DOCUMENT RESUME

ED 331 797 SP 033 017

AUTHOR Durham, John Richard; Sunal, Dennis W.
TITLE **The Enhancement of Teacher Education through the Use of Communication Technology.**
PUB DATE 16 Feb 91
NOTE 26p.; Paper presented at the Annual Meeting of the Association of Teacher Educators (71st, New Orleans, LA, February 16-20, 1991).
PUB TYPE Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Computer Networks; *Computer Uses in Education; Demonstration Programs; *Electronic Mail; Elementary Education; Field Instruction; Higher Education; Methods Courses; Preservice Teacher Education; *Student Teaching; Teacher Education Curriculum; *Telecommunications
IDENTIFIERS University of Alabama; University of Virginia

ABSTRACT

The University of Alabama set up a communication network pilot program to enhance the early childhood and elementary methods block in the College of Education. The pilot program incorporated electronic mail (E-Mail), a fax machine, and a microcomputer communications network. The network made possible instructors' clarifications of assignments, transmission of student progress reports, assistance in planning and implementing lessons, and other communications related to field placements. Some of the objectives were to save travel time and costs and to see if there would be any effect on students' success. Four schools participated in the project: Two schools with appropriate technology served as experimental sites; one school was a restricted experimental site; and one school was a control site using traditional supervisory methods. Each participant was asked to keep a log of interactions with others on subject matter, type of communication used (telephone visit, fax, computer network, etc.), and comments about the result of the interaction. The logs, student evaluative essays, interviews, and the Microteaching Skills Rating System provided the data for the study. According to the data analysis, 75 percent of the professional contacts were via computer network, the control school had the fewest contacts per student, and most contacts concerned lesson planning and classroom activity. A similar communication network system associated with the College of Education at the University of Virginia, as well as networks in schools, are also discussed. (IAH)

THE ENHANCEMENT OF TEACHER EDUCATION THROUGH THE USE OF COMMUNICATION TECHNOLOGY

John Richard Durham
Box 870231
The University of Alabama
Tuscaloosa, Alabama
35487-0231

Dennis W. Sunal
University of Alabama

Paper Presented at the National Meeting of the Association of Teacher Educators, New Orleans, Louisiana, February 16, 1991

TABLE OF CONTENTS

The Enhancement of Teacher Education Through the Use of Communication Technology

Introduction

The beginning of a new decade and the nearing of the twenty-first century have brought us out of the industrial era and into the technological age. This new age is centered around computers and communication technologies. Unfortunately, many of these technologies are still futuristic instruments for the vast majority of people, especially educators.

It is obvious that we are in the midst of this new era already and that many educators are unable or unprepared to teach with computers or other technologies in the classroom. Quality Education Data Inc., QED, has been tracking the number of computers in schools. The total has increased by 600% in the last six years alone and shows no sign of slowing down. The number of computers in schools has grown from almost 300,000 in the 1983-1984 school year to almost 2,000,000 in 1989-1990.

The use of other technologies such as interactive video, computer networks, and distance education programs are parts of many school programs. Many first year teachers as well as tenured teachers have had no experience with advanced technologies and are not using these technologies in their classrooms; and according to Hannofin(1985), the use of educational technologies improves comprehension skills.

Many teachers, educational administrators, university faculty, and parents are concerned that emerging technologies have been dispersed throughout the community, but that schools are doing little to pave the way for students. Businesses, the military, and many public service organizations are using technologies to speed up work, save time and money, and to improve productivity.

The time to adopt and utilize these new technologies in teacher education programs has arrived. An immense opportunity to increase educators' awareness of technologies is in teacher education programs. State of the art technologies such as interactive video disc, cd-rom and local area networks need to become standard equipment in teacher education programs in the 1990s. A large number of teachers will be retiring within the next ten years, so it is the responsibility of the teacher education programs to train future teachers in the use of educational technologies. Many current programs offer isolated courses in these areas, however isolated courses will not fulfill this need. Many educators believe that these technological advances should be used throughout the teacher education program, especially to improve communications between students and faculty.

Computer networks in the field of education have a wide range of uses. Most of these are centered around improving communication. Many universities and colleges already have computer networks on their campuses which have improved the quality and quantity of communication between faculty, staff and students. A few College of Education programs have computer networks that

link faculty with students at clinical placements sights. One of the most documented is the University of Virginia's Teacher Link program which incorporates Electronic-Mail on the computer network.

Electronic Mail

Electronic-Mail(E-Mail) is one method of networking computers that improves the quantity and quality of communication. E-Mail allows you to send and receive messages and share similar information such as group documents and announcements. There are many other advantages to E-Mail communication systems. E-Mail communication networks increase the frequency of interactions, improves productivity, removes the need for great amounts of note paper and computer paper, reduces the amount of telephone time greatly, and reduces the need for face-to-face interactions. One of the greatest advantages to E-Mail is that you can communicate with another person without that person being available at the exact same time. E-Mail systems can easily be linked by a Novel File Server, Fiber Octive Cables, or over telephone lines as long as the computers are equipped with modems.

Messages from all persons linked through E-Mail are sent over telephone lines or network cable to a centralized electronic mail facility, known as the electronic mailbox. All messages are stored here until a member of the network logs onto the system and calls up their messages. After messages are called up they are displayed on a computer screen and can be printed off or stored on a floppy disk.

Messages can be sent to a person sitting in the same room as easily as to a person 2500 miles away, often in a different country. Individual messages can be sent that contain "Eyes Only" material or messages can be sent to large numbers of people at the same time. Networks have proven to be most effective when large numbers of people can be accessed via the E-Mail network.

The following charts are typical screens that appear while using E-Mail. The opening menu provides the user with a wide variety of options. The most widely used functions are the F3 = E-Mail and the F4 = Calendar functions. Other options at this point on the network are Word Processing, Spread Sheets, Data Bases, Maps, Graphics and various tutorials. An example follows:

Network Applications
A) Word Processing B) Spread Sheets & Data Bases C) Maps D) Graphics E) Forms F) Tutorials
G) Logout H) Exit

F1=Help F2=Calc F3=E-Mail F4=Calendar

After choosing the F3 (E-Mail) function the following window appears. This provides the users with another list of options. It also informs you about the messages you have. At this point, you can either read your messages or prepare a message. The following is an example of the Mailbox Window.

CC: Mail MAILBOX WINDOWS John Durham

	MSGS	NEW		MSGS	NEW
INBOX	8	3	BULLETIN BOARD	0	0

MAIN MENU

READ INBOX MESSAGES
PREPARE MESSAGE
RETRIEVE MESSAGES
MANAGE MAILBOX
EXIT

Choosing the READ INBOX MESSAGES option will allow the network users to see the list of messages. This list states the name of the message's sender, the date that it was sent and a brief description of the topic. An example follows:

INBOX

8 BOB SMITH	2/5/91	739t	LUNCH
7 BOB SMITH	2/5/91	643t	ATE CONFERENCE
6 JACK WAY	2/3/91	947t	TRAIN TRIP
5 SHELLI PRICE	1/29/91	2113t	GRAPHICS
4 KC JONES	1/28/91	939t	GASDEN TRIP
3 CHRIS DURHAM	1/26/91	160t	STUFF!!!
2 DAVID FARRAR	1/24/91	1213t	TEACHING
1 SUKERO ITO	1/24/91	259t	CALL ME!

After checking your messages you can now prioritize them according to your preference. Once you have read a message you also have the option of deleting it from your INBOX. The following chart is an example of an E-Mail message.

```
{8} FROM: BOB SMITH   2/5/91   2:02PM  (583 bytes: 6 ln)
 TO: John Durham
 SUBJECT: LUNCH

 - - - - - - - - -    MESSAGE CONTENTS  - - - - - - - - - -

  Are you free for lunch today?  If so, send me an E-Mail
  message.  We need to talk about our upcoming presentation
  for the DEAN.  How about going to WINGS & THINGS?

  LOVE YOUR NEW CAR!  LET'S TAKE IT!
```

University of Alabama Pilot Project

The University of Alabama's College of Education has been looking for a method to improve the existing communication system. The existing system relies heavily on travel time, telephoning, and meetings. The College of Education is also looking to improve communications between practicing teachers, student supervisors, and faculty during the clinical placements of the participants involved with the undergraduate early childhood and elementary education programs. The existing communication system involved a great deal of driving between the College of Education and the placement sights, telephoning, and late afternoon and evening office hours for instructors and anxious students. This made many visits to the campus for faculty and students. Many of these trips to campus, after a day in the classroom, resulted in the students not finding the appropriate faculty member available. Returning telephone calls is also difficult as practicing teachers

are in classrooms far from the office telephone and can not be reached easily, and course instructors are busy with teaching, meetings, and numerous clinical supervisions.

The need for frequent communication between everyone involved in the early childhood and elementary methods block is essential for its success. This block consists of 18 semesters hours of classwork and 4 weeks of clinical placements. The methods course work is made up of Reading, Language Arts, Social Studies, Science, Math, and Classroom Management. The amount of work, studying, and research can be overwhelming if students are not organized. Needless to say, effective communication is necessary for its success, students must be able to communicate with their instructors. This clinical placement is also the first time that most students have been asked to participate in an elementary school setting for an extended period of time for the entire school day. Students are also planning and implementing unit and lesson plans almost daily.

A pilot study incorporating E-Mail and a fax machine was set up to provide an alternative to the existing communication system in the early childhood and elementary methods block during the spring semester, 1990. The pilot project included a microcomputer communications network to be installed and used during the four weeks of the students' clinical placements. This project would incorporate existing equipment from the Center of Educational Technology located in Temple Tutwiler on the campus. It would also require the use of three IBM computer, three fax machines, and a

variety of existing telephone lines. (Sunal, 1990)

Hardware and Software Used in Pilot Project

This Local Area Network (LAN) consisted of IBM XT personal computers with 256K hard drive and internal modems. Any of the Macintosh personal computers with a modem hook-up would work just as well. The file server was an IBM AT personal computer with a 640K hard drive and a modem. Each of these computers had PC Anywhere programs installed onto their hard drives. The file server was using the Novell Network software package. Each of the site computers was running on E-Mail Program software.

Purpose of Pilot Project

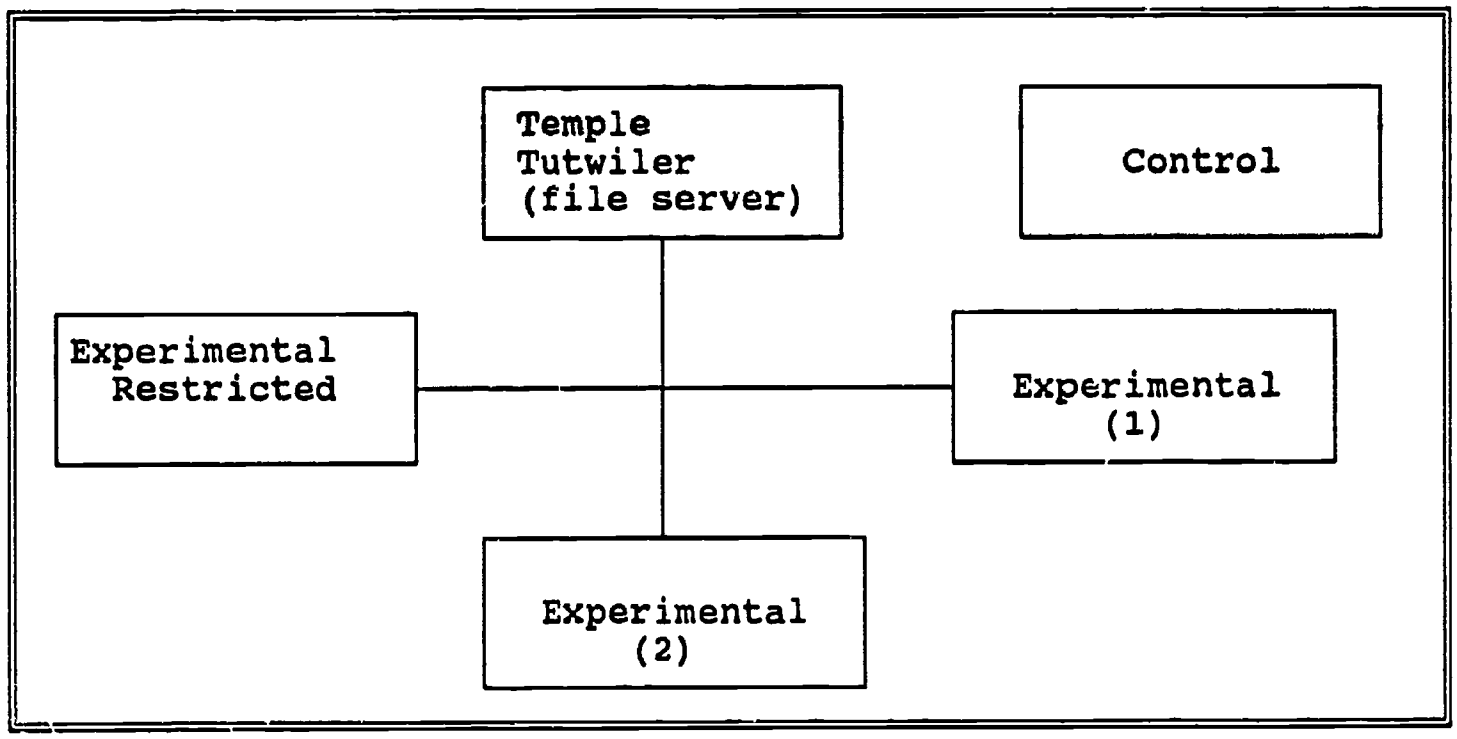
The main intention of this undertaking is to enhance the quality of our teacher education program, and more specifically the field placements which are difficult to administer, evaluate, and communicate with. The microcomputer network involves the instructor's clarifying of assignments, student progress reports, assistance in lesson planning and implementation of lessons, identifying materials and ideas for lessons, and other concerns that relate to the field placements. Some of the underlying objectives of the study are to see the amount of travel time and costs for faculty members that is saved and the effects of communications on students' success.

Staff and Student Training

The proposal was excepted by the College of Education and implemented. Training sessions were scheduled for students, faculty, and graduate student supervisors before the clinical experience began. During these session, which lasted 30-40 minutes, a university technology specialist trained faculty and graduate student supervisors in the use of the computer network and the fax machine. Then the graduate supervisors trained the methods students for whom they were responsible. When the methods students went out to their clinical sites, they would be responsible for training their cooperating teacher.

Clinical Sites

The four clinical sites differed in a variety of ways including the location of the communication hardware, access time, presence of supervisors, and school administration support. The sites were elementary schools located in a mixed rural and urban (small city) environment. The students came from a mixture of blue collar and professional neighborhoods. Three types of sites were used in the study, control(1 school), experimental(1 school), and experimental restricted(2 schools).



The control site differed from the other sites in that it did not have the communication technology. This was the only factor that made it different from the other schools. The students, supervisors, and faculty at the sites relied upon the existing communication modes: telephoning, personal visits, and third party correspondences.

The experimental sites involved two schools. These two schools were similar in traits to the control site except that the project participants had access to the communication technology. Participants had easy access to the technology and it was available at all times. The principal and supervisor at these locations were excited about the communication project and constantly urged students to communicate through the E-Mail and fax machine before attempting a more traditional mode.

The experimental restricted site had the communication technology just as the experimental sites did, but they were restricted to the amount of time that they could use the technology. The administrators of this school did not allow one of the school's telephone lines to be tied up all day. So participants were restricted to two hours, from 7:30am to 8:30am and from 2:30pm to 3:30pm. School was in session from 8:00am until 3:00pm each day so this limited the project participants to one hour of use, unless they had a free moment during the day in which to use the communication technology.

Data Collection

Data were collected in a variety of quantitative and qualitative methods. Data collection included surveys(pre and post), interviews, narrative journals, and observations before, during, and after the clinical experience with the communication technology. The survey instruments given before and after the clinical experience gathered data on the participants previous experience with communication technologies and their attitudes and perceptions about using a communication network.

Each participant in the project was asked to keep a log of their interactions with others within the project. This log included subject matter, type of communication used(telephone, visit, fax machine, computer network etc.), and comments about the results of the interaction.

The students were asked to write an essay about their perceptions of the clinical placement, the communication network, supervision, and their classroom experiences. The focus of the essays centered mostly around the communication which occurred during the clinical experience.

Other data sources included interviews and the Microteaching Skills Rating System(MSRS). An explanation of the MSRS which includes reliability and validity measures has been reported in previous studies (Sunal and Sunal, 1985). A complete analysis of this project's data can be found in a paper presented at the Annual Meeting of the Mid South Educational Association, 1990. (Sunal, 1990)

Data Analysis

Several interesting observations came from the data analysis. First, about 75% of the professional contacts (students to faculty, supervisor to faculty, supervisor to student, or faculty to students or supervisors) used the communication network. The remaining communication were by visits to campus and clinical sites, telephoning, and third party correspondences. Second, the experimental and experimental restricted schools had a greater number of contacts per student than the students at the control school. Third, most contacts concerned lesson planning, classroom management, and selection of activities.

Conclusion and Implications

In completion of this pilot project various assumptions were made. It was concluded that communication between The University of Alabama faculty and the students at clinical placements increased in number and in ease. It also increased the spontaneity of communication between the network parties. It was also concluded that the network had direct effect on lesson planning and performance in the classrooms. The availability and location of the network hardware did effect the amount of time spent communicating with the use of technology. The in-school supervisor and the school's administrator also had an impact on the students' use and attitudes about the communication technology.

A distinctive characteristic of this project is that it incorporates a variety of technologies. This project combined the computer network and fax machine. This combination of technologies has an even greater potential than the project's organizers had anticipated. Many students and faculty members use a word processor when writing. The fax machine allowed network users the flexibility to use whatever word processing program they preferred. This saved the network users from having to learn a whole new word processing program. The project is now part of the methods block and is still being monitored, adapted, and up-dated.

TEACHER-LINK AND BEYOND AT THE UNIVERSITY OF VIRGINIA

Introduction

The Curry School, The University of Virginia's College of Education, first began looking at E-Mail and its capacity for instructional use in 1984. A grant led to a joint study sponsored by the Curry School of Education and the IBM Academic Information Systems. The study established a three way communication network to reinforce the existing communication system for student teachers. In 1989, 80 teachers and 40 student teachers had access to a mainframe computer through IBM laptop computers with internal modems in each classroom. These computers linked students, teachers, and faculty via telephone lines.

Numerous unseen communication links evolved from the initial Teacher-LINK study. Students at the Curry School can now access the network from dormitories and network facilities in the education building. Students can send papers to classmates and or professors over the E-Mail. Electronic Bulletin Boards are also part of the system. This allows open discussion about a myriad of topics. Electronic Bulletin Boards differ from E-Mail in that they are public information systems for larger numbers of people.

Enhancing the Teacher Education Program

E-Mail is part of the undergraduates learning experience at The Curry School from day one. Upon entering the school each student receives an E-Mail Identification Code. This code stays

with each student until they graduate, drop out, or change careers. This E-Mail link has a wide variety of uses. It can be used for informal communications between students and faculty. The network also has many formal uses such as connecting field placements with professors and supervisors on campus, connecting students with professors without face to face meetings, and research purposes. Linking all the clinical placement sites allows students to share lesson plans, support each other during difficult times, and brainstorm with their peers.

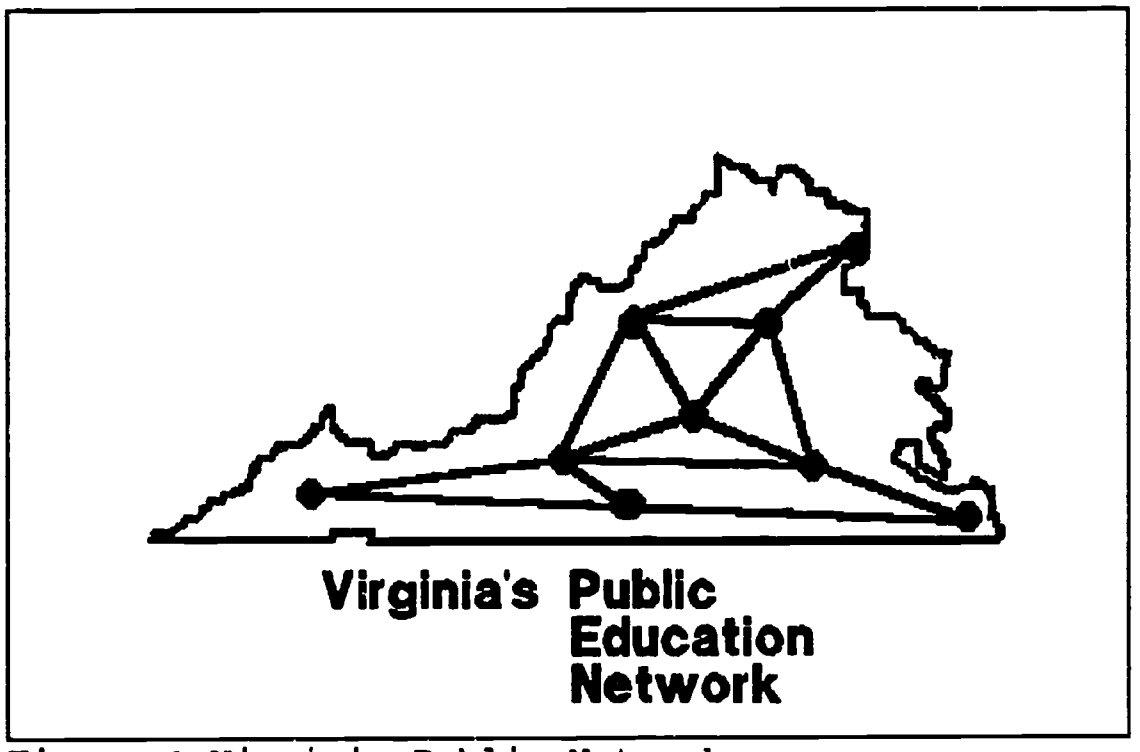


Figure 1 Virginia Public Network

Electronic Academic Village of the Near Future

Virginia is in the process of connecting nearly 2000 schools in 137 school district, with more than 10,000 terminals. When the network is completely installed, it will link all kindergarten classrooms through graduate schools in the state. The main intention of this network is to improve communication among administrators at all levels, but it will also function as an instructional tool. As an instructional tool students will transmit and exchange scientific data, geography and social studies information, and language arts activities. Students in Virginia's public schools are linked to a computer network that has no boundaries. It extends all over the state of Virginia, the United States, and the world.

Teacher Education Networks

Many reports about the effects of computers, communication technologies, and other technologies in teacher training programs have been reviewed by Brooks and Kopp (1989). In the 72 studies that they reviewed, they found a lack of research relating to practicing teachers and inservice teacher education. An analysis of the above research and other current literature shows a lack of effective use of networking and other technologies within teacher education programs.

The preceding literature includes descriptions of several local area networks (LAN) connecting university campuses with clinical placement sites. The EDTNET at Miami University in

Oxford, Ohio, is described. EDTNET links student teachers with staff supervisors with an E-Mile and conferencing system, a curriculum content data base, university faculty, and bulletin board announcements. Supervisors participate in advising from their offices as well as from their homes. (Perry, 1987) Mich: EdCorps, the University of Michigan's network connects all of the colleges of education throughout the entire state. (Swift, 1988) The Graduate School of Education at Harvard has networked first year teachers with university faculty and other first year teachers in order to enhance the first year teaching experience.

Networks and other communication technologies are only beginning to be used in teacher education programs. If practicing teachers are expected to be familiar with and innovative in using LAN technology they deserve to be introduced to them early and often in their educational training. This practice with technologies could easily be incorporated into teacher education programs by: 1) university faculty modeling the use of communication technologies throughout the undergraduate education classes and 2) using LAN to enhance the earliest clinical experiences through the student teaching experience. These two methods would create new instructional opportunities and learning situations for the practicing teachers and students. It would also assist the practicing teachers in developing their personal knowledge base and reflective decision making skills.

EDUCATIONAL NETWORKS IN SCHOOLS

Introduction

Many networks are being used to improve classroom instruction right now. Teacher Education programs should include networking and its uses as part of their methods instruction. The opportunities and information that networking provides the classroom teacher are only being realized now.

Each new technological advancement brought with it excitement. This excitement held students' attention for a while, but most advances had students interacting in a passive mode. Networks are anything but passive. They allow for a variety of different interactions, student to student, teacher to student, groups of people etc.

Computer Chronicle Newswire

Networks are being used in all content areas and at most grade levels. A good example of this is the Computer Chronicle Newswire. This network links third and fourth graders in Alaska with students of the same grade levels in California. These students share information about their schools and communities. Each school publishes a newsletter that consists of articles and editorials written by students and sends it off over via the telecommunications network. This program gives elementary students and teachers the opportunity to use network communications in a practical setting. (Congress of the US, 1988)

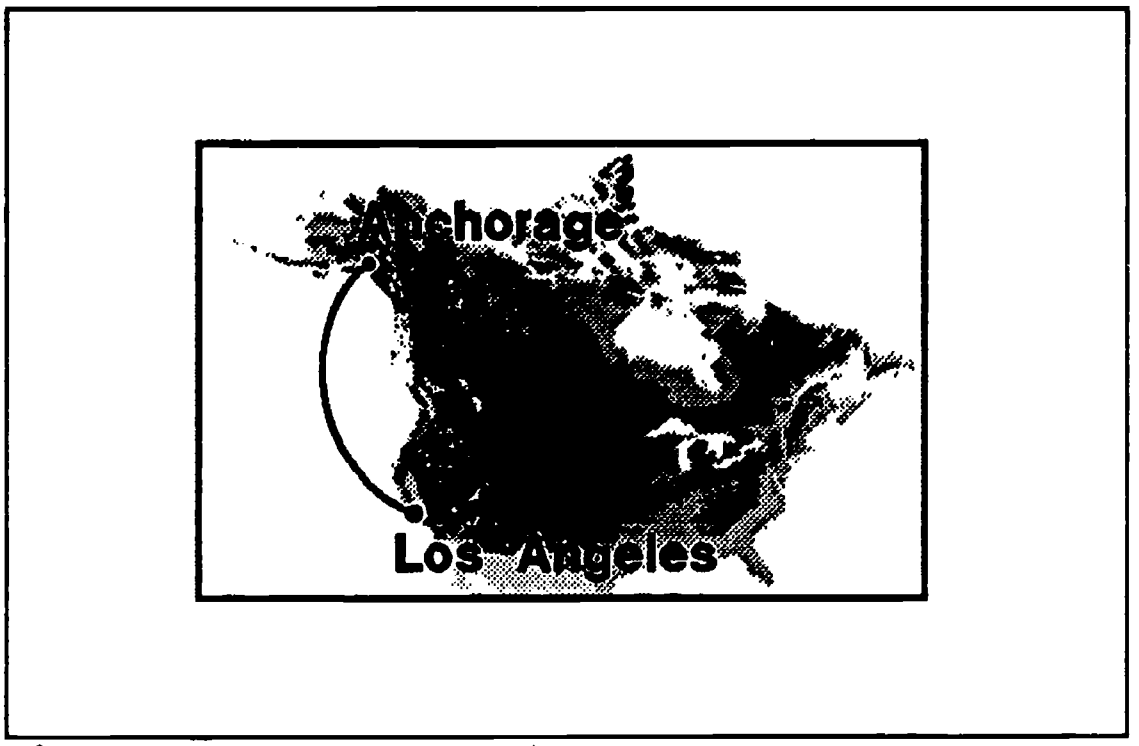


Figure 2 Computer Chronicle

De Orilla a Orilla

De Orilla o Orilla (From Shore to Shore) is a network that links limited and non-English speaking students in New England and California with native Spanish speakers in Puerto Rico and Mexico. This program was originally set up to improve the students' attitudes about school. There is high hope that this kind of network will alter the high drop out rates of non-English speaking students. (Congress of the US, 1988)

Earth Lab

The goal of the Earth Lab project, developed at the Center for Children and Technology at Bank Street College of Education, was to

develop an environment of cooperative learning in the collection and analysis of scientific data. This project received $785,000 from the National Science Foundation (NSF) for the implementation and study of the project. The project included databases, report writing, and communication systems. The test site for this project was located in Harlem, but included classrooms in New York, Hawaii, and Boston.

The researchers noticed a significant increase in the amount of student cooperation and collaboration as compared to activities before the study began. During the project students worked together, thought through their problems, gathered their own data instead of relying on textbooks and teachers, and came to their own conclusions about the topics being studied.

The network allowed the students to compare data with other students working on the same projects. This long distance communication provided the students with a meaningful reason to write. The ease with which they could send letters over the network motivated them to write more, especially in science and social studies classes. Students found out during this project that writing is a way of communicating, as opposed to writing papers for an assignment and a grade. (Congress of the US, 1988)

CONCLUSION

Local area networks (LAN) have only recently been used in educational settings, more specifically in Teacher Education Programs. However, the research on the programs that are currently

operating is overwhelmingly positive. Students are learning how to use communication technology in meaningful situations, they are working cooperatively, improving their test scores, staying in school longer, and improving their self images. However, many educators have cautioned its use as a cure all for all public school problems.

Educational technologies need to be used in effective educational settings that are orderly and disciplined, have clear goals and high expectations for students and staff, and are collaborative. This effectiveness is also fostered by an instructional leader, parental support and maximized learning time. (Stellar, 1988)

Networks have the ability to link persons all over a school, city, state, country, and the world. The educational possibilities are only just being realized. Teachers, practicing teachers, students, and administrators are sharing ideas and data for a vast amount of reasons. Many of these communications are in meaningful applications.

Teacher Education Programs should, if they haven't already, implement networking into their programs. Networking connects people with data bases, community leaders in science and other fields. It also helps with administrative duties and secretarial tasks.

Technology is quickly changing and that in itself is creating a problem. Computer networks, CD-ROM, and interactive video disc systems are solutions to problems and also additional obstacle to

face for teacher educators, teachers, and students. Please, let's not forget what we know about effective teaching, and completely replace it with educational technology. (Marker, 1989)

REFERENCES

Brooks, D., & Kopp, T. (1989). Technology in teacher education. Journal of teacher education, 18(7), 2-8.

Bull, G., Hill, I., Guyre, K., & Sigmon, T. (IN PRESS). Building an electronic academical village. Educational Technology.

Congress of the US, Office of Technology Assessment. (1988). Power on new tools for teaching and learning, (GPO Stock No. 052-003 -01125-5). Washington, DC. US Government Printing Office.

Hannofin, M.J. (1985). Empirical issues in the study of computer -assisted interactive video. ECTJ, pp. 235-245.

Marker, G., & Ehman, E. (1989, March). Linking teachers to the world of technology. Educational Technology, pp. 26-30.

Perry, B., & Brooks, D. (1987). EDTNet Department of teacher education computer network grant. Miami, OH: Miami University Graduate School and Apple INC.

Steller, A.W. (1988). Effective schools research: Practice and promise, Bloomington, Indiana: Phi Delta Kappa Educational Foundation.

Sunal, D., Sunal, C.S., McFadden, A., & Price, B.J. (1990, November). Instructional organization impact of local area network technology on a teacher education program. Paper presented at the annual meeting of the Mid South Educational Research Association, New Orleans, LA.

Sunal, D.W., & Sunal, C.S. (1985). Teacher cognitive functioning as a factor in observed variety and type of classroom teaching behaviors. Journal of research in science teaching, 22, 631-648.

Swift, K. & Coxford, A. (1988). Computer networking for student teachers. The innovator, 19(3), 1-5.