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# Internet Access in East Central Illinois Public K-12 Schools

Gary Thomas Grissom II

*Eastern Illinois University*

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Internet Access in East Central Illinois

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Public K-12 Schools

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(TITLE)

BY

Gary Thomas Grissom II

1962 -

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

Master of Science

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CHARLESTON, ILLINOIS

1998  
YEAR

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## Abstract

Internet access is becoming increasingly important to the public K-12 school system. This descriptive study reports on the current state of Internet access in east central Illinois public K-12 schools. Baseline data for Internet access have been collected that can be used to measure future progress. This study determined that 84.2 percent of public schools in east central Illinois have building level Internet access. Of the schools that reported Internet access, the mean student to computer with Internet access (SIA) ratio was 65.44. The mean student to computer (SCOM) ratio was 8.27. Analysis by type of connection revealed that 20.5 percent of building level Internet connections were T1 leased lines, 16.1 percent 56kbs leased lines, 12.6 percent ISDN, 19.6 percent dial-up, 5.0 percent wireless, 1.5 percent satellite, and 8.8 percent of respondents reported other types of Internet connections. Over 50 percent of the schools reported a monthly cost for Internet access of less than one hundred dollars. The LincOn Network accounted for 34.8 percent of the Internet connections. The percentage of schools with a district level technology plan was 95.3. Data were also collected on the distribution of computers available to students and teachers. The distribution of computer data indicated that 35.3 percent of computers were located in computer labs, 9.9 percent in media centers, 9.1 percent in administrative offices, and 45.7 percent in classrooms. More than one-half of schools reported having a full-time district technology coordinator. More than one-third of schools reported either no building level Internet access or Internet access that is considered non-robust. The goal of equitable and ubiquitous Internet access is not a current reality in east central Illinois public schools.

## Dedication

This study is dedicated to the technology coordinators of the Area IV Learning Technology Hub region. Their commitment to building the telecommunication and networking infrastructures are providing the resources necessary for our children to prosper in the 21<sup>st</sup> Century.

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## Table of Contents

	<u>Page</u>
Abstract .....	ii
Dedication .....	iii
Acknowledgments.....	iv
Table of Contents .....	v
List of Tables .....	vi
List of Figures .....	viii
Chapter 1 Introduction .....	2
Chapter 2 Review of the Literature.....	5
Chapter 3 Methodology .....	11
Sample and Population .....	11
Questionnaire and Data Collection .....	11
Data Analysis .....	12
Chapter 4 Results .....	14
Chapter 5 Conclusions .....	33
Recommendations for Further Study .....	36
References.....	37
Appendix A: Questionnaire .....	39
Appendix B: Cover Letter.....	41
Appendix C: Listing of Districts.....	42



## List of Tables

	<u>Page</u>
Table 1. Frequency Distribution of Questionnaires by County .....	15
Table 2. Frequency Distribution of Percent Computers by Location.....	17
Table 3. Building Level Internet Access by Category .....	18
Table 4. Building Level Internet Access by Connection Type.....	19
Table 5. Comparison of LincOn to Other Internet Service Providers by Type of Internet Access Connection .....	20
Table 6. Monthly Cost of Internet Access .....	21
Table 7. Monthly Cost by Type of Internet Connection .....	22
Table 8. Percent of Schools with a LincOn Connection.....	23
Table 9. Status of a District Level Technology Coordinator Position.....	23

Table 10. Status of Building Level	
Technology Coordinator Position .....	24
Table 11. Percent of Computers Located in	
Classrooms with Internet Access .....	25
Table 12. Status of District Technology Plan .....	26
Table 13. Status of District Web Page .....	26
Table 14. Percent of Students Eligible for	
Free and Reduced Lunch Program Compared	
To Building Level Internet Access .....	27

## List of Figures

	<u>Page</u>
<u>Figure 1.</u> Scatter plot diagram of student to computer (SCOM) ratio to the percent of students eligible for free and reduced lunch program .....	28
<u>Figure 2.</u> Scatter plot diagram of student to computer with Internet access (SIA) ratio to percent of students eligible for the free and reduced lunch program .....	29
<u>Figure 3.</u> Scatter plot diagram of student to Internet access (SIA) ratio by county.....	30
<u>Figure 4.</u> Scatter plot diagram of the student to computer (SCOM) ratio to the total number of students in the district.....	31
<u>Figure 5.</u> Scatter plot diagram of the student to computer with Internet access (SIA) ratio to the total number of students in the district .....	32

Running Head: INTERNET ACCESS IN ILLINOIS K-12 SCHOOLS

Internet Access in East Central Illinois Public K-12 Schools

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Eastern Illinois University

July 31, 1998

## Chapter 1

### Introduction

Internet access is becoming increasingly important to the public K-12 school system. The State of Illinois and the federal government are providing much needed funding to assist schools in developing telecommunication infrastructures to connect public K-12 schools to the on-line community.

Teachers and students need to be knowledgeable about the use of telecommunication technology in the classroom. In today's global economy it is necessary for our children to be fluent in the use of technology. In order to provide opportunity for all children, schools must have equitable Internet access. Internet access must also be ubiquitous in order for schools to integrate this technology into the curriculum.

#### Statement of Purpose:

The purpose of this study was to determine Internet accessibility in public K-12 schools in east central Illinois.

The objectives of this study were to gather data on:

1. The current state of Internet access and the monthly cost to public K-12 schools in east central Illinois.
2. The distribution of resources available to students and teachers in classrooms, computer labs, administration, and media centers.

Definition of Terms:

Telecommunication services- for the purpose of this study are services that are necessary for connecting and supporting Internet access.

Equitable access - having the necessary resources to allow all students and teachers access to telecommunication resources.

Ubiquitous access - having the necessary resources readily accessible without making prior arrangements for use. For example, a computer in the classroom with Internet access is considered to be ubiquitous.

T1 leased line - a type of telecommunication service that is a dedicated high-speed connection to the Internet.

56Kbs leased line - a telecommunication service that offers a dedicated connection to the Internet but at slower speeds than a T1 line.

Robust connection - a dedicated private line to the Internet or ISDN service capable of transmitting data at a rate of 56Kbs or higher.

Integrated Services Digital Network (ISDN)- a type of robust connection available only in portions of east central Illinois. ISDN is a dial-up service with rates that vary according to usage but is generally less expensive than a dedicated 56Kbps line for Internet connectivity.

Internet access - the ability to connect to the Internet for world wide web, file transfers, or e-mail capability.

Limitations:

The use of telecommunication resources is dependent upon the skill level of the teacher/student and the availability of equipment and proper training in the use of the

equipment. This study only considered the availability of resources and not the utilization of the resources.

Delimitations:

The boundaries of this study include public K-12 schools in east central Illinois designated as Area IV by the Illinois State Board of Education (ISBE). Area IV consists of 17 counties in east central Illinois. The counties include: Champaign, Clark, Coles, Cumberland, Dewitt, Douglas, Edgar, Ford, Iroquois, Kankakee, Livingston, Macon, McLean, Moultrie, Piatt, Shelby, and Vermilion. Four of these counties are considered urban based upon the Office of Management and Budget's Metropolitan Statistical Area (MSA) designations. The four urban counties are Champaign, Kankakee, Macon, and McLean. The remaining 13 counties are considered rural. Only public K-12 schools were considered in this study.

## Chapter 2

### Review of the Literature

The National Information Infrastructure initiative (NII), set forth by President Clinton, calls for connecting the nation's classrooms, libraries, and hospitals to the "Information Superhighway", (National Telecommunications and Information Administration, 1993). As a result of this agenda new legislation passed by the U.S. Congress is greatly impacting Internet access. In February of 1996, the U.S. Congress passed the Telecommunication Act of 1996, P.L. 104-104. The 1996 Act was the first comprehensive rewrite of telecommunication issues since the Telecommunications Act of 1934.

The Telecommunications Act of 1996 provides federal funds for use in connecting K-12 classrooms to the Internet. The Universal Services Fund (USF) has reserved 2.25 billion dollars for the first funding year to provide Internet access discounts for the nation's K-12 schools. This program is commonly referred to as the Education rate (E-rate). As part of the E-rate program schools are eligible to receive discounts varying from twenty to ninety percent for telecommunication services based upon poverty level and urban/rural status, (Federal Communication Commission, 1997).

The E-rate fund was originally scheduled to begin on January 1, 1998. As of the date of this writing, the E-rate program is still not operational. Many schools have applied for the E-rate discounts but the political and operational issues are still being



debated. Many school decisions regarding Internet access products and services are on hold while the issues are worked out. The School and Library Corporation is currently finalizing what products and services will be eligible for E-rate discounts, (School and Library Corporation, 1998).

The Technology Literacy Challenge Fund is also being used as a funding source to help provide funds for K-12 telecommunication services at the federal level. The Illinois State Board of Education (ISBE) was scheduled to receive 17 million dollars from the federal government for distribution to Illinois schools beginning May 1, 1998, (Spagnolo, 1997). Many other funding sources are being extended both at the state level and the federal level to help schools with telecommunication infrastructures.

Heaviside, Riggins, and Faris (1996) reported that sixty-five percent of U.S. schools had access to the Internet in the fall of 1996. The report also stated that large schools are more likely than their smaller counterparts to have Internet capabilities. Urban schools reported higher rates of Internet access than schools in rural areas. The report also noted that schools with high levels of poverty were less likely to be connected to Internet resources.

Heaviside, Riggins, and Faris (1996) also reported that 12 percent of network connections had T1 capability, 11 percent had 56Kbs capability, 4 percent had ISDN capability, and the remainder relied upon dial-up connectivity.

In order to help determine the technological performance of schools Plugging In: Choosing and using educational technology was prepared by the North Central Regional Educational Laboratory (NCREL), (Jones, Valdez, Nowakowski, and Rasmussen, 1995). According to Jones et al. (1995), there are six categories of high technology performance.

The six categories are identified as: access, operability, organization, engagability, ease of use, and functionality. The access category is the main focus of this study.

Jones et al. (1995) further state that access can be broken down into four indicators of high technology performance. The four access indicators are:

Connective - Schools are connected to the Internet and other resources.

Ubiquitous - Technology resources and equipment are pervasive and conveniently located for individual (as opposed to centralized) use.

Interconnective - Students and teachers interact by communicating and collaborating in diverse ways.

Designed for equitable use - All students have access to rich, challenging learning opportunities and interactive, generative instruction.

Area IV is predominantly a rural area and is presented with special challenges in building a telecommunications infrastructure for Internet access. Scheinberg et al. (1996) reported that one of the factors rural schools face is the increased cost for telecommunication services. Rural schools are also separated by greater distances and therefore supporting infrastructure costs are higher than urban areas. Another difficulty reported is that rural schools have fewer people to share the costs of the telecommunications infrastructure. This is another reason telecommunication services tend to be higher in rural areas. To address these cost difference issues some states, such as Nebraska, are addressing cost equity by charging a flat rate for both urban and rural schools, (Scheinberg et al., 1996).

Other states are implementing plans to build the needed telecommunication infrastructures for connecting school classrooms to the on-line community. Sox (1996)

reported that 99 percent of North Carolina schools had a technology plan. This contrasts with approximately 33 percent of Illinois schools with a technology plan, (ISBE, 1996). On a national level America lacks a common direction for implementing technology into primary and secondary schools, (Borrell, 1992).

The State of North Carolina has chosen to pursue an advanced state-of-the-art fiber optic network. North Carolina is one of the states considered to be a leader in building a state telecommunication infrastructure, (Scheinberg et al., 1996). As of December 1996 only 22 percent of respondents to a survey indicated they were connected with the North Carolina Information Highway, (Sox, 1996). This proposal will prepare the necessary data to determine the percentage of schools connected to the LincOn Network and other Internet providers in Illinois for the Area IV region.

The North Central Regional Education Laboratory (NCREL) reported that less than 10 percent of Illinois schools were making use of multiple technologies as part of an overall plan for restructuring their schools, (NCREL Policy Briefs, 1994). This extremely low percentage prompted members of ISBE, the state legislature, the governor, and others to develop an action plan that will address the states low performance in the area of learning technologies in schools.

The Illinois State Board of Education (ISBE) has developed the K-12 Information Technology Plan, State of Illinois, (ISBE, 1996). This plan is a comprehensive plan that provides direction and resources for connecting K-12 classrooms with learning technologies and the Internet.

The LincOn Network is one of the results of this plan and is a Wide Area Network (WAN) at the state level that provides Illinois schools connection to the

Internet. The LincOn Network allows schools to connect to the Internet and other resources at lower costs than otherwise would be possible. The State Board is attempting to bring universal, equitable Internet access to Illinois public schools, (Spagnola Communique, 1996).

One key component of the state technology plan called for the establishment of Learning Technology Hubs that are located in seven regions of the state, (State of Illinois Legislature, 1995). These seven hubs are charged with providing schools technical assistance, staff development resources, long range technology planning, network consultation, distance learning, Internet connectivity, support of the LincOn Network, and implementing the State K-12 Information Technology Plan, (ISBE, 1996).

The Area IV Learning Technology Hub, located in Rantoul, Illinois, is one of the seven hubs created by the ISBE in 1996. The Area IV Learning Technology Hub began operations in January of 1996. The first LincOn Network school connection in the Area IV region was made in April of 1996, K. Bjelland (personal communication, November 10, 1997). This study concentrates on public K-12 schools located within the Area IV Learning Technology Hub region.

Equitable access appears to be a problem across the State of Illinois. Inadequate funding and lack of resources have hindered some districts in implementing technology. Variations in funding can widen the disparity of opportunity that already exists in the public schools of Illinois, (NCREL Policy Briefs, 1994).

Today, at the state level, Illinois has recommitted itself to implementing technology into the classroom. "Technology can be one of the great equalizers of educational opportunities across Illinois. We are building classrooms without walls,

classrooms where wealth and geographic location do not define educational achievement.", Illinois Governor Jim Edgar, State of the State Address, January 1996.

The State of Illinois is aggressively implementing the state technology plan and this study reports the current state of Internet access within the Area IV region.

## Chapter 3

### Methodology

#### Overview:

The purpose of this study was to obtain an overview of the current state of Internet access in public K-12 schools in east central Illinois. The emphasis of this study was to determine the extent of availability to the Internet and the type of Internet access. A questionnaire was used to collect data regarding the number of computers by building, distribution of computers by building, the type of Internet access, approximate monthly cost of Internet access, and the status of a technology coordinator position within the district.

#### Sample and Population:

The population for this study was public K-12 school districts within the Area IV Learning Technology Hub region. For a complete list of districts that were mailed questionnaires see Appendix C.

#### Questionnaire and Data Collection:

A questionnaire was mailed to the person responsible for technology within the district. If the school did not have a designated technology person the questionnaire was mailed to the administrator of the building. A questionnaire was completed for each building within the district that is an attendance center for K-12 students. Please refer to Appendix A for a sample questionnaire.

Questionnaires were mailed to all attendance centers in the Area IV region based on data that the Illinois State Board of Education compiled for school year 1997-98. The questionnaire collected demographic data that was used to determine if Internet access is equitable for all schools regardless of size and poverty level. The poverty level was defined by the percent of students who participate in the free and reduced lunch program. The questionnaire collected demographic information that included the name of the school, total number of students in the district, total number of students in the building, and the number of students at poverty level for the attendance center.

The remainder of the questionnaire is building specific. The data collected were used to determine to what extent Internet access was available. The questionnaire included closed-ended questions and fill in the blank questions as the method of data collection. The type of Internet access was selected from T1, 56kbs, ISDN, dial-up, satellite, or wireless choices. The monthly cost of Internet access and the name of the Internet Service Provider were also asked.

One section of the questionnaire gathered data on the number of computers in the school by the location categories of computer lab, media center, administration, and classroom. The status of a technology coordinator was asked at the building level and also at the district level. The status of a district web page was also asked.

#### Data Analysis:

The data were analyzed to determine if Internet access is ubiquitous and equitable regardless of district size and poverty level. Data were analyzed to determine what percent of school buildings currently have Internet access and categorized by the type of Internet connection. The percentage of schools that have a LincOn Network connection

was determined. The student to computer (SCOM) ratio, student to computer with Internet access (SIA) ratio, and percentage of computers by location were determined. Building level Internet access by the categories of elementary (K-5), middle school (6-8), and high school (9-12) was also determined. The status of a technology coordinator position was analyzed to determine if a full-time position had an impact on the availability of Internet access.

The questionnaire was tested prior to its release with six education technology professionals. These individuals determined if the questions were clearly worded, unambiguous, appropriate, and valid. The recommendations from the six individuals were used to improve the questionnaire before the final release.

A cover letter and questionnaire were mailed to the individual responsible for technology or to the administrator of the building. See Appendix B for a sample of the cover letter. A questionnaire was supplied for each attendance center in the district. A follow-up contact was made two weeks and again three weeks after the initial mailing to individuals who had not responded to the questionnaire.



## Chapter 4

### Results

Questionnaires were sent out to 431 attendance centers covering 17 counties in east central Illinois. There were 348 questionnaires returned. Of these 348 questionnaires, 10 respondents combined attendance centers that were located within the same building. This made for a total of 358 attendance centers that were represented by 348 questionnaires. A return rate of 83.1 percent was achieved.

Only public K-12 attendance centers were considered for this study. Five of the questionnaires represented pre-kindergarten attendance centers and were rejected. One questionnaire was rejected because it exclusively represented an administrative center. For the purpose of this study 342 questionnaires were valid and represented a total of 352 attendance centers. Table 1 lists the frequency distribution of questionnaires by county.

Table 1

Frequency Distribution of Questionnaires by County

County	Number Participating	Number Not Participating
Champaign	55	4
Clark	10	0
Coles	20	0
Cumberland	3	4
Dewitt	10	0
Douglas	11	0
Edgar	13	0
Ford	7	0
Iroquois	23	5
Kankakee	42	0
Livingston	22	4
Macon	19	31
McLean	40	11
Moultrie	2	5
Piatt	9	2
Shelby	16	4
Vermilion	40	3
Total	342	73

The number of students in the school district ranged from 59 students for the smallest district, to 9652 students for the largest district. The mean for the number of students per district was 2579.26. All 342 of the respondents answered the question regarding the number of students in the district.

The number of students per building ranged from 37 to 1655 students. All 342 of the respondents answered the question regarding the total number of students per building. The mean number of students per building was 362.55.

For the question regarding the number of students eligible for the free and reduced lunch program responses ranged from 2 to 853 students per building with a mean of 104.40, 94 percent of the respondents answered this question.

The percentage of respondents with building level Internet access was 84.2. There were 288 schools reporting they had some form of Internet access for the building while 54 respondents reported that they had no building level Internet access. All 342 of the respondents answered the question regarding building level Internet access.

The mean student to computer (SCOM) ratio was 8.27 and responses ranged from a minimum of 1.40 to a maximum of 50.2. All 342 of the respondents answered the questions regarding total number of computers in the building and also the total number of students in the building from which the SCOM ratio was calculated.

For buildings with Internet access, the mean student to computer with Internet access (SIA) ratio was 65.44 and responses ranged from a minimum of 1.95 to a maximum of 566.0. There were 281 respondents that answered the questions regarding total number of students in the building and the total number of computers with Internet access. The SIA ratio did not include the 54 respondents that do not have Internet access.

The location categories of computers located in computer labs, media centers, administration, and classrooms can be found in Table 2. All 342 of the respondents answered the questions regarding the number of computers by location category.

Table 2

Frequency Distribution of Percent Computers by Location

Location Category	Percent of Computers
Computer Labs	35.3
Media Centers	9.9
Administration	9.1
Classrooms	45.7
Total	100.0

Table 3 shows the results of dividing the questionnaires into three arbitrary categories of elementary (K-5), middle school (6-8), and high school (9-12) and comparing to building level Internet access.

Table 3

Building Level Internet Access by Category

Location Category	Number of bldgs with IA	Number of bldgs without IA
Elementary	139	34
Middle School	66	16
High School	83	4
Total	288	54

The most common type of Internet connection was the T1 leased line with a total of 20.5 percent of schools reporting this type of connection. Dial-up access was determined to be 19.6 percent, 16.1 percent had 56kbs leased line access, and 12.6 percent had ISDN access. Table 4 displays the complete results of building level Internet access by connection type.

Table 4

Building Level Internet Access by Connection Type

Type of Connection	Frequency	Percent
T1	70	20.5
56kbs	55	16.1
dial-up	67	19.6
ISDN	43	12.6
Wireless	17	5.0
Satellite	5	1.5
Other	30	8.8
Not Connected	54	15.8
No Response	1	0.3
Total	342	100.0

The results comparing LincOn to other Internet Service Provider connections are shown in Table 5.

Table 5

Comparison of LincOn to Other Internet Service Providers by Type of Internet Access Connection

Type of Connection	Frequency LincOn	Frequency Other ISP	Total
T1	48	19	67
56kbs	36	19	55
dial-up	2	62	64
ISDN	2	39	41
Wireless	1	15	16
Satellite	0	5	5
Other	6	24	30
Total	95	183	278

The most common monthly cost was in the \$0 - \$100 dollars per month range with 50.9 percent of the respondents stating the monthly cost of Internet access was less than \$100 per month. It should be noted that 19.6 percent of the respondents indicated the dial-up connection type for Internet access. Dial-up access is the least expensive connection type and is not considered robust. There were 54 schools that did not have Internet access to which this question did not apply. There were 25 respondents that did not answer the question regarding monthly cost of Internet access. Table 6 lists the results on the monthly cost of Internet access.

Table 6

Monthly Cost of Internet Access

Monthly Cost	Frequency	Percent
\$0 - 100	134	50.9
\$101 - 200	48	18.3
\$201 - 300	25	9.5
\$301 - 400	14	5.3
\$401 - 500	18	6.8
\$501 - 600	12	4.6
\$601 - 700	5	1.9
\$701 - 800	4	1.5
\$801 - 900	1	0.4
\$901 - 1000	0	0.0
\$1000 - higher	2	0.8
Total	263	100.0

Table 7 lists the frequency distribution of monthly cost by type of Internet connection. Connection types were selected from the categories of T1 leased line, 56kbs leased line, dial-up, ISDN, Wireless, Satellite, and other. There were 262 respondents that answered the questions regarding monthly cost and connection type.



Table 7

Monthly Cost by Type of Internet Connection

Monthly Cost	T1	56k	DU	ISDN	Wless	Sat.	Other
\$0 - 100	17	20	57	12	15	1	12
\$101 - 200	3	17	2	22			3
\$201 - 300	5	12	2	4			2
\$301 - 400	10	2	2				
\$401 - 500	13	2					3
\$501 - 600	10			5			1
\$601 - 700	2						3
\$701 - 800	3					1	
\$801 - 900						1	
\$901 - 1000							
\$1000 - higher						2	
Total	63	53	63	39	15	5	24

The percentage of attendance centers that have a LincOn connection was 34.8.

There were 279 respondents that answered the question regarding LincOn connectivity.

There were 54 schools to which the question did not apply because of no Internet access.

Table 8 shows the results of schools with a LincOn connection.

Table 8

Percent of Schools with a LincOn Connection

LincOn Connection	Frequency	Percent
Yes	97	34.8
No	182	65.2
Total	279	100.0

It was determined that 54.6 percent of attendance centers had a full-time district technology coordinator. The percentage of respondents that had a part-time technology coordinator position was 33.8 and 11.6 percent of schools had no district technology coordinator. Table 9 displays the results on the status of a district level technology position.

Table 9

Status of District Level Technology Coordinator Position

District Tech. Coord.	Frequency	Percent
Full-time	184	54.6
Part-time	114	33.8
None	39	11.6
Total	337	100.0

Of the 54 buildings that did not have Internet access, 28 attendance centers had a full-time district level technology coordinator, 9 attendance centers did not have a full-time district level technology coordinator, and 16 attendance centers had a part-time district level technology coordinator. One respondent did not answer the question regarding a district level technology coordinator position.

It was determined that 4.4 percent of attendance centers had a full-time building level technology coordinator. It was also determined that 31.9 percent of attendance centers had a part-time building technology coordinator and 56.4 percent of attendance centers had no building level technology coordinator position. The results of the building level technology coordinator position are shown in Table 10.

Table 10

Status of Building Level Technology Coordinator Position

Building Tech. Coord.	Frequency	Percent
Full-time	15	4.4
Part-time	109	31.9
None	193	56.4
No Response	25	7.3
Total	342	100.0

The percentage of computers with Internet access that were located in the classroom is shown in Table 11.

Table 11

Percent of Computers Located in Classrooms with Internet Access

Percent Classroom Computers with Internet access	Frequency	Percent
0 - 10	99	28.9
11 - 20	10	2.9
21 - 30	9	2.6
31 - 40	7	2.0
41 - 50	13	3.8
51 - 60	6	1.8
61 - 70	8	2.3
71 - 80	10	2.9
81 - 90	10	2.9
91 - 100	111	32.5
No Response	59	17.3
Total	283	99.9

The percentage of districts with a technology plan was 95.6. Table 12 displays the results of schools with a district technology plan. There were 3 respondents that did not answer the question regarding a district level technology plan.

Table 12

Status of District Technology Plan

District Technology Plan	Frequency	Percent
Yes	326	95.3
No	13	3.8
No Response	3	0.9
Total	342	100.0

The percentage of districts that had a web page was 57.4. Four respondents did not answer the question regarding a district level web page. Table 13 displays the results.

Table 13

Status of District Web Page

District Web Page	Frequency	Percent
Yes	194	57.4
No	144	42.6
Total	338	100.0

The percent of students eligible for the free and reduced lunch program ranged from 1 to 100 percent. The mean value was 29.83 percent. Frequency data for comparing the percent of students eligible for the free and reduced lunch program to building level Internet access is displayed in Table 14. There were 20 respondents that

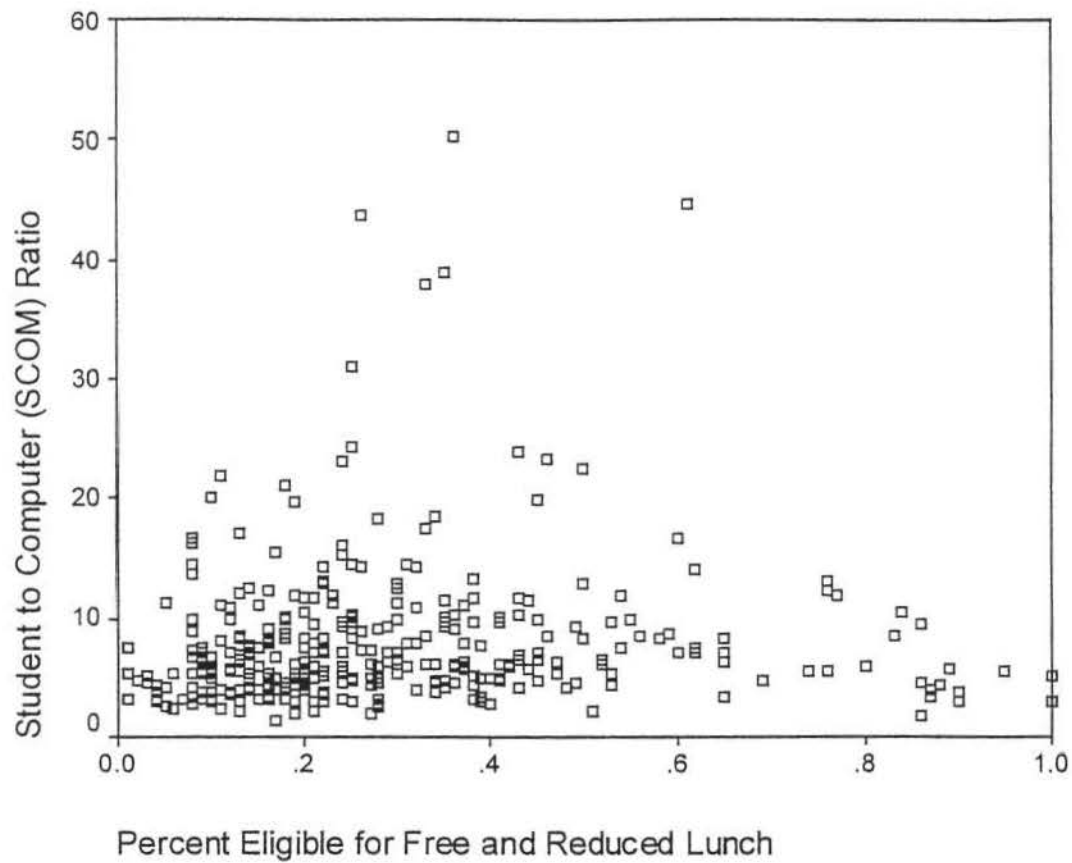
did not answer the question regarding number of students eligible for the free and reduced lunch program.

Table 14

Percent of Students Eligible for Free and Reduced Lunch Program Compared to Building Level Internet Access

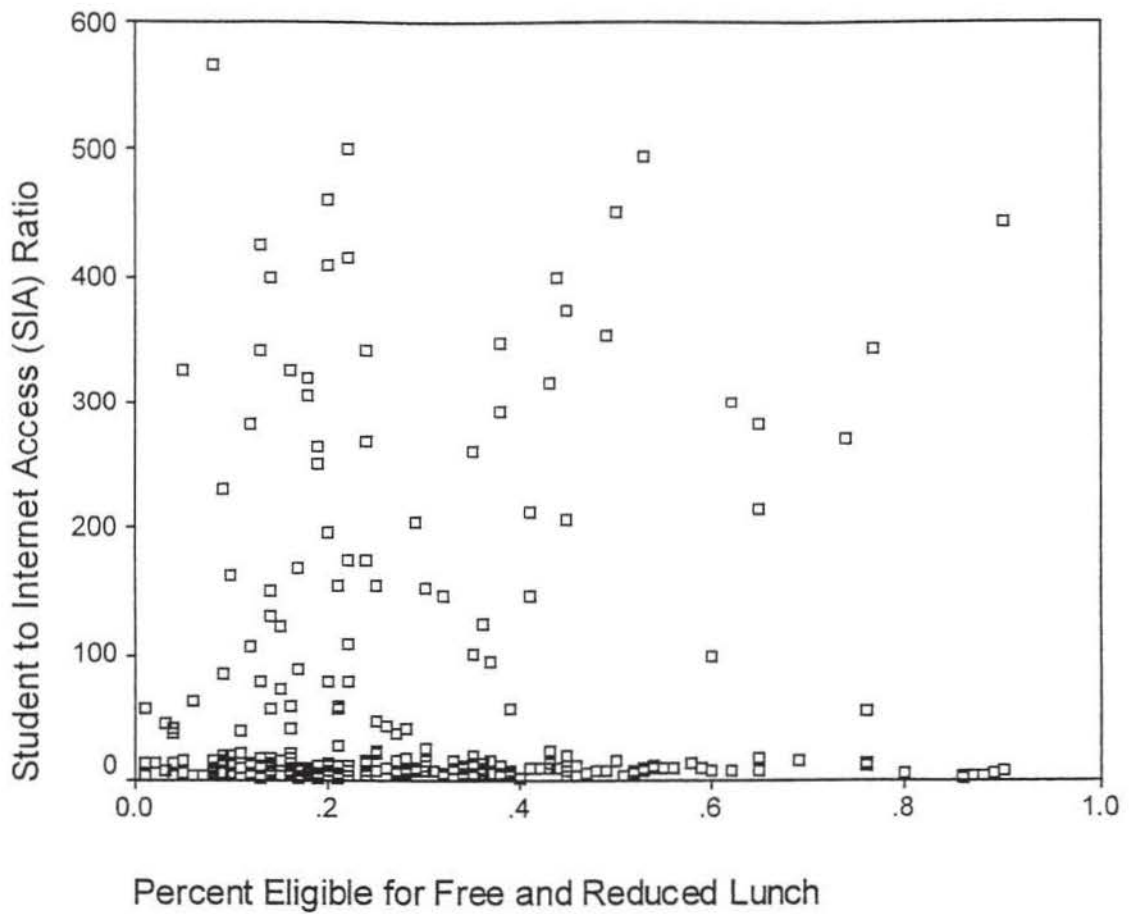
Percent of students eligible for F&R Lunch	Frequency	Number bldgs with IA
0 – 10	47	44
11- 20	83	72
21- 30	69	56
31 - 40	48	36
41- 50	31	25
51 - 60	14	14
61- 70	9	7
71 - 80	6	6
81- 90	12	9
91 -100	3	0
Total	322	269

Figure 1 displays a scatter plot diagram of the student to computer (SCOM) ratio to the percent of students eligible for the free and reduced lunch program.



**Figure 1.** Scatter plot diagram of student to computer (SCOM) ratio to the percent of students eligible for free and reduced lunch program.

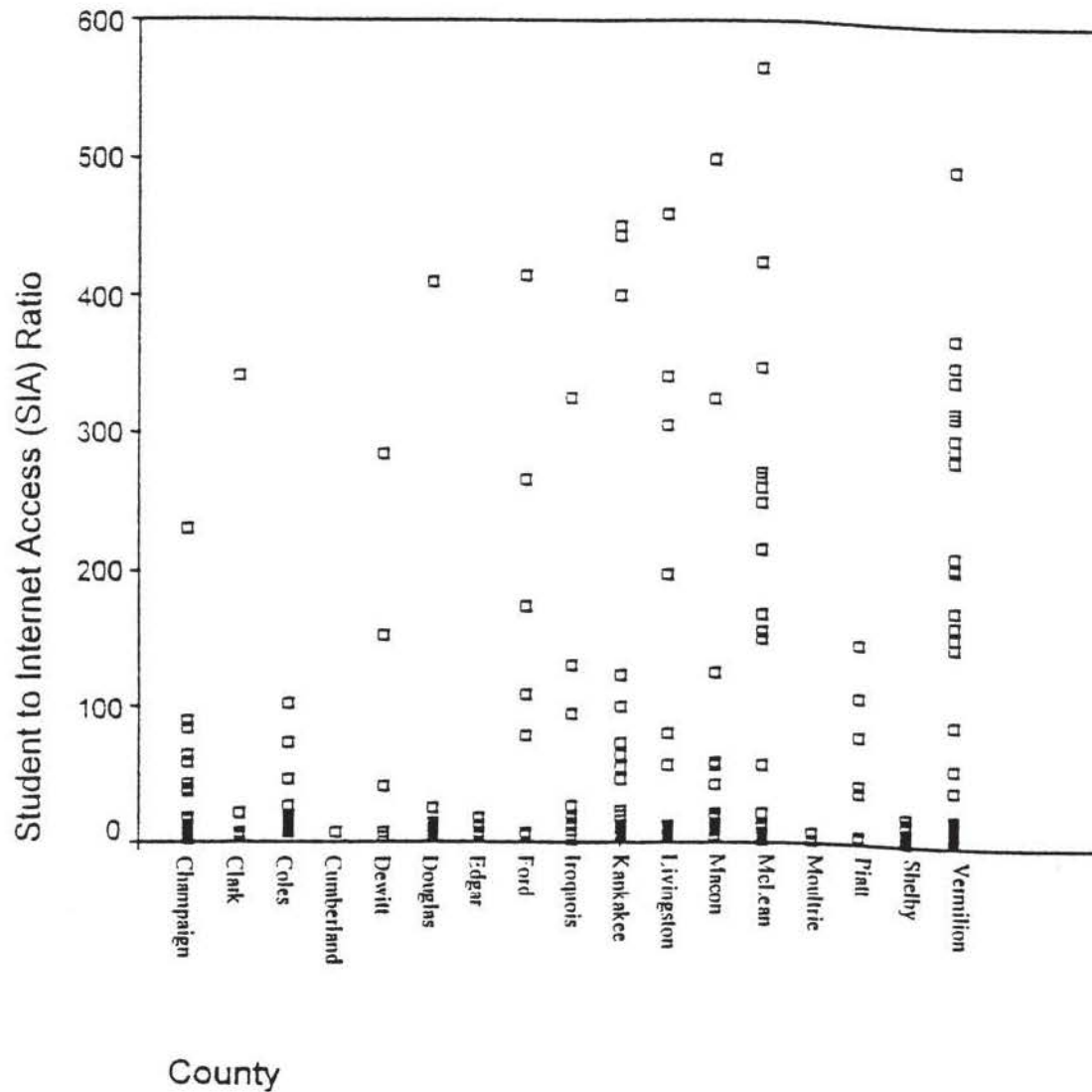
Figure 2 displays a scatter plot diagram of the student to computer with Internet access (SIA) ratio to the percent of students eligible for the free and reduced lunch program.



**Figure 2.** Scatter plot diagram of student to computer with Internet access (SIA) ratio to percent of students eligible for the free and reduced lunch program.

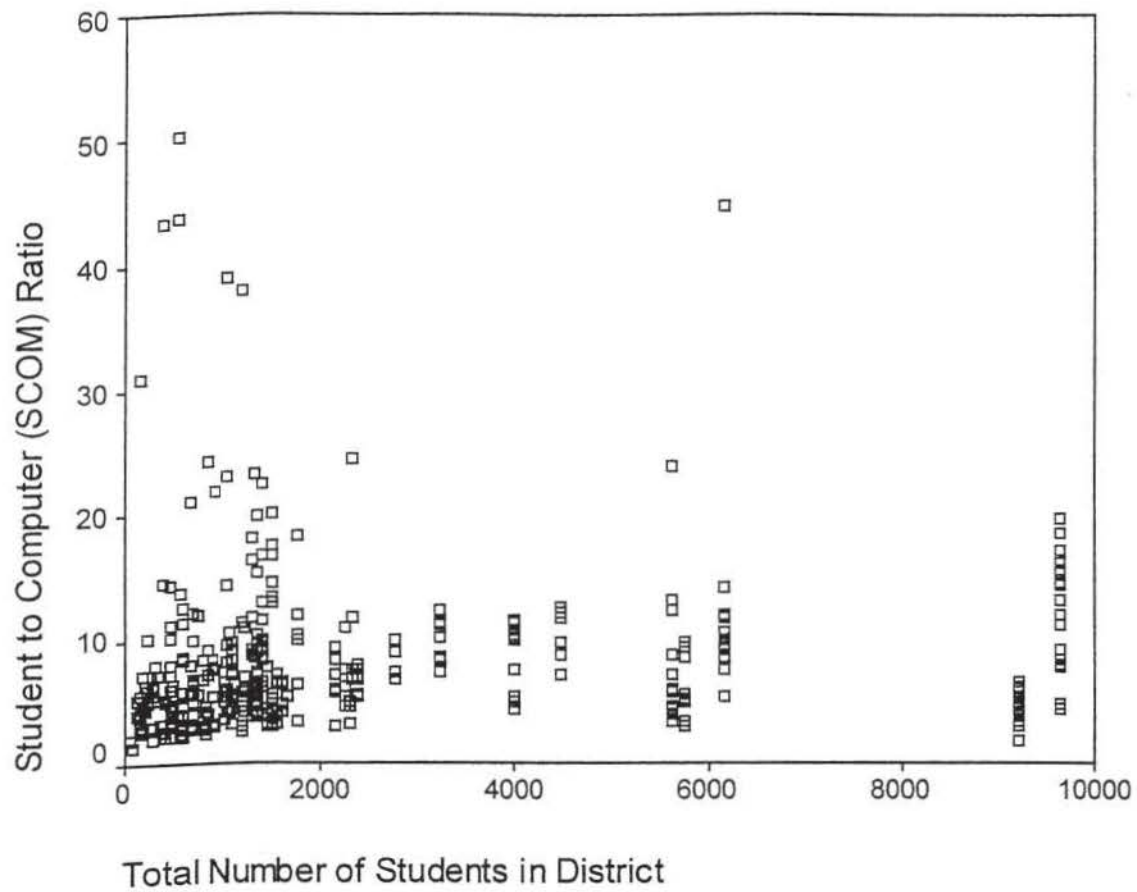
Figure 3 is a scatter plot diagram of student to computer with Internet access (SIA) ratio by county.





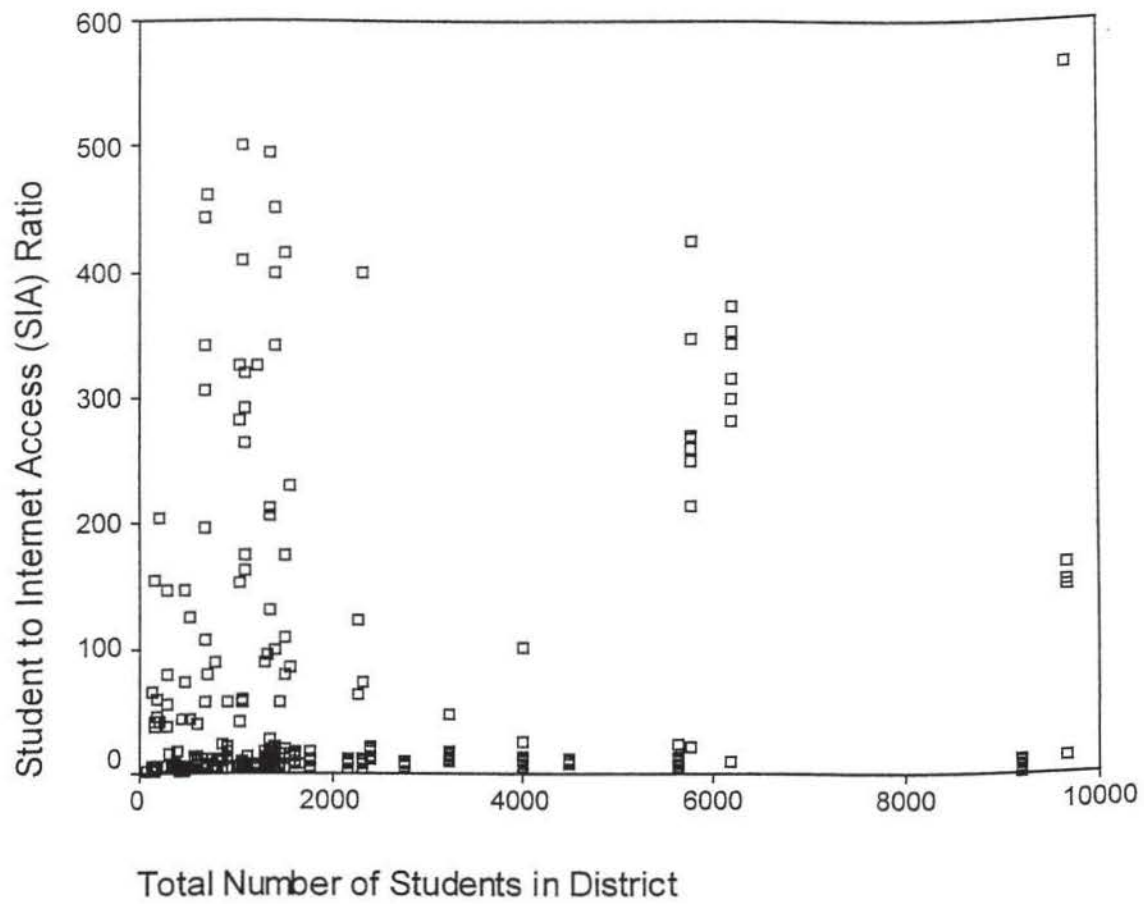
**Figure 3.** Scatter plot diagram of student to Internet access (SIA) ratio by county

Figure 4 is a scatter plot diagram of the student to computer (SCOM) ratio to the total number of students in district.



**Figure 4.** Scatter plot diagram of the student to computer (SCOM) ratio to the total number of students by district.

Figure 5 is a scatter plot diagram of the student to computer with Internet access (SIA) ratio to the total number of students in the district.



**Figure 5.** Scatter plot diagram of the student to computer with Internet access (SIA) ratio to the total number of students by district.

## Chapter 5

### Conclusions

The purpose of this study was to gather data on the current state of Internet access and the monthly cost to public K-12 schools in east central Illinois. This study also collected data on the distribution of computer resources available to teachers in classrooms, computer labs, administration, and media centers. The percentage of public schools in east central Illinois with Internet access was 84.2. The mean student to computer (SCOM) ratio was 8.27. The mean student to computer with Internet access (SIA) ratio was 65.44 for those respondents that reported building level Internet access.

Progress has been made since the report by Heaviside, Riggins, and Farris (1996) that found 65 percent of the nations schools had building level Internet access. This study determined that 84.2 percent of schools had building level Internet access. Progress is also being made with regard to the type of Internet connection. This report found that 20.5 percent of connections were T1 leased lines, 16.1 percent were 56kbs leased lines, 12.6 percent were ISDN connections, and 19.6 percent were dial-up connections. See Table 4 for a complete listing. This is an improvement to what was reported by Heaviside, et al. (1996) - 12 percent T1 leased lines, 11 percent 56kbs leased lines, 4 percent ISDN, and the remainder relying upon dial-up connections.

The monthly cost of Internet access is displayed by Table 6. This study found that 50.9 percent of the schools had a monthly recurring cost of less than 100 dollars. While monthly cost is dependent upon the type of Internet connection method there was no correlation between monthly cost and district size or poverty level of the school.

This study determined that robust connections are being made. LincOn connections represented 34.8 percent of all connections and are generally more robust than other ISP connections. See Table 5 for a complete listing. The majority of dial-up connections are from Internet Service Providers other than LincOn. Dial-up connections are not robust for many applications that require higher bandwidth to be of practical use. Almost 20 percent of the respondents indicated dial-up as the type of Internet connection.

The distribution of computers was 35.3 percent in computer labs, 9.9 percent in media centers, 9.1 percent in administration, and 45.7 percent in classrooms. Of the computers that were located in the classrooms, 32.5 percent of schools reported having more than 90 percent of classroom computers capable of Internet access.

There was no correlation found between the poverty level of students and building level Internet access. It was determined that 95.6 percent of the schools had a district level technology plan. This is an improvement from the 33 percent of districts with technology plans as reported by ISBE (1996). It was also determined that 57.4 percent of schools had a district level web page.

Progress has been made in connecting east central Illinois public schools to the Internet. It was determined that 84.2 percent of public schools in east central Illinois have building level Internet access, however; the mean SIA ratio of 65.44 remains too high for our children to have equitable and ubiquitous access to Internet resources. It was

determined that dial-up connections accounted for 19.6 percent of building level Internet connections. Over one-third of the schools reported either no building level Internet access or Internet access that is considered non-robust.

The goal of equitable and ubiquitous computing is currently not a reality in east central Illinois public schools. Integrating technology into the curriculum will require continued investment and development of the telecommunication and networking infrastructures that are necessary to support Internet technologies. This investment will be required to insure equitable and ubiquitous access for our children.

### Recommendations for Further Study

This study has provided baseline data regarding the present state of Internet access for public K-12 schools in east central Illinois. Further study is needed to determine the effects of the E-rate program once it is implemented. As of the date of this writing, the E-rate program had not begun distributing funds. Many schools in east central Illinois have applied for the E-rate discounts. A study on the effects of the E-rate program and how it is affecting purchasing decisions is needed.

A longitudinal study is needed to determine if progress is occurring with regard to equitable and ubiquitous Internet access. It is further recommended that the type of Internet connection as well as the SIA ratio be qualified.

This study only considered Internet access. Further studies are needed to determine utilization and integration of technology into the classroom for east central Illinois schools.

Further studies are also needed for other areas of the state. Area IV is predominately a rural area and these data could be used for comparison of Internet access to other areas in the State of Illinois.

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## Appendix A

## Building Level Questionnaire of Internet Access

Please complete one questionnaire for each building that is an attendance center for the district. When completed return to the Area IV Learning Technology Hub, Suite 305, 200 South Fredrick, Rantoul, IL 61866

District Name: \_\_\_\_\_ Date: \_\_\_\_\_

School Name: \_\_\_\_\_

Total number of students served by the district: \_\_\_\_\_

Number of students served by this building: \_\_\_\_\_

Number of students eligible for free and reduced lunch program for this building? \_\_\_\_\_

Grade levels served by this building: (check all that apply)

☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th ☐ 6th ☐ 7th ☐ 8th  
☐ 9th ☐ 10th ☐ 11th ☐ 12th ☐ Kindergarten

What is the total number of computers in this building? \_\_\_\_\_

Does this building have Internet access? ☐ Yes ☐ No

If yes, how many computers in this building have Internet access? \_\_\_\_\_

How is this building connected to the Internet?

☐ T1 line ☐ 56 Kbs line ☐ dial-up connection ☐ ISDN  
☐ Wireless ☐ Not Connected ☐ Satellite  
☐ Other (please specify) \_\_\_\_\_

What is the monthly cost for Internet access for this building?

☐ \$0 to \$100 ☐ \$101 to \$200 ☐ \$201 to \$300 ☐ \$301 to \$400  
☐ \$401 to \$500 ☐ \$501 to \$600 ☐ \$601 to \$700 ☐ \$701 to \$800  
☐ \$801 to \$900 ☐ \$901 to \$1000 ☐ \$1001 or higher

Is this building connected to the ISBE LincOn Network? ☐ Yes ☐ No  
 If no, please list the Internet Service Provider: \_\_\_\_\_

Does the district have a technology coordinator position?

☐ full-time ☐ part-time ☐ none

Does this building have a technology coordinator position?

☐ full-time ☐ part-time ☐ none

How many computers in this building are located in computer lab(s)? \_\_\_\_\_

How many computers in this building are located in media center(s)? \_\_\_\_\_

How many computers in this building are located in administrative office(s)? \_\_\_\_\_

How many computers in this building are located in classrooms?  
\_\_\_\_\_

What percent of classroom computers in this building are currently connected to the Internet?

☐ 0 to 10   ☐ 11 to 20   ☐ 21 to 30   ☐ 31 to 40  
☐ 41 to 50   ☐ 51 to 60   ☐ 61 to 70   ☐ 71 to 80  
☐ 81 to 90   ☐ 91 to 100

Does the district have a technology plan?   ☐ Yes   ☐ No

Does the district have a web page?   ☐ Yes   ☐ No

If yes, please list the URL: \_\_\_\_\_

## Appendix B

April 15, 1998

Dear Technology Coordinator,

I am currently working on my master thesis titled, "Internet Access In East Central Illinois Public K-12 Schools." Would you please take a few minutes of your time to help determine the status of Internet access in your district? This questionnaire is being sent to all public K-12 schools in the 17 counties that the Area IV Learning Technology Hub serves. Your participation is very important in the completion of this research. Please answer all questions based upon the current status. This research will establish baseline data for Internet access as it exists before the effects of the "E-rate" program.

Please fill out one questionnaire for each building that is an attendance center for your district. To get a true picture of east central Illinois schools it is important that all schools participate in this research. If necessary please route the questionnaire(s) to the appropriate individuals. You will find a self-addressed stamped envelope enclosed for your convenience. Please fill out and return the questionnaire(s) as soon as possible.

A copy of the completed research will be kept on file at your districts Regional Office of Education and also at the Area IV Learning Technology Hub in Rantoul, Illinois. If you have questions or comments I can be reached via e-mail at [csgtg@eiu.edu](mailto:csgtg@eiu.edu) Please return your questionnaire(s) no later than April 30, 1998.

Your cooperation is greatly appreciated!

Sincerely,

Tom Grissom

## Appendix C

District Name	County
Fisher C U School District 1	Champaign
Mahomet-Seymour C U Sch Dist 3	Champaign
Champaign Comm Unit Sch Dist 4	Champaign
Tolono C U School Dist 7	Champaign
Heritage Comm Unit Sch Dist 8	Champaign
Monticello CUSD 25	Champaign
Urbana School Dist 116	Champaign
Thomasboro C C Sch Dist 130	Champaign
Rantoul City School Dist 137	Champaign
Ludlow C C School Dist 142	Champaign
St. Joseph C C School Dist 169	Champaign
Gifford C C School Dist 188	Champaign
Prairieview Comm Cons Dist 192	Champaign
Rantoul Township H S Dist 193	Champaign
Ogden Comm Cons Sch Dist 212	Champaign
Casey-Westfield C U Sch Dist 4C	Clark
Martinsville C U Sch Dist 3C	Clark
Marshall C U School Dist 2C	Clark
Charleston C U School Dist 1	Coles
Mattoon C U School Dist 2	Coles
Oakland C U School Dist 5	Coles

District Name	County
Cumberland C U School Dist 77	Cumberland
Neoga Comm unit School Dist 3	Cumberland
Clinton C U School Dist 15	De Witt
Blue Ridge Comm Unit Sch Dist 18	De Witt
Tuscola C U School Dist 301	Douglas
Villa Grove C U Sch Dist 302	Douglas
Arthur C U School Dist 305	Douglas
Arcola C U School Dist 306	Douglas
Shiloh Comm Unit Sch Dist 1	Edgar
Kansas Comm Unit School Dist 3	Edgar
Paris Comm Unit School Dist 4	Edgar
Edgar County C U Dist 6	Edgar
Paris-Union School Dist 95	Edgar
Gibson City-Melvin-Sibley CUSD 5	Ford
Paxton-Buckley-Loda CU Dist 10	Ford
Central Comm Unit School Dist 4	Iroquois
Cissna Park Comm Unit Sch Dist 6	Iroquois
Iroquois Co C U School Dist 9	Iroquois
Iroquois West C U S Dist 10	Iroquois
Milford Twp High Sch Dist 233	Iroquois
Crescent-Iroquois Comm Dist 252	Iroquois
Crescent City C C School Dist 27	Iroquois

District Name	County
Milford Comm Cons Sch Dist 280	Iroquois
Donovan Comm Unit School Dist 3	Iroquois
Sheldon Comm Unit School Dist 5	Iroquois
Momence Comm Unit Sch Dist 1	Kankakee
Herscher Comm Unit Sch Dist 2	Kankakee
Manteno Comm Unit Sch Dist 5	Kankakee
Grant Park C U School Dist 6	Kankakee
Bourbonnais School Dist 53	Kankakee
Bradley School Dist 61	Kankakee
Kankakee School Dist 111	Kankakee
St Anne 256	Kankakee
St George CC School Dist 258	Kankakee
Pembroke C C School District 259	Kankakee
St Anne Comm H S Dist 302	Kankakee
Bradley Bourbonnais C HS D 307	Kankakee
Flanagan C U School Dist 4	Livingston
Streator Woodland C U Sch Dist 5	Livingston
Prairie Central C U School Dist 8	Livingston
Pontiac Twp H S Dist 90	Livingston
Dwight Twp H S Dist 230	Livingston
Dwight Common School Dist 232	Livingston
Pontiac C C School Dist 429	Livingston

District Name	County
Odell Comm Cons School Dist 435	Livingston
Saunemin C Consol Sch Dist 438	Livingston
Tri Point C U School Dist 6-J	Livingston
Cornell Comm H S Dist 90	Livingston
Rooks Creek C C School Dist 425	Livingston
Pontiac-Esmen C C School Dist 430	Livingston
Argenta-Oreana Comm Unit Sch D 1	Macon
Mt Zion Comm Unit Sch Dist 3	Macon
Niantic-Harristown C U S D 6	Macon
Warrensburg-Latham C U Dist 11	Macon
Meridian Comm Unit Sch Dist 15	Macon
Maroa-Forsyth C U Dist 2	Macon
Decatur School District 61	Macon
Leroy Community Unit Sch Dist 2	Mc Lean
Tri-Valley C U School District 3	Mc Lean
Heyworth C U Sch Dist4	Mc Lean
McLean County Unit Dist No 5	Mc Lean
Lexington C U Sch Dist 7	Mc Lean
Gridley C U Sch Dist 10	Mc Lean
Ridgeview Comm Unit Sch Dist 19	Mc Lean
Bloomington Sch Dist 87	Mc Lean
Chenoa C U School Dist 9	Mc Lean



District Name	County
Olympia C U School Dist 16	Mc Lean
Ridgeview Comm Unit Sch Dist 19	Mc Lean
Lovington C U School Dist 303	Moultrie
Sullivan C U School Dist 300	Moultrie
Bethany C U School Dist 301	Moultrie
Bement Comm Unit School Dist 5	Piatt
Deland-Weldon C U Sch Dist 57	Piatt
Cerro Gordo C U School Dist 100	Piatt
Atwood-Hammond C U Sch Dist 39	Piatt
Windsor Comm Unit Sch Dist 1	Shelby
Findlay Comm Unit Sch Dist 2	Shelby
Shelbyville C U School Dist 4	Shelby
Tower Hill C C School District 1	Shelby
Central A&M C U Dist #21	Shelby
Tower Hill Comm High Sch Dist 18	Shelby
Cowden-Herrick Comm H S Dist 188	Shelby
Stewardson-Strasburg C U Dist 5A	Shelby
Cowden-Herrick Elem C C Dist 11	Shelby
Bismarck C U School Dist 1	Vermilion
Westville C U School Dist 2	Vermilion
Georgetown-Ridge Farm C U D 4	Vermilion
Catlin C U Sch Dist 5	Vermilion

District Name	County
Rossville-Alvin CU Sch Dist 7	Vermilion
Potomac C U Sch Dist 10	Vermilion
Hoopeston Area C U Sch Dist 11	Vermilion
Armstrong-Ellis Cons Sch Dist 81	Vermilion
Community Unit School Dist #76	Vermilion
Danville C C School Dist 118	Vermilion
Armstrong Twp HS Dist 225	Vermilion
Jamaica C U School Dist 12	Vermilion