for school districts, especially in rural areas, to enhance their curriculum and offer their students enrichment experiences.

## **Chapter 5 - Summary, Conclusions and Recommendations**

### **Summary**

The purpose of this study was to explore how distance learning is utilized in elementary schools. Despite a slow rate of return of questionnaires, eventually 47% were returned which provided sufficient usable data. This study was intended to be used as a guide by distance learning coordinators to gain an understanding of potential uses for distance learning technology.

The majority of distance learning coordinators (95.7%) rated videoconferencing as a very effective or effective instructional tool. Although each school district used distance learning differently, the majority of schools infused it into all subject areas. The most frequent application of distance learning was for enrichment (virtual field trips) or curriculum enhancement (advanced level courses), and many distance learning coordinators/teachers employed distance learning to coordinate projects, communication and sharing between their students and students in other locations.

The amount of time devoted to distance learning activities varied among school districts. Distance learning was offered three to five hours per week in 30% of the schools surveyed. Frequent usage was due to regularly programmed advanced courses made available to middle school students.

Responses of distance learning coordinators indicated that distance learning technology was positively viewed by administrators, and funded in the school budgets. A commitment to distance learning education was supported by the school's willingness to ensure that funds were available for its implementation.

Most distance learning coordinators hold the position of technology coordinator (38%), supervisors of curriculum and instruction represented 19%, media specialists (11%) and distance learning coordinators (15%). Large school districts with more than one school were more likely to have full-time distance learning coordinators, and schools with a strong commitment to distance learning education designated a distance learning

coordinator to design, implement and coordinate their distance learning activities. Sixty percent of distance learning coordinators had more than 20 years of teaching experience and 95% had less than five years of experience with distance learning, which is logical due to the newness of the technology.

Eighty-five percent of coordinators believed that they were sufficiently trained to conduct distance learning activities, with the most common methods of training being workshops and in-services. Coordinators reported that their responsibilities often included attending Consortium meetings (40), coordinating usage and developing programs (31), operating equipment (28) and watching broadcasts (24).

Problems with distance learning affecting teachers as well as students, while not insignificant, did not inhibit its use. Twenty-one percent of teachers and 48% of students were reported as having no problems using distance learning equipment. When problems were reported, they were described as technical difficulties with equipment, lines or connections. Hearing and sound level difficulties were the most frequent complaint of students engaged in distance learning activities.

Schools with grades K-8 used distance learning most frequently (51%), K-6 schools (21%), and schools with grades 6-8 (12%). Of the K-2 and K-4 schools which responded to the survey, none reported using distance learning for instruction. These figures are confirmed by the use of distance education for middle school-aged students for the purpose of providing advanced level courses in math and foreign languages. Also, the types of virtual field trips that are available through distance learning (museums, historical sites and NASA) are appropriate for students in grades 6 through 8. K-2, K-4 and schools with students in grade levels 3, 4 and 5 were more likely to use distance learning to conduct discussions with experts and authors, or to develop lessons in which students collaborate or share in projects with students in other classes.

Eighty-nine percent of the schools using distance learning had a school enrollment of 500-1500 students. Larger schools, particularly in rural areas, often find that distance learning is a necessity if they are to provide their students with advanced level courses which require teachers that are qualified and certified in subjects such as geometry and foreign languages.

When asked to designate which aspects of distance learning they believed were most valuable, 68% of distance learning coordinators reported introducing students to new experiences, 62% specified supplementing curriculum, 38% indicated providing instruction in classes not presently offered, and 32% checked staff or student technology training. In each of these instances, distance learning serves a need of students that has not been addressed in a conventional educational setting.

How do elementary schools use distance learning in unusual or innovative ways? Coordinators responded to this question with a medley of answers. The diverse uses of distance learning reported in the surveys emphasized the unlimited potential of this technology. Videoconferences with students in Hong Kong, student teachers observing certified teachers in their classrooms, instruction to homebound students, debates between classes, workshops for teachers, classes in sign language for deaf students, spelling/ geography bees between schools, and visits to disc jockeys to prepare students for public speaking were some of the ways in which distance learning technology was used to expand the walls of the classroom.

## **Conclusions**

Although a usable number of surveys were returned, the response rate of 47% was low. Since many of the questionnaires were mailed to large rural school districts where the technology coordinators and the distance learning coordinators may be shared by more than one school, it is possible that some of the surveys were not received. Also, although the addresses were taken from the most recent Partners in Distance Learning Directory, it is always possible that the person who held the position of IDL coordinator is no longer there or has been replaced by someone else. Several of the persons listed in the Partners in Distance Learning Directory as IDL coordinators held other positions as superintendents, principals or curriculum supervisors and it is possible that their other responsibilities took precedence over their role as distance learning coordinator. It is unlikely that any one reason can be pinpointed for the lack of responses; however, the responses which were received were greatly appreciated.

In looking at the information that was gathered, the overall impression is that the distance learning coordinators were overwhelmingly positive in their attitudes about the value of distance learning as an instructional tool. The fact that all of the IDL coordinators who participated in this study worked in schools which were members of the Partners in Distance Learning Consortium possibly influenced their respect for technology generally, and distance learning technology, specifically. Because attitude is such a motivational factor in behavior, the positive attitude adopted by distance learning coordinators encourages them to develop programs whereby they can utilize distance learning technology in the classroom. Furthermore, positive experiences with students in distance learning settings, i.e., advanced level courses or virtual field trips, enables classroom teachers to understand the possibilities for distance learning. It is essential that coordinators and classroom teachers collaborate to plan activities in which distance learning activities are integrated into the curriculum. Planning time is necessary to prepare students for the activity and to coordinate the operation of the equipment so that students will experience success.

As indicated by the variety of ways in which distance learning was implemented in schools, it is apparent that innovative uses of distance learning have expanded the possibilities for its future use. Students will benefit from the integration of technology into the curriculum, and at the same time benefit from the introduction of new experiences.

Some of the factors which may curtail the implementation of distance learning are budget restrictions for line charges, lack of planning time, scheduling conflicts and class size. There is a need for teachers using distance learning to construct and deliver carefully planned lessons which involve the students in a proactive way, blending distance learning technology with hands-on projects. Without this preparation, distance learning lessons will create an environment of isolation for the students and teacher.

Many school districts, especially in rural areas, have found in distance learning an opportunity to introduce students to an array of experiences that they would not have if not for distance learning technology. Unable to afford or find certified teachers in subject areas such as advanced math or foreign languages, educators can offer these classes through distance learning. Also, many schools are located far from resources such as

museums and historical sites which prevents them from taking students on field trips. The two-way audio and video capability of videoconferencing makes it a viable alternative to face-to-face instruction or field trips. As technology improves the quality of distance learning equipment, and connections become less expensive, distance learning will be available to a larger number of schools and students.

### **Recommendations**

A national survey of distance learning coordinators in elementary schools would provide a broader insight into the uses and attitudes toward distance learning education in the United States. Many colleges and universities throughout this country have combined resources and offer various services and educational opportunities to their membership organizations. Through meetings and web sites they are sharing distance learning equipment and training teachers, students and members of community organizations to familiarize them with equipment, assist them in polishing the delivery of their presentations, and assigning students as site managers to help tutor students on technical matters. Attempts to build networks of distance learning users and provide training for teachers in schools that do not have distance learning have resulted in the organization of various consortia.

Conducting a study of the ways in which members of of these consortia organize, meet, communicate and share resources would help distance learning coordinators to create a framework for the implementation of future uses of this technology.

This study made no attempt to investigate the relationship of distance learning and student achievement. A longitudinal study linking distance learning activities and student achievement could be fruitful. There is much speculation about the value of technology and student learning. Research that relates distance learning as a method of delivering instruction to student performance may help educators to understand its value, explore further uses of distance learning technology and create a framework for the implementation of innovative programs or augmentation of existing curriculum.

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## Appendix

## Questionnaire

Please check appropriate responses. Use the back of the page if needed for explanations.

1. What types of instruction are delivered via distance learning?

Virtual field trips	[ ]
Courses	[ ]
Staff development	[ ]
Interviews with experts	[ ]
Activities with other classes	[ ]
Other	_____

2. What subjects are offered through distance learning?

Language arts	[ ]	Math	[ ]
Social studies	[ ]	Science	[ ]
Art	[ ]	Music	[ ]
Library	[ ]	Other	_____

3. Approximately how many hours does your school spend in offering distance learning activities to students?

Per week [ ] Per month [ ] Per year [ ]

4. Is distance learning used for remedial instruction?

Yes [ ] No [ ]

Explain \_\_\_\_\_

5. Is distance learning used for enrichment instruction?

Yes [ ] No [ ]

Explain \_\_\_\_\_

6. Where are distance learning activities conducted in your school?

Library	[ ]	Computer lab	[ ]
Classroom	[ ]	Distance learning room	[ ]
Other	_____		

7. Would you describe the attitude of your school's administration toward distance learning as an instructional tool as:

Very positive	[ ]	Negative	[ ]
Positive	[ ]	Very negative	[ ]
Neutral	[ ]		

8. Are funds for distance learning activities incorporated into your school's budget?

Yes [ ] No [ ]  
If so, what is the budgeted amount? \_\_\_\_\_

9. What kind of training is provided for distance learning activities?

In-services [ ]  
Workshops [ ]  
Reading material [ ]  
College or university classes [ ]  
Other \_\_\_\_\_

10. Do you feel that you have had sufficient training?

Yes [ ] No [ ]  
If not, in what areas do you wish you had more training? \_\_\_\_\_

11. Is your school's distance learning equipment used by the following? Check all that apply.

Administrators [ ]  
Board of education members [ ]  
Parents [ ]  
Community organizations [ ]  
Other \_\_\_\_\_

12. As the distance learning coordinator, your role is:

	Often	Sometimes	Never
Supervise class during DL activity	[ ]	[ ]	[ ]
Coordinate equipment usage	[ ]	[ ]	[ ]
Operate equipment	[ ]	[ ]	[ ]
Watch DL activity with students	[ ]	[ ]	[ ]
Program development	[ ]	[ ]	[ ]
Other _____	[ ]	[ ]	[ ]

13. Would you rate the instructional value of distance learning activities as:

Very effective instruction [ ]  
Effective [ ]  
Not very effective instruction [ ]  
Not at all effective instruction [ ]



22. What type of distance learning equipment do you use?

PictureTel Swiftsite [ ]  
Tandberg [ ]  
Desk top (computer) [ ]  
Other \_\_\_\_\_

23. What type of connection do you have?

ATM [ ] ISDL [ ]  
ISDN [ ] Other \_\_\_\_\_

24. Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

If you would like to receive a summary of my results, please  
fill out.

Name \_\_\_\_\_

E-mail address \_\_\_\_\_

Address \_\_\_\_\_

**February 29, 2000**

**Dear Distance Learning Coordinator:**

**I am a graduate student at Rowan University working on my master's thesis in School and Public Librarianship.**

**For my master's thesis I am conducting an inquiry into the ways in which interactive distance learning is used in elementary/middle schools.**

**Participation in this survey is voluntary and you need not answer every question. Completing the items in this survey, however, will help my research to better reflect the current role of interactive distance learning in education today. All responses will be kept anonymous and confidential.**

**Please complete the survey and return it in the enclosed, self-addressed envelope by March 20th. If you choose not to participate in the survey, please return it to me for my records.**

**If you have any questions, please contact me at the telephone number listed below, or contact my thesis advisor, Dr. Holly Willett, at Rowan University whose number is listed below. If you prefer, you may also e-mail either of us. Thank you for your time and cooperation.**

**Sincerely,**

**Linda Spano  
(609)383-6870  
spano.linda@pleasantville.k12.nj.us**

**Dr. Holly Willett  
(856)256-4759  
willett@rowan.edu**

**Reminder Letter**

**March 14, 2000**

**Dear Distance Learning Coordinator:**

**About two weeks ago, you received a survey on the ways in which distance learning is used for instruction in your school.**

**If you have not completed the survey yet, please take a moment to fill it out and return it to me in the enclosed envelope as soon as possible. All responses will be kept anonymous and confidential.**

**Thank you for taking the time to help me with my research.**

**Sincerely,**

**Linda Spano  
Graduate Student, School of School &  
Public Librarianship  
Rowan University, New Jersey**