1-1-1997

Use of the Internet Connection in Selected Illinois Schools

Dean Keller
Eastern Illinois University
This research is a product of the graduate program in Educational Administration at Eastern Illinois University. Find out more about the program.

Recommended Citation
http://thekeep.eiu.edu/theses/1797

This Thesis is brought to you for free and open access by the Student Theses & Publications at The Keep. It has been accepted for inclusion in Masters Theses by an authorized administrator of The Keep. For more information, please contact tabruns@eiu.edu.
THESIS REPRODUCTION CERTIFICATE

TO: Graduate Degree Candidates (who have written formal theses)

SUBJECT: Permission to Reproduce Theses

The University Library is receiving a number of requests from other institutions asking permission to reproduce dissertations for inclusion in their library holdings. Although no copyright laws are involved, we feel that professional courtesy demands that permission be obtained from the author before we allow theses to be copied.

PLEASE SIGN ONE OF THE FOLLOWING STATEMENTS:

Booth Library of Eastern Illinois University has my permission to lend my thesis to a reputable college or university for the purpose of copying it for inclusion in that institution's library or research holdings.

I respectfully request Booth Library of Eastern Illinois University not allow my thesis to be reproduced because:

________________________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________________________

Author ___________________________________________ Date ______________________
Use of the Internet Connection
in Selected Illinois Schools

BY
Dean Keller

THESIS
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
Specialist in Educational Administration
IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1997
YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
THIS PART OF THE GRADUATE DEGREE CITED ABOVE
Abstract

The purpose of this study was to investigate the practice of school districts connecting to the internet within the Southern Illinois Instructional Technology Association. The research questions for this study were: (a) Should an internet connection be initiated, continued, improved, or terminated? (b) To what extent is connecting to the internet cost effective for schools? (c) To what extent do increased program expenditures increase the use of the internet connection by staff and students? (d) To what extent does the program achieve its intended objectives?

The review of literature indicated that school districts can effectively use an internet connection as a resource for students, staff and administration. Those school districts initiating a successful connection have also budgeted funds to train staff members in the use of the internet.

A survey instrument was developed by the researcher to seek information related to the research questions. The participants were the 76 superintendents of the Southern Illinois Instructional Technology Association. The geographic area of the sample was from Effingham, Illinois, to the southern tip of Illinois. The survey was mailed to the 76 superintendents of the target population in November of 1996.

The study found that 68% of the respondents were connected to the internet. Those districts connected to the internet also reported an average assessed valuation two times as high as those districts not connected. The study found that it can be cost effective for school districts to connect to the internet. The study also found that the amount of money spent on the internet connection and training affects the use of the connection. The findings of the study will be
used to compare the status of the internet connection in the Effingham Unit 40 Schools to the ideal. The results of this study will help school districts officials to ascertain whether or not an internet connection should be a part of their educational program. The researcher concluded that the funds expended on the internet connection and training in its use affect the number of students and staff using the connection.
# Table of Contents

Abstract ................................................................. i

List of Tables ........................................................... iii

Chapter 1: Overview of the Problem .................................. 2

  Statement of the Problem ........................................... 2
  Limitations .......................................................... 2
  Assumptions of the Study ......................................... 3
  Definition of Terms ............................................... 3

Chapter 2: Rational, Related Literature and Research .............. 9

  Rationale ......................................................... 9
  Review of the Literature and Research .......................... 9

Chapter 3: Design of the Study ...................................... 26

  General Design of the Study .................................... 26
  Sample and Population .......................................... 26
  Data Collection and Instrumentation ............................ 27
  Data Analysis ................................................... 28

Chapter 4: Results .................................................... 31

  Results for Research Question a ............................... 37
  Results for Research Question b ............................... 37
  Results for Research Question c ............................... 37
  Results for Research Question d ............................... 38

Chapter 5: Summary, Findings, Conclusions, and Recommendations .... 39

  Summary ......................................................... 39
  Findings ......................................................... 39
  Conclusions ..................................................... 40
Recommendations ............................................. 40
References .................................................. 42
Appendix A--Charges Incurred ............................. 44
Appendix B--Survey Document ............................ 45
Appendix C--Survey Cover Letter ......................... 47
List of Tables

Table 1--Schools Connected to the Internet ................................................. 32
Table 2--Average Assessed Valuations .......................................................... 32
Table 3--Comparison of Connections Costs to Use ......................................... 33
Table 4--Cost of Training Compared to Staff Use ........................................ 34
Table 5--Priorities .......................................................................................... 35
Table 6--Priority of Technology Purchases By Those Connected .................... 35
Table 7--Goal of the Connection ................................................................... 36
Chapter 1

Overview of the Problem

Statement of the Problem

In 1993, Effingham Unit 40 School administrators created a technology committee which consisted of a small group of teachers and administrators mapping a plan for the district. This group expanded to include the entire staff. One of the committee's goals was to connect one of the eight district sites to the internet and then develop a wide area network. The wide area network would then provide each site with internet services. The cost of this project was approximately $30,000.00 for installation, provider fees, and line charges for one year.

The purpose of this study was to investigate the practice of school districts connecting to the internet within the Southern Illinois Instructional Technology Association. The research questions for this study were: (a) Should an internet connection be initiated, continued, improved, or terminated? (b) To what extent is connecting to the internet cost effective for schools? (c) To what extent do increased program expenditures increase the use of the internet connection by staff and students? (d) To what extent does the program achieve its intended objectives? Results from the findings of the study will enable the administration to make the decision to initiate or maintain such a connection, improve the connection, or discontinue the connection.

Limitations

The factors placed outside the scope of this study are as follows:

1. Large rural areas do not have the same access to the internet that metropolitan areas do. This is controlled by the telephone companies through the service provided and the fee structures in place.
2. The knowledge level of school officials, staff, and students in the use of the internet.

3. The finances available to districts to initiate and maintain an internet connection.

4. The enrollment of school districts within the Southern Illinois Instructional Technology Association.

Assumptions of the Study

The researcher made the following assumptions:

1. It is assumed that school officials are aware of the State’s emphasis on connectivity to the internet.

2. School district officials are aware of the internet and its capabilities.

3. School districts have connected to the internet to provide students and staff with greater research material, increased communication capabilities, and electronic mail.

Definition of Terms

The following presents operational definitions:

**Application.** A software program used by a computer such as a word processor, spreadsheet, or database. Internet applications may be host-terminal, file-transfer, or computer-network communications based.

**Archie.** A program to help locate files accessible through file transfer protocol (ftp) on the internet.

**Arcnet.** A network topology used in the local area and wide area network when distances greater than one mile are spanned.
Assessed Valuation. The value of the property within a school district. This value is established by the county supervisor of assessments and includes all taxable properties within the school district.

Baud. The rate at which information is transferred from one computer to another computer. Baud rates indicate signals per second whereas bps refers to bits per second. Mbs (mega bits per second) connection for distances of one mile or less.

Fiber Optic. The most modern form of dedicated line. These lines are capable of providing speeds greater than 45 Mbs and carry an optical signal instead of the usual electrical signal.

File Server. A computer on a local area network or wide area network that is used as a massive storage device for the network. In the client server mode, the file server is used to store files, and the personal computer or workstation does any calculations required by the application.

FTP. An abbreviation for File Transfer Protocol. FTP is used to connect two computers and transfer data between the two computers. This is an older, but standard, internet application.

Gopher. An internet application using menus to access information that is available. The information found on gopher servers is text only.

Graphical Interface. The use of pictures in the presentation of information to the end user of the computer. Two very popular graphical interfaces are the Macintosh and Microsoft Windows.

Graphics. Pictures, drawings, and diagrams used to present information on the computer. These graphics may be still pictures, animations, or video.
**Hypertext.** Hypertext is a text that offers alternatives to sequential reading. Hypertext documents are texts that contain links to other programs containing graphics, video, or sound that would enhance the reader's understanding of the text.

**Host.** A computer physically connected to the internet.

**Internet.** A global connection of computer networks that is both a medium for communication and a reference resource for virtually any subject.

**LAN.** An abbreviation for Local Area Network. A LAN is a collection of file servers, personal computers, printers, scanners, modems, routers, and bridges used to transfer information. The primary objective of the network is to maximize the use of resources by sharing the use of the resources and eliminate as much duplication as possible.

**Leased lines.** Telephone lines not requiring "dial up" to access. Telephone lines are typically leased according to their distance; they can be analog or digital, and require no long distance services. Leased lines are typically 56k or greater and more expensive than dial up. These lines are great for connecting a LAN of 5-32 terminals.

**Modem.** An abbreviation for modulator/demodulator. This piece of computer equipment changes the digital signal of the computer to an analog signal capable of traveling over standard telephone lines. The modem can be seen in both dial up and leased line connections. The modem is the primary way of connection to the internet at home. Today's modems commonly have speeds of 9,600, 14,400, 19,200, and 28,800 baud.
Mosaic. A software used for navigating the World Wide Web. Mosaic has a graphical interface and requires a Macintosh or Windows based terminal. Mosaic is available on the internet through ftp.ncsa.uiuc.edu.

Netscape. A software used for navigating the World Wide Web. Netscape has a graphical interface and requires a Macintosh or Windows based terminal. Netscape has become a very popular web browser since 1994.

Network. A group of computers and associated devices that are connected by communications facilities. A network can involve permanent connections, such as cables, or temporary connections made through telephone links. A network can be small consisting of a few computers, printers, and other devices; or it can be composed of many small and large computers existing over a vast geographical area. The network exists to provide computer users with a means of communicating and transferring information electronically.

Novell. A family of local area network operating system products produced by Novell Incorporated. The operating system is designed to run on IBM PC's and Apple Macintoshes. Novell Netware allows users to share files and system resources such as hard disks and printers.

Protocol. A mutually agreed upon set of conventions that handle the delivery of messages from source to destination on the internet. Protocols may choreograph the movement of the messages from point A to point B, or they may "massage" messages to ensure their integrity.

RAM. An acronym for Random Access Memory. This memory is the computer's working memory and is temporary in nature. RAM is reusable and can be used for different needs and times.
**ROM.** An acronym for Read Only Memory. The ROM of a computer is written at the factory. The computer cannot change the contents of ROM as it can with RAM.

**Router.** A router is a piece of computer hardware used to connect two differing network topologies such as arcnet to ethernet, ethernet to token ring.

**T1 Line.** A digital telephone line. T1 lines are generally more expensive than leased lines. The 1.544 Mbs transmission rate of the T1 line makes it very useful for graphics transmissions. The 1.544 Mbs is equal to roughly 94 screenfuls to data per second.

**T3 Line.** The T3 telephone line makes up the backbone of the internet across the United States. The T3 line has a transmission speed of 45 Mbs or 2,800 screens of information per second. Major cities connected by T3 since 1991 and forming the internet backbone are: Hartford, CT; New York, NY; Washington, D.C.; Greensboro, NC; Cleveland, OH; Chicago, IL; St. Louis, MO; Houston, TX; Denver, CO; Seattle, WA; San Francisco, CA; and Los Angeles, CA.

**TCP/IP.** An acronym for Transmission Control Protocol/Internet Protocol. The scope of TCP/IP is to control the flow of the information over the internet. Information is sent in packets that are usually 1,500 bytes in size. TCP/IP ensures that packets are in the proper order and not garbled.

**Technology.** The use of computer hardware and software to achieve educational objectives.

**Technology Plan.** A plan to use computer hardware and software in an educational institution to achieve educational objectives.

**Telnet.** A unix program designed to log in to another computer on the internet. The use of telnet may require a password to access the information at the remote site.
Unix. A multiuser, multitasking, operating system originally developed by Ken Thompson and Dennis Ritchie at AT&T Bell Laboratories in 1969 for use on minicomputers. Unix is considered powerful because it is not written to be machine specific like other operating systems. Unix is available in several forms: AIX for IBM RISC based computers, A/UX for the Apple Macintosh, and Mach for NeXT computer. UNIX is found to be widespread on the internet.

Veronica. An acronym for Very Easy Rodent-Oriented Netwide Index to Computer Archives. It performs for Gopher the same services that Archie provides for ftp. It is a searchable index of all the titles of menu items available on gopher servers throughout the internet.

Voice-grade line. A type of telephone line used for dial up access to the internet. These lines are analog, inexpensive, good for four terminals or less, poor for graphics, and require a long distance vendor.

WAN. An acronym for Wide Area Network. A wide area network is a group of LAN's connected by some type of transmission media. That media could be dial up, ISDN, leased line, T1, T3, fiber optic, or wireless.

Web browser. A software designed to navigate the World Wide Web.

Chapter 2

Rationale, Related Literature and Research

The purpose of this study was to investigate the practice of school districts connecting to the internet within the Southern Illinois Instructional Technology Association. The research questions for this study were: (a) Should an internet connection be initiated, continued, improved, or terminated? (b) To what extent is connecting to the internet cost effective for schools? (c) To what extent do increased program expenditures increase the use of the internet connection by staff and students? (d) To what extent does the program achieve its intended objectives?

Rationale

The rationale for this study was predicated upon the need of the researcher to determine if an internet connection was to be a part of the Effingham Unit 40 technology plan. The research questions were generated by the following concerns: (a) The first year costs for Effingham officials to connect the entire district to the internet was approximately $30,000.00. (b) This cost seemed high in comparison to other expenditure needs of the district. (c) Previous technology purchases in the district had not been utilized at expected levels by staff and students. (d) Effingham Unit 40 had limited funds available for instructional technology purchases. Results from this study should enable the administration to make an informed decision as to whether an internet connection should be initiated, continued, improved, or terminated.

Review of the Literature and Research

To determine if an internet connection should be initiated, continued, improved, or terminated an examination of what the internet is and how the
internet could be experienced is required. The internet began with the development of Advanced Research Projects Agency (ARPANET). ARPANET was a network designed by Advanced Research Projects Agency, which was introduced in 1969. Researchers soon found that it was desirable to connect to other networks, and this required the development of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite in 1983. The internet is a worldwide collection of thousands of computer networks that can intercommunicate. This communication is made possible by the language spoken by all connected computers. This language is known as TCP/IP. TCP/IP is a protocol suite that directs the flow of information from one computer to another computer.

National Science Foundation Network (NFSNET) began to provide the backbone of the internet to Supercomputing Centers in 1986. Since that time the NFSNET has expanded the scope of its service to academic and commercial communities. NFSNET is a network of networks and a part of the internet. Other networks found on the internet include: CompuServe, MCI Mail, BITNET, FIDOnet, UUNET, and USENET. These networks include other networks such as CREN/CSNET, DDN, ESNET, NASA, and Terrestrial Wideband Network. This listing is just a few of the networks that are a part of the internet.

The internet began as a way for Department of Defense researchers to communicate. As time went on, the internet outgrew the Department of Defense and became global. It is now an indispensable tool for academic research and is spilling into homes at an increasing rate (Falk, 1994). Today it is estimated that over 12,000 networks are on the internet and growth takes place at such a rapid rate that infrastructure cannot keep up. The average home owner can now connect
to the internet through such providers as America On Line, CompuServe, or numerous local providers.

The rapid growth of the internet and its use have created an ever-changing pattern of costs and services to be accessed. The range of services could be from no service to a fiber optic high speed connection costing $5,000 per month.

There are several categories that can be used to describe projects using the internet and other networks. Examples of these projects include real-time (interactive), electronic mail, and bulletin boards. Interactive projects are usually informal and offer immediate feedback, such as a telephone conversation. Electronic mail is comparable to sending a letter. A bulletin board is a forum for the discussion of a topic and usually involves large numbers of people.

An interactive project involves a great deal of work and demands the most of available resources. "Chat" is an example of such a project. Chat refers to a setup whereby two or more people can communicate directly. As one user types a message on the screen, all other participants can see what is being typed. To chat, one must locate a host such as Cleveland Free Net. The hard part of the chat project is coordinating the parties (NCSA Educational Group, 1995).

Electronic Mail is physically delivered faster than regular mail, but the response depends on the frequency with which E-mail is checked. If a letter is sent on Tuesday, but the recipient only checks E-mail on Wednesday, the response will not occur until Wednesday at the earliest.

Bulletin Boards seem to be the middle ground between chat and E-mail. News groups are an off shoot of the bulletin board. These groups are composed of people dedicated to a specific issue such as: alternative lifestyles, education issues, comic books, etc. A message posted on a bulletin board or with a news group has
the potential to reach millions of readers. A response within a day or so is not uncommon (NCSA Education Group, 1995).

The first level of internet use is the UNIX command line. UNIX is a language developed in 1969 at AT&T Laboratories. This involves logging onto a computer and then accessing whatever contents are available. The UNIX language includes such features as: mail, telnet, and ftp. UNIX was developed as a true network, multitask, multiuser operating system. This allows workstations to be connected to a file server and share resources, applications, and data. The UNIX command telnet: %telnet optimism.wspqd.com connects a workstation to a host named optimism. This process is referred to as logging in. The person logging in will require a password and a valid login name. Once into the system the host will provide a menu or description of how to access the available files. The UNIX command ftp: %ftp optimism is the command to transfer files between the connected workstation and the host. The ftp command will also require a proper login name and password. Archie is a program to locate files that are available through ftp on the internet. The following was an example of the use of these tools (Falk, 1994):

To find the CIA World Fact Book, use the command: %archie factbook.

The host would response with: Host bric-a-brac.apple.com

Location: /alug

DIRECTORY drwxr-xr-x

512 May 14 1994 factbook

This information allowed the user to ftp the host bric-a-brac and access the CIA World Fact Book. All the information available through this process is only text.
A level above the command line interface described above is the gopher interface. The Gopher is a menu driven program that provides access to many of the internet's features. The use of the Gopher does not require the user to be familiar with UNIX commands. Veronica is the program that allows a search of the gopher space. Veronica will search the gopher space for "factbook" in the same way that Archie searches internet for files available through ftp. The difference is that Veronica is menu driven (point and click the mouse) versus the command line interface of Archie. Veronica would produce a series of menus to be opened and examined for finding the CIA World Fact Book.

The third level of experiencing the internet is the World Wide Web, or graphical interface. A Web connection requires a 80486 based processor and the Windows platform or a Macintosh computer. The Web or WWW is composed of hypertext. Hypertext is a system of cross-referencing and retrieving related documents. Hypertext is loaded and read as any other document, with the exception that cross-references are highlighted. The mouse is used to click on the highlighted text to load the cross-referenced document. That document could be text, video, sound or graphics.

AT&T marked its tenth anniversary of the divestiture in 1994. Few predicted the amazing period of rapid change that has followed. In 1984, it was quite clear that the only players in the technology game were AT&T, the Federal Communications Commission, and the broadcasters. The services offered and the infrastructure was very clear also. All this has changed; we have evolved from monopolies to a myriad of suppliers, from a narrow scope of supporting technologies to a vast array, from supplier driven infrastructure to a user and
market driven infrastructure. All indications are that this is just the beginning of the change. The "information superhighway" is upon us.

To initiate or improve an internet connection, one must understand the physical aspects of connecting and what is required. This includes equipment, a connection and their capabilities. To get connected to the internet requires a computer that is physically connected to the internet. Once connected, the computer is now a host. The physical connection can be one of several forms. The least expensive is the modem or dial up connection. The modem allows the digital circuitry of the computer to pass a signal or message over an analog (voice) telephone line. Modems are manufactured to process signals at speeds from 2,400 to 28,800 baud. This analog connection has the advantage of being inexpensive ($20.00 - $30.00 per month) and works well when connecting four terminals or less. The disadvantages are found in the poor graphics display and the cost of the long distance charges incurred (Gliński, 1996).

Another type of physical connection to the internet is the leased line connection. The leased line connection is more expensive than the dial up, but capable of transmitting far more information. Leased lines can take the form of Integrated Services Digital Network (ISDN), 56K, T1, and Fiber Optic. The 56K line can be either analog or digital and is great for medium sized networks consisting of up to 32 terminals. It is acceptable to use 56K lines for light graphics, and the price is dependent upon the distance the line must run to connect the user to the internet provider. The ISDN line is digital. This line can be leased in incremental units referred to as channels, and is excellent for future expansion. The ISDN line has a maximum bandwidth of 1.488 Mb and is capable
of handling video conferencing. The T1 line is more expensive than other leased lines and offers a maximum band width of 1.544 Mb.

An option available to those able to afford the up front costs is the fiber optic line. This line can be installed by the owner and connected to services. This type of connection is very expensive, but incurs no monthly charges.

A third possible connection to the internet is wireless. This connection requires the purchase of expensive equipment, but eliminates line charges. The wireless connection will not be feasible in all applications as the topography of a geographic location may render the solution worthless. A satellite antenna or a microwave dish pointed at a specific site is required. If the microwave connection is to be used, the line of sight must be free of obstacles, such as buildings or hills.

In addition to a physical connection to the internet, the user must purchase certain equipment in order to communicate over leased telephone lines. The CSU/DSU on the digital line is the equivalent to the modem on the analog line. The CSU/DSU works in conjunction with a router to connect the LAN to a dissimilar network topology such as ethernet to token ring or arcnet. The router uses a logical addressing system to send packets of information to the proper location.

Once the physical connection is made to the internet, the connection must be routed to an internet provider. The internet provider connects the user’s LAN or computer to the internet for a fee. The provider could be an academic institution such as a university, a commercial provider such as America On Line, or a local business.

The telephone lines used to connect the first four sites of the ARPANET were connected with 56K lines. These telephone lines were capable of carrying
data at speeds of 56 kilobits per second. This translates into approximately 3.5 screenfuls of information per second. The ethernet used to connect LANs today is capable of carrying information at speeds of 10 Mbs. The demand for greater and greater capacity has produced T1 lines which are capable of speeds of 1.5 Mbs. This is still slower than the ethernet found on the LAN. Ninety-four screenfuls of data per second is equivalent to 1.5 Mbs. T3 lines carry data at speeds of 45 Mbs or 2,800 screenfuls of information per second. In a typical connection, a school may connect to a provider with a 56K line. The provider will connect to the internet with a T1 line, and the backbone of the internet is composed of T3 lines (Falk, 1994). The goal of the internet connection, be it text or graphics, will determine the connection needed.

To determine if the initiation of an internet connection is in the future of a school district, the administration must consider to what extent connecting to the internet is cost effective for the school district. Appendix A lists the charges incurred by Effingham Community Unit School District #40 in connecting to the internet. Effingham's solution involved several local players including the local telephone company as internet provider, the local cable television company for wide area network connections, and a network engineer for installation.

Examination of Appendix A reveals that an internet connection was much more cost effective by involving both the telephone company and the cable company. The telephone company was the internet provider and leased the district the T1 line connecting Effingham High School to the internet. The cable television company provided the connections to the rest of the buildings in the district. Closer examination reveals great differences in the price of 56K leased lines
between buildings. This was caused by two factors: (1) distances between buildings and (2) the location of two latta boundaries within the district.

A latta is a boundary line between two local telephone service providers. When a leased line crosses a latta, a tariff is imposed by the telephone company increasing the cost of the line. In addition to the tariff, a long distance carrier must then be used to cross the latta. This structuring causes the price of leased lines to the Early Learning Center and Central to increase, and then increases again the cost to connect Edgewood to the WAN (Wide Area Network). The scenario used by the district did not connect Edgewood to the WAN. Instead, internet service was provided by the Regional Office of Education. To connect Edgewood to the regional offices, a router cost $90.00 per month. The disadvantage to this connection was the inability to share all of the applications of the district's WAN, such as student management and fund accounting software.

Why should a school district initiate an internet connection? What is on the internet that would benefit students, staff and administration? According to Sheekley (1995, p. 44): "Survey after survey shows that members of the general public like traditional schools and conventional teaching and learning practices." A glance at the internet reveals educational opportunities in abundance. On March 23, 1996, a search of the internet using the search engine Lycos (http://www.cccp.net:80/interest/search-d/lycos.htm) revealed within seconds many sites available to educators: (a) mailing lists (http://tile.net.news/), (b) grant opportunities (http://tram.rice.edu/TRAM/-TRAM), (c) research through the Library of Congress (telnet//locis.loc.gov), (d) teacher training opportunities (http://sunsite.unc.edu.horizon/), (e) PBS opportunities (http://www.wnet.org:80/mom/index.html),
(f) classrooms on the Web (http://word.std.com/~mkjg/), (g) NASA projects (E-mail GET.VIDEO@QUEST.ARCA.NASA.GOV), (h) U.S. Department of Education documents, (i) 125 newspapers on-line, (j) 25 other newspapers available in some form or another, (k) ERIC search capabilities, (l) Encyclopedia Britannica, (m) hundreds of magazines and journals, (n) the human anatomy as seen through the magnetic resonance imaging process, and (o) art objects and pictures.

This short list is very accessible to the novice world wide web surfer by merely using a search engine. The search engine is available through the internet provider and will give the user links to places on the world wide web that relate to the search. Other listings are available in print from various resources.

The internet houses thousands of projects set up specifically for students. Ask the scientist is a project between high schools and elementary schools. Elementary students ask questions of advanced placement science students. The high school students then research the questions and provide answers to the elementary students. The project is designed to increase interest in science by challenging students to explore new areas, improve communication skills, and sharpen computer skills.

The kids weather net is designed to bring distant classrooms together by sharing weather and climatic data. This project shares the daily high and low temperatures, precipitation, and a short paragraph summarizing the weather for the previous week. Students engaged in the project use the data to become more informed on how seasons, weather data, and astronomy affect climate.

Tele-fieldtrips were designed to encourage students to explore their own local resources and share them with students and classes all over the world. Teachers send in a list of fieldtrips they wish to take for the year, along with
student generated questions about the trips. These lists are shared by all the classrooms involved. Those students located within easy access of the desired destination then physically take the trip armed with the questions. The classroom physically taking the trip then posts a summary of the trip. This summary is then accessible to all classrooms in the project.

Geogame is an on-line competition between classrooms, and the subject is geography. This project is designed to stimulate students' interest in geography, sharpen map reading skills, and increase awareness of cultural diversity.

Global grocery list is a project designed to allow students to engage in a "global grocery shopping spree". The purpose is to expose students to differing cultures, monetary systems, cuisines, and languages.

The U.S. Geological Survey and the National Oceanographic and Atmospheric Administration are storing vast amounts of information available on the internet. This material can be used by students and teachers to forecast weather and study topographic maps (Novitski, 1995, p. A13).

Project KYBER-12 is a study of the leadership, management, and supervision of kindergarten through twelfth grade computer networking. This project seeks out exemplary K-12 computer programs and operations, vision, usage policies, funding solutions, strategic plans, and evaluation practices. In turn, these can be used as tools to guide users through the process of integrating technology into the curriculum (K-12).

Noon observation project is designed to enable students to calculate the circumference of the earth.
An ozone network seeks classrooms to become involved in the process of taking ozone measurements and integrate those into the curriculum through science sources and put it into a social context.

The acid rain study connected a high school in Stuttgart, Germany, with one in Moscow to analyze drinking water. The results were then posted on the internet.

Many projects which have used the internet in the past to engage students are:

1. The virtual track meet - students perform events at their schools and post results on the Cleveland Freenet for international competition.
2. What's Japan - students ask questions about Japan, and Japanese students answer.
3. Telecomputing activity contest - a contest for the best telecomputing in the classroom.
5. Space mission simulations - an electronic simulation of four space missions, with students acting as differing groups (crew, mission control, and recovery team).
6. Architecture challenge - students build popsicle structures and test them, then post the results.
7. Zero g school design - students design solutions to zero gravity problems (NCSA Education Group, 1995, p. 85).

The NCSA Education Group (1995) has espoused the idea of the library without walls. This idea translates into access to a myriad of library resources for
schools, students, teachers, administration, and the public. The library without walls could conceivably reach into the farthest corners of the earth to provide this access. This means that the user of the electronic workstation can access a vast array of automated information systems independent of the physical library. This group hails the internet as the great research tool. A shortened version would be a superhighway of local, regional, and national telecommunications networks. This is the highway of ideas, a collective brain of the nation's scientists, the world's most important bulletin board. This connection has evolved to the point that students can take classes over the internet for credit at educational institutions (Varma, 1996, p. 21).

The internet can be an essential tool in the nation's classrooms, and there are possibilities for it to have an integral part in the reform of our educational institution according to Mann (1989, p. 40):

Just as the cop on the beat determines the street-level meaning of Supreme Court dicta, so teachers determine how much school reform filters down to U.S. classrooms. Given this state of affairs, networking - teachers talking to teachers as professionals does appear to be one of the few realistic options for restructuring our $212 billion educational enterprise. The average teacher is 41 years old and has been in the classroom for 15 years non-stop. He or she is a tenured, dues-paying, card carrying union member (more teachers than steelworkers and coal miners belong to unions). The average teacher works 51 hours per week: 39 in a school alone and 12 at home. Teaching has replaced air-traffic control as America's most stressful occupation.
Mann (1989, p. 41) goes on to point out that in order for teachers to effectively use the new technologies available in the classroom, they must learn of it from those they respect, their peers. Consider the good ole boy power lunches of the bankers and lawyers, and even school superintendents. The power lunch is considered a good investment because of the "networking" that takes place within peer groups. Now, consider the teacher who is alone most of the day to deal with students; there is no opportunity to relate to a peer group. The electronic wide area network offered by the internet provides access to teacher peer groups. During the current round of reform, states have passed 1,000 mandates, with teachers as the target. This makes teachers less autonomous and less professional, probably not the way to boost student reform. Even though these reforms have been about quality, one half of the teachers in Los Angeles in 1989 had emergency certificates, and in New York City 90% of 6,500 teachers hired in 1989 had no certificates. Albert Shanker of the American Federal of Teachers said:

There is nothing more difficult than keeping 20 or 30 kids still, keeping quiet, and 20 or 30 individuals learning at the same rate. It's just impossible. Teachers are having feelings of guilt; they know they are reaching only some and neglecting others (Mann, 1989, p. 41).

Shanker is also realistic about how many teachers would be willing to roll up their sleeves and take responsibility for their own professional destiny.

I think quite a few teachers are saying, "Look, I thought I made a deal when I came into this field, I'm going to close my door, and you're going to leave me alone. I know how to work with these kids here. I'm doing my work, and you do your work (Mann, 1989, p. 41).
Mann (1989, p. 41) went on to say that schools do not have the money to hire the best and brightest, that teachers in our schools are straining for a chance to change what they have been doing for 15 years, and that teachers are a skeptical lot. Sixty-two percent of teachers say that in-service programs do nothing to address their needs. According to a 1985 Metropolitan Life Survey, only one-fourth of teachers believe that anyone in authority considers their ideas. Mann (1989, p. 41) also says that reform should include changing some of the structures in which teachers work: that is a 770 square foot classroom box, the absence of adult or professional interaction, and the lack of recognition, rewards, or changes to participate and grow.

This brings us to the internet solution. The internet can be a mechanism for the exchange of ideas for classroom improvement. The internet provides a potentially world-sized auditorium open 24 hours a day for teacher in-service and the improvement of the classroom. Teachers now have the opportunity to become involved with discussion groups that deal with specific problems such as attention deficit disorder, subject matter, delivery of instruction, and many others (NCSA Education Group, 1995, p. 6). This forum could benefit administrators in the same manner.

To what extent do increased program expenditures increase the use of the connection by staff and students? If the wide area network is built, will the staff and students come on board the information superhighway? Is the investment a sound financial decision? Sheekley (1995, p. 45) reports that if school leaders expect the electronic networks to eventually deliver useful services and compliment educational reform efforts, they cannot afford to be bystanders. The fact that the 1994 Information Superhighway bill is dead for the time being does not diminish
any prospects for new technologies for reforming education. Leaders should focus on informing the public of the importance of the new technology and its possibilities in education. Figure out who needs to learn what, and where they need to learn it. From that point, the experts (telephone companies, cable operators, wireless, and satellite companies) can help with the process of calculating costs and dealing with procurement. The public needs to be informed about new technologies and their uses. This is the job of the school leader.

A survey by Sheekley (1995, p. 46) indicated that more than half of the public approves of the idea of the information superhighway, but two-thirds could not give a definition. During this period of time, it is imperative that school officials realize that $100 billion is spent annually on catalog shopping, movie theater tickets, home video rentals, and interactive television/video games in the electronics service industry, yet the electronic educational materials share accounts for only $1.45 billion. This indicates that recreational use of the electronic medium will drive the developers. One-third of the U.S. households have computers. This is also a prime target for developers of educational software, thereby reducing even more the money allocated for developing educational software for the classroom.

To offset this, educators should develop their own set of demands for the medium.

Besides convincing the public of the need for internet services, school leaders must also convince staff. For example, the Bond, Fayette, and Effingham, County Regional Office of Education has embarked on a staff development project with the aid of an Eisenhower Grant (Schwarm, 1996). This project will open school computer labs for internet training programs. These programs are geared for differing ability level teachers. This process will develop a basic understanding of what is on the internet, how to access it, make use of it in the classroom, and
share these ideas with peers. It is hoped that this project will foster the desire to implement the use of the internet in the classroom and bring those vast resources to the students.

Another group of professionals that must be trained are the librarians and media specialists. This group must learn to use the on-line materials available on the internet as though they were a natural extension of the reference librarian’s responsibilities. Locating references on a network requires similar skills.

To what extent does the program achieve its intended objectives? The internet provides an opportunity for sharing resources and information access that is unparalleled. Databases half a world away can be accessed as easily as a database in the next room. Researchers at Bergen University in Norway have been known to use the library catalog in California because they can access it faster than their own local catalog. As more information becomes available on the internet, the importance of the network resources to reference services will increase as well.

Information professionals in the electronic age must learn the skills required to use these resources effectively. In many cases they must also teach their clientele how to use these resources themselves. Accomplishing these objectives will require some extra effort, adaptability, and commitment on the part of information professionals, but this is necessary if they are to harness the potential of the internet (NCSA Education Group, 1995, p. 7).
Chapter 3
Design of the Study

General Design of the Study

The purpose of this study was to investigate the practice of school districts connecting to the internet within the Southern Illinois Instructional Technology Association. The research questions for this study were: (a) Should an internet connection be initiated, continued, improved, or terminated? (b) To what extent is connecting to the internet cost effective for schools? (c) To what extent do increased program expenditures increase the use of the internet connection by staff and students? (d) To what extent does the program achieve its intended objectives?

The study examined the practice of connecting to the internet within the Southern Illinois Instructional Technology Association. This association is composed of 76 school districts from Effingham, Illinois, south to Cairo, Illinois, and from Carmi, Illinois, to Carbondale, Illinois.

Sample and Population

In this study the participants were the superintendents of the 76 school districts involved with the Southern Illinois Instructional Technology Association. The target Illinois school districts were involved with instructional television. The association has expanded its base to other technologies including the computer and wide area networks (including internet access). The geographic area of these districts was from Beecher City to the southern tip of Illinois. Schools have become members of the Southern Illinois Instructional Technology Association because of an interest in technology and a vision for its importance in the classroom.
Data Collection and Instrumentation

The researcher developed a survey instrument designed to answer the research questions. The survey sought respondents' perceptions on 15 questions in the survey documents, see Appendix B. The surveys were mailed to the superintendents of the 76 public school districts of the Southern Illinois Instructional Technology Association in November of 1996. The superintendents were given six weeks to respond. The survey questions were designed to provide data related to the research questions as follows: (Research questions will be referred to as a, b, c, and d as found in the abstract to avoid confusion.)

Research question (a): Should an internet connection be initiated, continued, improved, or terminated? Survey questions: (1) Is your school connected to the internet? (2) If not, are there plans to do so? (3) If you are not connected and plan to do so, when do you expect to do connect? (14) What type of connection does your district have?

Research question (b): To what extent is connecting to the internet cost effective for schools? Survey questions: (4) What is your school's assessed valuation? (5) What was the total budgeted expenditures of the education fund for fiscal year 1995-1996? (6) Rank the priority of each 1-7 as to its importance in your district (1 = highest, 7 = lowest) building construction, building maintenance, technology purchases, additional staff, staff development, and instructional supplies. (7) If you have an internet connection, what were/are the expected first year expenditures for the connection? (8) What was the total amount of funds spent on training for the use of the internet connection?

Research question (c): The what extent do increased program expenditures increase the use of the internet connection by staff and students? Survey
questions: (7) If you have an internet connection, what were/are the expected first year expenditures for the connection? (8) What was the total amount of funds spent on training for the use of the internet connection? (11) What is the number of staff members using the connection? (12) What is the number of students using the connection? (13) What is the average number of users per day?

Research question (d): To what extent does the program achieve its intended objectives? Survey questions: (14) What was the goal of the internet connection (student resource, staff resource, administrative resource)? (15) Rate the degree to which the internet connection met its intended goal (Rate 1-10: 1 = low, 10 = high).

Data Analysis

The data were compiled in December of 1996. Fifty-six surveys were returned resulting in a 74% response rate. The data was organized into a spreadsheet. The spreadsheet was organized by placing all survey data in 18 separate columns: (a) connected, containing a yes or no, (b) the assessed valuation of the respondent in dollars, (c) the education budget of the respondent in dollars, (d) ranking of the importance (1-7) of building construction, (e) ranking of the importance (1-7) of building maintenance, (f) ranking of the importance (1-7) of technology purchases, (g) ranking of the importance (1-7) of additional staff, (h) ranking of the importance (1-7) of staff development, (i) ranking of the importance (1-7) of staff salaries, (j) ranking of importance (1-7) of instructional supplies, (k) first year connection expenditures in dollars, (l) training expenditures in dollars, (m) the type of connection: modem, leased line, wireless, satellite, fiber optic, (n) a number representing the total number of staff that have used the connection, (o) a number representing the total number of students that have used the connection,
(p) a number representing the average number of users in one day, (q) the goal of the connection: student use, staff use, administrative use, (r) rating of the degree to which the connection met its intended goal (1-10).

The researcher then formed two groups: (a) districts that were connected and (b) those that were not connected. An average assessed valuation was then calculated for each group: (a) $48,732,192.00 and (b) $22,505,418.00.

The group of districts connected was then subdivided into smaller groups based upon ranges of connection costs: (a) $0.00, (b) $150.00-$700.00, (c) $1,000-$6,000.00, and (d) $10,000.00-$70,000.00. An average connection cost was then calculated for each range: (a) $0.00, (b) $367.00, (c) $3,225.00, and (d) $24,438.00. An average was calculated by range for each of the following: total staff use, total student use, and average daily use.

All connected districts were then placed into three groups based upon the funds expended to train staff in the use of the internet connection. The three groups represented expenditures ranges as follows: (a) $0.00, (b) $100.00-$500.00, and (c) $1,000.00-$15,000.00. An average connection cost was then calculated for each range: (a) $0.00, (b) $400.00, and (c) $4,356.00. The researcher then calculated an average staff use for each range.

An average ranking for each expenditure priority was calculated. Those priorities (building construction, building maintenance, technology purchases, additional staff, staff development, staff salaries, and instructional supplies) were sorted from the highest ranking to the lowest ranking.

All connected districts were grouped by the six goals of the connection: (a) no goal, (b) student use, (c) staff use, (d) student and staff use, (e) staff and administrative use, and (f) student, staff and administrative use. Six goal groups
were formed by recording all the combinations of the three goals on the survey instrument (student use, staff use, and administrative use). This was required because the superintendent in the sample population often reported more than one goal. An average rating was then calculated for each group from the information in column x. These groups provided the basis to construct all tables found in the study.
Chapter 4

Results

The internet survey was sent to 76 superintendents of the Southern Illinois Instructional Technology Association. Fifty-six participants returned the survey which is a 74% response rate. The purpose of this study was to investigate the practice of school districts connecting to the internet within the Southern Illinois Instructional Technology Association. The research questions for this study were:

(a) Should an internet connection be initiated, continued, improved, or terminated?
(b) To what extent is connecting to the internet cost effective for schools? (c) To what extent do increased program expenditures increase the use of the internet connection by staff and students? (d) To what extent does the program achieve its intended objectives?

Data were analyzed and summarized in relation to the costs of the connection, costs of training users, and the number of internet connection users. The format for the presentation of the results includes a narrative of the data followed by a table summarizing the data.

Table 1 is a summary of the number of respondents and non-respondents of the survey. The table also includes the total number of school districts connected to the internet and the number not connected. The results showed that 68% of the districts surveyed were connected to the internet and 32% were not. Twenty-six percent of the subject school districts did not respond. The total number of districts receiving the survey was 76, which represents 100% of the sample as indicated by total.
Table 1

Schools Connected to the Internet

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>38</td>
<td>68</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 is a summary of the responding school districts' assessed valuations. The average assessed valuation of the responding districts connected to the internet is $48,732,192.00. This figure is 46% higher than the $22,505,418.00 average assessed valuation of the school districts not connected to the internet.

Table 2

Average Assessed Valuations

<table>
<thead>
<tr>
<th>Districts</th>
<th>Connected?</th>
<th>Average Assessed Valuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>Yes</td>
<td>$48,732,192.00</td>
</tr>
<tr>
<td>18</td>
<td>No</td>
<td>$22,505,418.00</td>
</tr>
<tr>
<td>56</td>
<td>Total</td>
<td>$39,989,934.00</td>
</tr>
</tbody>
</table>

Table 3 summarizes the cost of the school districts’ internet connection in relation to the number of staff, students, and daily users of the connection. This table is the result of placing districts into groups representing ranges of connection costs. The top group was composed of 9 districts whose superintendents reported $0.00 cost in connecting to the internet. The second group with an average cost of $367.00 was composed of 10 districts which spent between $150.00 and $700.00 to connect. The third group of 9 school districts with an average connection expenditure of $3,225.00
Table 3

Comparison of Connection Costs to Use

<table>
<thead>
<tr>
<th>Number of Districts in the Group</th>
<th>Average Connection Cost</th>
<th>Average Total Staff Use</th>
<th>Average Total Student Use</th>
<th>Range Average of Daily Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>$0.00</td>
<td>10</td>
<td>187</td>
<td>27</td>
</tr>
<tr>
<td>10</td>
<td>$367.00</td>
<td>6</td>
<td>56</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>$3,225.00</td>
<td>30</td>
<td>563</td>
<td>35</td>
</tr>
<tr>
<td>10</td>
<td>$24,438.00</td>
<td>40</td>
<td>335</td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td>$7,291.00</td>
<td>21</td>
<td>280</td>
<td>32</td>
</tr>
</tbody>
</table>

was composed of districts which spent from $1,000.00 to $6,000.00 to connect. The last group of 10 districts represents those districts spending from $10,000.00 to $70,000.00 to connect. The bottom row of the table represents averages for the 38 schools connected. The average cost to connect to the internet was $7,291.00.

The third column of the table indicates the number of staff in the district that use the internet connection. The group of districts averaging $24,438.00 to connect recorded the highest average number of staff users at 40, while the group of districts averaging $367.00 to connect recorded the lowest average number of staff users at six. This indicates an increase in expenditure by a factor of 66.6 increased the number of staff users by a factor of 6.6.

The fourth column of the table shows the average number of student users per group. The group recording the highest number of student users at 563 averaged $3,225.00 to connect to the internet. The group with the lowest average number of student users at 56 spent an average $367.00 to connect. This indicates an increase in expenditures by a factor of 8.8 increased the number of student users by a factor of 10.
The fifth column summarizes the average daily use of the internet connection irrespective of student or staff. The lowest average number of users per day of 10 was recorded by the group averaging $367.00 to connect. The highest average number of daily users of 56 was recorded by the group averaging $24,438.00 to connect. This indicates that increasing expenditures by a factor of 66.5 increased the number of daily users by a factor of 5.6.

Table 4 summarizes the comparison of the expenditure of funds to the staff use of the internet connection. The 38 districts connected to the internet were grouped into 3 categories of training expenditures. Group one contained 18 districts spending $0.00 for training; this group averaged 8 staff users. Group two contained 4 schools averaging $400.00 for training, while ranging from $100.00 to $500.00 and averaged 4 staff users. Group three contained 16 districts averaging $4,356.00 for training and averaging 41 staff users. Group three ranged from $1,000.00 to $15,000.00 in training expenses. The last row in Table 4 summarizes all districts connected to the internet. Of the 38 schools connected, the recorded average training cost was $1,876.00, and the average number of staff users was 21.

Table 4

Cost of Training Compared to Staff Use

<table>
<thead>
<tr>
<th>Number of Districts in the Group</th>
<th>Average Training Costs</th>
<th>Average Total Staff Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>$0.00</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>$400.00</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>$4,356.00</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>$1,876.00</td>
<td>21</td>
</tr>
</tbody>
</table>
Table 5 summarizes the ranking of seven categories of expenditures by all respondents. Respondents ranked expenditures in order of importance, with 1 being the highest and 7 the lowest. The table shows that the respondents ranked the expenditures for technology as highest and for buildings as lowest.

Table 5

<table>
<thead>
<tr>
<th>Categories</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>2.83</td>
</tr>
<tr>
<td>Instructional supplies</td>
<td>3.28</td>
</tr>
<tr>
<td>Staff development</td>
<td>3.38</td>
</tr>
<tr>
<td>Salaries</td>
<td>3.41</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4.07</td>
</tr>
<tr>
<td>Additional staff</td>
<td>4.79</td>
</tr>
<tr>
<td>Buildings</td>
<td>5.15</td>
</tr>
</tbody>
</table>

Table 6 emphasizes the priority of technology purchases by those districts connected to the internet. Thirty-eight districts responded as connected, and the average rating of technology purchases was 2.91. This table is a subset of Table 5. The districts connected to the internet consider technology purchases a high priority as indicated by the table.

Table 6

<table>
<thead>
<tr>
<th>Districts</th>
<th>Priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>2.91</td>
</tr>
</tbody>
</table>
Table 7 summarizes the respondents’ ratings of the degree to which the internet connection met its intended goal, with 1 as lowest and 10 as the highest. Respondents connected to the internet were grouped into 6 groups according to the intended goal of the internet connection. Group one had no goal and rated the degree to which they met this as 10. Nine districts reported the goal of the connection as student use and indicated an average rating of 7.22. Two districts indicated a goal of staff use and an average rating of 3.50. Sixteen districts reported goals of student and staff use and averaged a rating of 6.90. One school district indicated goals of staff and administrative use and rated the degree to which these goals were met as 8.00. Nine districts indicated goals of student, staff, and administrative uses and averaged a rating of 7.33. The average rating of all districts connected to the internet was 7.03. Closer examination of the table reveals 3% had no goals; 24% student use; 5% staff use; 42% student and staff use; 3% staff and administrative use; 23% student, staff and administrative use.

Table 7

<table>
<thead>
<tr>
<th>Districts</th>
<th>Goal Group</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>no goals</td>
<td>10.00</td>
</tr>
<tr>
<td>9</td>
<td>student use</td>
<td>7.22</td>
</tr>
<tr>
<td>2</td>
<td>staff use</td>
<td>3.50</td>
</tr>
<tr>
<td>16</td>
<td>student and staff use</td>
<td>6.90</td>
</tr>
<tr>
<td>1</td>
<td>staff and administrative use</td>
<td>8.00</td>
</tr>
<tr>
<td>9</td>
<td>student, staff and administrative use</td>
<td>7.33</td>
</tr>
<tr>
<td>38</td>
<td>total</td>
<td>7.03</td>
</tr>
</tbody>
</table>
Results for Research Question a

Should an internet connection be initiated, continued, improved, or terminated?

The target group indicated that the number one priority for the expenditure of funds is technology (Table 5). Seventy-six percent of the respondents were connected to the internet (Table 2). Respondents reported that as connection costs increased, staff and student use increased (Table 3). The increases in connection costs were correlated with districts using leased lines. This information indicated that school districts should consider initiating an internet connection, continue with its use, and strive to improve the connection.

Results for Research Question b

Is the practice of connecting to the internet cost effective for schools?

The costs to connect to the internet can be very effective. Nine school districts reported a cost of $0.00 for connection costs with higher student and staff use than those districts spending an average of $3,225.00 (Table 3).

Results for Research Question c

Should increased program expenditures increase its use by students and staff?

The average training costs for the districts connected were $4,356.00. These costs ranged from $0.00 to $15,000.00. Districts spending more money to train staff saw an increase in the use of the internet connection. Districts spending from $0.00 to $400.00 saw minimal use, while districts spending an average of $4,356.00 saw an increase in staff use of 80% (Table 4). The cost of the physical connection averaged $7,291.00. Increasing connection costs increased use by staff and students (Table 3). The researcher concludes that the cost of the connection
represents the quality of the connection (modem versus leased line connection).

Therefore, the study showed that increasing program expenditures will increase
the use of the connection by students and staff.

Results for Research Question d

Does the program achieve its intended objectives?

On a scale of 1 (low) to 10 (high), the target group connected to the internet
indicated the degree to which they had met their intended goals with a 7.03
average (Table 7). Forty-two percent of the connected districts indicated that the
goal of the internet connection was student and staff use. Twenty-three percent
indicated the goal was student, staff, and administrative use. Districts having a
goal of staff and administrative use reported the highest success followed closely by
a goal of student, staff, and administrative use. These findings indicate that an
internet connection can meet its intended goal.
Chapter 5
Summary, Findings, Conclusions, and Recommendations

Summary

The purpose of this study was to investigate the practice of school districts connecting to the internet within the Southern Illinois Instructional Technology Association. The research questions for this study were: (a) Should an internet connection be initiated, continued, improved, or terminated? (b) To what extent is connecting to the internet cost effective for schools? (c) To what extent do increased program expenditures increase the use of the internet connection by staff and students? (d) To what extent does the program achieve its intended objectives?

Findings

The analysis of data provides a realistic view of the number of school districts in the Southern Illinois Instructional Technology Association that are connected to the internet, the costs encountered in connecting to the internet, the costs of training, the use of the connection, the priority of expenditures for the target group, and the success of the connections in the target group. The study found that 68% of the respondents were connected to the internet. Those districts connected to the internet also reported an average assessed valuation two times higher than those not connected. The respondents ranked technology purchases highest among the seven expenditure items on the survey. Nine school districts reported connection costs of $0.00 and higher student and staff use than districts spending more to connect. Funds spent on training ranged from $0.00 to $15,000.00. As training costs increased, the use of the connection by staff
increased. The target population connected to the internet reported the degree to which the connection had met its intended goal with a rating average of 7.03.

Conclusions

Based on the results gathered, the writer concludes that it is important for a school district to be connected to the internet in order to make the wealth of information available to students, staff, and administration. A key factor in connecting is to provide a leased line connection as indicated by the poorer rating of those districts spending less funds for the connection. This indicates that districts should not only initiate a connection, but strive to improve it.

Connecting to the internet can be very cost effective. School districts have reported expenditures of $0.00 and shown success in their intended goals.

The findings also enabled the researcher to conclude that school districts should budget funds for training of staff in an internet connection project. Training will increase the use of the connection by staff members and will cause students to use the connection. An examination of training costs reveals that $0.00 spent on training produces more users than costs in the $100.00 to $500.00 range, while above $500.00 produces much better results. Schools in the $1,000.00 to $5,000.00 range have had the best results.

Those respondents which indicate project goals of staff and administrative use of the internet connection reported the highest rating of the degree to which those goals were met. Those districts were closely followed by districts having a goal of student, staff, and administrative use.

Recommendations

The recommendations presented are designed to assist other educators and professionals who desire to investigate similar internet connection practices.
1. It is recommended that schools connect to the internet to make its resources available to students, staff, and administration.

2. School districts unable to afford the high costs of leased line connections should connect with a modem.

3. Costs of connecting to the internet can range from very expensive to $0.00. This range is caused by factors that the district cannot control such as lattas, telephone carriers, and options available. Many districts have connected for $0.00; therefore, alternative funding should be pursued because it is available.

4. Training staff to use the internet connection is a must. A budget of less than $1,000.00 has proven to be ineffective. Funding training up to the $5,000.00 level has proven to be far more effective.

5. Schools wishing to connect to the internet must place a high priority on technology.

6. A successful internet connection should include goals of staff, student, and administrative use.
References


Varma, K. (1996, February 21). Internet brings the high school home. *USA Today*, 5D.


### Appendix A

#### Charges Incurred

<table>
<thead>
<tr>
<th>Fixed one time expenditure</th>
<th>Phone Line Solution</th>
<th>Cable Line Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Router/Router Software</td>
<td>$3,300.00</td>
<td>$3,300.00</td>
</tr>
<tr>
<td>CSU/DSU</td>
<td>$700.00</td>
<td>$700.00</td>
</tr>
<tr>
<td>Installation</td>
<td>$2,500.00</td>
<td>$2,500.00</td>
</tr>
<tr>
<td>Total</td>
<td>$6,500.00</td>
<td>$6,500.00</td>
</tr>
<tr>
<td>Other School Sites (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOV*IV Software</td>
<td>$17,550.00</td>
<td>$17,550.00</td>
</tr>
<tr>
<td>Router/Router Software (12)</td>
<td>$2,200.00</td>
<td></td>
</tr>
<tr>
<td>CSU/DSU (2)</td>
<td>$700.00</td>
<td></td>
</tr>
<tr>
<td>Bridge</td>
<td></td>
<td>$1,400.00</td>
</tr>
<tr>
<td>Total Equipment At Other Sites</td>
<td>$5,800.00</td>
<td>$9,800.00</td>
</tr>
<tr>
<td><strong>Total All Equipment</strong></td>
<td><strong>$63,950.00</strong></td>
<td><strong>$27,350.00</strong></td>
</tr>
</tbody>
</table>

| Installation Of Circuit          |                     |                     |
| Unit Office                      | $265.00             | $700.00             |
| Central                          | $450.00             | $700.00             |
| Early Learning Center            | $325.00             | $700.00             |
| Edgewood                         | $950.00             | $700.00             |
| South Side                       | $265.00             | $700.00             |
| West Side                        | $265.00             | $700.00             |
| East Side                        | $265.00             | $700.00             |
| Total Installation Charges       | $2,785.00           | $4,900.00           |
| **Total One-Time Charges**       | **$66,735.00**      | **$32,250.00**      |

| Monthly Recurring Charges        |                     |                     |
| Internet Access                  | $400.00             | $400.00             |
| Effingham High School            | $395.00             | $395.00             |
| Unit Office                      | $106.00             | $240.00             |
| Central                          | $560.00             | $240.00             |
| Early Learning Center            | $300.00             | $240.00             |
| Edgewood                         | $1,200.00           | $240.00             |
| South Side                       | $106.00             | $240.00             |
| West Side                        | $106.00             | $240.00             |
| East Side                        | $106.00             | $240.00             |
| Total Recurring Charges          | $3,279.00           | $2,475.00           |

**First Year Charges**            | **$70,014.00**      | **$34,725.00**      |
Appendix B
Survey Document

Internet Survey

DIRECTIONS: Please circle the appropriate response.

1. Is your school connected to the internet? YES NO

2. If not, are there plans to do so? YES NO

3. If you are not connected and plan to do so, when do you expect to be on-line?
   _Summer, 1996
   _Fall, 1996
   _Winter, 1997
   _Spring, 1997
   _Other

4. What is the assessed valuation of your school district?

5. What were the total budgeted expenditures of the education fund for fiscal year 1995-1996?

6. Rank the priority of each 1-7 as to its importance in your district. (1 = highest, 7 = lowest)
   _Building Construction
   _Building Maintenance
   _Technology Purchases
   _Additional Staff
   _Staff Development
   _Staff Salaries
   _Instructional Supplies

If you are connected please answer the following:

7. If you have an internet connection, what were/are the expected first year expenditures for the connection?

8. What was the total amount of funds spent on training for the use of the internet connection?

9. Who is your internet provider?
   _Regional Office
   _ISBE
   _Commercial
   _Telephone Ph. Company
   _Other
10. What type of connection does your district have?  
   ___Dial-Up (Modem)  
   ___Leased Line - 56K-T1-ISDN  
   ___Wireless (Microwave, Etc.)  
   ___Satellite  
   ___Fiber Optic

11. What is the number of staff members that use the connection?  

12. What is the number of students that use the connection?  

13. What is the average number of users per day?  

14. What was the goal of the internet connection?  
   ___Student Use  
   ___Staff Use  
   ___Administrative Use

15. Rate the degree to which the internet connection meets its intended goal (Rate 1-10: 1 = low, 10 = high).  

I would like to receive the results of this survey.  

Address:  


Dear Colleague:

I am a graduate student at Eastern Illinois University working on my Field Study Experience as part of the requirements for obtaining an Educational Specialist degree in Administration. The objectives of the field study are two fold:

1. To compare the wealth of school districts to the type of connection used.

2. To compare the type of connection to the use of the connection.

I would very much appreciate your cooperation in completing the enclosed 15 question survey. Indicate your response by circling your answers or filling in a blank where provided. I have included an addressed stamped envelope to return the survey.

Thank you,

Dean Keller

Enclosure