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Availability of Technology in Rural and Small Town Central Illinois K-12 Public School Districts

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Availability of Technology in Rural and Small Town

Central Illinois K-12 Public School Districts

BY

Robert H. Ehlke

FIELD EXPERIENCE

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

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CHARLESTON, ILLINOIS

1996

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Abstract

In the current technological information based society there is a critical need to integrate technology with education. Although many technologies have been available for over 20 years, public educational institutions have been slow to acquire and use the technological advances in the classroom for instructional purposes. In order to help the state and the communities of Illinois develop technology plans to meet the technology needs of K-12 public school districts in rural and small town Illinois, there was a need to investigate the availability of existing technologies. This study was conducted to determine the present condition of K-12 public school classroom teachers in rural and small town central Illinois schools regarding the availability of current technologies for instructional use.

The study took place in the spring of 1996 utilizing a survey of a random sample of 400 rural and small town central Illinois public school classroom teachers. Responses to the survey were received from 252 classroom teachers.

The majority of classroom teachers did not report availability of current technologies for instructional use in their classrooms. Most teachers reported frequent use of technologies available to them in their classrooms for instructional use. When teachers had current technologies available for instructional use in their school, teachers did not report using the technologies as frequently as teachers who reported having the technologies in their classroom. Most rural and small town K-12 central Illinois public school classroom teachers do not expect unavailable technologies to become available for instructional use within the next five years.

With the assistance of the Illinois State Board of Education and state government officials, rural and small town central Illinois K-12 public school districts need to invest in current technologies for instructional use by classroom teachers in the classroom.

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Chapter 1

Overview of the Problem

Background

Technology today is often equated with computers. In education computer instruction is often the main focus of technology. While computers are at the heart of today's technology in the home, workplace, and educational settings, there are a wide variety of technologies available to assist individuals, businesses, industries, and schools in being more productive.

In the current technological information based society there is a critical need to integrate technology with education. Educators are exploring distance learning using telephones, FAX machines, modems, and full motion video over existing phone lines as an option to bring more courses to students, especially in remote rural areas. As more and more schools link with distance learning labs, school districts find that they are able to explore and benefit from existing telecommunication. Administration has turned to technology to solve scheduling and data management problems. Classroom teachers are logging on to the internet to provide research, explore remote places in the world, and communicate with people from other countries.

Although many technologies have been available for over 20 years, public educational institutions have been slow to acquire and use the technological advances in the classroom for instructional purposes. At a time when the Illinois State Superintendent of Schools was calling for each student to be provided a laptop computer for use at home and at school, many classrooms in central Illinois may not even have access to outdated personal computers such as an Apple IIe. The first step in creating a technologically literate staff and student body is to have access to current technologies. In order to help the state and the communities of Illinois develop a technology plan to meet the technology needs of K-12 public school districts in rural

and small town Illinois, there was a need to investigate the availability of existing technologies in rural and small town Illinois.

Problem

The problem addressed by this study was: What is the present condition of K-12 public school classroom teachers in rural and small town central Illinois schools regarding the availability of current technologies for instructional use?

The short term effects of this study were to assist rural and small town central Illinois school districts to evaluate and plan in the area of technology. By providing information about the availability of current technologies in rural and small town central Illinois schools, this study may create an interest on the part of rural and small town central Illinois school boards and state level governmental bodies to find ways to invest in the acquisition of current technologies for instructional use.

The long term effect of this study will be achieved only if the original study results in rural and small town central Illinois school districts acquiring current technologies for instructional use. Students in rural and small town central Illinois school districts will have access to current technologies and will become proficient in the use of current technologies in their school studies which, in the writer's opinion, will provide life skills that will transfer to post-secondary educational and work situations.

This study should provide information to rural and small town central Illinois school districts that will help them make decisions about acquisition of current technologies for instructional use. A rural or small town central Illinois school district can compare its present use of current technologies for instructional use with other rural and small town school districts in central Illinois and help the district to develop a technology plan that will increase the availability of current technologies for instructional use in the district.

The results of the study will be made available to Joseph Spagnolo, State Superintendent of Schools; Cheryl Lemke, Associate Superintendent of Learning Technology and Systems; and Jim Edgar, Governor. At the state level the information can help the Illinois State Board of Education and state government officials make decisions about assisting central Illinois rural and small town school districts in acquiring current technologies for instructional use.

Research Questions

The specific questions addressed by this study were:

1. What is the current availability of each technology in the school and/or classroom for instructional use?
2. How often (using the categories of at least once a day, once a week, once a month, once a quarter, once a year, and never) is each available technology used in the classroom by classroom teachers for instructional purposes?
3. Which unavailable technologies would be used by classroom teachers for instructional purposes, if available?
4. Which technologies are perceived by classroom teachers as essential to provide a comprehensive education to students?
5. How do classroom teachers prioritize a list of current technologies (overhead projectors, calculators, overhead calculators, telephones, fax capability, teacher laptop computers, teacher PC computers, teacher notebook computers, student PC computers, local area networks (LAN), wide area networks (WAN), e-mail, internet access, LCD projection panels, and cable/satellite television) based on importance for instructional use in the classroom?
6. Has the classroom teacher's school/district developed a technology plan that includes acquisition of current technologies for instructional use in the classroom?
7. What is the classroom teacher's estimate of how long (using the categories of

1 year, 2 years, 3 years, 4 years, 5 years, and over 5 years) before each unavailable current technology will be made available for instructional use in the classroom?

Assumptions

The following factors that are related to the use of current technology were not being investigated by this study:

1. Classroom teachers are aware of current technologies.
2. Classroom teachers value the acquisition of some current technologies.
3. Classroom teachers recognize the need for use of some current technologies in classroom instruction.

Delimitations

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

1. What was the availability of staff development to classroom teachers in how to use current technologies for instructional use? It was assumed that if classroom teachers are using current technologies for instructional use, they have obtained some level of training, or if classroom teachers do not have current technologies available for instructional use, they have no need for staff development at this time.
2. What was the level of knowledge of classroom teachers in how to use current technologies for instructional use? It was assumed that if classroom teachers are using current technologies for instructional use, they have some level of relevant knowledge, or if classroom teachers do not have current technologies available for instructional use, their knowledge of how to use current technologies is not relevant at this time.
3. What was the availability of financial resources to purchase current technologies for instructional use? It was assumed that rural and small town school districts in central Illinois do not have abundant financial resources available to acquire most available current technologies and that resources to purchase current technologies

would be the result of making acquisition of current technologies a high priority for expenditure of the meager resources available.

4. What was the support of administration, school board and/or community to acquire current technologies for instructional use? It was assumed that if current technologies are presently available for instructional use, support for acquisition of current technologies is present at some or all levels. If current technologies are not available for instructional use, support is not relevant at this time.

5. What was the interest and support of classroom teachers in acquiring current technologies for instructional use? If current technologies are available to classroom teachers and the classroom teachers are using the technologies for instruction, it was assumed that the classroom teachers have some level of interest in and support of use of current technologies for instruction. If classroom teachers do not have current technologies available and they report that they see current technologies as essential for students to receive a comprehensive education, it was also assumed that the classroom teachers have some level of interest in and support of use of current technologies for instruction.

6. What was the availability of current technology to classroom teachers and students outside the school environment? It was assumed that if current technologies are not available within the classroom situation for instructional use, not all students and teachers have current technologies available to them to assist in the teaching and learning process.

Limitations

The following limitations were placed on this study: (a) rural and small town; (b) K-12 public school districts; (c) central Illinois; (d) representation in the sample of grade level groupings K-5, 6-8, and 9-12; and (e) a random sample of 400 classroom teachers.

Definition of Terms

The following presents operational definitions.

Current technology. Overhead projectors, calculators, overhead calculators, telephones, fax capability, teacher laptop computers, teacher PC computers, teacher notebook computers, student PC computers, local area networks (LAN), wide area networks (WAN), e-mail, internet access, LCD projection panels, and cable/satellite television.

K-12 public school classroom teachers. Classroom teachers who primarily serve regular education students in a classroom situation.

Central Illinois. The following counties in central Illinois: Hancock, McDonough, Fulton, Schuyler, Brown, Adams, Pike, Brown, Scott, Morgan, Cass, Calhoun, Greene, Jersey, Macoupin, Montgomery, Christian, Sangamon, Menard, Mason, Logan, Tazewell, McLean, Livingston, DeWitt, Macon, Piatt, Ford, Champaign, Vermilion, Shelby, Moultrie, Douglas, Coles, Cumberland, Edgar, and Clark.

Rural and small town schools. Public school districts with student enrollments of less than 1,500 for K-12 districts, 1,000 for K-8 districts, and 500 for High School districts.

Instructional use of current technology. Used by a teacher and/or students to teach or learn academic subject content, used by students to assist with academic projects, and/or used to teach and learn how to use the current technology.

Comprehensive education. An education that will provide the skills necessary for students to achieve in post-secondary educational and work pursuits.

Chapter II

Review of Related Literature and Research

Technology in the form of computers, video, television, telephones, radio, and telecommunications networks has influenced how Americans live, work, and play. As current technologies become more powerful and affordable and new technologies emerge, Americans will need to be prepared to use current and new technologies. The Secretary's Commission on Achieving Necessary Skills (1991) recognized the ability to use technology as an indispensable skill.

Betts (1994) reported Thornberg stated that the Information Age is over, and the American society is witnessing the birth of the Communication Age. Thornberg contended that many schools have not yet entered or have just begun to enter the Information Age. Schools need to adjust to the new realities of the Communication Age by merging the informational tools with the communication tools, and students need to use these tools wherever they are. Thornberg (1992) suggested that the educational community has treated current technology like foreign objects trying to invade the whole educational system.

Some educational curriculum subject area groups (e.g., National Council of Teachers of Mathematics, 1989; American Association for the Advancement of Science, 1993) recognized in their standards that current technologies need to be used by classroom teachers for instructional purposes. Journals have told educators how to use computer technology to improve literacy (e.g., Wepner, 1992) and how to teach math concepts using calculators (e.g., Mercer, 1995). Some journal writers have explained how schools can acquire technology (e.g., Schnitzer, 1995; Betts, 1994). Researchers have studied the impact of technology on schools and student learning (e.g., Dwyer, 1994) and identified problems in implementation of programs using technologies (e.g., O'Neil, 1995).

The U. S. Congress Office of Technology Assessment recently released a new report, Teachers and Technology: Making the Connection (1995), a comprehensive study of the presence and impact of technology in U.S. Schools from the teacher perspective. This government study was based mainly on data gathered through case studies of university lab schools and large city school districts that have model technology schools. Observations by study participants at the case study schools were often used as the basis for general conclusions about the availability of current technologies in American school classrooms. Some of the key findings of the study about availability of current technologies for classroom instructional use were as follows:

1. Only minimal data have been collected from teachers about availability of technology for instructional use.
2. Despite projections that by spring 1995 U.S. schools will have one computer for every nine students, computer use for instruction is not reported by many teachers.
3. Data concerning school access to newer technologies are extremely weak.
4. Most K-12 schools are not ready to take advantage of telecommunications networks. Telephones, modems, fax machines and other telecommunications links with the outside world may exist in some school buildings, but classroom availability is scarce.

The National Education Association (1992) conducted a nationally representative survey of teachers who reported on resources "readily available" at their work site and using the resource "regularly for instruction." The report showed that 68% of the teachers surveyed had a personal computer "readily available" at their work site with 42% of the teachers reported using a personal computer "regularly for instruction."

The researcher was unable to find a comprehensive study about the availability of current technologies to rural and small town K-12 public school classroom teachers for instructional use. Most data gatherings, including Illinois State Board of Education data gatherings, have focused on the availability of current technologies from the district or school administration level. The scope of the data gatherings has also generally been limited to computers and computer networking. Instructional technology includes a wide range of devices, some of which have been around for over 30 years. This study was focused on gathering data from rural and small town K-12 central Illinois public school classroom teachers about the availability of 15 current technologies for classroom instructional purposes.

This study helps to provide some of the data missing from research concerning the availability of current technologies to K-12 classroom teachers. The researcher has not been able to find any significant studies on the availability of current technologies to classroom teachers for instructional use other than the one done by the U. S. Congress Office of Technology Assessment. The U.S. Congress study used case studies rather than a survey of classroom teachers and made projections of availability and use in the U.S. based on the case studies. The 1992 National Education Association report did survey classroom teachers, but only gathered data on personal computer availability and use.

While this study cannot be used to draw accurate conclusions about the availability of current technologies to K-12 classroom teachers in the U.S., it does provide a basis for comparisons with projections made by the U. S. Government's Office of Technology Assessment and the limited data obtained in the 1992 National Education Association report. It also provides data for any U.S. school district to use in comparing its availability of current technologies with rural and small town K-12 public school districts in central Illinois.

The most significant contribution this study provides is data for central Illinois rural and small town K-12 public school districts to use in analyzing their own use of current technologies and developing future technology plans. The Illinois State Board of Education can also use the data provided by this study as a more accurate assessment of the availability of current technologies in rural and small town K-12 public school districts in central Illinois than the data obtained through administrative surveys.

Chapter III

Design of the Study

General Design of the Study

The study utilized a survey to gather data about the availability of current technologies to rural and small town K-12 central Illinois public school classroom teachers for instructional use. The survey was designed to provide data to answer the following seven research questions:

1. What is the current availability of each technology in the school and/or classroom for instructional use?
2. How often (using the categories of at least once a day, once a week, once a month, once a quarter, once a year, and never) is each available technology used in the classroom by classroom teachers for instructional purposes?
3. Which unavailable technologies would be used by classroom teachers for instructional purposes, if available?
4. Which technologies are perceived by classroom teachers as essential to provide a comprehensive education to students?
5. How do classroom teachers prioritize a list of current technologies (overhead projectors, calculators, overhead calculators, telephones, fax capability, teacher laptop computers, teacher PC computers, teacher notebook computers, student PC computers, local area networks (LAN), wide area networks (WAN), e-mail, internet access, LCD projection panels, and cable/satellite television) based on importance for instructional use in the classroom?
6. Has the classroom teacher's school/district developed a technology plan that includes acquisition of current technologies for instructional use in the classroom?

7. What is the classroom teacher's estimate of how long (using the categories of 1 year, 2 years, 3 years, 4 years, 5 years, and over 5 years) before each unavailable current technology will be made available for instructional use in the classroom?

Sample and Population

Fourteen Regional Offices of Education which serve the counties of Hancock, McDonough, Fulton, Schuyler, Brown, Adams, Pike, Brown, Scott, Morgan, Cass, Calhoun, Greene, Jersey, Macoupin, Montgomery, Christian, Sangamon, Menard, Mason, Logan, Tazewell, McLean, Livingston, DeWitt, Macon, Piatt, Ford, Champaign, Vermilion, Shelby, Moultrie, Douglas, Coles, Cumberland, Edgar, and Clark in central Illinois were contacted to obtain the following demographic information:

1. The schools in rural and small town public school districts within the county.
2. The student population of all public school districts within the county.
3. The name, school address, and teaching assignment of teachers currently serving each rural and small town public school within the county.

All of the counties' Regional Offices of Education were able to supply the above demographic information except for the Regional Offices of Education serving Fulton, Schuyler, Ford, Champaign and Vermillion counties. Demographic information was obtained for 31 central Illinois counties containing 131 school districts which met the rural and small town school definition of public school districts with student enrollments of less than 1,500 for K-12 districts, 1,000 for K-8 districts, and 500 for High School districts.

The 131 rural and small town school districts reported 5,895 classroom teachers with 2,437 (41%) of the classroom teachers in grades K-5, 1,112 (19%) of the classroom teachers in grades 6-8, and 2,346 (40%) of the classroom teachers in grades 9-12. A random sample of 400 classroom teachers was chosen from the total

population of 5,895 classroom teachers using the following sample categories and category percentages:

1. Grade K-5 classroom teachers (41% of 2,437 or 164 classroom teachers).
2. Grade 6-8 classroom teachers (19% of 1,112 or 76 classroom teachers).
3. Grade 9-12 classroom teachers (40% of 2,346 or 160 classroom teachers).

In order to insure that all parts of central Illinois were represented, each Regional Office of Education was made a separate sub-population with the sample teachers from each sub-population selected by the following procedure:

1. A percentage relationship between each sub-population sample category and the total population sample category was figured in order to determine the number of sample teachers to be randomly chosen from each sample category in each sub-population. For example, the total population of the Regional Office of Education serving Logan, Mason, and Menard counties had 528 classroom teachers of which 229 were K-5 elementary classroom teachers (representing 9.4% of the total K-5 classroom teacher population), 124 were 6-8 classroom teachers (representing 11.2% of the total population of 6-8 classroom teachers) , and 175 were 9-12 classroom teachers (representing 7.5% of the total 9-12 classroom teacher population). These representative percentages were applied to the number of classroom teachers needed to be randomly selected from sample category which resulted in 16 elementary classroom teachers in grades K-5 (9.4% of 164), 8 classroom teachers in grades 6-8 (11.2% of 76), and 12 classroom teachers in grades 9-12 (7.5% of 160) randomly selected from Logan, Mason, and Menard counties.

2. The classroom teachers in each sub-population were separated into the three grade level categories and given a number. Numbers for each grade level category were placed into appropriate boxes for random selection drawing.

3. Numbers were randomly drawn from each sub-population grade level category based upon the number of classroom teachers needed for each grade level category for that sub-population. Using the example above, the numbers of 16 elementary classroom teachers in grades K-5 were randomly selected from the numbers of all K-5 elementary classroom teachers in the sub-population of Logan, Mason, and Menard counties.

Data Collection And Instrumentation

After the random sample of classroom teachers was chosen, the cover letter and Technology Availability Survey (Appendix) were sent to the selected teachers along with a self-addressed stamped return envelope. The following data were collected using the Technology Availability Survey to measure and evaluate each of the corresponding specific project questions:

1. Teachers used a check mark to indicate whether or not each technology was currently available in the school and/or classroom for instructional use.
2. Teachers used a check mark to identify how often each available technology was used in the classroom for instructional purposes using the categories of at least once a day, once a week, once a month, once a quarter, once a year, and never.
3. Teachers who did not currently have a technology available used a check mark to identify if they would use that technology for instructional purposes if the technology were available to them for use in their classroom.
4. Teachers used a check mark to identify which technologies they perceived as essential to provide a comprehensive education to students.
5. Teachers prioritized a list of current technologies (overhead projectors, calculators, overhead calculators, telephones, fax capability, teacher laptop computers, teacher PC computers, teacher notebook computers, student PC computers, local area networks (LAN), wide area networks (WAN), e-mail, internet access, LCD projection

panels, and cable/satellite television) based on importance for instructional use in the classroom by numbering the technologies from most important (1) to least important (15).

6. Teachers identified by check mark whether or not their school/district had developed a technology plan that includes acquisition of current technologies for instructional use in the classroom.

7. Teachers used a check mark to estimate how long before each unavailable current technology will be made available for instructional use in the classroom using the categories of 1 year, 2 years, 3 years, 4 years, 5 years, and over 5 years.

Teachers identified with check marks their grade level as K-5, 6-8, or 9-12 and their school district student population as less than 500, 500-1,000, or 1,000-1,500.

Surveys Returned

Of the 400 surveys sent to rural and small town K-12 central Illinois public school classroom teachers, 252 completed surveys (63% of the surveys) were returned. Two uncompleted surveys were returned with both survey respondents indicating that as Physical Education teachers the survey was not appropriate for them to fill out. Of the 252 completed surveys, 94 surveys (37%) were completed by K-5 classroom teachers, 50 surveys (20%) were completed by 6-8 classroom teachers, 74 surveys (29%) were completed by 9-12 classroom teachers, 20 surveys (8%) were completed by classroom teachers who teach either across the K-8, 6-12, or K-12 grade levels, and 14 surveys (6%) were completed by classroom teachers who did not indicate a teaching level. Of the 252 completed surveys, 123 classroom teachers (49%) reported serving districts with less than 500 students, 69 classroom teachers (27%) reported serving districts with 500-1,000 students, 39 classroom teachers (15%) reported serving districts with 1,000-1,500 students, and 21 classroom teachers (8%) did not indicate district student enrollment range.

Data Analysis

Descriptive statistics were used to analyze the data collected for each specific research question. The analyses of the data are presented through figures which represent responses by percentage.

Chapter IV

Results of the Study

Overview

The analyzed data for each research question is presented in a figure or figures. Selected data are highlighted in the text.

The research questions addressed in this study were:

1. What is the current availability of each technology in the school and/or classroom for instructional use?
2. How often (using the categories of at least once a day, once a week, once a month, once a quarter, once a year, and never) is each available technology used in the classroom by classroom teachers for instructional purposes?
3. Which unavailable technologies would be used by classroom teachers for instructional purposes, if available?
4. Which technologies are perceived by classroom teachers as essential to provide a comprehensive education to students?
5. How do classroom teachers prioritize a list of current technologies (overhead projectors, calculators, overhead calculators, telephones, fax capability, teacher laptop computers, teacher PC computers, teacher notebook computers, student PC computers, local area networks (LAN), wide area networks (WAN), e-mail, internet access, LCD projection panels, and cable/satellite television) based on importance for instructional use in the classroom?
6. Has the classroom teacher's school/district developed a technology plan that includes acquisition of current technologies for instructional use in the classroom?
7. What is the classroom teacher's estimate of how long (using the categories of 1 year, 2 years, 3 years, 4 years, 5 years, and over 5 years) before each unavailable current technology will be made available for instructional use in the classroom?

Results for Research Question 1

Figures 1, 2, and 3 contain the responses to research question 1. Figure 1 shows the percentages of teachers who reported having each current technology available to them in their classrooms. Figure 2 shows the percentages of teachers who reported having each current technology available to them in their schools. The percentages of teachers who reported not having each current technology are shown in Figure 3.

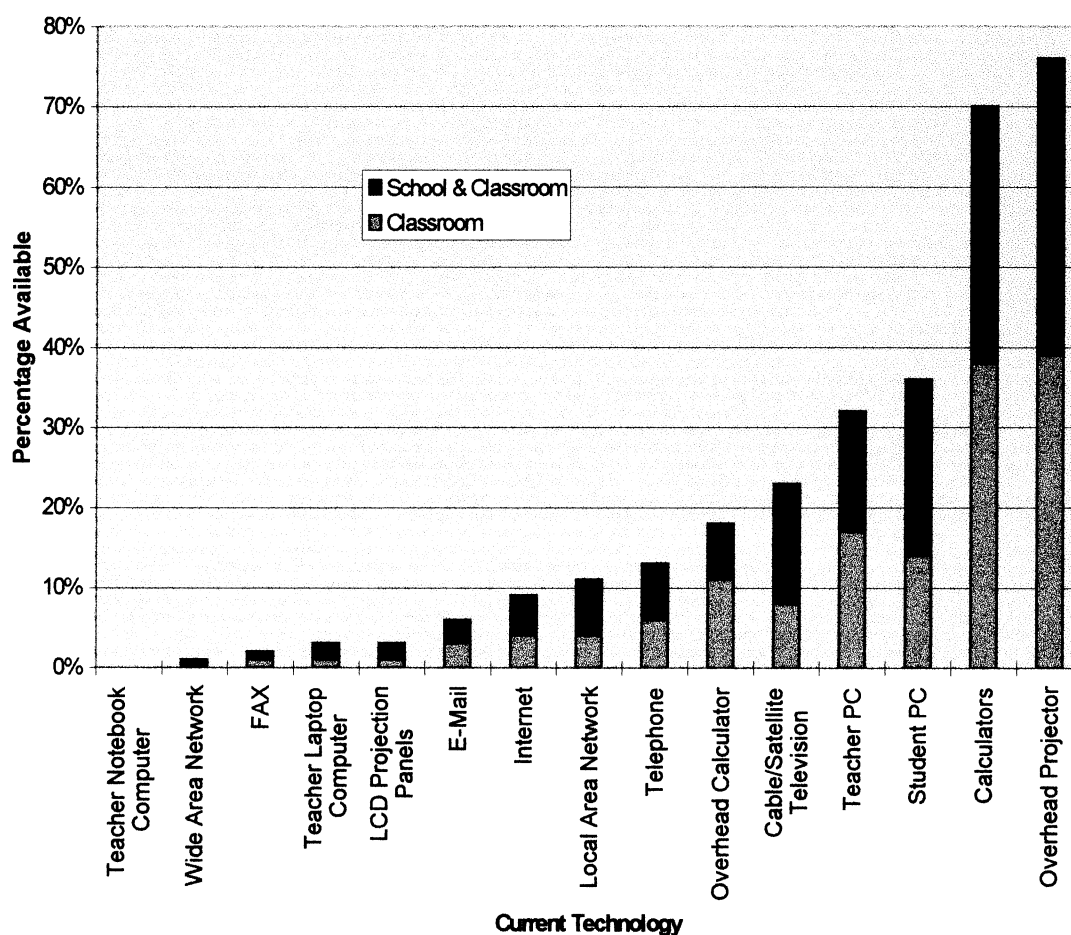


Figure 1. Percentages of rural and small town K-12 central Illinois public school district classroom teachers reporting availability of current technologies for instructional use in their classroom.

The most available current technology, as shown in Figure 1, was overhead projectors with 76% of the teachers reporting overhead projectors as available in their classrooms for instructional use. Calculators were reported available in the classroom for instructional use by 70% of the classroom teachers.

Many teachers in rural and small town K-12 central Illinois public school classrooms do not have access to a teacher computer in their classroom. The least available current technologies for instructional use in the classroom were teacher notebook computer and teacher laptop computer. Only 3% of the teachers reported classroom availability of a teacher laptop computer with no teachers reporting availability of a teacher notebook computer. More teachers (32%) reported availability of a teacher PC in their classroom for instructional use.

Most teachers in rural and small town K-12 central Illinois public schools do not have student computers available to them for instructional use in their classrooms. Student PC availability for instructional use was reported by classroom teachers to be 36% for classroom availability.

Computer related communication technologies of local area networks, wide area networks, e-mail and internet were not reported available in the classroom to most rural and small town K-12 central Illinois public school teachers. Only 11% of the classroom teachers reported classroom availability of a local area network while 1% reported classroom availability of a wide area network for instructional use. E-mail and internet were reported available for instructional use by classroom teachers in less than 10% of the classrooms. The telephone, a more traditional form of communication, was reported available in the classroom for instructional use by only 13% of the classroom teachers.

As shown in Figure 2, the technologies reported most available for instructional use in their school by rural and small town K-12 central Illinois public school teachers

were FAX capability (79%) and telephones (77%). Student PCs were reported by 49% of the teachers to be available in their school for instructional use.

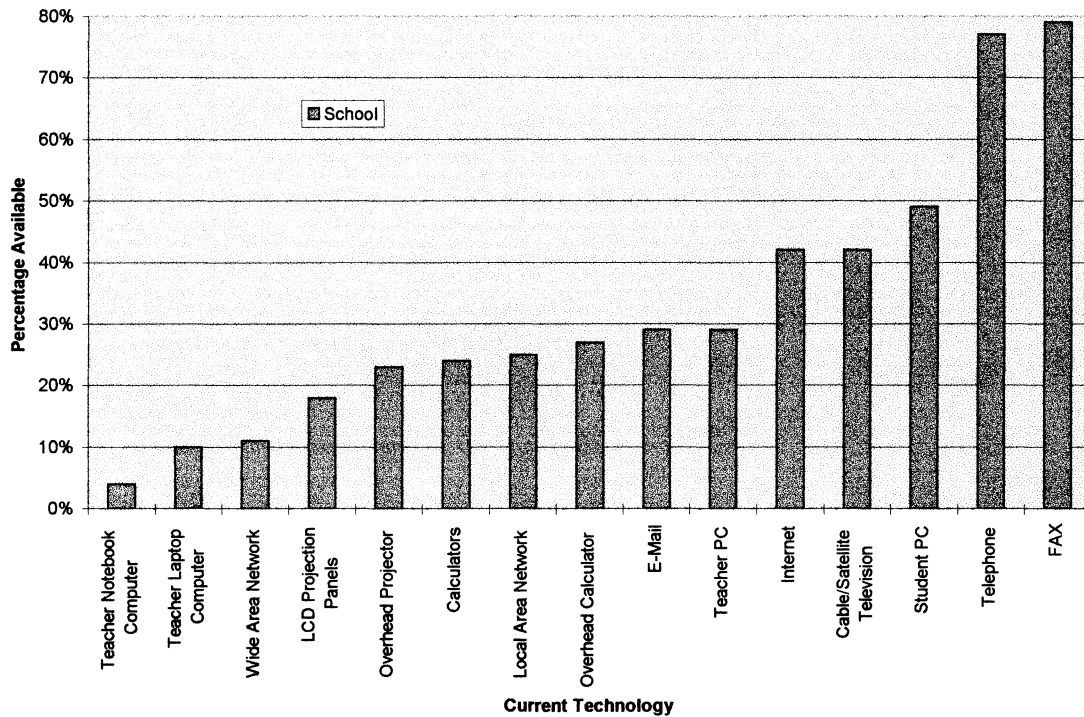


Figure 2. Percentages of rural and small town K-12 central Illinois public school district classrooms reporting availability of current technologies for instructional use only in their school.

Many teachers in rural and small town K-12 central Illinois public school classrooms do not have access to a teacher computer in their school. Only 4% of the classroom teachers reported availability of a teacher notebook computer and 10% reported availability of a teacher laptop computer in their school for instructional use. A greater percentage (29%) of the teachers reported availability of a teacher PC in their school for instructional use.

Computer related communication technologies of local area networks, wide area networks, e-mail, and internet were not reported available in the school to most rural and small town K-12 central Illinois public school teachers. While 42% of the classroom teachers reported availability of internet in their school for instructional use, only 29% of the schools had e-mail available. Local area networks were reported available in the school by 25% of the teachers, but only 11% of the teachers reported school availability of a wide area network.

As shown in Figure 3, less than 1% of the classroom teachers reported that

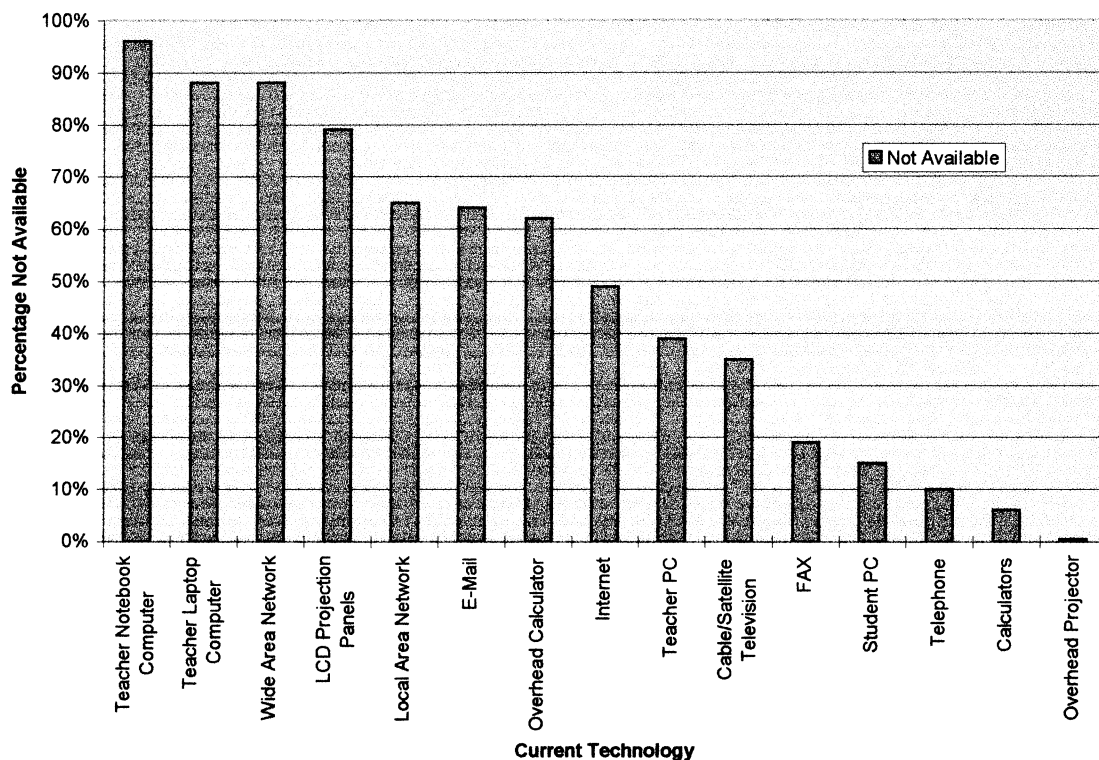


Figure 3. Percentages of rural and small town K-12 central Illinois public school district school classroom teachers reporting no availability of current technologies for instructional use in their classroom or school.

overhead projectors were not available for instructional use. Calculators were reported not available by 6% of the teachers. Only 15% of the classroom teachers reported that student PCs were not available for instructional use in their classrooms and schools.

Most teachers in rural and small town K-12 central Illinois public school classrooms do not have access to a teacher computer in their classroom or school. Teacher notebook computers and teacher laptop computers were reported unavailable by 96% and 88% of the teachers respectively. A significant percentage of teachers (39%) reported no availability of a teacher PC in their classrooms and schools for instructional use.

Computer related communication technologies of local area networks, wide area networks, e-mail and internet were not reported available in the school to most rural and small town K-12 central Illinois public school teachers. The majority of classroom teachers reported that a wide area network (88%) and a local area network (65%) were not available to them in their classrooms and school for instructional use. E-mail was reported not available by 64% of the teachers while internet was not available to 49% of the teachers. Only 10% of the classroom teachers reported that a telephone was not available to them for instructional use.

Results for Research Question 2

The responses to research question 2 are contained in Figures 4 and 5. Figure 4 shows the use of current technologies for instruction as reported by teachers who had the technologies available to them in their classrooms. Figure 5 shows the use of current technologies for instruction as reported by teachers who had the technologies available to them in their school.

As shown in Figure 4, when teachers had a technology available to them in their classroom, the technology was reported to be used frequently. The most frequently used technologies were student PCs, local area networks, and teacher PCs. These three

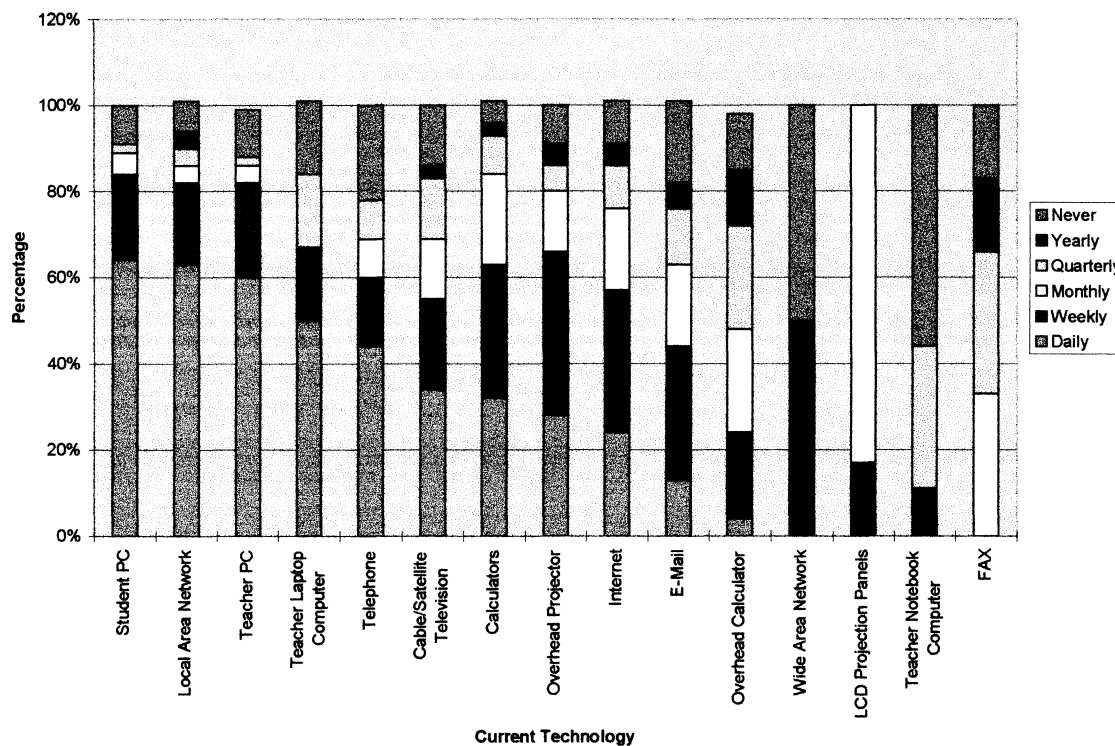


Figure 4. Percentages of rural and small town K-12 central Illinois public school district school classroom teachers reporting instructional use of current technologies available in their classroom.

technologies were reported being used at least weekly by over 80% of the teachers who have classroom availability with at least 60% of the teachers using these technologies on a daily basis. Technologies reported being used daily or weekly by at least 50% of the teachers for instructional use were teacher laptop computer, telephone, calculators, overhead projector, wide area networks, cable or satellite television, and internet.

The only technology reported being used by all teachers for instructional use who had the technology available to them in their classroom was LCD projection panels. All technologies available to teachers in the classroom were reported being used at least on a weekly basis except FAX capability.

As shown in Figure 5, when teachers had current technologies available for instructional use in their school, teachers did not report using the technologies as frequently as teachers who reported having the technologies in their classroom. The most frequently used technology available in the school for instructional use was student PC. While 50% of the teachers with school availability reported using student PCs for instructional use daily or weekly, only 15% used student PCs daily. One-third of the teachers reported never using student PCs for instruction use when they were available at the school.

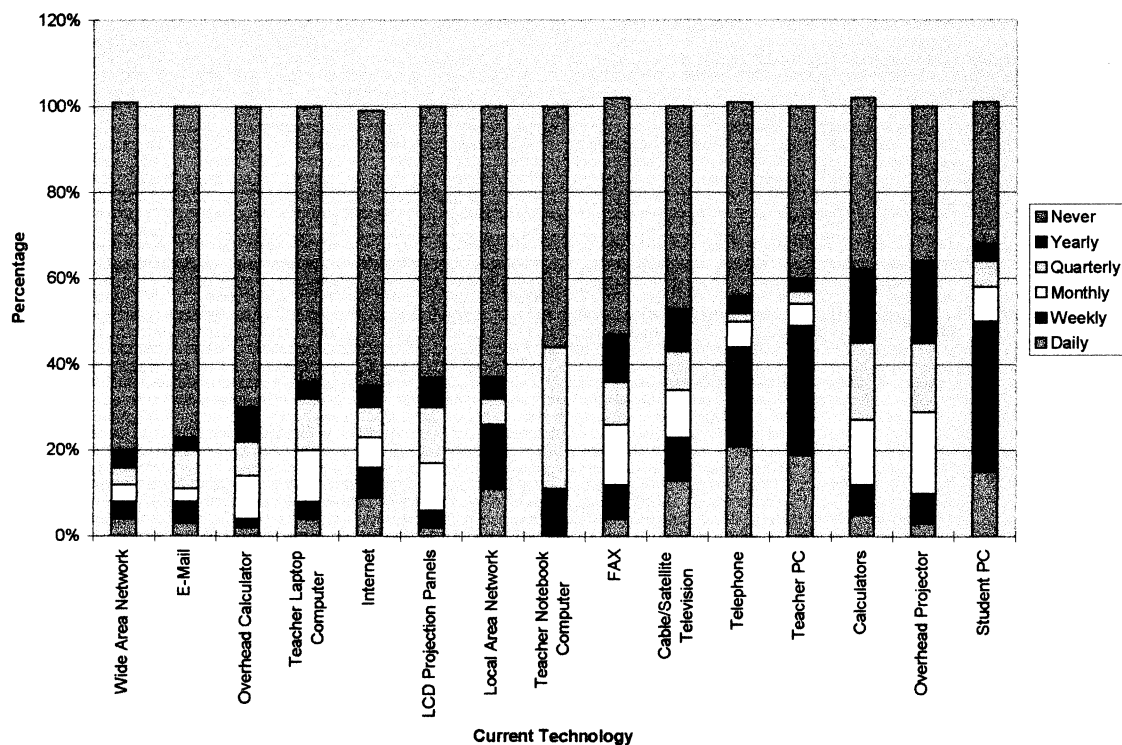


Figure 5. Percentages of rural and small town K-12 central Illinois public school district school classroom teachers reporting instructional use of current technologies available in their school.

School available teacher PC daily or weekly use also dropped to 49% while local area network use plummeted to 26%. Use of telephones by teachers for instructional use on a daily or weekly basis dropped to 44%. Less than 20% of the teachers reported using internet, calculators, overhead projectors, and teacher laptop computers on a daily or weekly basis. Most technologies available in the school were never used by more than 40% of the teachers.

Results for Research Question 3

The results for research question 3 are shown in Figure 6. Teacher PC, internet, student PC, teacher laptop computer, and cable or satellite television would be used by at least 60% of the teachers who do not have these technologies available. Over 50% of

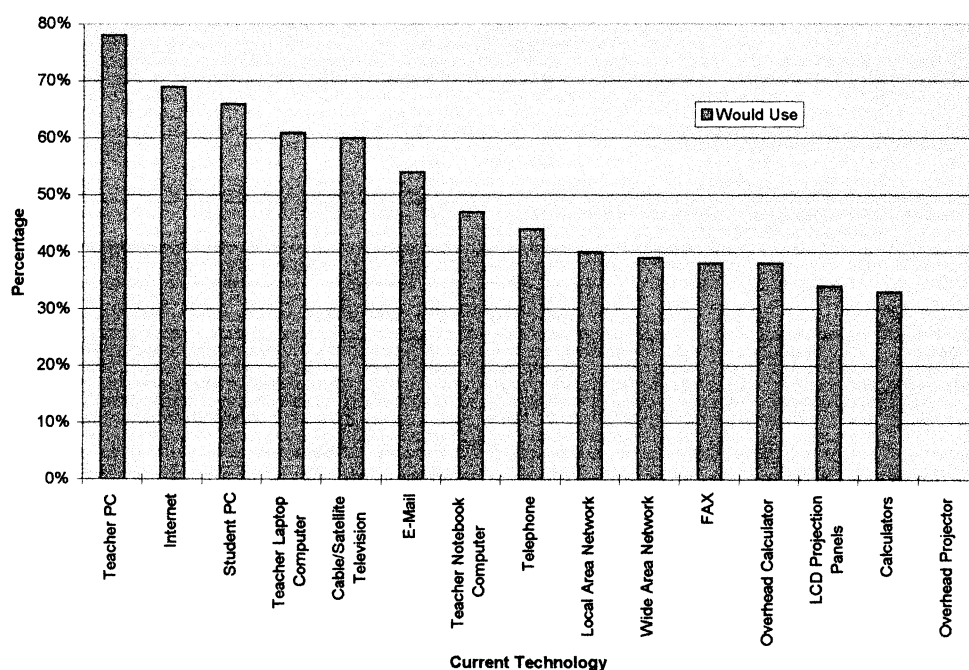


Figure 6. Percentages of rural and small town K-12 public school district school classroom teachers who would use current technologies if the technologies were available to them for instructional use.

the teachers would use e-mail if it were available for instructional use. All the other technologies would be used by over one-third of the teachers if they were available in the classroom for instructional use.

Results for Research Question 4

Figure 7 shows the results for research question 4. The technology reported by the most teachers to be essential to provide a comprehensive education to students was student PC (77%). Calculators were reported by 65% of the teachers and overhead projectors by 58% of the teachers as essential to provide a comprehensive education. Half of the teachers reported internet as essential to provide a comprehensive education, while just under half reported teacher PC and cable or satellite television as essential

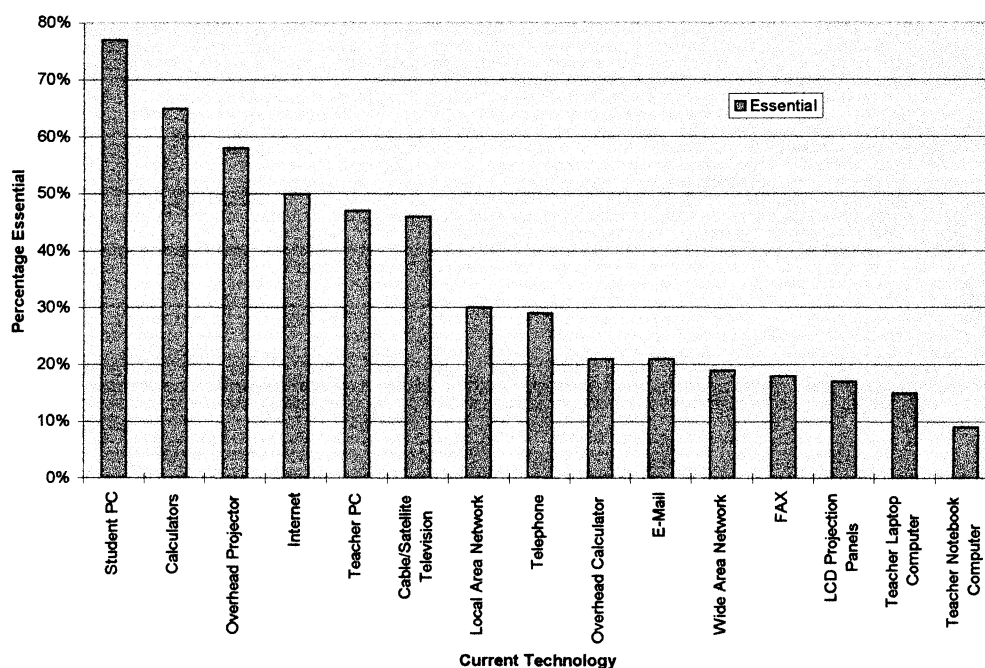


Figure 7. Percentages of rural and small town K-12 public school district school classroom teachers reporting technologies essential to provide a comprehensive student education.

to provide a comprehensive education. The rest of the technologies were considered essential by 30% or less of the teachers.

Results for Research Question 5

The results for research question 5 are shown in Figure 8. The figure is organized from highest priority (lowest average number) to lowest priority (highest average number) of importance for instructional use in the classroom. Teachers reported student PC as the highest priority followed by overhead projector, teacher PC, and calculators. Internet and cable or satellite television were almost two points behind the top four technologies. LCD projection panels were reported by teachers to be the lowest priority.

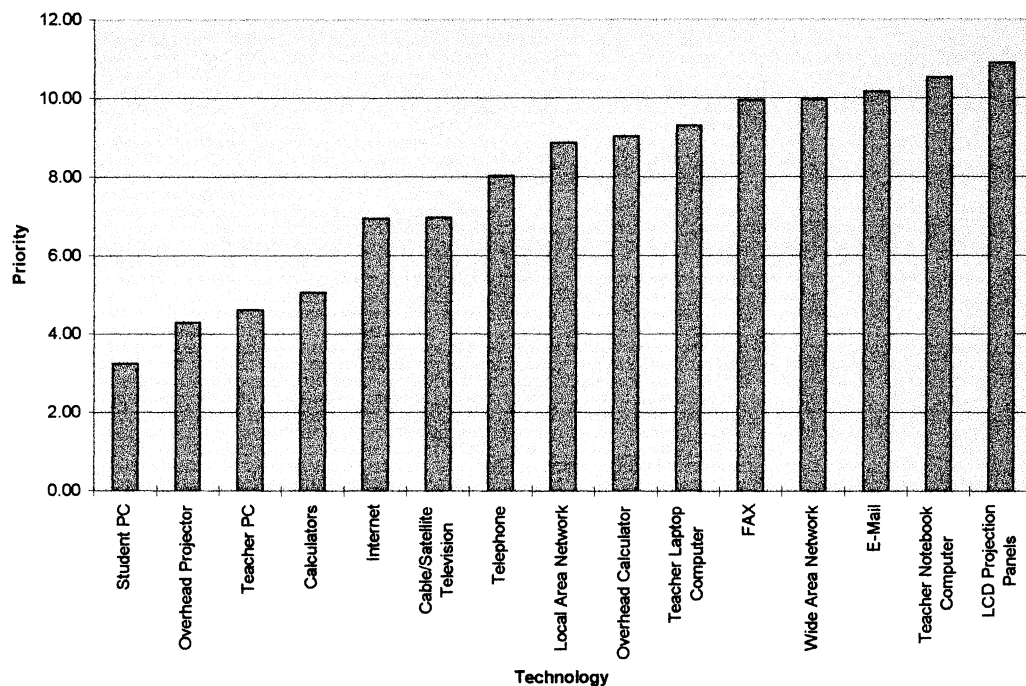


Figure 8. Average priority rankings of current technologies based on importance for instructional use in the classroom as reported by rural and small town K-12 central Illinois public school classroom teachers.

Results for Research Question 6

The results for research question 6 are shown in Figure 9. Seventy-one percent of the teachers reported their school or district had developed a technology plan that included acquisition of current technologies for instructional use in the classroom. No technology plan was reported by 29% of the teachers.

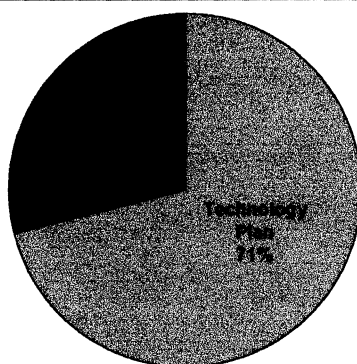


Figure 9. Percentages of rural and small town K-12 public school district school classroom teachers reporting a district or school technology plan.

Results for Research Question 7

The results for research question 7 are shown in Figure 10. If teachers did not check an expected availability time, it was recorded as “no response.” The response of “over 5 years” has been placed next to “no response” for each technology to show the percentages of teachers who did not expect the technology to be available within the next 5 years for technologies not available.

The technology that teachers least expected to be available was teacher laptop computer. Only 8% of the teachers who did not have a teacher laptop computer expected to have availability within five years. At least 80% of the teachers did not expect to have teacher notebook computers, LCD projection panels, or local area networks within 5 years. All technologies except student PC and internet were not

expected by over 60% of the teachers to be available for classroom instruction within 5 years.

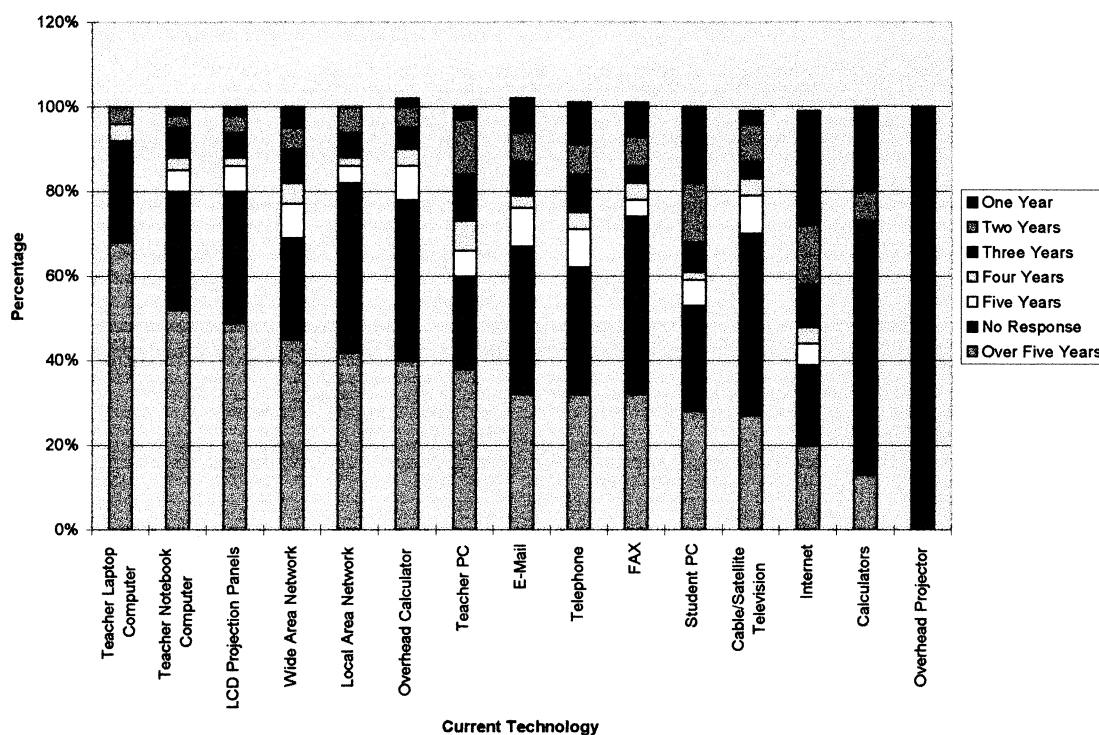


Figure 10. Percentages of rural and small town K-12 central Illinois public school district school classroom teachers reporting how long before each unavailable technology will be made available for instructional use in the classroom.

The technology most teachers expected to be available within 1 year was internet access. About one-fourth of the teachers who did not have internet available expected it to be available for instructional use within 1 year. An additional 33% of the teachers expected internet to be available for instructional use in 2 to 5 years.

The second technology teachers expected to be available within the next 5 years was student PCs. About one-third of the teachers expected student PCs to be available

for classroom instruction within 2 years. An additional 15% of the teachers expect student PCs to be available within 3 to 5 years.

Chapter V

Summary, Findings, Conclusions, and Recommendations

Summary

This study investigated the present condition of K-12 public school classroom teachers in rural and small town central Illinois public schools regarding the availability of current technologies for instructional use. The short term effects of this study were to assist rural and small town K-12 central Illinois public school districts to evaluate and plan in the area of technology. The long term effect of this study will be achieved only if the original study results in rural and small town K-12 central Illinois public school districts acquiring current technologies for instructional use.

The specific research questions addressed by this study were:

1. What is the current availability of each technology in the school and/or classroom for instructional use?
2. How often (using the categories of at least once a day, once a week, once a month, once a quarter, once a year, and never) is each available technology used in the classroom by classroom teachers for instructional purposes?
3. Which unavailable technologies would be used by classroom teachers for instructional purposes, if available?
4. Which technologies are perceived by classroom teachers as essential to provide a comprehensive education to students?
5. How do classroom teachers prioritize a list of current technologies (overhead projectors, calculators, overhead calculators, telephones, fax capability, teacher laptop computers, teacher PC computers, teacher notebook computers, student PC computers, local area networks (LAN), wide area networks (WAN), e-mail, internet access, LCD projection panels, and cable/satellite television) based on importance for instructional use in the classroom?

6. Has the classroom teacher's school/district developed a technology plan that includes acquisition of current technologies for instructional use in the classroom?

7. What is the classroom teacher's estimate of how long (using the categories of 1 year, 2 years, 3 years, 4 years, 5 years, and over 5 years) before each unavailable current technology will be made available for instructional use in the classroom?

This study was based on data collected from a survey of a random sample of rural and small town K-12 central Illinois public school classroom teachers. Descriptive statistics were used to analyze the data collected for each specific research question.

In addition to collecting data, a review of the current literature and research was conducted. The Secretary's Commission on Achieving Necessary Skills report (1991) recognized the ability to use technology as an indispensable skill. Educational curriculum groups, such as the National Council of Teachers of Mathematics (1989) and the American Association for the Advancement of Science (1993), have recognized in their standards that current technologies need to be used by classroom teachers for instructional purposes. Much has been written about how to acquire and use technology in curriculum and professional education journals. Researchers, such as Dwyer (1994) have studied the impact of technology on schools and student learning.

Data collection concerning the availability of current technologies in K-12 public school classrooms has been done by the Illinois State Board of Education, but the focus was mainly on computers and networking as reported by district administrators. The researcher was unable to find a comprehensive study about the availability of current technologies to rural and small town K-12 classroom teachers for instructional use. The U.S. Congress Office of Technology Assessment's report (1995) found that only minimal data have been collected from U.S. K-12 classroom teachers about the availability of technology for instructional use in the classroom.

Findings

The majority of classroom teachers did not report availability of current technologies for instructional use in their classrooms. Only two technologies, calculators and overhead projectors, were reported available for instructional use in the classroom by at least 75% of the teachers. Student and teacher PCs were reported available for instructional use in the classroom by less than one-third of the teachers with only 3% reporting teacher laptop availability. Local area networks, wide area networks, internet access, e-mail, telephones, and FAX capability were reported available for instructional use in the classroom by less than 13% of the teachers. Cable or satellite television was reported available by 23% of the teachers.

Availability of current technologies in the school for instructional use was reported by a higher percentage of teachers for most current technologies. Almost 50% of the teachers reported availability of student PCs in their school for instructional use. Teacher PCs were reported available by nearly 30% of the teachers. Telephones and FAX capability were reported available for instructional use by over 75% of the teachers. Just over 40% of the teachers reported availability of internet and cable or satellite television. The rest of the technologies were reported available in their schools for instructional use by less than 30% of the teachers.

Teacher notebook computers, teacher laptop computers, wide area networks, LCD projection panels, local area networks, e-mail, and overhead calculators were reported not available for instructional use by over 60% of the teachers. Almost 50% of the teachers reported no availability of internet access for instructional use. Teacher PCs and cable or satellite television were reported not available by over one-third of the teachers. Very few teachers reported no availability of overhead projectors, calculators, telephones, student PCs, and FAX capability.

Most teachers reported frequent use of technologies available to them in their classrooms for instructional use. Classroom available technologies reported being used for instruction on at least a weekly basis by over 50% of the teachers were student PCs, local area networks, and teacher PCs. Teacher laptop computers, telephones, cable or satellite television, calculators, overhead projectors, wide area networks, and internet. The most frequently used classroom available technologies were student PCs, local area networks and teacher PCs which were reported being used daily by at least 60% of the teachers. The only technology reported being used by all teachers for instructional use who had the technology available to them in the classroom was LCD projection panels. All technologies were reported being used at least on a weekly basis except FAX capability.

When teachers had current technologies available for instructional use in their school, teachers did not report using the technologies as frequently as teachers who reported having the technologies in their classrooms. Student PCs available at school were reported being used for instruction at least weekly by 50% of the teachers. Just under 50% of the teachers reported using teacher PCs and telephones available in the school at least weekly. School available local area networks and cable or satellite television were reported used at least weekly by 25% of the teachers. All other school available technologies were reported being used at least weekly by less than 17% of the teachers.

Over 50% of the teachers who do not have teacher PCs, internet, student PCs, teacher laptop computers, cable or satellite television, or e-mail reported they would use these technologies for instructional use if these technologies were available to them. At least one-third of the teachers who do not have calculators, LCD projection panels, overhead calculators, FAX capability, wide area networks, local area networks,

telephones, or teacher notebook computers reported they would use these technologies for instructional use if these technologies were available to them.

The technology reported by most teachers (77%) to be essential to provide a comprehensive education to students was student PC. At least 50% of the teachers reported internet, overhead projectors, and calculators as essential to provide a comprehensive education to students. Teacher PCs and cable or satellite television were reported essential by just over 45% of the teachers. Less than 30% of the teachers considered the rest of the technologies essential to provide a comprehensive education to students.

Teachers ranked student PC as the highest priority of current technologies based on importance for instructional use in the classroom. Overhead projector, teacher PC, and calculators were ranked second, third, and fourth respectively. Internet and cable or satellite television were ranked almost two points behind the top four technologies. LCD projection panels were reported by teachers to be the lowest priority.

Seventy-one percent of the teachers reported their school or district had developed a technology plan that included acquisition of current technologies for instructional use in the classroom. No technology plan was reported by 29% of the teachers.

At least 80% of the teachers who did not report availability of teacher laptop computers, teacher notebook computers, LCD projection panels, or local area networks did not expect to have these technologies within five years. All unavailable technologies except student PC and internet were not expected by over 60% of the teachers to be available for classroom instruction within five years.

The unavailable technology most teachers expected to be available within one year was internet access. About one-fourth of the teachers who did not have internet available expected it to be available for instructional use within one year. An additional

33% of the teachers expected internet to be available for instructional use in two to five years. Of the teachers reporting no availability of student PCs, 47% expected availability of student PCs for instructional use within five years. Only 8% of the teachers who reported no availability of a teacher laptop computer expected availability within five years.

Conclusions

Some technologies ranked by rural and small town K-12 central Illinois public school teachers as important for instructional use in the classroom are available to most teachers for instructional use. Overhead projectors and calculators, the second and fourth highest priority technologies, were reported available in the classroom or school for instructional use by over 90% of the teachers with over 70% reporting availability in the classroom. Student PCs, the technology given the highest priority based on importance for instructional use in the classroom, were reported by 36% of the teachers to be available in the classroom and 49% of the teachers to be available in school for instructional use. The third ranked technology, teacher PCs, was reported not available for instructional use by 39% of the teachers with only 32% reporting availability in the classroom.

A large percentage of rural and small town K-12 central Illinois public school teachers reported most current technologies to be unavailable in their classroom or school for instructional use. Over 75% of the teachers reported unavailability of teacher notebook computers, teacher laptop computers, wide area networks, and LCD projection panels for instructional use in their classroom or school. Over 60% of the teachers reported unavailability of local area networks, e-mail, and overhead calculators for instructional use in their classroom or school. Almost 50% of the teachers reported unavailability of internet for instructional use in their school.

Teachers who have a technology available in their classroom for instructional use are more likely to use the technology daily or weekly. Student PCs were reported being used at least weekly by 84% of teachers who reported availability of student PCs in their classrooms and 50% of teachers who reported availability of student PCs in their schools. Overhead projectors were reported being used at least weekly by 66% of teachers who reported availability of overhead projectors in their classrooms and 10% of teachers who reported availability of overhead projectors in their schools. Calculators were reported being used at least weekly by 63% of teachers who reported availability of calculators in their classrooms and 12% of teachers who reported availability of calculators in their schools. All technologies except teacher notebook computer and FAX capability showed more frequent use when available in the classroom.

Most current technologies were reported by rural and small town K-12 central Illinois public school teachers as available in their classroom for instructional use in the classroom for a very low percentage of the teachers. Less than 10% of the teachers reported availability of teacher notebook computer, wide area networks, FAX capability, teacher laptop computer, LED projection panels, and internet in the classroom for instructional use. Less than 25% of the teachers reported availability of local area networks, telephones, overhead calculators, and cable or satellite television in the classroom for instructional use. Teacher PCs were reported by only 32% of the teachers and student PCs were reported by only 35% of the teachers as available in the classroom for instructional use.

A large percentage of rural and small town K-12 central Illinois public school classroom teachers would use current technologies if the technologies were available to them for instructional use. Teacher PCs, internet, student PCs, teacher laptop computers, and cable or satellite television would be used by 60% or more of the

teachers if these technologies were available to them for instructional use. E-mail, teacher notebook computers, telephone, and local area networks would be used by 40% or more of the teachers. At least 33% of the teachers would use the rest of the surveyed technologies if the technologies were available for instructional use.

Not all current technologies were reported by most rural and small town K-12 central Illinois public school classroom teachers as essential to provide a comprehensive student education. Only student PCs, calculators, and overhead projectors were reported by most rural and small town K-12 central Illinois public school classroom teachers as essential to provide a comprehensive student education. Internet access was considered essential by 50% of the teachers, while 47% considered teacher PCs and 46% considered cable or satellite television essential to provide a comprehensive education. The rest of the current technologies surveyed were considered essential by less than one-third of the teachers.

Most rural and small town K-12 central Illinois public schools or school districts have developed a technology plan that includes acquisition of current technologies for instructional use. A significant percentage (29%) of the school districts have not yet developed a technology plan.

Most rural and small town K-12 central Illinois public school classroom teachers do not expect unavailable technologies to become available for instructional use within the next 5 years. Only internet was reported by the majority (61%) of the teachers as a technology teachers expected to have available for instructional use within the next 5 years. Student PCs were expected to be available for instructional use within 5 years by 47% of the teachers. Teacher PCs were expected by 40% and telephones by 39% of the teachers to be available for instructional use within 5 years. The rest of the surveyed technologies were expected available by 35% or less of the teachers for instructional use within 5 years.

Recommendations.

Rural and small town central Illinois K-12 public school districts need to invest in technologies that provide opportunities for classroom teachers to communicate with the outside world. The majority of rural and small town K-12 central Illinois public schools do not have telephones, fax machines, wide area networks, internet and other telecommunications links with the outside world available to teachers in the classroom for instructional purposes.

Telecommunication technologies need to be available in the classroom to teachers for instructional use. Teachers who have access to telecommunication technologies through their schools do not use the technologies for instruction as frequently as teachers who have access to telecommunication technologies in the classroom.

Rural and small town central Illinois K-12 public school districts need to invest in PC computers for teachers to use for instruction in their classrooms. Almost 40% of the teachers do not have access to a teacher PC for instructional use. Only 32 % of the teachers have access to a teacher PC for instructional use in their classroom. Over 80% of the teachers with availability of teacher PCs in their classrooms reported they used their teacher PC for instructional use on a daily or weekly basis. Only 49% of the teachers with availability of teacher PCs in their school reported they used the teacher PC for instructional use on a daily or weekly basis.

Rural and small town central Illinois public school districts need to make teacher laptop computers available to teachers for instructional use in the classroom. While only 3% of the teachers have classroom availability of a teacher laptop computer, 67% of those teachers reported using the teacher laptop computer for instructional use daily or weekly. Of the 10% of the teachers who have school availability only 8% of

those teachers reported using the teacher laptop computer for instructional use daily or weekly.

Rural and small town central Illinois public school districts need to provide classroom access to student PCs for instructional use. Only 36% of the teachers reported classroom availability of a student PC for instructional use. An overwhelming majority of those teachers (84%) with classroom availability of a student PC reported using a student PC for instructional use on a daily or weekly basis with 64% reporting daily use. While almost half of the teachers reported school availability of a student PC for instructional use, only 40% of those teachers reported daily or weekly use with 15% reporting daily use. Student PCs available in the classroom are used over twice as frequently by teachers for instructional use than student PCs available in the school. Student PCs are not available to 14% of the teachers in rural and small town K-12 central Illinois public schools.

All rural and small town central Illinois K-12 public school districts need to develop a technology plan that includes acquisition of current technologies and provides these technologies in the classroom for instructional use. This study shows that if rural and small town central Illinois K-12 public school classroom teachers have current technologies available to them in their classroom, they will use them frequently for instructional use. Teachers who do not have these current technologies available to them would use these technologies if the technologies were available.

The Illinois State Board of Education and state government officials need to assist rural and small town central Illinois K-12 public school districts in making current technologies available to classroom teachers for instructional use in the classroom. While some technologies such as overhead projectors and calculators are available in almost all classrooms, other technologies such as e-mail, local area networks, wide area networks, teacher PCs, and student PCs are not available to most

classrooms for instructional use. Most teachers do not expect their district to be able to provide availability of these current technologies within the next five years. If the Illinois State Superintendent of Schools wants availability of a laptop computer for every student in the state and schools cannot even provide a laptop computer for every classroom teacher, there is a wide gap between what is needed in school districts to provide a comprehensive education to students and what school districts can afford to provide. The state of Illinois needs to help close the gap by providing funding to all schools that will allow acquisition of current technologies for instructional use in the classroom.

A follow-up study of the condition of K-12 public school classroom teachers in rural and small town central Illinois schools regarding the availability of current technologies for instructional use should be conducted in five years to determine if rural and small town central Illinois K-12 public schools have improved availability of current technologies.

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Appendix

Cover Letter and Technology Availability Survey

R 4, Box 33A
Shelbyville, IL 62565
April 5, 1996

«FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«City», «State» «PostalCode»

Dear «FirstName»:

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 topic of my field study is The Availability of Technology in Rural and Small Town Central Illinois K-12 Classrooms. You have been randomly chosen to represent your grade level and geographical region in this study. I would greatly appreciate it if you would take a few minutes of your time to fill out the enclosed survey and return it to me in the self-addressed stamped envelope by **April 19, 1996**. All responses are confidential.

The results of the study will be shared with Joseph Spagnolo, State Superintendent of Schools; Cheryl Lemke, Associate Superintendent of Learning Technology and Systems; and Jim Edgar, Governor. I will also make the results available to you if you request a copy. **Please follow the directions on the back side of this letter to complete the survey.**

Please place the survey in the enclosed self-addressed stamped envelope and return to me by **April 19th**.

Thank you,

Robert Ehlke



OVER



OVER

OVER

Directions:

Section A: Number from 1 to 15 the technologies listed based on how important you perceive each technology to be for instructional use in the classroom.

Section B: Check which technologies you, as a classroom teacher, currently have available in your classroom and/or school for instructional use.

Section C: For each technology you checked in section B as available to you for instructional use, check the box that best describes how often you use the technology in your classroom for instructional use.

Section D. For each technology you did not check in section B, place a check mark to indicate you would use that technology for instructional use if it were available to you or leave blank to indicate you would not use that technology even if it were available to you.

Section E: Check all technologies you perceive as essential to be available to you in order to provide a comprehensive education to your students.

Section F: For each technology you did not check in section B, place a check mark in the box that best describes how long you perceive it will be before that technology will be made available to you for instructional use.

Section G: Check the grade level grouping that describes your current teaching assignment and your school district enrollment.

Section H: Check whether or not your school/district has a technology plan that includes acquisition of some of the technologies listed.

Technology Availability

11/6/95

51

A. Use numbers 1-15 for Section A.

Use ☒ mark for Sections B-H.

B.

C.

D.

E.

Prioritize 1-15 (1=Most Important)		Currently Available for Instructional Use		How Often Each Technology is Used in the Classroom (Check one for each technology currently available)						Would Use If Available		Essential for Comprehensive Student Educ.		How Long Before Available for Use in the Classroom (Check one for each unavailable technology)					
Current Technologies		Classroom	School	At Least Once a Day	At Least Once a Week	At Least Once a Month	At Least Once a Quarter	At Least Once a Year	Never			Within One Year	Within Two Years	Within Three Years	Within Four Years	Within Five Years	Over Five Years		
Overhead Projector																			
Calculators																			
Overhead Calculator																			
Telephone																			
Fax Capability																			
Teacher Laptop Computer																			
Teacher PC Computer																			
Teacher Notebook Computer																			
Student PC Computers																			
Local Area Network (LAN)																			
Wide Area Network (WAN)																			
E-Mail																			
Internet Access																			
LCD Projection Panel																			
Cable/Satellite Television																			

G.

Grade Level	<input type="checkbox"/> K-5	School District Enrollment	<input type="checkbox"/> <500
	<input type="checkbox"/> 6-8		<input type="checkbox"/> 500-1,000
	<input type="checkbox"/> 9-12		<input type="checkbox"/> 1,000-1,500

H.

Does your school/district have a technology plan that includes acquisition of current technologies for instructional use in the

☐ Yes ☐ No