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AUTHOR Stiegemeier, Lois
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ABSTRACT

In April 1993, the Alaska Department of Education conducted an instructional technology survey of all schools and school districts. The purposes of the survey were to collect baseline data on the numbers and types of technologies for instruction currently employed in Alaska schools, to collect information on utilization of the technologies, to determine the level of priority for instructional technology in Alaska's schools, and to determine what needs must be met in schools in order to effectively employ technologies in instruction. Information from the survey will be used by the Department in developing plans for instructional technology. Responses were received from 47 of the 56 district superintendents and by 264 principals, which represented a response rate of 84% for superintendents and 53% for principals. The major findings of the survey from responding schools are as follows: (1) nearly half of the superintendents and principals rated instructional technology as a high priority for their schools; (2) almost half of the teachers use some form of instructional technology daily; (3) principals estimate that 37% of students use some form of instructional technology daily; (4) wide disparities exist across the state in the kinds of technologies available in schools; (5) many computers in Alaska schools are older models limited in their to application potential to new and emerging instructional uses; (6) training teachers to use technology is the most prevalent need beyond additional funding for technology. Recommendations include that school districts that place a priority on the role of technology should develop a comprehensive plan for its acquisition and implementation, teachers must be trained to use the technology as effectively as employees in the private sector, educational equity will not be realized in the information age until all schools are capitalized with the hardware necessary to take advantage of new technologies integrating voice, video, and data, and the state should explore its role in building a wide area network infrastructure to ensure that all students have access to online data networks, video resources, and distance education resources. (DGM)

Summary of

Alaska Instructional Technology Survey

April 1993

Lois Stiegemeier

Alaska Department of Education
801 W. 10th Street, Suite 200
Juneau, Alaska 99801-1894
(907) 465-8724

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Executive Summary

In April of 1993, the Alaska Department of Education conducted an instructional technology survey of all schools and school districts. The purposes of the survey were to:

- Collect baseline data on the numbers and types of technologies currently employed in Alaska schools for instruction.
- Collect information on utilization of the technologies.
- Determine the level of priority for instructional technology in Alaska's schools.
- Determine what needs must be met in schools in order to effectively employ technologies in instruction.

Information from the survey will be used by the Department in developing plans for instructional technologies and working with districts in the area of instructional technology.

Responses were received from 47 of the 56 district superintendents and by 264 principals. That represents a response rate of 84% for superintendents and 53% for principals.

Major Findings

- Nearly half the superintendents and principals responding rate instructional technology as a high priority for their schools.
- Almost half the teachers in responding schools are using some form of instructional technology daily.
- Principals estimate that 37% of students are using some form of instructional technology daily.
- Wide disparities exist across the state in the kinds of technologies available in schools.
- Many computers in Alaska schools are older models limited in their applications to new and emerging instructional uses.
- Training teachers to use technology is the most prevalent need beyond additional funding for technology.

Recommendations

- School districts placing a priority on technology's role in the schools should develop a comprehensive plan for its acquisition and implementation.

- Teachers must be trained to use technology as effectively as employees in the private sector.

- Educational equity will not be realized in the information age until all schools are capitalized with the hardware necessary to take advantage of new technologies integrating voice, video and data.

- The state should explore its role in building the wide area network infrastructure to ensure that all students in the state have access to on-line data networks, video resources, and distance education resources.

Overview

In April of 1993, the Alaska Department of Education conducted an instructional technology survey of all schools and school districts. Staff designed two survey instruments to collect data on the instructional uses of technology. The purposes of the survey were to:

- Collect baseline data on the numbers and types of technologies currently employed in Alaska schools for instruction.
- Collect information on utilization of the technologies.
- Determine the level of priority for instructional technology's in Alaska's schools.
- Determine what needs must be met in schools in order to effectively employ technologies in instruction.
- Information from the survey will be used by the Department in developing plans for instructional technologies and working with districts in the area of instructional technology. Information will also be used in responding to information requests regarding the level of technologies in Alaska schools and in responding to proposed legislation involving instructional technology.

Questionnaires were mailed to all districts and schools by the Department of Education in April 1993. No follow up questionnaires were sent to schools prior to the end of the school year. By June 1, responses were received from 47 of the 56 district superintendents and by 264 principals. That represents a response rate of 84% for superintendents and 53% for principals. Schools responding to the survey closely paralleled the demographic profile of all schools in the state. An analysis of respondents was made on the basis of building enrollments and grade levels in the school as well as the number of responses from the five largest school districts to see if the data was representational of all schools in the state or if any type of school or district was over-represented

Table 1 shows the correlations of schools by size of enrollment represented in the survey and the statewide demographics of building enrollments.

Table 1
Building enrollments

Building Enrollment (Number of Students)	Survey Results		All Schools	
	Count	Percent	Count	Percent
0 -25	39	15%	79	17%
26 - 50	34	13%	65	13%
51 - 100	34	13%	68	14%
101 - 300	64	25%	116	24%
301 or more	90	34%	156	32%

Table 2 shows the demographics of respondents as compared to statewide demographics by school grade level:

Table 2
School types

School Type	Survey Results		All Schools	
	Count	Percent	Count	Percent
Elementary	101	39%	190	39%
Middle/Jr. High	19	7%	26	5%
High School	27	10%	54	11%
PE - 12	106	41%	192	40%
Middle/Jr. High	8	3%	22	4%

Table 3 shows the number of respondents in the five largest school districts (Anchorage, Fairbanks, Kenai, Mat-Su and Juneau) as opposed to respondents in other districts:

Table 3
District Size

	Survey Results		All Schools	
	Count	Percent	Count	Percent
Five Largest Districts	100	38%	181	37%
Other Districts	161	62%	303	63%

As can be seen by the three tables, respondents mirrored very closely the overall demographics of schools in the state. Although there may be some differences between respondents to the survey and non-respondents, the demographic picture of the respondents is representational of all schools in the state. Thus, results of the survey can be assumed to generally apply to most types of schools in the state.

Major Findings

- Nearly half the superintendents and principals responding rate instructional technology as a high priority for their schools.
- Almost half the teachers in responding schools are using some form of instructional technology daily.
- Principals estimate that 37% of students are using some form of instructional technology daily.
- Wide disparities exist across the state in the kinds of technologies available in schools.
- Many computers in Alaska schools are older models limited in their applications to new and emerging instructional uses.
- Training teachers to use technology is the most prevalent need beyond additional funding for technology.

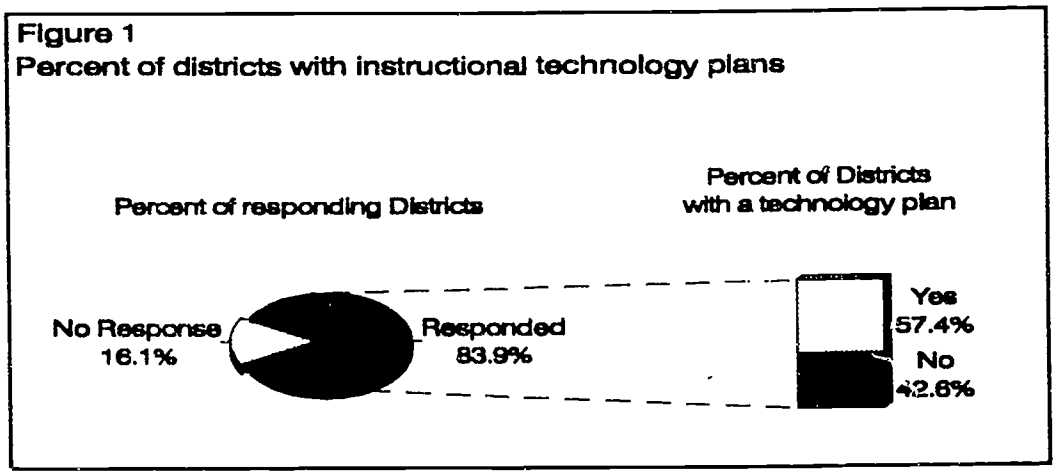
Survey Results

Superintendents Survey

Superintendents were asked three questions regarding technology in their districts. These questions were designed to elicit information regarding district level planning, priorities and communications networks.

Superintendents were asked if their district had a district wide instructional technology plan. Research has shown that planning for the inclusion of instructional technologies in schools is critical to its successful implementation and curriculum integration. Over half the districts responding indicate that they have a plan. Figure 1 denotes the level of superintendent response to the survey and those responding that have a technology plan.

Figure 1
Percent of districts with instructional technology plans



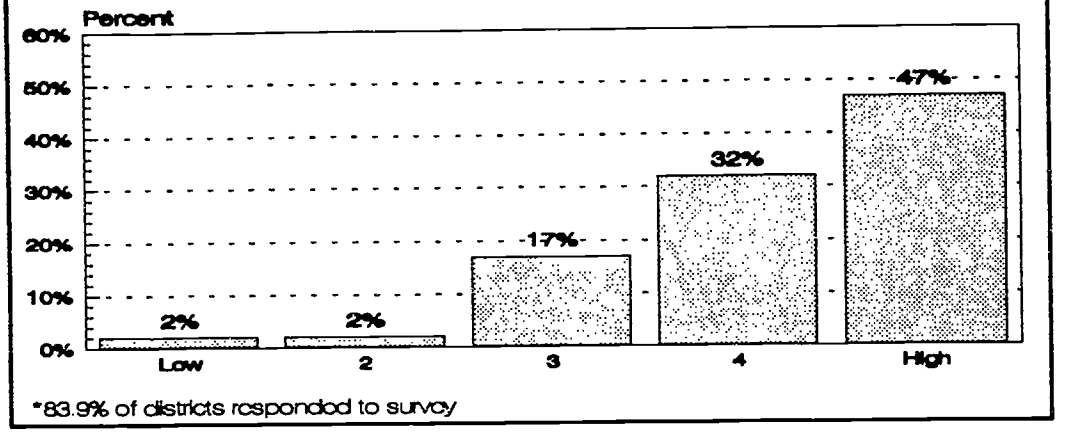
Superintendent comments regarding planning for technology were analyzed and summarized as shown in Table 4. These comments indicate that even in districts without a technology plan, the preponderance of superintendents understand the value of a technology plan and several additional districts are proceeding with developing one.

Table 4
Technology Planning Comments

Comment	Number of Responses
Planning currently underway	3
High Priority and will be developed	2
Drafted and to the board for approval	1
Needs to be developed	1
Has been subsumed into strategic plan	1
No Plan	1

Almost 80% of the superintendents see the use of instructional technology as a medium high to high priority. Only two districts felt that use of instructional technology is a medium low or low priority for their district as indicated in Figure 2.

Figure 2
Districts priority for the use of instructional technology*



*83.9% of districts responded to survey

Superintendents were asked if their district has an intra-district communications network. Slightly over 40% of superintendents report that their district has a communications network. Nearly 60% report no intra-district network. Superintendents were asked to describe the kind of network they are employing to communicate within their district. Table 5 shows the similarities in superintendents descriptions of their intra-district networks.

Table 5
Intra-District Network

Comment	Number of Responses
Fax Machines	7
IBM AS 400	5
QuickMail	4
Designing one/hope to install	3
UACN/Telecommunications	3
Macintosh/QuickMail operational in Fall '93	2
Computer/Modem	1
Finanacial use only-not communications	1
STAR schools	1
Macknowledge	1
Unixbased/IBM Powerstation	1
Electronic Mail	1
Establishing PSINet	1
Network (no identificatiorı)	1

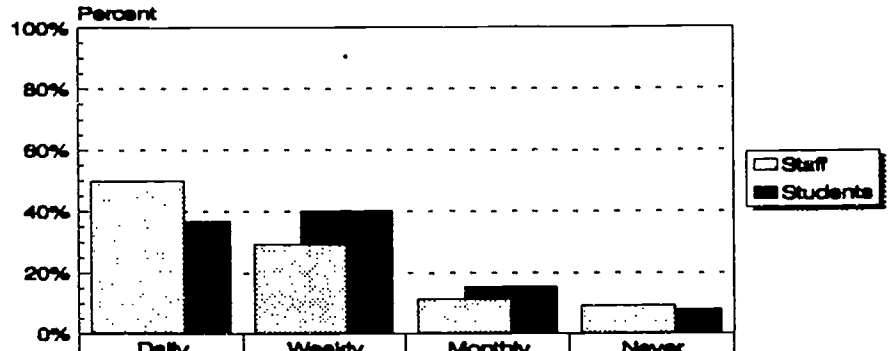
Principal's Survey

The principal's survey was intended to elicit information regarding the kinds of technologies in each individual school, and the ways in which teachers in that school were utilizing the technologies available to them. In addition to detailing the kinds of technologies they utilize, principals were asked to determine the level of priority they placed on instructional technology and whether or not the school has a technology plan. Respondents were also given an opportunity to discuss the needs they have other than additional funding in ensuring that instructional technology be used effectively.

Principals were asked to give their best estimate of the percent of staff utilizing instructional technology daily, weekly, monthly or less, or never. Results from this question indicate that half of the teaching staff utilize some form of instructional technology daily.

Principals were asked a similar question regarding the percentages of students using instructional technology on a daily, weekly, monthly or less, or not at all basis. Principals report that 37% of the students in their schools use technology daily while 40% use technology weekly. Figure 3 compares the frequency of student and staff use of technology in responding schools.

Figure 3
Frequency of staff use versus student use of instructional technology



	Daily	Weekly	Monthly	Never
Staff	50%	28%	12%	9%
Students	37%	40%	15%	8%

The responses to these two questions indicate that both teachers and students are utilizing the technologies that they currently have in the schools. Some respondents provided comments showing what progress they had made in utilizing technology with their students:

> ***"Over a 3 year period we have gone from teaching 3 high school typing classes on typewriters to keyboarding for all 6th grade. Middle school and high school students are now completing projects onlinking and Hypercard. We have piloted a middle school "check out a Mac" program this past spring-with kids taking Macs home each evening (very popular). Next year we are placing 4 to 5 computers in each 4th and 5th grade classrooms, expanding our use of video disc technology at high***

school, and fully integrating our English 9 and computer Application I courses."

Further questions focused on the technologies indicate that there seems to be a wide disparity in what is available to teachers and students to use, however.

Computer Technologies

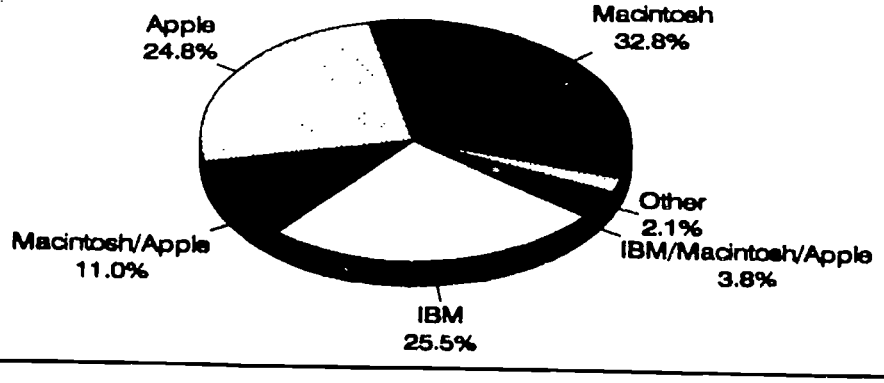
Principals were asked a number of questions regarding the configuration and uses of computer based technologies in the schools. The following information summarizes the responses from those questions.

Labs

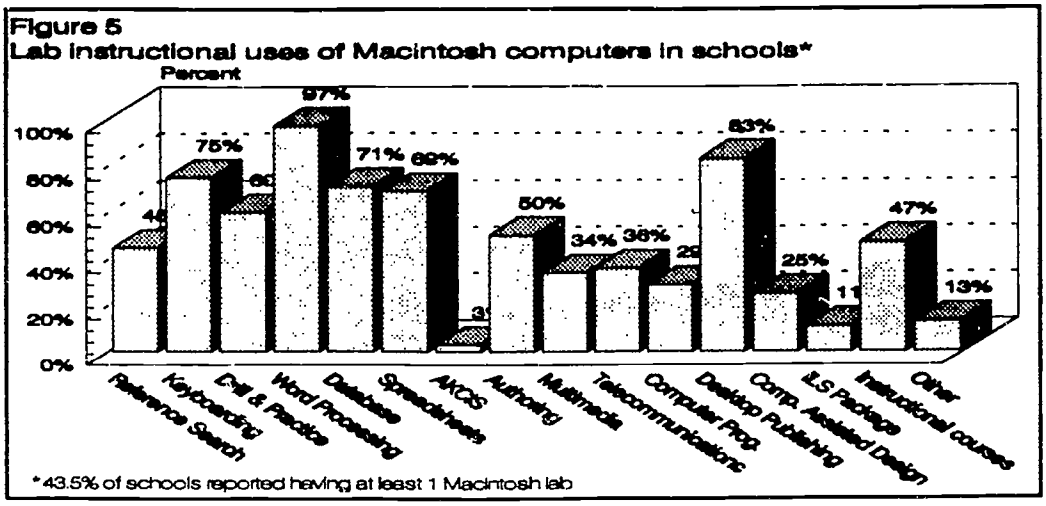
Computers are often configured in computer labs in schools. A computer lab consists of space for a number of computers which are generally networked with printers, often with file servers, modems, and other devices (laser disks, cameras, etc). Labs generally serve entire classes of students and are scheduled for use by teachers. Principals were asked in this section to describe all the computer labs in their school. They were also asked not to duplicate their inventory with any of the other configurations generally found in schools (library media centers and classroom computers).

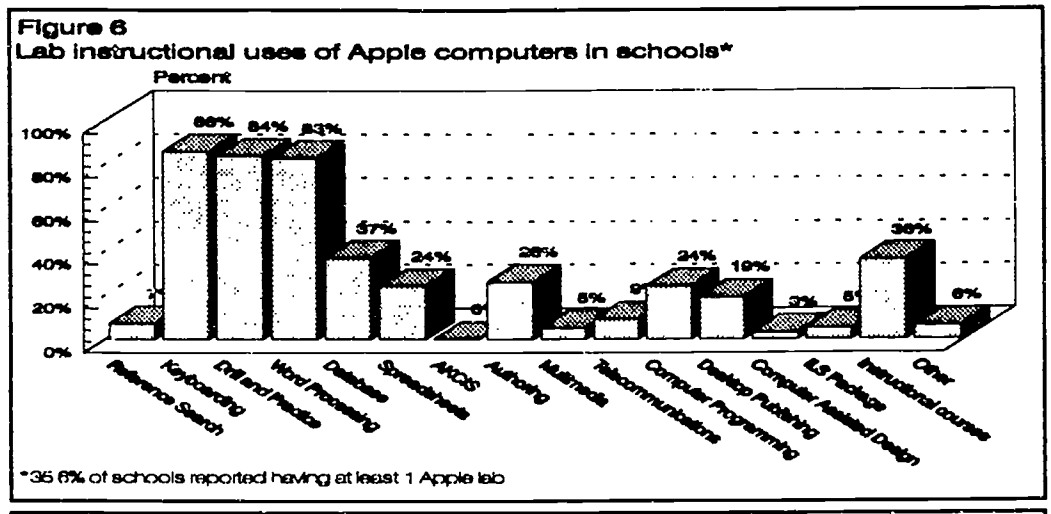
A total of 290 labs were reported in 168 schools or 64% of the schools responding to the survey. Schools were asked to describe their labs in terms of the kinds of computers, networking and other technologies connected with their labs. Most labs utilize Apple brand computers: Macintosh and Apple computers (IIe, IIc and GS) either separately or mixed together. IBM/IBM compatible labs accounted for nearly 26% of the total labs. A small number of labs utilize a mix of Apple brand computers and IBM/IBM compatible computers. Figure 4 shows the breakdown of labs by kind.

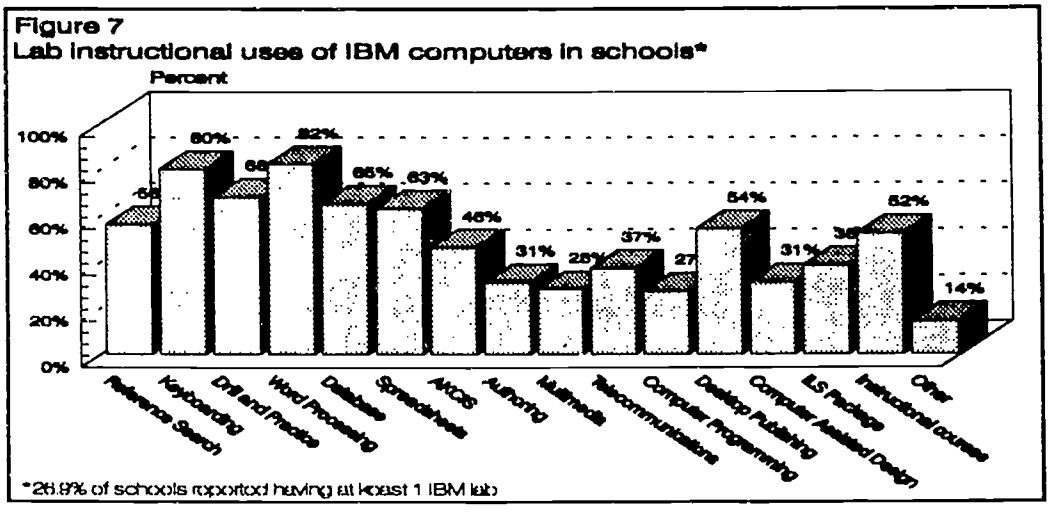
Figure 4
Types of labs in schools



Principals also were asked to indicate the uses for their labs. Figures 5, 6, and 7 show the uses for each of the three prevalent kinds of computers.







As one would expect, computer labs which generally accommodate many teachers representing multiple curriculum areas are utilized for multiple functions. The most prevalent uses for all types of labs are word processing, keyboarding, drill and practice,

databases, desktop publishing, and spreadsheets. While most most labs are used for those purposes, there were some notable differences in use by brand of computer. Drill and practice was used more often by Apple labs, suggesting that both the Apple line of computers and the types of software available for them lends itself to drill and practice use. In addition, desktop publishing is the second most used function for Macintosh labs. Little more than half the IBM/IBM compatible labs are reported used for desktop publishing and only 24% of Apple labs are used in this way. This indicates that Macintosh computers are leading the school desktop publishing market in Alaska schools. Multimedia, one of the newest uses for computers and quickly becoming a powerful instructional devise is nearly totally conducted on Macintosh and IBM/IBM compatible machines. This is not surprising since multimedia applications make power and other demands on machines that Apple lines and older machines have difficulty fufilling. Macintosh and IBM/IBM compatible machines are also used more for spreadsheet applications. Integrated Learning Systems (ILS) packages and the Alaska Career Information System (AKCIS) are accessed mainly by IBM/IBM compatible machines.

Some respondents noted that the need for updated or upgraded labs are great in their schools as typified by this comment:

> ***"We are in need of a computer lab at the elementary and/or 4-6 computer/CD-ROM laser disks in each classroom. Teachers have seen the awesome power of laserdisks, CD-ROMs, multimedia, and content area programs and are sold. We need to get them the tools to do it."***

Other lab descriptions showed the high level of sophistication achieved in some schools with networking, other high end hardware, and utilization of software that allows students a multitude of learning opportunities:

> ***"We feel that we have one of the most complete and advanced computer lab/network in the state. We strongly emphasize using the technology we have available to improve student learning and confidence."***

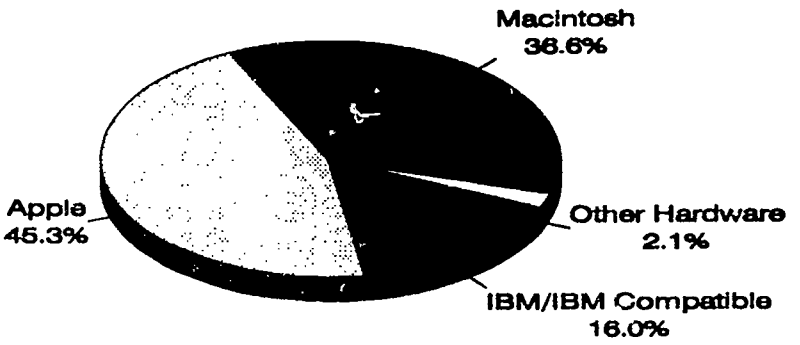
Classroom Computers

The typical number of computers found in the classroom is two; however, the number of computers in classrooms ranged from 0 to 34. Again there is a wide disparity in the numbers of computers located in classrooms where most students spend most of their time. Twenty-one schools responded having no computers in the classroom. As one respondent noted:

> ***"They (teachers) also need personal access in their own rooms to a Mac that is networked throughout the school. We can't make real progress until teachers are comfortable with technology and there is sufficient access to computers for both teachers and students."***

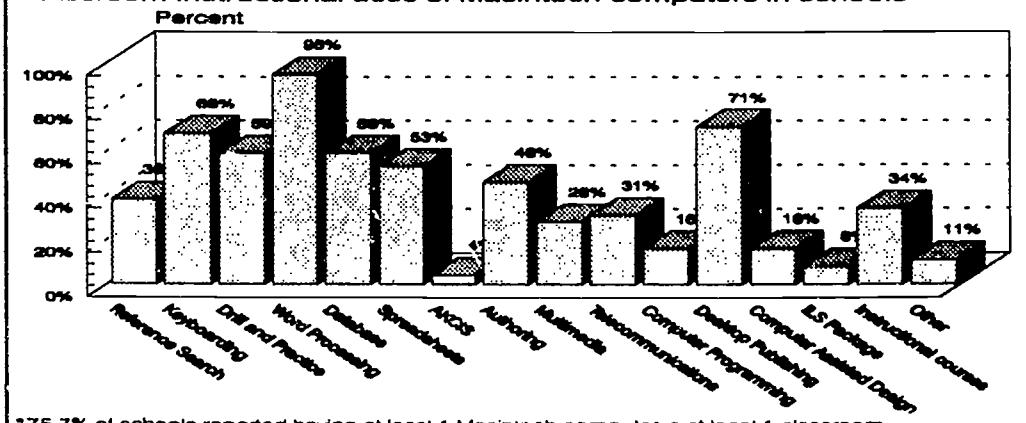
Figure 8 shows the distribution of computers in the classroom by type. Most computers found in the classroom are Apples and Macintosh with IBM/IBM compatible computers lagging behind.

Figure 8
Types of computers in the classroom



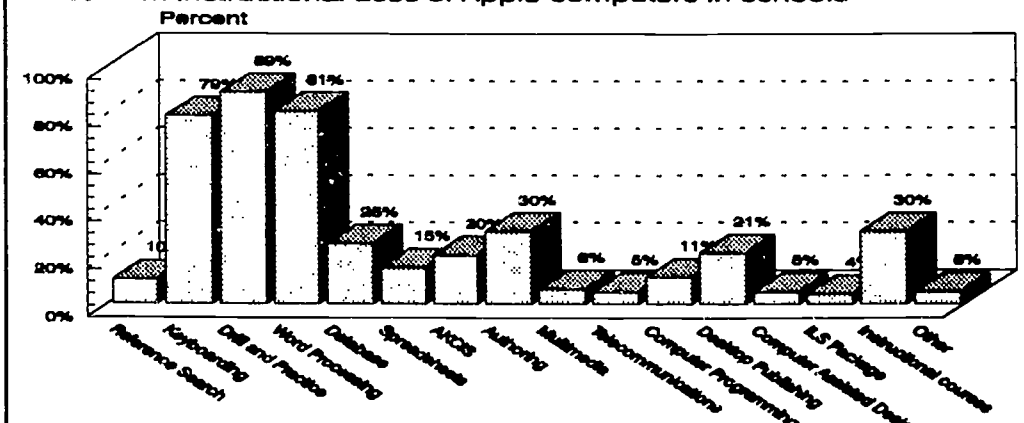
Figures 9, 10, and 11 show the reported uses for each type of computer found in classroom.

Figure 9
Classroom instructional uses of Macintosh computers in schools*



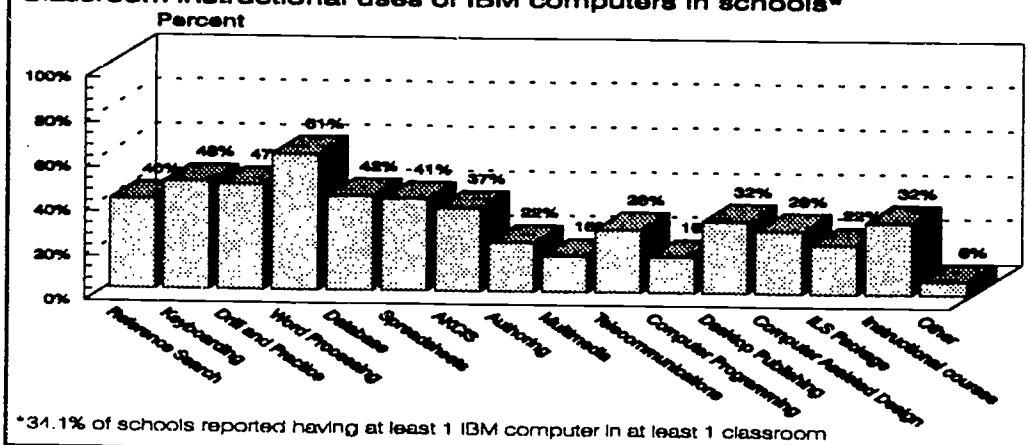
*75.7% of schools reported having at least 1 Macintosh computer in at least 1 classroom

Figure 10
Classroom instructional uses of Apple computers in schools*



*75.7% of schools reported having at least 1 Apple computer in at least 1 classroom

Figure 11
Classroom instructional uses of IBM computers in schools*



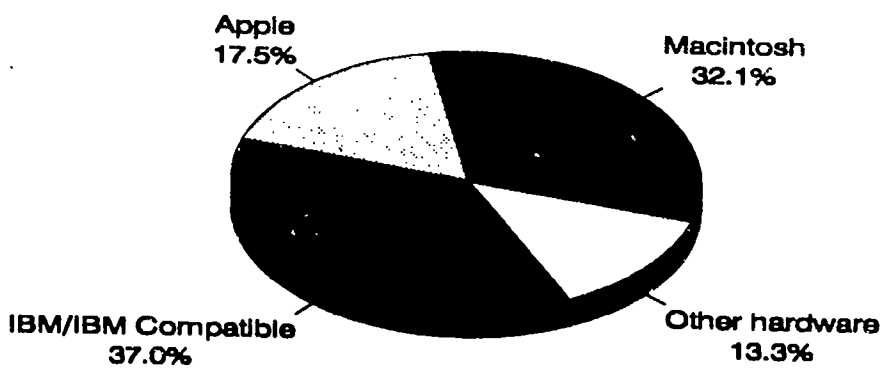
*34.1% of schools reported having at least 1 IBM computer in at least 1 classroom

Very little difference is seen in the uses of computers in the classroom and uses in the lab. The top use of computers in the classroom is word processing, followed by drill and practice and keyboarding, desktop publishing and database use. Again, however, the type of computer in the classroom makes a difference in its use. Apple computers are used more for drill and practice and keyboarding. As in the labs, Macintosh computers are used more heavily for desktop publishing than Apple or IBM. Use of IBM/IBM and Macintosh computers seems to be more evenly distributed among a wide variety of applications. IBM/IBM compatible classroom computers are used significantly more for accessing the Alaska Career Information System (AKCIS) and for Integrated Learning System (ILS) packages.

Library/Media Center

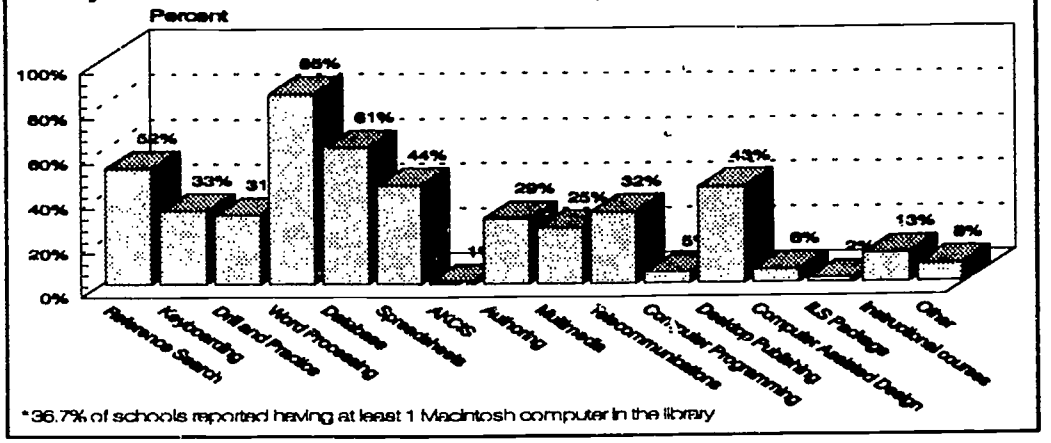
The third general configuration of computers in most schools are those in the library/media center. Figure 12 shows the distribution of computers in the library by type. Library configurations are notable in that IBM/IBM compatible computers are more prevalent than Apple brand computers.

Figure 12
Types of computers in the library



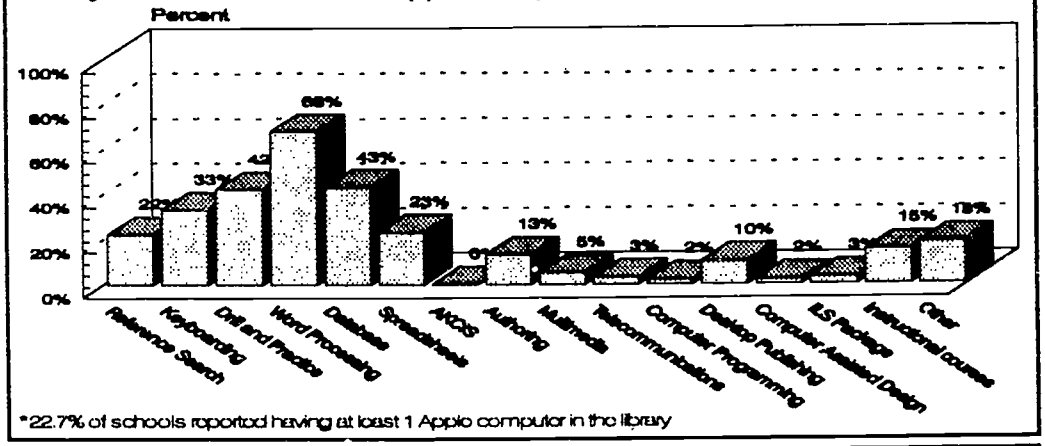
Figures 13, 14, and 15 show the reported used for each type of computer located in libraries.

Figure 13
Library instructional uses of Macintosh computers in schools*



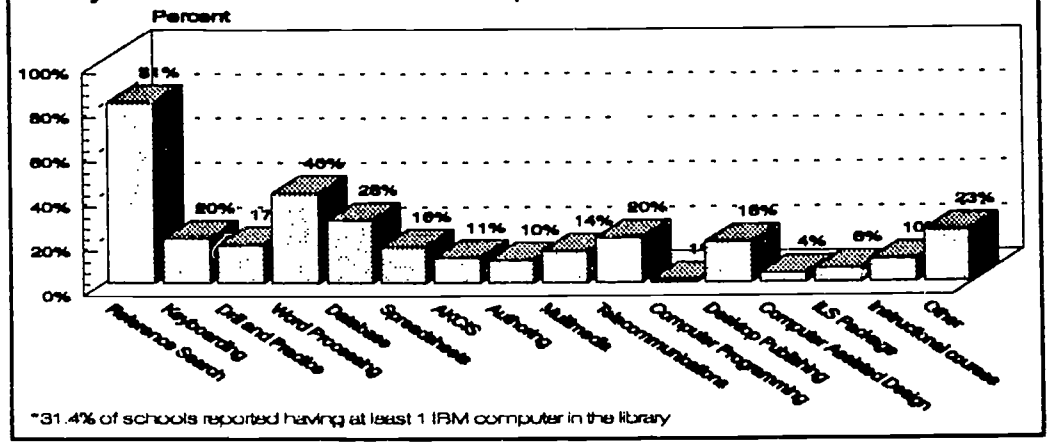
*36.7% of schools reported having at least 1 Macintosh computer in the library

Figure 14
Library instructional uses of Apple computers in schools*



*22.7% of schools reported having at least 1 Apple computer in the library

Figure 15
Library instructional uses of IBM computers in schools*



*31.4% of schools reported having at least 1 IBM computer in the library

Computers located in libraries are used similarly to those in classrooms and labs, though uses more commonly connected to the library such as conducting reference searches predominate. The three highest uses of computers located in libraries are

word processing, reference searches, and databases. Consistent with responses regarding hardware in the other two configurations, Macintosh computers are used more for desktop publishing and multimedia than the other types of computers. IBM/ IBM compatible computers, however report far more use in conducting reference searches. That may be due to the online or CDROM technologies employed to conduct reference searches. Apple computers are reported more heavily used even in the library for drill and practice.

Overall

Many of the computers noted in all three general configurations are older Apple IIe and IIc computers especially in the classroom where Appies represent 45% of the total number of classroom computers. These computers while still adequate for initial learning of keyboarding and word processing and still being used heavily for drill and practice are not suitable nor upgradable for the newer applications in schools—hypercard, multimedia, and many interactive uses. As these respondents noted:

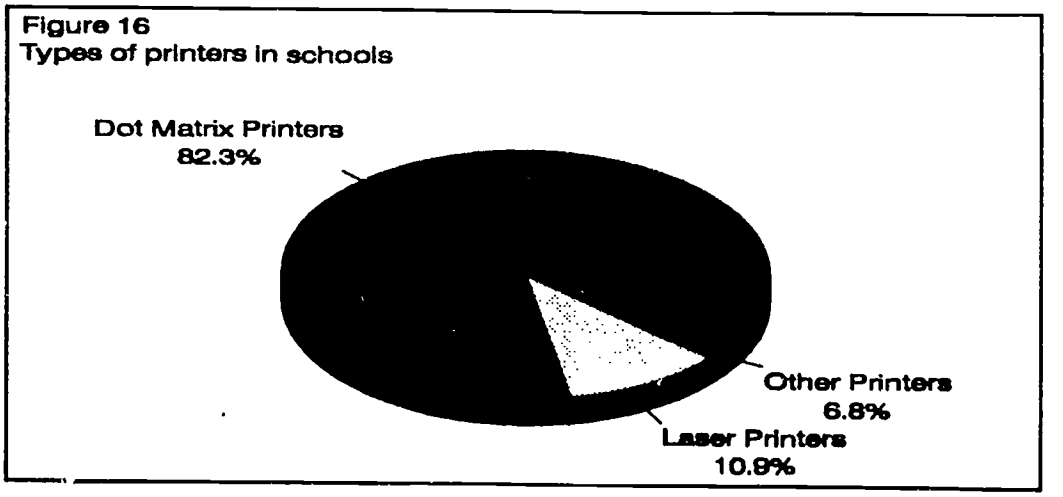
> ***"We are severely lacking in technological equipment to enhance teaching and learning. Many of our machines are obsolete. We have not even had sufficient funds to repair all of the items that have broken down during the school year."***

> ***"We need updated technology badly. I feel our staff would be more enthused than they are if we had the technology to work with. The technology in the building is very outdated nor is there enough to go around."***

Printers

Schools were asked to report how many printers they had available for use outside their computer labs. The availability of printers outside the lab gives students and teachers more flexibility in the use of computers on a daily basis. Figure 16 represents the kind of printers available in schools outside labs. As in the case of computers, the most printers available for use are dot matrix computers which is an older and more limited technology.

Figure 16
Types of printers in schools



Calculators

The National Council of Teachers of Mathematics (NCTM) has recommended students have available to them and use calculators to perform certain kinds of math functions. Principals were asked to report on the number of different kinds of calculators in their schools. Most calculators in use by schools are basic four function calculators. About 17% of the total number of calculators reported were scientific calculators generally used in secondary level mathematics classes, and only about 4% are graphing calculators, a powerful tool recently made available with widespread applications for grades 7-12. Figure 17 shows the breakdown of the types of calculators reported in the school.

Figure 17
Percent of calculators used in schools

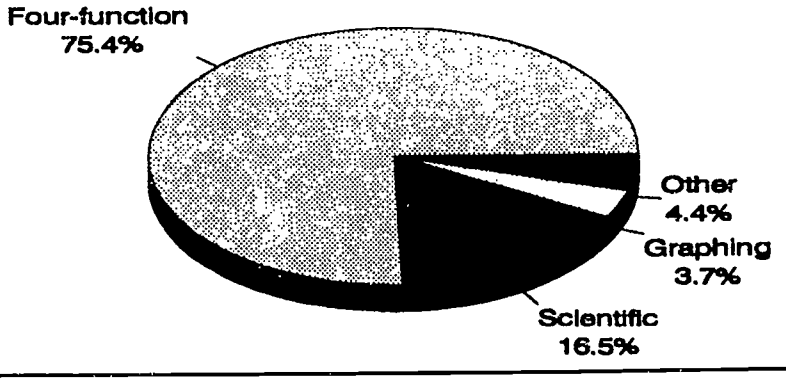
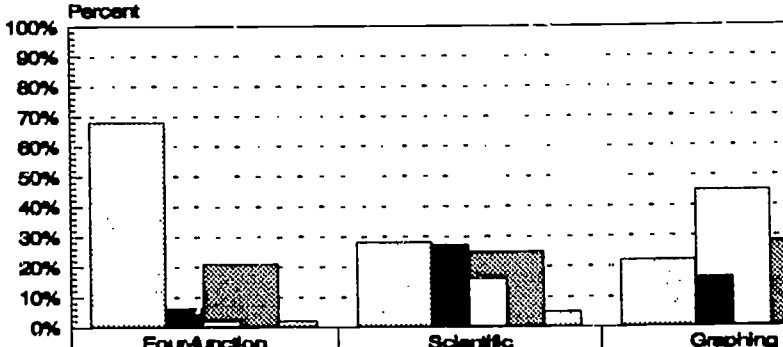


Figure 18 denotes the prevalance of each type of calculator by grade level categories of schools Most of the basic four function calculators are located in elementary schools with an additional 21% of four function calculators in schools containing grades PE-12. While 18% of the schools reported having no four function calculators; one elementary school reported as many as 500 four function calculators, again showing the wide disparity of available technologies in the schools.

Figure 18
Percent of calculators used by each type of school



	Four-function	Scientific	Graphing
Elementary	68%	28%	22%
Middle/Junior High	6%	27%	16%
High School	2%	16%	45%
PE-12	21%	25%	28%
Middle/High School	2%	5%	9%

Elementary Middle/Junior High High School PE-12 Middle/High School

The number of scientific calculators are spread fairly evenly among all types of schools. However, middle/jr high schools represent only a little over 7% of survey respondents but have 27% of the scientific calculators. Nearly half of the schools reported having no scientific calculators.

Graphing calculators which are generally used in more advanced classes are found predominantly in secondary schools with a total of 45% located in high schools. Again, since high schools account for only 10% of survey respondents, this shows that the highest concentration of these tools is where one would expect them. No graphing calculators were reported in 167 schools or 63% of the schools responding to the survey. Only eight schools reported having enough graphing calculators for entire classes of students to use. Lower number of graphing calculators may be due to the recency of of graphing calculators introduction to educators and to their higher cost relative to other calculators.

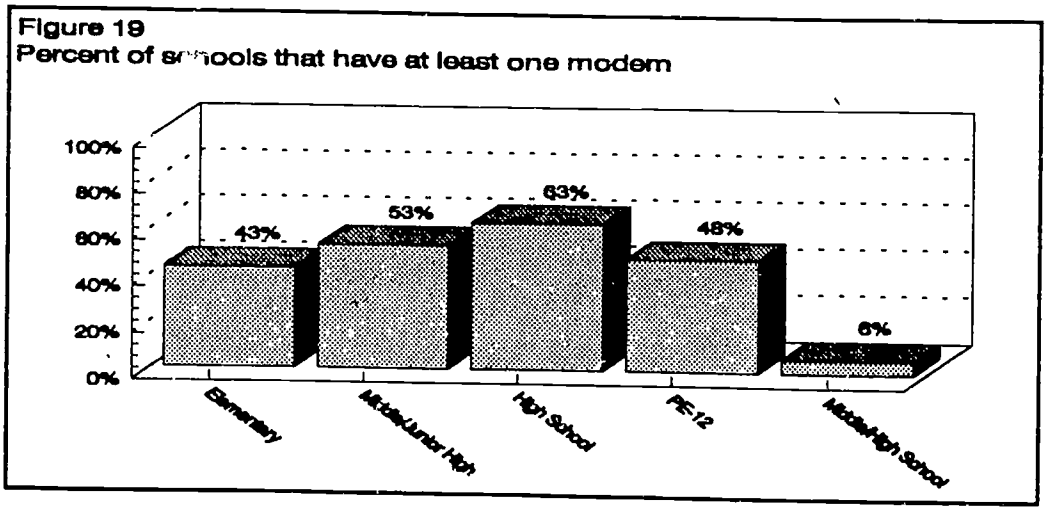
Telecommunications and Video Based Technologies

Many schools are increasingly using telecommunications and video based technologies. Networks are increasing that give teachers and students access to information and other people through telephone lines, satellite dishes and cable television. In this section of the survey, principals were asked to report on the prevalence and use of these types of technologies in their schools.

Modems

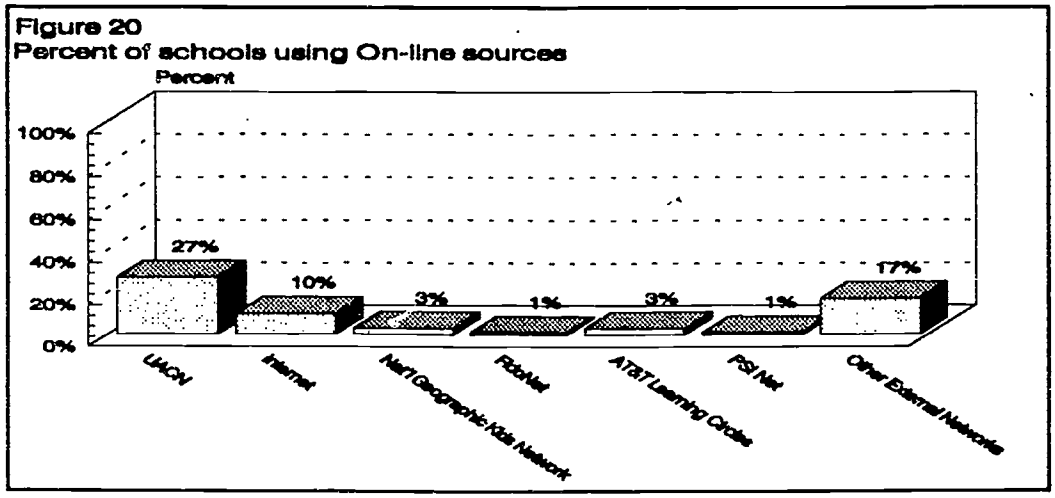
In order to access telephonic based networks it is necessary for schools to have modems. Only 175 modems were reported available for instructional use. One hundred schools (38%) reported having no modems. The maximum number reported available for instructional use by schools was 4. The data shows that more high schools responding to the survey have modems available for instructional use than other types of schools. Figure 19 shows the availability of modems by type of school.

Figure 19
Percent of schools that have at least one modem



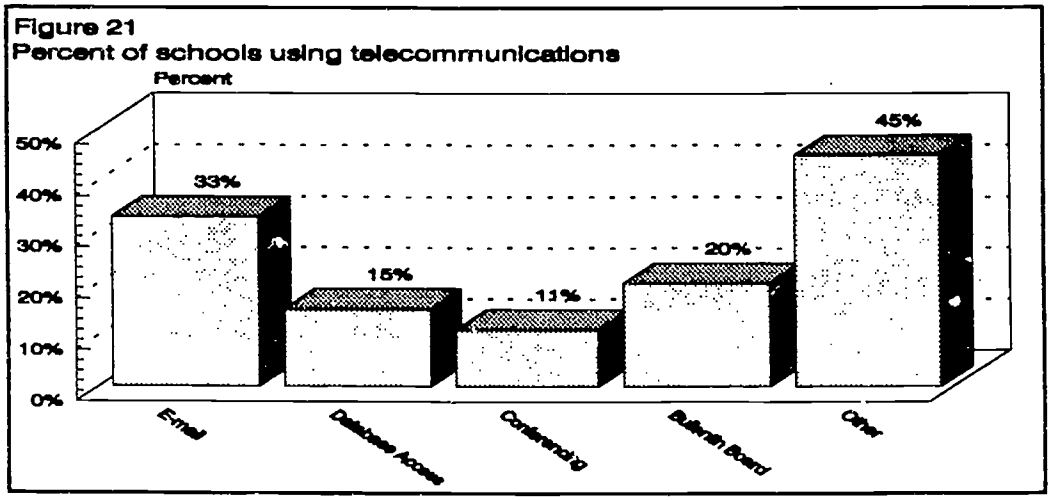
On-line Resources

Schools were asked what online services are accessed for or by teachers and students. Figure 20 shows the percent of responding schools using online networks.



More schools responding to this question use the University of Alaska Computer Network (UACN) than any other identified network. The largest use of UACN is for electronic mail followed by bulletin board access. Use of the Internet was the second highest reported network used. The Internet is a large electronic highway that allows users access to many online and data networks. Use of the Internet to access online resources indicates that some schools are beginning to utilize this powerful resource for instruction.

Figure 21 shows the most reported uses of all online services or networks.



Telephones

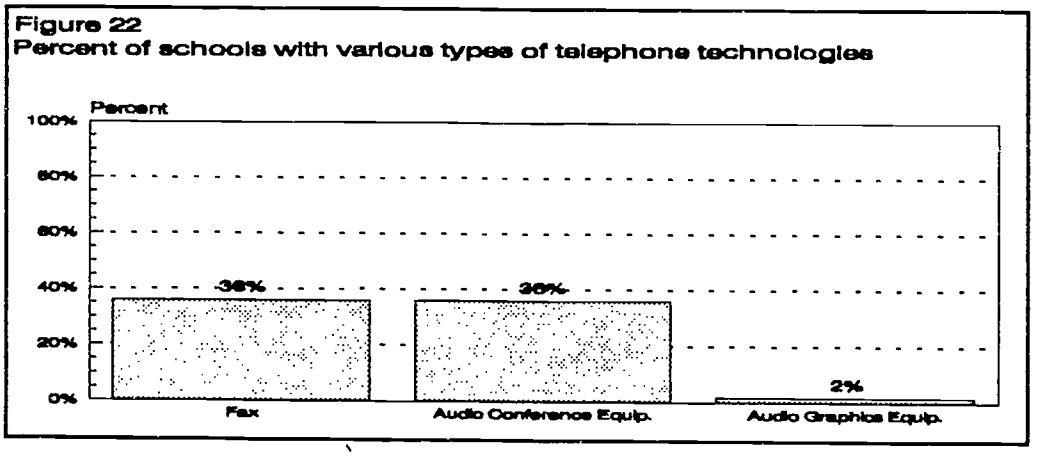
In order to access online services, utilize audioconferencing and audiographics for instruction, teachers and students must have access to a very basic technology—the telephone. Answers to the question what percentage of your classrooms have phones generated a wide disparity of responses. Nearly half of the schools responded that none of their classrooms had phones. Yet, nearly 20% responded that all of their classrooms had phones. The average number of classrooms with phones was 26.7%.

There were four districts in which all schools responding to the survey reported phones in all the classrooms. This is an indicator that some districts have committed to having phones in all classrooms. There were also eight districts in which ail responding schools reported no phones in classrooms. Lack of access to phones was seen by some respondents as problematic as noted by this comment:

> ***" Besides money, we need an attitude conducive to the 21st century All the buildings have electrical conduit for TV cable and telephones/computer lines but the decision was made . . . not to install everything. Now the money is gone and so are many of our hopes. We still can't get anyone to allow us to install phones in classrooms!!"***

Schools were also asked to report on the kinds of telephone based technologies available including Fax machines, audio conference, audio graphic and other equipment and how they are used. Figure 22 shows that only about a third of the schools have FAX and audio conference equipment available for instructional use. A very small percentage of schools have audio graphic equipment. Utilization of such telephone based equipment is higher for teachers than for students.

Figure 22
Percent of schools with various types of telephone technologies



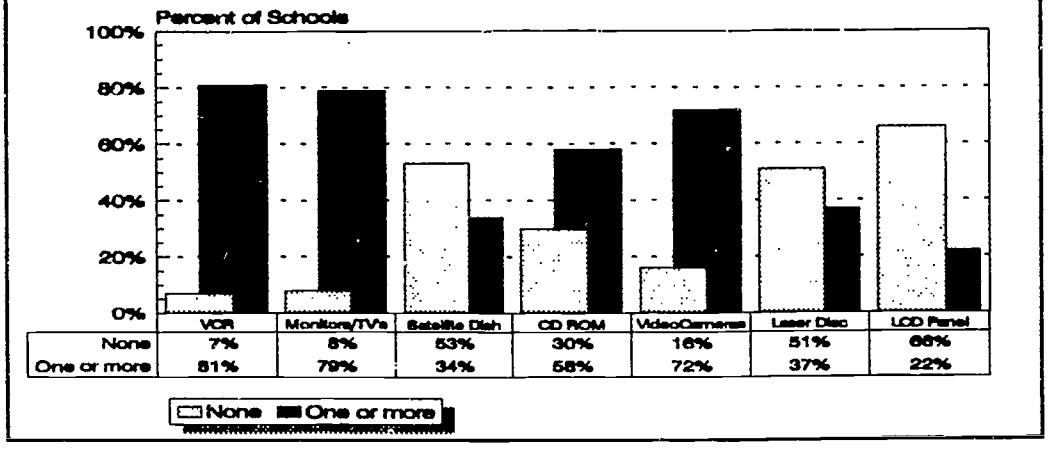
Video/visual based Technologies

Digitization and compression of video technologies are quickly changing the video technology landscape. Use of digitized video over fiber optic networks will allow 500+ channels of entertainment and information in the home Plans are currently underway for services on these networks that will allow video on demand, more extensive home shopping, electronic medical house calls, electronic banking, access to databases and electronic libraries, and highly interactive games. These new networks have vast potential for use by schools, however most schools do not have the infrastructure to capitalize on the potential these networks hold for education.

Most schools responding reported having the "basic" technology of videocassette recorders and monitors. Although some schools still report having no video cassette recorders (VCR's) or television/monitors, the maximum reported was 25 VCR's and 40 televisions/monitors in a school. Figure 23 compares the schools reporting not having the indicated technology to those reporting at least one. As can be seen in the graph,

digital/video cameras and CD-ROM players are fairly prevalent in schools; laserdisk players and LCD display panels are scarcer technologies.

Figure 23
Comparison of school reports of video/visual-based technology

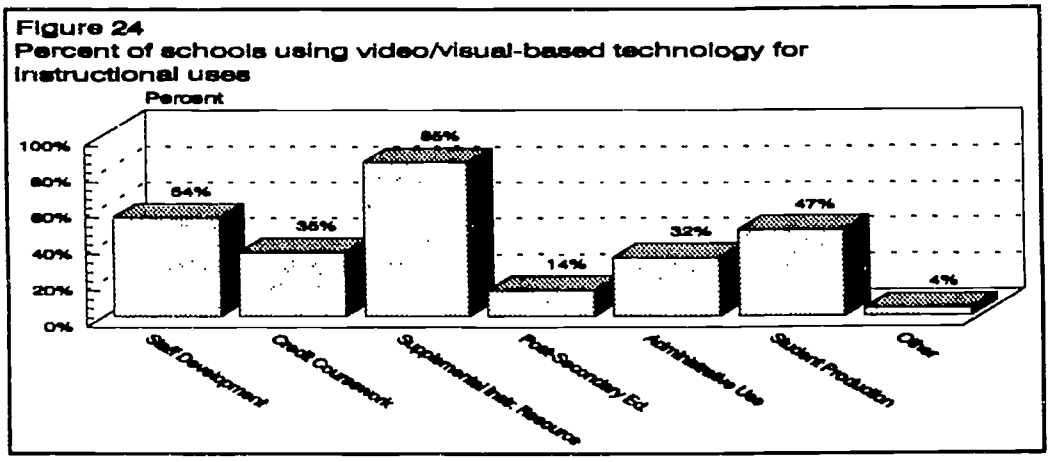


	VCR	Monitors/TVs	Satellite Dish	CD ROM	VideoCameras	Laser Disc	LCD Panel
None	7%	8%	53%	30%	16%	51%	66%
One or more	81%	79%	34%	58%	72%	37%	22%

As is the case with telephones in schools, there is wide disparity among schools with cable television. Nearly 50% of the schools reported that none of their classrooms have cable television. On the other hand, over 20% of the schools responded that all of their classrooms have cable. Schools reporting no cable in the classrooms were reviewed in light of the Alaska Department of Administration's "Inventory of Communication Facilities Serving Alaska, 1992". This review revealed that nearly one-third of schools without cable have no cable available in their community.

Schools were asked to report on the ways they are using video and visual technologies in their schools. The most common use of all video based technologies was as supplemental instructional resources as noted in Figure 24.

Figure 24
Percent of schools using video/visual-based technology for instructional uses



In other words, teachers are generally utilizing these technologies primarily as adjuncts to their classroom instruction. Staff development accounts for the second highest use of these technologies followed by student production. Some differences in uses were found among the different video based technologies. CD-ROM's most prevalent use is to provide teachers with supplemental resources (88%). The next highest use of CD-ROM is for student production (28%). Satellite technology's second highest use (74%) is in the delivery of credit coursework. This is as expected since 80% of the survey respondents with satellite capability are involved in the state's Star Schools project

which delivers credit courses to students. Satellite dishes were noted by several respondents as a means to open up student experiences:

> ***"We use the satellite classes extensively, both for the students and staff development. I think it opens up the curriculum, in the small schools, for those students who are academically beyond the scope of a one-two teacher high school. Technology has to be careful not to become a tumor in the educational process, but part of it."***

Also, as expected, schools reported that the highest use of digital and video cameras in schools is for student production. The second highest use (63%) of laserdisks is for post secondary education.

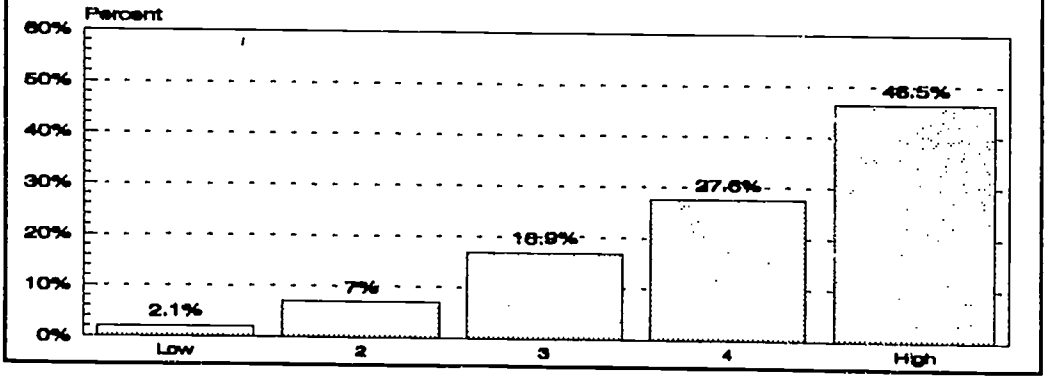
Comments from the survey indicated that some respondents feel a need for a statewide telecommunications network able to connect all schools with audio, video and data:

> ***"We need to move towards a statewide network able to access data, video conference and in general communicate. Resources and curriculum . . . need to be available to all Alaskan teachers and students. Just think about how great we can become if we share the best of what we all have to offer."***

Technology Priorities/Planning

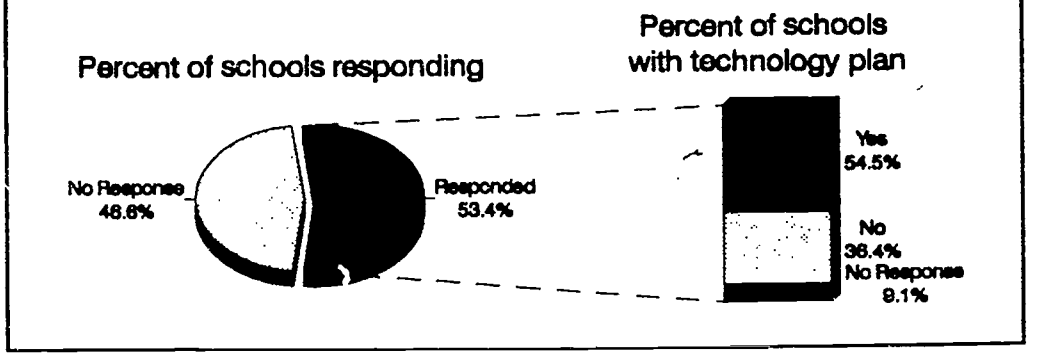
Principals were asked how high a priority instructional technology is for their schools on a scale of 1 to 5 with 5 being a high priority. The majority (74%) of respondents to the survey indicated that instructional technology is a medium high to high priority for their schools as seen in Figure 25. This correlates very strongly with the 78.7% of superintendents reporting a medium high to high priority for technology in their districts.

Figure 25
Schools priority for the use of instructional technology



When asked whether the schools had a technology plan, nearly 55% indicated they do have a plan. Figure 26 shows the percentage of schools responding to the survey and their response to this question.

Figure 26
Percent of responding schools with a technology plan



Some respondents noted that a comprehensive plan needs to be developed:

> ***"The use of instructional technology is on the rise in our district-though the district as a whole needs to develop a plan for total technological expenditures, training, monitoring, and coordination. Our students are very motivated by computer use and other technology. My staff needs the additional training required to use technology competently and instruct students effectively."***

Principals were also asked to indicate areas other than money in which their school needs assistance to effectively use instructional technology. Responses to this open ended question were analyzed and categorized. Overwhelmingly, the respondents indicated that training was the most serious need. Table 6 indicates the generalized responses and the times that comment was made.

Table 6
Technology Needs Other Than Funding

Comment	Number of Responses
Teacher training/staff development	124
Equipment/equipment upgrades	30
Personnel/support staff	17
Information on new software/media/technologies	15
Software/software upgrades	12
Time	11
District/building commitment or plan	10
Adequate funding/resources	10
Telephones/better telephone service	9
Technical support/maintenance	8
Building changes (space/wiring/rooms)	8
Building/district networking	7
Information/resources for implementation	6
Statewide network	4
State adopted technology curriculum	3
On-site technical assistance	3
Assistance in developing a plan	3
Integration into the curriculum	3

Table 6 (cont.)
Technology Nees Other Than Funding

Comment	Number of Responses
Parent training	2
Student training	2
Innovative instructional approaches	2
Statewide technology plan	2
Evaluation of technology	2
Access to Internet and online resources	2

Comments in this section of the survey indicate that the biggest need in the schools is for training of teachers. As one respondent noted:

> ***"Just having computers, networks, labs, CD ROMS, etc. in a school is not enough. All staff members using this technology should receive enough inservice training during school hours to build confidence and make things "user friendly". If it is important enough to have this technology in the school, it is important enough to spend the money for proper inservicing This builds a positive attitude and promotes the full use of these new instructional tools."***

Further Comments

Finally, respondents were given an opportunity to make general comments. This section saw a variety of responses ranging from those discussing the survey itself to others noting the kinds of technologies currently used in the respondents schools. There were several redundancies with the question asking about needs other than funding. Where applicable, the responses were categorized. Table 7 lists the multiple responses found in this section and the number of incidents for each response.

Table 7
General Comments

Comment	Number of Responses
Need technology in the school	17
Plans to implement technology including new tech., Star Schools, personnel	14
Need teacher training	10
Description of current technologies used in the school	8
Information on school demographics that had a bearing on the survey	7
Need for a plan/work on a plan described	4
Need facility with technological capabilities	4
Funding	4
Need computer for each teacher	3
Multimedia interest	3
Star Schools use	3
Telecommunications interest	2
Lack of teacher/admin. understanding of technology	2
Rural Schools need technology	2
Need statewide integrated audio, video, data network	2
Comments about the survey	2

Survey Conclusions/Recommendations

Both the majority of superintendents and principals responding to the survey gave educational technology a high priority for their districts, but fewer indicated an articulated plan. Because research has shown that successful integration of technology depends on a careful plan, it is recommended that school districts place a priority on technology's role in the schools and develop a plan for its acquisition and implementation. A well developed plan includes not only a strategy for acquisition of technology, but also strategies for integration into the curriculum and training of staff. Planning must account for the long-term process of adoption of new technologies before integration into schools is successful.

Training is an issue that stands out in the survey as the number one need beyond funding. U.S. employers spend $50 billion a year to train employees often focusing on the means, both technological and human to enhance job productivity, yet school districts spend very little to train their employees in the new ways to make instruction better and more efficient use of technology. If teachers are to become leaders in the information age in a business that is basically an information business, they must be trained to use technology at least as effectively as employees in the private sector.

The survey pointed out that there is generally high levels of use by both teachers and students of the technologies now in place in Alaska schools. However, it also points out that schools are in need of upgraded equipment, newer equipment and training in order to effectively use technology to enhance learning. As one respondent stated:

> ***"There needs to be upgrading of all software and equipment. Without funds for this, it will not or cannot be done. You can only stretch money so far with the high cost of the technology. Would like to see up-to-date technology but beyond our local school budget."***

Studies have shown that people retain 10% of what they see, 20% of what they hear, 50% of what they see and hear, and 80% of what they see, hear and do. When applied to the technologies available, it is when you add the power of interactive technologies and those capable of allowing students to access and manipulate information and create meaningful products that you dramatically increase the ability of technology to enhance learning. As technology rapidly changes to an integration of voice, video and data, schools with more powerful computers connected to sophisticated networks will be positioned to take advantage of these resources.

The survey also indicates that there are wide disparities across the state and even within school districts in the numbers and kinds of technologies available for teacher and student use. Some schools have few technologies or predominantly older technologies for instructional use, while other schools have sophisticated labs, CD-ROM players, digitized cameras, telephones in every classroom or other technologies with which to work. As the resources that technology makes possible become more common and in demand in the classroom, educational equity will not be possible until

schools are capitalized with the hardware necessary to access to those resources possible.

As with the hardware, access to basic infrastructures that make educational resources available to teachers and students on demand is widely disparate. Telephone lines, cable television or satellite dishes, and building networking make accessing online data networks, video resources, distance education resources, and much more possible. Again an equity issue is raised when some students and teachers have access to such materials and others do not. Equal educational opportunities cannot be really equal when some students are more prepared for life and work opportunities in the information age than others. In this regard there is a role for statewide networks or plans as this respondent notes:

> ***"An overall strategic plan for state-wide implementation of technology is in order, a wide area network connecting all schools and classrooms by modem, fax, voice and video to provide distance education, collaborative learning and exchange of powerful ideas, enough technology to make schools empowered for the 21st century."***