

Technology Plan

Dover Sherborn Public Schools

**Updated
3/29/1999**

The enclosed document is an update of the Technology Plan which was originally drafted during the 1997 school year and updated again in the Spring of 1998. The areas which are updated and revised in this document are:

1. District Technology Mission and Vision Statements
2. Instructional and Curricular Goals and Initiatives
3. Student and Staff Assessment of Technology Skills, Knowledge and Attitudes
4. Inventories
5. Assessment of Current Curriculum Status
6. Assessment of Existing Professional Development Activities and Structures
7. Assessment of Current Technology Support Staff
8. Administrative and Management Goals and Initiatives
9. Communication/Information Access Goals and Initiatives
10. Instructional and Curricular Goals and Initiatives
11. Budgeting

District Technology Mission and Vision Statements

MISSION:

Technology, by definition, is the application of tools and skills to solve practical problems and extend human capabilities. In recent years technology has become a more prevalent component of our society and is rapidly transforming our world of work, home and leisure. Software tools allow us to store, gather, analyze and manipulate data in ways not previously possible. Electronic connections provide us with a "virtual" ability to interact, communicate and share information with people around the world. Together these changes are generating an interdependent global society.

As the 21st century approaches, technology will continue to transform our world and technology use increasingly will become an essential life skill. It is, therefore, the mission of the Dover-Sherborn technology program to provide students with the appropriate tools and skills to live, learn and thrive in our global society.

VISION:

To accomplish this mission, our program must make technology an integral part of student life. By the year 2003 the public school systems of Dover, Sherborn, and Dover-Sherborn Regional Schools will have established technology infused environments for teaching and learning, in all subject matter, across all disciplines and for all student age levels. Students and staff will use state of the art technology to discover, communicate and enhance knowledge.

Though it is important that technology be integrated across the curriculum, students also must continue to develop and improve their skills in an environment dedicated primarily to the teaching and use of technology.

In addition, we must be cautious that as we implement our vision, we continue to view technology as a tool. It is crucial that technology serve the curriculum rather than act as its driving force.

Technology is powerful and can impact what and how students learn. Through its connections to the real world, technology can serve as a vehicle to help students take a more active role in the construction of their knowledge. As this occurs, students will become more productive learners who are analytical and critical thinkers, skilled researchers and empowered decision-makers. Teaching students these skills along with the ability to adopt and use new technologies will help to prepare the students of Dover and Sherborn for the 21st century.

Dover-Sherborn Schools

Instructional and Curricular Goals and Initiatives:

Goal A: Students will access, retrieve and evaluate information using current technologies to prepare them for their futures and to enhance learning.

English:

- Students will become familiar with the advantages and limitations of the available search engines and databases on the Internet.
- Students will devise search strategies for accessing information.
- Students will evaluate the reliability and validity of information with respect to propaganda and bias.
- Students will become proficient at identifying, locating, evaluating and integrating appropriate print and on-line materials for classroom projects and personal research.
- Students will demonstrate that writing is a communication process, inviting response.
(An awareness of audience enhanced by publication.)

Social Studies:

- Students will be able to identify, locate and utilize materials for research projects.
- Students will increase their geographical, cultural and political awareness and understanding of people all over the world.
- Students will use technology to broaden their perspectives and enhance their understanding of the cultural as well as social, political and economic aspects of historical events.
- Students will use e-mail to communicate with one another and with other schools.
- Students will enhance their research through the ability to retrieve, review and evaluate multiple sources.
- Students will participate in interactive lessons using distance learning.
- Students will access information using CD-ROM and on-line services.

World Language:

- Students will explore Internet sites retrieved by the teacher.
- Students will do searches on the Internet and discriminate between good and better sites.
- Students will use on-line access to visit shopping and service sites in the target language and target culture to practice the application of daily living skills.
- Students will develop the ability to research cultural information by access to international on-line services.
- Students will access international news services to compare and contrast the issues and ideas expressed in foreign media with those expressed in US sources.
- Students will access and utilize “virtual travel” web sites to familiarize themselves with the layout of cities in target countries, and to “visit” important museums, monuments and other attractions.
- Students will engage in the exchange of e-mail with a sister school in the target culture.
- Students will use CAI (Computer Aided Instruction) software to extend and enrich understanding of curriculum content.

Math:

- Students will gather statistics and present them in database and spreadsheet formats.
- Students will use CBLs (Computer Based Labs) and graphing calculators for experiments and practical applications.
- Students will access, retrieve and evaluate information from the Internet for use in their math classes.
- Students will become proficient in the use of integrated software applications.

Science:

- Students will pose problems to scientists via the Internet.
- Students will use technology for the life, physical and earth sciences.
- Students will use electronic forums to participate in problem - solving.
- Students will use computers, CBLs (Computer Based Labs) GPS (Global Positioning System), and Globe equipment to collect and send data to the Globe Project.
- Students will use the Internet and library computer programs to access the latest information on current environmental issues.
- Students will use database and spreadsheet to compute lab data.
- Students will use CBL (Computer Based Lab) Systems to measure and analyze scientific data.
- Students will prepare oral and written reports, detailing research efforts using CD-ROMs, Internet, laser disks and videotape.

Technology:

- Students will use the library network and CD-ROM tower to research and obtain information.
- Students will know the role of satellite communications.
- Students will become adept at using the various search engines to access the Internet.
- Students will learn to use Internet browser software.
- Students will learn to evaluate the strengths and limitations of the various search engines and to critically assess the reliability and integrity of information found on the Internet.
- Students will learn about the history as well as current and future directions of technology.
- Students will develop an understanding of how various technologies have and will continue to impact our lives.
- Students will develop an understanding of how technology has created an interdependent global society.
- Students will develop an understanding of the evolution of computer hardware and software.
- Students will have an understanding of how a computer network operates.
- Students will gain an understanding of the various computer operating systems.
- Students will know how to save to floppy and hard disk on various platforms and in a network environment.
- Students will learn how to convert file formats to be used on a different operating system than the original.

Business

- Students will become skilled typists, mastering the keyboard, so they may emulate the proficiency of many office employees in the work force.
- Students will use up-to-date software (word processing, multimedia, presentation, database, spreadsheets, page layout, photos, and multi-tasking) in their daily assignments.
- Students will become adept using scanners, camera, video equipment, and laser printers.
- Students will utilize information obtained from the Internet and integrate their research within their reports, presentations, and multimedia assignments.

Health Education:

- Students will explore the different uses of technology as it applies to research and hospital utilization and as a diagnostic tool.
- Students will access current health articles available on the Internet and CD-ROM and evaluate the studies published in these journal articles.

The Arts:

- Students will use testing software to plan, design, modify, and evaluate various design vehicles in mechanical drawing.
- Using design software, students will develop basic CAD (Computer Aided Design) projects.
- Students will use computer technologies as research tools for art history and contemporary art appreciation: i.e. research and museum exhibits, CD-ROMs.
- Students will appropriate technologies to compose, arrange and print music.
- Students will use computer aided drafting and architectural design software.
- Students will use technology in graphics and printing.
- Students will use video technology to learn the basics of video production, both field-based and studio-based.
- Students will use technology to: Manage budget and household finances; Make wise consumer choices of foods, clothing, housing for themselves and families; use new technologies in food preparation, storage and cleaning; use new technologies in clothing maintenance.
- Students will use technology to: analyze nutritional content in foods, analyze dietary needs and use the Internet to search for and analyze consumer information regarding purchases for personal use.
- Students will access the Internet and use other technologies to explore significant national and international works of art.
- Students will use the Internet and CD-ROMs to access information on music history and theory.
- Students will use video to produce presentations of their dramatic performances.
- Students will develop video and/ or electronic portfolios of their work, where appropriate.

Goal B: Students will develop an understanding of the ethics and personal responsibilities related to technology use.

All Content Areas:

- Students will discuss and respect issues including plagiarism, electronic privacy, licensing and copyright laws, public domain software and acceptable use of the Internet.
- Students will learn about computer viruses; what viruses are, how they can effect hardware, software, and how to take steps in preventing computer viruses.
- Students will be made aware of the consequences of improper activities such as creation and distribution of computer viruses, plagiarism, infringement of access rights, tampering and illegal access.
- Students will learn proper use of computer hardware and software and video and equipment.
- Students will learn and use proper computer “etiquette”, such as use of their password only and proper behavior for Internet use.
- Students will understand the difference between home computer use vs. school computer use.

Goal C: Students will use technology to expand problem-solving skills

All Content Areas:

- Students will develop critical thinking skills to access available information provided through technology.
- Students will use content-specific software to promote and enhance inferential reasoning.
- Students will manipulate, interpret and evaluate data.
- Students will use computers to locate, organize and communicate information.
- Students will develop skills necessary to analyze and solve computer hardware problems.
- Students will use software tools for brainstorming and idea mapping.
- Students will use CAI (Computer Assisted Instruction) to supplement remediation of basic skills.
- Students will use simulation software, where appropriate, to reinforce skills.

Goal D: Students will work individually and in small groups to design, plan and create projects.

English:

- Students will use video and other multimedia sources for their classroom presentations.
- Students will collectively create a portfolio of writings, with graphics and interesting layout, to be submitted for publication.

Social Studies:

- Students will use video and other multimedia sources for their classroom presentations.
- Students will use the Internet for collaborative projects.
- Students will increase their geographical, cultural and political awareness and understanding of people all over the world.
- Students will use the Internet to gather information from many resources to enhance their projects.

World Languages:

- Students will use e-mail to engage in pen-pal relationships with students in the target language and target cultures.
- Students will access web pages produced by schools in target cultures that invite the participation of American students.
- Students will access cultural web sites to acquire information to be used in the production of cultural projects.
- Students will utilize CD-ROM, laser disk, and videotapes to research and support the development of projects on the art, music and history of the target culture in the target language.
- Students will use Internet resources to research and collaborate on geography projects, as well as on the creation of word searches, crosswords, and other learning and teaching aids.
- Students will use the Internet to create travel logs of target countries.

Math:

- Students will use multimedia technology to design and create projects within a group.
- Students will use graphing calculators and CBLs lab experiments in small groups
- Students will download programs from computers to graphing calculators for use in CBL experiments in small groups.
- Students will participate in national and international math competitions via the Internet.

- Students will create a web site (WebQuest) to post geometry questions and answers to be used interactively with other schools.

Science:

- Students will develop a profile of a harbor system using information from the multiple resources.
- Students will: develop a research methodology; design means of collecting data; formulate an acceptable means of treating data; interpret and draw informed conclusions from a data base and/or spreadsheet.
- Students will create a web site, “WebQuest”, posting scientific questions that can be answered interactively with other schools, thus developing a forum.

Technology:

- Students will assess, select and use the software to accomplish the task at hand.
- Students will develop and monitor the school Web Site to include links to Web sites selected by teachers to be used for specific assignments.

Business

- Students will work in small groups to improve teamwork, using multimedia software in their collaborative effort.
- Students will use clip art, paint programs, sound, text and video to design major assignments for their other subject areas.

Health Education:

- Students will publish a Dover-Sherborn High School teen yellow pages with information from the Internet and other various resources and, as a class, assemble them.

The Arts:

- Student teams will present futuristic CAD projects to the class.
- Students will develop a “mass production” unit and participate in line assembly.
- Students will explore imaging techniques for the study of various specializations: perspective, architecture, analytical, and free form drawing.
- Students will use appropriate technologies to assist in musical composition and/or arrangement.
- Students will utilize the resources of the Internet for guidance in entrepreneurial activities in construction and manufacturing.
- Students will learn the various modes of video production (i.e. documentary, news, public service, and interviews)
- Students will use multimedia capabilities to search and showcase group projects such as: 1) Foreign food restaurant menus and food preparation; 2) product marketing and packaging design using current labeling laws; 3) Design and produce costumes and clothing projects.

Goal E: Students will investigate, analyze and synthesize all available resources to create logical and meaningful products.

English:

- Students will use video and other multimedia sources for their classroom presentations.
- Students will collectively create a portfolio of writings, with graphics and interesting layout, to be submitted for publication.
- Students will study the function of audience in any transfer of information.
- Students will become proficient at identifying, locating, evaluating and integrating appropriate print and on-line materials for classroom projects.

Social Studies:

- Students will access web sites to acquire current knowledge of related topics from other schools.
- Students will use the Internet to gather information from other resources to enhance their projects.
- Students will use Laser Disk, CD-ROMs, videotape and student produced videos to enhance their classroom presentations.
- Students will utilize word processing, desktop publishing and presentation software applications in class projects.

World Languages:

- Students will access the Internet to collect information about the target culture.
- Students will become familiar with applications for word processing, desktop publishing and presentation software.
- Students will access foreign news via telecommunication on-line services.
- Students will use interactive computer programs to increase exposure to native speech, and to simulate the challenge of being in the target-language environment.
- Students will use word processing software to produce documents in the target language.

Math:

- Students will use multimedia technology to design and create their own project.
- Students will use calculators and scientific calculators when appropriate.
- Students will do linear programming problems on graphing calculators or on computer.
- Students will become aware of all the technology resources available for creating a presentation.
- Students will access networked computer courseware to implement and enhance class work.
- Students will create spreadsheets and charts to represent quantitative data.
- Students will become proficient in the use of integrated software applications.

Science:

- Students will use Internet services to monitor earthquake and volcanic activity worldwide.
- Students will use the Internet to monitor weather systems.
- Students will use computers, CBLs (Computer Based Labs) GPS (Global Positioning System), and Globe equipment to collect and send data to the Globe Project.

Technology:

- Students will identify, locate and use print, electronic and Internet resources for classroom projects and personal research.
- Students will learn to critically evaluate all available resources so they can effectively incorporate the most appropriate technology.
- Students will understand and apply the concepts and functions of word processing, desktop publishing, spreadsheet, database, drawing and painting software to produce assignments and projects as appropriate.

- Students will create computer based multimedia projects and presentations that incorporate text, sound, scanned images, digital images, and drawn and painted art.

Business:

- Students will use drawing and painting programs, importing sound, text, video, CD-ROMs and the Internet to create multimedia projects.

Health Education:

- Students will publish a Dover-Sherborn High School teen yellow pages with information from the Internet and other various resources, and as a class, assemble them.

The Arts:

- Students will plan, design, modify, evaluate, layout, cut, shape, fabricate, finish a variety of class projects.
- Students will explore and develop technical procedures for the presentation of their projects.
- Students will use available resources to create musical compositions, arrangements to enhance classroom performances/presentations.
- Students will access the Internet to retrieve information and design options in project planning for manufacturing and/or construction.
- Students will use library media technologies and classroom resources to expand their search for information from industry, government agencies, and private sources.

<p>Goal F: Students will communicate effectively using oral and written presentation skills.</p>

English:

- Students will develop appropriate formats for the delivery of information and knowledge.
- Students will study the function of audience in any transfer of information.
- Students will become proficient in skimming material for information, evaluating its relevance, paraphrasing and summarizing the material, and then using the information to develop an argument or to generate an original idea.

Social Studies:

- Students will use the computer to help organize and communicate more effectively.
- Students will be encouraged to use technology in the development of oral and written presentations.
- Students will be able to use multimedia resources in their presentations.

World Languages:

- Students will use Internet resources to create a travel brochure in the target language for a destination in the target culture.
- Students will create class presentations in the target language using presentation software (e.g. PowerPoint)
- Students will use text-related and supplementary software programs to reinforce grammar and vocabulary skills.
- Students will practice speaking skills with programs designed to record, playback, and assess student output.
- Students will use computer resources to prepare for standardized test in world languages.
- Students will use Newsbank to access international newspapers.

Math:

- Students will present projects to their classes, having utilizing various technological resources.
- Students will collaborate to produce projects and assignments using multimedia resources.
- Students will present to their classes, their projects using presentation software.

Science:

- Students will use classroom time to make oral presentations on various areas of science and they will be expected to integrate the presentation with appropriate technologies (video, laser disk, multimedia etc.).

Technology:

- Students will understand the importance of knowing one's audience when communicating or presenting information.
- Students will become skilled at using presentation software such as ClarisWorks, Hyperstudio and PowerPoint.

Business:

- Students will use multimedia software to demonstrate their ability for effective communication.
- Students will demonstrate proficiency giving presentations to the class using the computer and projecting to a large screen.

Health Education

- Students will research and present material on different drugs both legal and illegal.

The Arts:

- Students will share and present their projects in various stages of development.
- Collaborative projects will be enhanced through technology. Visual thinking as a mode of communication will be intensified.
- Students will use appropriate technologies to enhance oral, written and performance presentations in music classes.
- Students will learn the teamwork and inter-reliability that is required when producing group video productions.
- Students will use multimedia presentation equipment to present results of research assignments.

3.1 Students and Staff Assessment of Technology Skills, Knowledge and Attitudes

Dover Elementary Schools:

The vision of technology education by both the school administration and its stakeholders has become stronger with each passing year. With this increase in understanding of importance, has also come a greater availability of resources to be used in our schools. The strong sense of commitment from all angles, has had a significant impact on the students', teachers', and administrations' use and application of technology. All embrace and apply technological applications as long as there is adequate training, support and resources.

Students and teachers utilize technology under the auspice that the technology skills being taught, from basic to advanced, are in direct alignment with the curriculum. Technology is not taught in isolation, rather projects and activities designed to reinforce or expand upon a skill are introduced in the classroom as a curriculum strand, and then extended to the technology lab. Students are taught computer basics, such as general filing skills, keyboarding, and how to create multimedia presentations by the technology teacher. Students then take these skills and apply them to their educational activities. Students' excitement and confidence with technology is made visible through the completion of their curriculum driven projects.

Our philosophy continues to change with the trends and needs of education. Teacher attitudes have however remained in support of our program given the continued staff development and support that they need to be successful. Currently the technology teacher is the one responsible for the initial technology instruction, yet it is the classroom teacher, who in a co-teaching manner, help to design projects in relation to the grade level curriculum. This positive environment, coupled with continued technology support, has helped to foster an advanced acquisition of skills and risk taking on all levels, from student to administration.

Here are some of the interesting results from the survey, which consisted of 25 questions:

- 95% of Dover's teachers have computers in their homes
- 80% of Dover's teachers access the Internet from their homes
- 47.5% of Dover's teachers do not feel that they have adequate technological resources for instructional use
- 42.5% of Dover's teachers do not feel that they have been given adequate professional development time with regards to technology

Pine Hill School:

Within the staff at Pine Hill there is a wide range of technology ability. The majority of teachers have computers at home and are becoming increasingly comfortable with tools used for their own professional use. Teachers feel that they need training in the use of the Internet, both for their own use and as it applies to student classroom use. Teachers also need training on the various tools for multi-media presentation. Many teachers however are still at a loss when it comes to simple troubleshooting of technological problems. Teachers are taking more initiative in designing and delivering lessons taught in the computer lab. As a direct result of this, teacher's technology skills have increased and the curriculum content is more directly aligned to classroom practice.

Following are some interesting results from the Faculty survey of February, 1999:

- 89.5% of Pine Hill's teachers own home computers
- 68.4% of Pine Hill's teachers have access to the Internet from home
- 37% of Pine Hill's teachers do not feel that they have adequate technological resources for instructional use
- 47.4% of Pine Hill's teachers do not feel they have been given adequate professional development time with regards to technology

Students

As you might expect there is a wide range of ability levels regarding technology among the students at Pine Hill. Most students have computers at home for their own use and are quite comfortable using word-processing and various electronic research tools. Students particularly need instruction on choosing the right tool to use for a particular job, designing search strategies and understanding the way a computer works. We expect that students will be using a wide variety of multi-media presentation tools over the next several years and will need direct instruction and time to practice those skills.

Regional Middle School:

An assessment survey of faculty and student technology access, skills, knowledge and attitudes was administered in the spring of 1998 to 141 6th grade students and in Feb. 1999 to the faculty at the Dover Sherborn Middle School.

Our 6th grade students expressed a strong positive attitude toward computer technology. They feel very skilled with computers in general and particularly adept at using computers for writing and research. They feel particularly strong in their ability to use the internet for finding information.

The following are two interesting results from the survey:

- 99.3% of the present 7th graders have at least one (1) computer in their home. They average 1.98 computers per student.
- 82.5% of the present 7th graders have internet access from their home.

The middle school staff is very strong in basic computing skills. All teachers do their student grades on computer and turn them in each term on a computer disk. Many teachers use the computer as a rankbook and progress report generator.

The following are some interesting statistics from the survey:

- When asked, "Would more technology placed within your classroom enhance the teaching and learning environment?", 87% of the teachers answer "YES".
- When asked, "Do you feel that you have adequate technological resources for your instructional use?", 73% of the teachers answered "NO".
- When asked, "Do you feel that you have been given adequate professional development time?" 74% of the teachers answered "NO".
- 84.6% of the faculty has at least one (1) computer in their home. They average 1.3 computers per teacher.
- 56.4% of the faculty has internet access from their home.

Regional High School:

The staff and students, from the totally fearful user to the network gurus, continue to have a wide range of technical skills. Many have found technology to be a true time saver while others are still skeptical. Truly time invested in "playing" with technology, allows most to overcome their fears and realize the beneficial role that technology plays in our daily lives.

With the completion of the wiring infrastructure, comes the understanding that "now" there is the capability to communicate more efficiently and expediently with peers, administrators and students. Also, comes the ability to utilize the Internet to its fullest capacity from within the classrooms. This visual understanding has increased the enthusiasm for technology training and hardware purchases. (Teachers want computers in their classrooms!) Over the next year, our #1 goal we will be to focus on supplying the hardware, support and training for our teachers, giving them the ability to expand their own knowledge and feel comfortable with technology.

Our faculty, having been surveyed in March 1999, report the following:

- 95% of faculty own at least one home computer of which 78% are 2 years old or older

- 75% have access to the internet of which 77% have taken advantage of the MassEd.Net connection (Full Internet dial-up connection provided to all Mass. Teachers at a discounted rate of \$25.00/year)
- 95% of classroom teachers want additional technology placed in their classroom but,
- 63% of faculty do not feel that they have been given adequate professional development time.

52% of faculty use technology for classroom preparation, although most of that preparation is happening on their home computers due the lack of available computers on teachers' desks and/or teacher work areas.

3.2 Inventories:

We are currently in the process of creating complete and up-to-date K-12 software and hardware inventories. The hardware portion, which is complete, is maintained in a Microsoft Access database by the Technology Manager. Updates (moves, adds, deletions) to this database are e-mailed to the Technology Manager for recording. The final goal is to have the Technology Coordinators in each building entering moves and changes to existing systems but the Technology Manger still maintaining all additions and deletions from the database. While the current system is capable of this, there are some Wide-Area Network (WAN) systems that need to be implemented before this feature can be used.

While each individual building maintains it's own software inventory, a short-term goal is to record this inventory in much the same way as the hardware.

3.2.1 Software

Dover Elementary Schools:

Most of the existing software in the Dover Elementary Schools, is on the Macintosh platform. Software, purchased in bundles, or site license packages, according to it's use, is used to reinforce skills, create real world simulations, and produce multimedia productions. Various software titles are chosen as to their relevance to the curriculum for each grade level, determined by the classroom and technology teacher.

Pine Hill School:

Most of the software at the elementary level is for the Macintosh. The majority of the software selection is done by teachers in consultation with the technology coordinator and is content related. All computers have AppleWorks 5 installed as a standard tool based software. Microsoft Office 95 is also available through the server for anyone who needs it. HyperStudio is our standard multi-media software program. All classrooms have an electronic encyclopedia that is age appropriate. The various encyclopedias that we use are GoldenBook Encyclopedia, Comptons, Groliers and Encarta.

Regional Middle School:

At the Dover Sherborn Middle School, educational software consists mostly of Macintosh titles utilized for word processing and enhancing topics of study through software used on the lab or classroom computers. A building license for Follett, library card catalog software, and MacSchool, administrative software for scheduling, report cards etc. is maintained and updated as appropriate. Site licenses for LogoWriter and Typing Tutor are used at the Middle School. In the PC lab, Windows 98, Windshield, and Microsoft Office 97 are under regional licenses. All other software is used on a machine or package basis.

Regional High School:

The high school software inventory consists of Multimedia titles for specific curricular areas including instructional text-based multimedia software, administrative software for grading, scheduling and planning, research databases, library circulation, electronic card catalog software and college search software. In addition, some research databases have moved to a web-based platform, alleviating periodic updates to software and freeing up space on our library server. The web-based databases are linked to the Dover Sherborn library web-site and can be accessed from all computers on the network. Word processing, spreadsheet/database and presentation software is installed on all computer lab and classroom computers.

Web design software and computer-programming software is installed on the computers in the lab. Software procurement is handled by the technology building coordinator with input from each department. It is recommended that all software be previewed, prior to purchase.

3.2.2 Hardware

Elementary Schools:

Both the Sherborn and Dover elementary schools use Apple computers as their primary platform for classroom and lab use. Both libraries maintain their circulation information on a Windows Client/Server platform. The student stations and the libraries are both Apple OS and Windows based. The administration machines at Pine Hill School are Apple computers while those at the Dover Elementary Schools have begun the switch to a Windows platform. All of the Macs range from LCIIIs to PowerMacintosh 5400/200s.

Regional Middle School:

Students and teachers have access to both Apple OS and Windows based machines both in the classrooms and in the labs. The library maintains its circulation database on a Windows client/server platform and the student workstations are all PCs. There are two computer labs – one is all Mac and one is all PC. The Macs are mostly LCIIIs and the PCs are Pentium II 350s. The administrative workstations will migrate to a Windows platform in the Summer of 1999. Since there are not computers in every classroom yet, there are a mix of PCs and Macs on rolling carts which can be used in any classroom that does not already have a computer or needs an extra one. There are also several Mac laptops which can be lent to the faculty on an as-needed basis.

Regional High School:

The High School also supports both the Apple OS and Windows platforms. Most classrooms do not have dedicated computers as of this writing, but those that do have both Apple and Windows machines. There are currently two computer labs at the High School – one is all Mac based and one is PC based. The Mac lab is a mix of Appletalk and Ethernet-capable Macs ranging in age from 8 years to 6 months. The PC lab consists of 18 Pentium PCs running Windows 95. A third area will be made available for Fall '99 and it will consist of public access machines for both students and faculty to enable people to work on a computer when the computer labs are booked for class time. This situation is made more serious by the lack of classroom machines. The library maintains its circulation database on a Windows client/server platform with all of the student workstations being PCs. The administration machines are all Apple OS with a move to Windows planned for the near future but not the 99/00 budget year.

Hardware Inventory Summary:

As can be seen by these two charts, the elementary schools of the District have improved their inventories reasonably well, getting the bulk of their computers in to the B or A range. The Pine Hill School in Sherborn went from 42% in the D range to 12%. Much of Pine Hill's improvement can be attributed to the recent building project which supplied the school with over 50 brand new Macintoshes. The Dover Elementary Schools went from 41% in the D range to only 13%. However, the Middle School and the High School have not fared nearly as well. The Middle School went from 30% in the D range to 48%. The High School did not fair as badly in this respect; its D category machines percentage dropped from 49 to 43. However, the High School's A category went down from 26% of the installed machines to only 8%, whereas the Middle School's rose slightly from 17% to 21%. Overall, you can see that at the Regional level a stronger commitment needs to be made to keeping our computer inventories up to date.

3.2.3 Facilities

Dover Elementary Schools:

There is one multimedia computer in each classroom. The 3-5 site has a lab consisting of 24 multimedia computers. Each library has a multimedia Mac and the 3-5 library also has 3 PCs.

Pine Hill School:

All classrooms have at least one multimedia Mac. The computer lab has 25 iMacs served by a G3 Appleshare server. The library has two Pentium PCs, which are served by a Windows NT4 server, and a multimedia Mac. The music room has a multimedia Mac and one Mac LC. The offices have one iMac, one Apple G3 tower and one PowerMac 5200.

Regional Middle School:

The language lab (20 Apple workstations), the Mac Lab (20 workstations), and the PC Lab (16 workstations) are the major technology centers. The library consists of six PC workstations.

Regional High School:

There are currently two computer labs. One is a Macintosh lab with 22 workstations ranging from Mac Classics to G3 All-In-Ones. The PC lab is made up of 18 Pentium 100 PCs. A third computer room, designed for individual student and faculty use and mentoring, will be added over the next two years. The library consists of nine PC workstations.

3.2.4 Network/Telecommunication Capacities

The Sherborn Public Schools, Dover Public Schools, Regional Middle School, and Regional High School are all connected for data transference via cable modem using both Time Warner's and MediaOne's infrastructure. The cable modems are capable of transmitting 4Mb/sec in both directions, thus providing a total bandwidth of 8Mb/sec. This infrastructure also enables all of the schools to access the Internet at T1 speeds (1.544Mb/sec). The T1 is based at the High School as is the Internet firewall, which provides security from Internet-based hacker attacks as well as web-site content filtering.

Dover Elementary Schools: The K-2 site has only a small network which enables the administrative workstations to share data and a printer. There are no plans to extend this network to any classrooms since Dover will have a new K-5 building within two years. The K-3 site has Category 5 Ethernet wiring throughout the building, with one data port in each classroom. The Ethernet hub is 10-BaseT only. There are no voice capabilities in any of the classrooms.

Pine Hill School: The school is networked for data with Category 5 Ethernet wiring throughout the building, with six ports in each classroom. There are one strand of multi-mode fiber connecting the two

wiring closets. The network is designed for 100MB/sec Ethernet performance with the use of 10/100 auto-sensing Ethernet switches. These also enable us to create separate “virtual” networks for the administration and the classrooms, thus protecting the administrative resources. There is also a video retrieval system in place that enables on-demand video/vcr access to any classroom. Each classroom has two video ports. There is also a telephone in each classroom.

Regional Middle School: The school underwent a wiring project this Fall and is now Fast Ethernet (100Mb/sec) capable to all of the classrooms and administrative offices. There are five data and one voice connection per classroom. Four of the connections are intended for student computer use and the fifth is located on the same wall plate as the voice connection for teacher use, though there are no phones in any of the classrooms. There are also two labs of 24 data connections each. This provides a total of 232 data connections for the building. This building also has the 10/100 auto-sensing Ethernet switches from BayNetworks. Virtual networks are also possible in this building, again providing a “separate” network where necessary. There is multi-mode fiber connecting the two wiring closets

Regional High School: Like the Middle School, the High School also went through the wiring project this Fall and is now Fast Ethernet compliant, with the possibility of creating separate networks with our BayNetworks switches. There are five data connections (four student and one teacher) in each classroom and one voice connection for the teacher. Again, there are, as of yet, no phones in any of the classrooms. There are three rooms wired for lab use with 24 data connections in each. There are a total of 313 data connections in the building. Three wiring closets exist in the building, with multi-mode fiber connecting each of the intermediate closets to the main one on the second floor. Additional electrical outlets have been added in two of the three wiring closets though the classrooms have remained unaltered and will need to be addressed at some point.

3.3a Assessment of Current Curriculum Status

Dover Elementary School:

Pine Hill School: Currently all classrooms have a scheduled computer time to come to the lab. The lab time is taught by the classroom teacher. Students will typically work with software packages that are directly connected to their classroom curricula. An example of this would be a second grade class using Field Trip to the Sea while they are studying tide pool animals. Another example of this would be third grade students who use HyperStudio to create a presentation on their study of the Solar System.

Regional Middle School: At the Middle School, all students are required to take a comprehensive Computer/Technology Literacy Course during all three years. Most of the coursework takes place in a twenty-two station, networked Macintosh Lab. When space is available, any staff or student may use the Lab for individual work. A new, fifteen station, multimedia, networked, windows based, PC Lab is located upstairs in the library. Keyboarding, which is required for all 8th grade students who do not type 30 wpm with an accuracy of at least 95%, is scheduled in this lab. Writing and Social Studies classes frequently use this Lab for class activities and, as with all of our equipment, individuals and small groups may use the lab if computers are available. The library has seven networked patron workstations. The entire book collection is computerized using Follett software, a CD Tower houses various research programs, and the Internet are all accessible from any properly equipped computer anywhere in the school. All classrooms and offices are wired for voice, video and data. Multimedia computers on rolling carts and several laptop computers are available to staff and students on a “as needed” basis. The World Language Department has the use of a multi-station language lab for class use. The Special Needs Department has a small, five station, computer lab and two laptop computers for their students’ use.

Regional High School: Classroom teachers create assignments that involve students to utilize the extensive library databases containing current, archival and reference materials. Our current collection of over 20,000 books, videos and music CDs have been entered into the Follett Electronic Card Catalog. The high school offers technology specific courses that include: Introduction to Computer Science (soon to be renamed Office Applications), Computer Programming I & II, Desktop Publishing and Keyboarding (although FY 99 will be the last year for these two programs). Senior and Sophomore writing classes integrate advanced word processing skills, creating portfolios of individual and group writing projects. A few of these classes have not been able to continue using the lab due to scheduling issues. The Science, Math and World Language departments have all shown signs of integrating technology by utilizing Multimedia CDs and textbook related software. A course in Science and Technology provides the student with an opportunity to test and apply theories of science with practical applications. Students enrolled in the Video and Multimedia production course learn the fundamentals of video production from script writing to using a camcorder, editing, directing and even being on-air. Students apply their learned skills in creating and directing "school produced" cable productions.

3.3b Technology Initiatives in Relationship to Education Reform

The Dover-Sherborn District Technology Program provides the opportunity for students to learn about events that have influenced or may influence computer development and use. Students become familiar with characteristics of computer-related hardware, software, and documentation as well as principles underlying their design and use. Our goal is to help students understand the principles, procedures, and limitations of computer systems so that they can use computers as tools for inquiry, problem solving, and recreation. It is important for students to be able to adapt concepts and processes of computer science to examine issues, to clarify personal values, to solve personal and social problems and to satisfy personal curiosity. Students also examine the effects of computers on society and relate their knowledge about computers to career goals and plans. In conjunction with the ASCD Guidelines for curricular reform, the following core values have been developed.

- Students are knowledge producers as well as consumers; they must participate in their own learning.
- Students must learn to access and use a knowledge base outside of themselves and their immediately available instructional materials; use of a variety of technologies facilitates this process.
- Learning activities must be problem oriented and project organized, focused on an integrated set of knowledge and skills outcomes (interdisciplinary approach).
- Learning activities must require applications, as appropriate, of a variety of technology support tools (e.g. word processor, database, telecommunications).
- Learning activities must develop social interaction; such activities include collaborative learning and peer coaching.
- Learning activities must produce meaningful work intended for audiences beyond the teacher.

As indicated, the core values are used to guide the development of computer curriculum. In addition to these values, the continually evolving technology also drives the creation of the curriculum. Because computer technology is always changing, and at such a rapid rate, there is not one fixed curriculum that is followed year after year. Rather, each time a course is offered it is revised to reflect the recent and ongoing technological change.

The introduction of our local area networks, wide area networks, the Internet and telecommunications in general in the Dover-Sherborn Schools have made communication among individuals and groups easier than ever before. The addition of more computers, large screen displays, and printers in teachers' classrooms will greatly enhance the use of technologies in teachers' and students' everyday lives. Computer labs, as places to introduce new software and give whole group instruction, are vital to the ongoing infusion of technology into the curriculum. Teachers are finding it easy to introduce whole classes to simulation software that promotes exploration and engages student in complex problem-solving tasks. Students are then able to work in cooperative groups with the teacher assuming the role of the facilitator. The computer lab is also a place for meeting the individual needs of students. With a wide variety of software available, it is possible to address many different learning styles and include all students in the mainstream of education. Process writing is also greatly enhanced by the use of the computer lab. Peer

editing and rewriting using a word processor has proved to be one of the most effective usage's of technology in schools thus far. Teachers are working very hard to align their curriculum to the Curriculum Frameworks and technology is essential to this endeavor.

3.4 Assessment of Existing Professional Development Activities and Structures

Dover Elementary Schools: The key to the success of the technology program in Dover is a strong commitment to staff development. This takes place in the form of attended conferences, in-house workshops, and one to one relating about an issue between the technology teacher and the classroom teacher. Upcoming conferences are posted and encouraged by the technology teacher. Classroom teachers are invited to choose a conference based on his or her own individual needs. These have ranged in topics from multimedia presentations to general computer basics. The technology teacher, in addition to curriculum based conferences, has also attended several conferences on troubleshooting basics.

Our in-house workshops have been done on a variety of levels, and take place on selected Wednesday afternoons. They are generally taught by the technology teacher. Topics included in these workshops were Microsoft Works 4.0 basics, PC5 (portable computers) basics and classroom application, digital camera and scanner: basics and applications, and importing graphics. In the Fall of 1998, Tom Snyder Productions came in for two Wednesday afternoons, to provide training on how to effectively use one computer in a classroom, a challenge that many teachers face. With the new accessibility for our teachers and students to use the internet, a workshop, again presented by Tom Snyder, has been scheduled for the Fall of 1999 to help guide teachers on how to integrate the internet into their daily lessons.

The technology teacher has also held mini workshops for teachers who have presented a need in a variety of areas. These have ranged from saving to a disk, to downloading of information from the internet. The continued support and participation by the staff, has helped to further the advancement of Dover's technology program.

Pine Hill???

Regional Middle School: As we strive to integrate technologies into the curriculum areas, the need for staff training and support becomes more and more critical. Teachers need improved access to skills development programs. These are necessary so that professional staff can intelligently evaluate technology opportunities, successfully integrate these into the curriculum, and effectively deliver instructional programs to an enthusiastic group of students -- students who are typically more comfortable with technology than their parents or our own school staff.

At the Middle School, general technology training is offered on a one-to-one basis as the need arises and tends to be teacher initiated. Staff training in the integration of technologies in teacher's subject matter areas needs to occur in half-day or full-day sessions with substitutes and a trainer provided. This was done with MacSchool training as follows: Formal MacSchool training was given to all staff in half-day sessions. Substitute teachers were provided and training took place in the computer lab. After school sessions were offered to any teacher needing general help or more advanced training. A MacSchool trainer provided the formal training and follow-up training was provided by our staff. If our trainers are to be used to train the staff, time needs to be made available to them for this purpose. Presently, training for a new Industrial Technology course is being scheduled for this summer (1999) at the Middle School. For the 1999-2000 school year, the emphasis will be placed on two areas: 1) using our electronic mail system and (2) the alignment of the Middle School curriculum with the state frameworks.

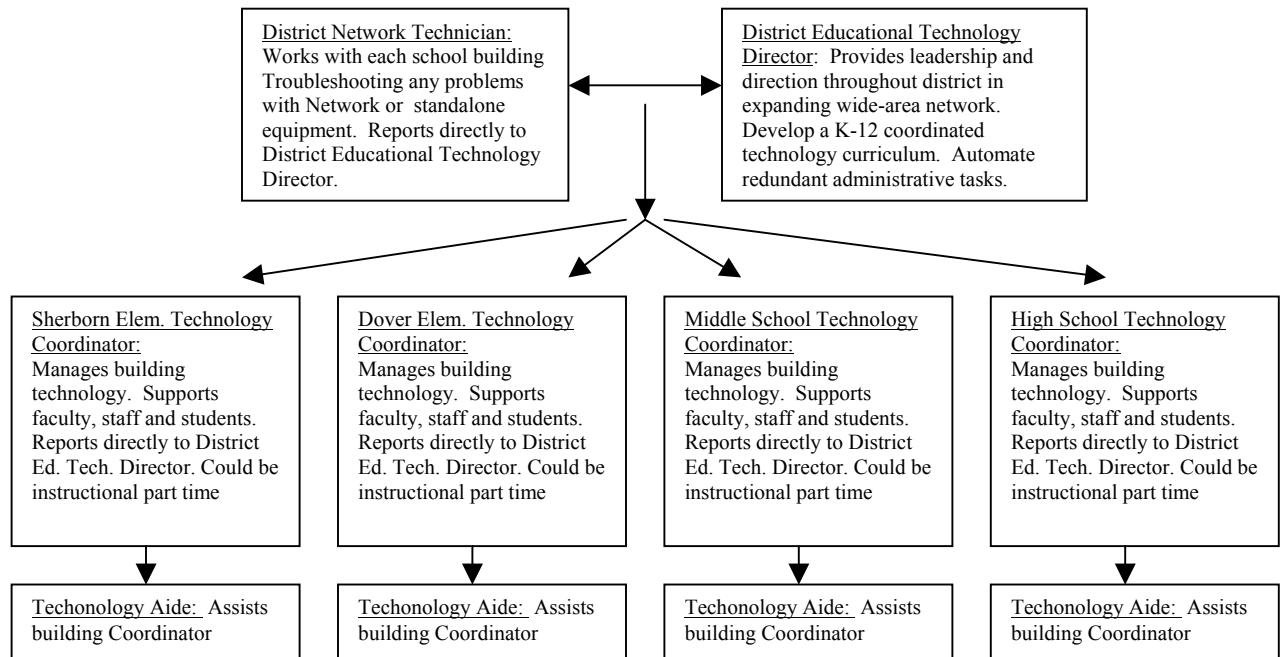
Regional High School: As indicated under the skills assessment section, the faculty of Dover-Sherborn High School are showing enthusiasm for the integration of technology into their classrooms. The Dover-Sherborn Regional High School continues to provide individual training along with a few professional

development in-house workshops; ie. During the last week of June '98 a 5 day (40 hour) graduate course offered to 18 staff members entitled "Basic Internet for Educators" took place. In April 1999 an in-service session to train our faculty on First Class E-Mail and Departmental groups will meet to discuss and share Internet sites of interest to their Departments. Technology training for our faculty and staff must include additional time during the school year. Many area schools have held professional development days, where teachers report to school and are engaged in professional development activities (including technology training) for a period of 6 hours. Days like this should be incorporated into the school year's schedule to provide for a comprehensive ongoing training program. The regional school district continues its involvement with two collaboratives; 1) Project Accept (MecNet) whose members participate in user group training sessions and 2)The Education Collaborative(TEC) which provides 1 staff member with approx. 30 hours of training/year.

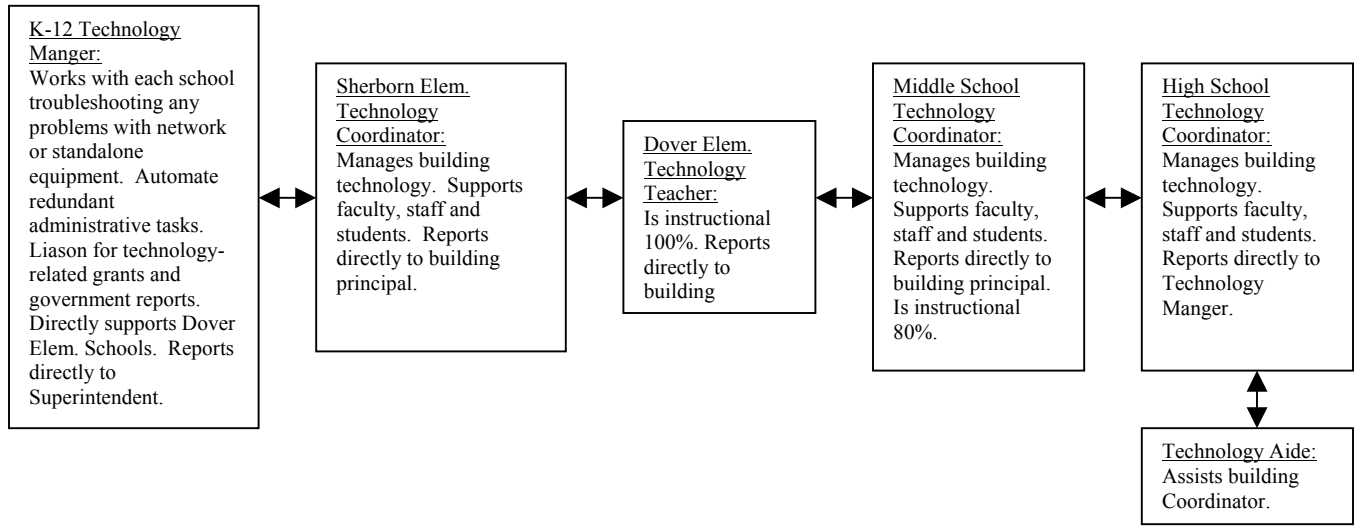
3.5 Assessment of Current Technology Support Staff

Currently, our support staff consists of the K-12 Technology Manager, a Computer Technician (based at the High School), a Technology Coordinator who is 80% instructional (based at the Middle School), and a Technology Coordinator (based at the Pine Hill School). As can be seen from the chart below, this does not conform to our vision from the 1995-2000 Technology plan, nor does it provide adequate support for our future needs. A reality of the advance of computers into the classroom is the growing support needs. The more computers, the more bodies needed to support them. Outsourcing this support is a viable option and one that is being looked at. However, even if major support issues were outsourced, there are many cases when that solution is not enough. For example, a teacher has a presentation for her class but the computer will not start. There are many cases when, even though it will not start, it is actually a minor issue and one that is easily rectified by a competent technical support person. It would be a shame for this presentation to be canceled and the computer sent out for repairs simply because we did not have the staff to properly diagnose the problem. We recognize the reality that each school cannot afford a support “wizard” who is able to fix all problems on any of the computers – and this is where outsourcing comes in. Each school, however, must have the support staff in place to at least properly diagnose the problem and fix the relatively low-level, easily repaired, issues, pass the problem on to the Technology Manager and his support staff or call the support contract vendor.

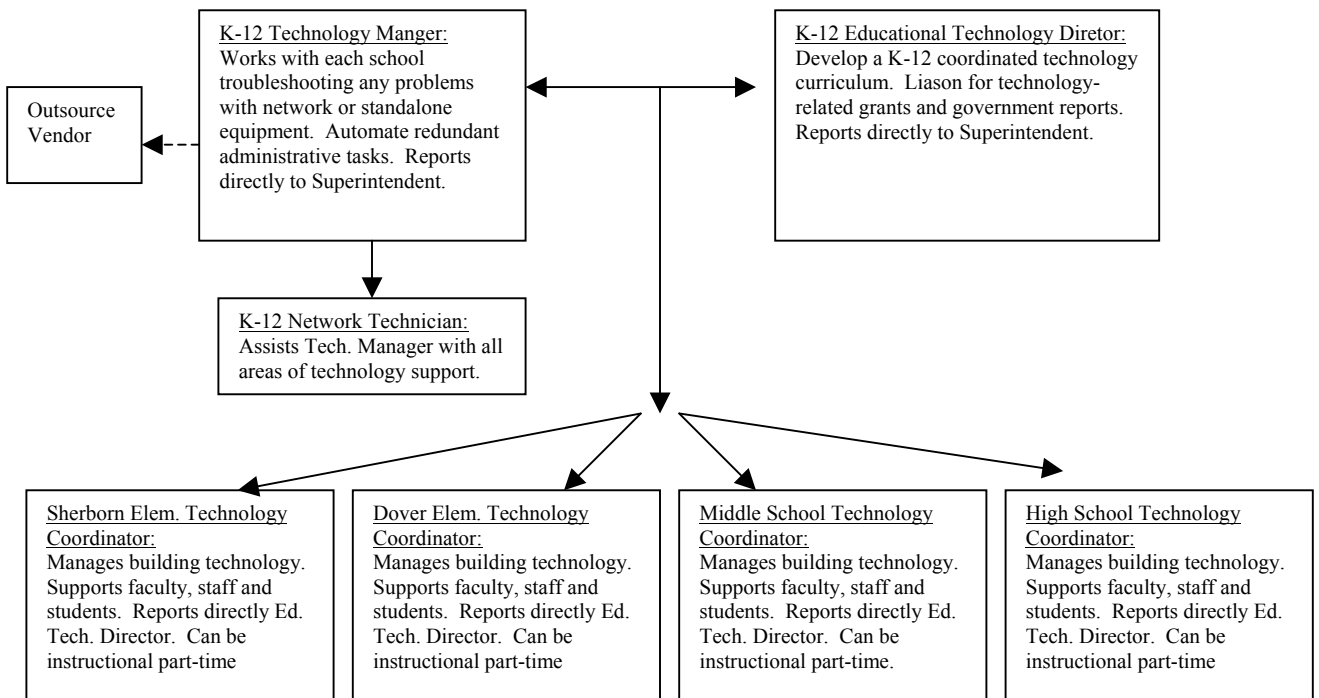
Original Technology Personnel Plan:



Current Technology Support Personnel



Proposal for Technology Personnel by 2003



4.1 Administrative and Management Goals and Initiatives

Five-Year Goals

Previous Goals:

- A. Standardize administrative and management tasks throughout the district.
 1. Student data, health, attendance, scheduling, hardware/software inventory.
Status: All schools have or plan to acquire the MacSchool or WinSchool software to track all relevant student data. Hardware inventory is now kept in a central database with updates being emailed to the Technology Manager from each of the schools when appropriate. The software inventory has yet to be completed.
 2. Administrative staff will have access, training and ability to retrieve appropriate student data.
Status: This will come with the K-12 deployment of Chancery's Macschool/Winschool software.
 3. Ensure faculty and staff have appropriate equipment to facilitate their needs.
Status: For staff, once the Middle School is refitted with new Windows machines this Summer, only the High School staff will be working on outdated equipment. This will be planned for the following budget year. For faculty, only Pine Hill School is completely up-to-date. In the Dover Public Schools, all of the teachers have computers, but many are four or more years old. As for the Regional Schools, very few teachers have computers in their rooms. Every effort is being made to provide as many machines as possible for teacher access until the necessary funds are allocated through the budgeting process.
- B. Standardize school libraries' automation of cataloging capabilities (reword!)
Status: All of the K-12 schools, except for the Chickering School in Dover, are now fully-functioning with the Follett library system. Currently these schools do not share this catalogued data and there is no foreseen need to do so.
- C. Standardize software usage for word processing and spreadsheeting system wide.
Status: The administration is being standardized on Microsoft Office for PC and Mac. There is still a wide range of products being used in the classrooms, however.
- D. Develop management tools to be used district wide for purchases and budgetary tracking.
Status: Not met

New Goals:

- A. Develop and implement K-12 systems for purchasing and budget management.
- B. Establish e-mail as the primary communications link among all personnel.
- C. Refine budgeting process with regards to technology expenditures to facilitate smarter and more efficient purchasing practices.

4.2 Communication/Information Access Goals and Initiatives

Five-Year goals:

Previous Goals:

- A. Library automation
Status: Met as stated above
- B. Schools buildings to have building-wide LANs (Local Area Network) with a connection to all other buildings
Status: Met
- C. Internet access for all

- Status: Met
- D. Standardize internal e-mail accounts on TCP/IP
Status: Met. All staff and faculty are being given individual accounts on our e-mail server.
- E. Install and implement a regional WAN (Wide Area Network)
Status: Met
- F. Allow for community and local government to connect to Intranet
Status: Partially met. Several student projects are in place to establish an Internet presence that will enable the community to keep up with District events as well as facilitate communication.
- G. Sharing administrative data
Status: Partially met as stated above. We are in the process of standardizing on Chancery's MacSchool and WinSchool software.

New Goals:

- A. Install phones in all classrooms that are wired for voice
- B. Utilize FirstClass's conferencing functions to facilitate communications among functional groups
- C. Develop K-12 web site with student and community participation and support

4.3 Instructional And Curricular Goals and Initiatives

Five Year Goals:

- A. All students will graduate with a basic understanding of the role technology can play in the working world and exhibit a level of proficiency necessary to access, retrieve, apply and present information using current technologies
- B. Technology related ethics will be discussed at age-appropriate and content-appropriate areas at all grade levels
- C. Technological skills will be implemented and integrated into the classroom content areas
- D. Students will be empowered to use their own problem solving skills when encountering technological problems
- E. Student creativity will be encouraged in designing meaningful projects
- F. When gathering information, students will use, synthesize and analyze all available resources to create a logical and meaningful product
- G. Teachers and students will be encouraged to work in small groups and collaborate on projects to enhance the interpersonal skills of the students

5.2 Hardware, Facilities and Network Priorities

5.2.1 Hardware – Workstations for the classrooms, administrative areas and labs will be purchased according to software requirements, upgradability and connectivity to the LAN. An emphasis will be placed on balancing the cost of flexibility with the specific tasks that each workstation is destined for.

5.2.2 Facilities – Network Design

- All network hardware purchased will be of the manageable type, based on our prior investment in a network management platform
- A periodic assessment of our WAN capabilities will be carried out to determine if and when we will need to upgrade from the current cable modem infrastructure.

5.2.3 Building and Classroom Wiring – Standards

- Each classroom will be wired for data connections using Category 5 level wiring and jacks, tested and certified to FCC standards.
- Each classroom will have sufficient electrical capabilities to accommodate classroom computers.
- Each classroom and office space will be wired for voice communications.
- Video capabilities will be accommodated for in the Auditorium and 2-3 classrooms in each building for scheduled distance learning and mentoring projects

5.2.4 Additional Implementation Issues to be Addressed

- Electrical outlets to accommodate computers in the classrooms, determining current circuit capabilities and expanding the electrical infrastructure where necessary
- Coaxial wiring in each and every classroom for general video, Cable TV and satellite broadcasts

6. Budgeting

1998-1999 Budget

Building	Equipment/Furniture	Supplies	Purchased Services	Additional Personnel	Other	TOTALS
Dover Elementary	\$2,000	\$4,900	\$1,500	\$0		\$8,400
Pine Hill School	\$0	\$3,000	\$0	\$0	\$108,000*	\$111,000
Middle School	\$22,300	\$5,700	\$2,000	\$0		\$30,000
High School	\$26,400	\$9,800	\$6,000	\$0		\$42,200
TOTALS	\$50,700	\$23,400	\$9,500	\$0	\$108,000	\$191,600

* - Pine Hill's building project

1999-2000 Budget

Building	Equipment/Furniture	Supplies	Purchased Services	Additional Personnel	Other	TOTALS
Dover Elementary	\$0	\$5,000	\$2,300	\$0		\$7,300
Pine Hill School	\$0	\$9,900	\$2,500	\$0		\$12,400
Middle School	\$25,934	\$6,670	\$2,250	\$0	\$13,900*	\$48,754
High School	\$26,400	\$9,800	\$6,000	\$0		\$42,200
TOTALS	\$52,334	\$31,370	\$13,050	\$0	\$13,900	\$110,654

* - Replacement of Middle School administration machines

2000-2001 Budget

Building	Equipment/Furniture	Supplies	Purchased Services	Additional Personnel *	Other	TOTALS
Dover Elementary	\$6,000	\$5,400	\$3,000	\$17,000	\$150,000 ¹	\$181,400
Pine Hill School	\$36,900	\$12,300	\$7,500	\$17,000		\$73,700
Middle School	\$34,900	\$8,000	\$2,500	\$17,000		\$62,400
High School	\$29,400	\$10,780	\$6,600	\$17,000		\$63,780
TOTALS	\$107,200	\$36,480	\$19,600	\$68,000	\$150,000	\$381,280

* - Hiring of District Educational Technology Director

1 – Dover Elementary building project

2001-2002 Budget

Building	Equipment/Furniture	Supplies	Purchased Services	Additional Personnel	Other	TOTALS
Dover Elementary	\$0	\$6,500	\$3,700	\$0		\$10,200
Pine Hill School	\$41,200	\$12,700	\$8,250	\$0		\$62,150
Middle School	\$34,200	\$8,100	\$3,000	\$0		\$45,300
High School	\$33,000	\$12,500	\$7,200	\$0		\$52,700
TOTALS	\$108,400	\$39,800	\$22,150	\$0		\$310,350

2002-2003 Budget

Building	Equipment/Furniture	Supplies	Purchased Services	Additional Personnel *	Other ¹	TOTALS
Dover Elementary	\$0	\$7,000	\$4,500	\$9,000	\$5,000	\$25,500
Pine Hill School	\$27,000	\$14,260	\$9,075	\$9,000	\$5,000	\$64,335
Middle School	\$33,500	\$8,200	\$3,500	\$9,000	\$5,000	\$59,200
High School	\$26,400	\$12,500	\$7,200	\$9,000	\$5,000	\$60,100
TOTALS	\$86,900	\$41,960	\$24,275	\$36,000	\$20,000	\$209,135

* - Hiring of District Network Technician

1 – Implementation of outsourced support contract