SCHOOL TECHNOLOGY EVOLUTION PLAN (STEP)

INSTRUCTIONAL TECHNOLOGY PLAN

2007-2010

Eureka County School District

Eureka, Nevada

A VISION FOR EDUCATIONAL TECHNOLOGY

STUDENT FOCUSED – TOTAL INVOLVEMENT – LIFE LONG LEARNING

JUNE 2007

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TECHNOLOGY AND SCIENCE MULTIPLY AROUND US. TO AN INCREASING EXTENT THEY DICTATE THE LANGUAGES IN WHICH WE SPEAK AND THINK. EITHER WE USE THOSE LANGUAGES, OR WE REMAIN MUTE.

J. G. Ballard (b. 1930), English novelist

INDEX

"The Mediocre teacher Tells. The Good teacher Explains. The Superior teacher Demonstrates. The Great teacher Inspires."

William Arthur Ward

STEP MISSION STATEMENT:

To develop a plan that will facilitate a technologically rich environment that enhances instruction, student learning, and meets administrative needs for the Eureka County School District [ECSD, the district].

ECSD MISSION STATEMENT:

The Eureka County School Board, teacher, administrators, and school staff believe that every student can learn and achieve. It is the purpose of the School Board, teachers, administrators, and staff, with the support of the parents/guardians, to teach, guide, and assist students toward acquiring skills in academic, occupational, and social areas. We feel these skills are essential for choosing success and making positive contributions to society.

PHILOSOPHY:

Eureka County School District is committed to ensure that all students become successful, life-long learners. It is difficult to imagine that this can be obtained without preparing students for the Information Age of the 21st century. Both instructional practice and supporting curricular and management systems must take advantage of the power of current emerging technologies. Learners will be able to interact successfully in a technological environment to achieve their personal, education and workplace goals. ECSD views technology as an effective and necessary tool, capable of enhancing both the communication ability and productive capacity of our students, staff and parents. Eureka County students must be competitive in an ever-changing world. The opportunity to develop technological proficiency will enable students and staff to maximize their access to information, enhance problem-solving skills and develop effective communication in the Information Age.

TIME TO TAKE ACTION

Increasingly, everything which is done at home, at work, and at the school is intertwined with technology. Almost 40 million Americans have computers in their homes. Sixty percent of the jobs that will be available at the beginning of the 21st century will require skills currently held be only 20 percent of the work force. Only eight of the 54 careers projected to have the most

growth potential over the next five years do not require technological fluency. There is a tidal wave of students coming to school ready to weave technology into what they do at home, just as they will need to do when they leave school. ECSD recognizes the need to integrate technology into the classroom from all areas of the curriculum. By providing students and staff with adequate technology tools based upon a sound strategic plan, providing students access to technology, and developing a professional development program based upon the goals and assessments of the District, ECSD can educate students for the 21st century.

PLAN OVERVIEW:

This four-year plan will focus on the District's direction for integrating technology into the curriculum, continued staff development and technology access for students and staff. Technology is constantly changing, and these changes continue to influence every area of school and district functioning. Technology planning cannot be considered in isolation of other areas. A balance must always be maintained so that the needs of students, teachers, administration and the curriculum goals of the district are the driving forces behind the implementation of technology.

TEACHER INSTRUCTION AND STUDENT LEARNING CURRICULUM GOALS AND ASSESSMENT

"Teaching the Future, Today"

The implementation of technology is affecting how our schools operate, how teachers teach, and how students learn. The teacher's role is changing from one of a provider of information to one of organizer, leader and facilitator of learning. Students are changing from passive learners to active participants in the learning environments. We are changing our curriculum focus from instructional objectives that guide learning to outcomes that are expected of students as they master the curriculum. Students today are charged with more responsibility for their own learning. They need to master curriculum principles and problem solving techniques.

New learning environments enhanced by technology emphasize personalized student educational plans, a greater degree of independent small group learning, and a more active learning environment. Technologies help students find and handle more information more quickly, build a more productive knowledge base, and learn more about the real world by engaging in real world simulations that aid in the process of developing logical problem-solving skills.

By changing the focus of curriculum and methods for delivery of instruction, and by empowering students through technology, the District can produce a learning environment where students can be expected to achieve at higher levels.

The District will use a variety of methods to measure improvement in student achievement with the implementation of technology. Administrators and counselors will monitor student TerraNova, College Entrance Exams, and Nevada Proficiency Exams to determine whether or not student performance has increased due to educational technology integration. The use of an integrated software program within the elementary schools will provide teachers and administration timely information for learning assessments and remediation training. Teachers and administration will use technology applications to monitor student achievement.

The District shares the beliefs and assumptions outlined in the *Nevada Commission on Educational Technology State Plan to Implement Technology to Support Student Learning.*

1. Promote access to high-quality content.
2. Establish a statewide professional development program to support curriculum integration.
3. Provide adequate technical support for classroom teachers.
4. Conduct formative evaluations on an annual basis.
5. Continue to support the technical infrastructure.
6. Technology enhances learning, when applied in a planned manner involving the integration of training, curriculum, and hardware resources.
7. Educational technologies will be required to meet the wide variety of geographic and curricular needs in Nevada.
8. Technology helps cultivate communities of learners that extend beyond boundaries of traditional classrooms.
9. Technology is not just a subject to be taught. It is a tool that helps learners complete the tasks set before them.
10. Access to interactive technology establishes connections to the world, creating the relevance that motivates students to remain in school.
11. Skills in using technology are essential for the successful transition from school to career, providing the ability to compete in an increasingly technological world.
12. The level of educational opportunity for all Nevada students must be equal, regardless of geographical or economic status.
13. Learning is lifelong. The advantages of educational opportunity through technology must always be available to students of all ages.
14. Technology contributes to an environment, which stimulates participatory democracy for all citizens, supports healthy government, and fuels a rich economy.
15. Shared management and funding responsibilities for statewide education technology resources demonstrate effective collaboration among state agencies as well as within the education system.
16. Technology can provide ready access to vital educational information to make informed data driven decisions to improve education, increase educational accountability, and improve the delivery of services to students.

Methods of evaluating the impact of educational technology integration on student achievement will include:

- Adapting district wide implementation of the Nevada computer technology performance standards and skills.
- Monitoring TeraNova student achievement test results in reading, language arts, mathematics, and science at the fourth, eighth, and tenth grade level;
- Distributing a school technology evaluation checklist. The technology checklist will be completed by teachers, students, administration, technology and curriculum committees once per school year;
- Interviews and informal meetings with both instructors and students on their uses of educational technology;
- Providing integrated learning computer systems to teachers for collecting immediate student achievement progress reports.
- Developing project-based assessments based upon the state standards.

Effective evaluation of student and staff achievement will force ECSD technology planners to rethink and/or adapt objectives, priorities, and strategies as technology implementation proceeds in the years to come. Continuous evaluation also facilitates making changes if aspects of the plan are not working. Evaluation of technology curriculum objectives will enable state, district, and building administrators to proceed with funding planned areas as to whether technology dollars have truly enhanced student performance.

BENEFITS OF TECHNOLOGY INTEGRATION

The benefits of technology integration into the Districts schools will:

- Provide an increase in student test achievement performance of state and district test scores.
- Induce student mastery of technology curriculum goals.
- Increase student, teacher, and staff access to technology.
- Connect students, staff and the community of Eureka to the vast stores of information and resources available via the Internet and electronic media.
- Facilitate communication between various groups of Eureka students and groups of other students in Nevada and the world.
- Provide teachers with the electronic means to manage the non-instructional aspects of the classroom.
- Support the professional training network consistent with the guidelines set forth by the State of Nevada and other agencies.
- Provide the students and staff with the necessary technology to implement the goals of the State of Nevada and District technology plan.
- Sustained interest and use by students.
- Opportunities for students to use technologies for different learning styles.
- Opportunities for individualized problem solving.
- Provide teachers with greater number of teaching tools for serving a diverse student population.
- Increased teacher creativity and renewal.
- Provide students with alternative ways to learn and express their knowledge.
- Students become capable information technology users
- Allows students to become problem solvers and decision-makers
- Provides for creative and effective users of productivity tools
- Empowers communicators, collaborators, publishers, and producers
- Provides for informed, responsible, and contributing citizens
- Students will be able to compete in a global market.

It's the difference between looking at a picture of a heart in a textbook, and looking at a beating heart and being able to analyze it to see exactly how it works, step by step.

- High School Science Teacher

STUDENT LEARNING GOALS

To enhance the use of technology in **Student Learning**, ECSD will:

(Goal 1)
…….provide students adequate access to technology.

Strategies: The district will accomplish this goal by…….

1. providing students with sufficient hardware and software.
2. scheduling classes and classrooms to maximize student usage.
3. providing students with the capabilities for remote access to relevant information.

(Goal 2)
…….provide ample training for students.

Strategies: The district will accomplish this goal by…….

1. writing and revising K-12 curriculum that mandates student training in technology use while applying appropriate scope and sequence considerations.
2. hiring sufficient, qualified staff.

(Goal 3)
…….use technology to enhance student learning and expand the curriculum.

Strategies: The district will accomplish this goal by…….

1. budgeting for new technology.
2. integrating goals set forth by the technology plan into K-12 curriculum plans.
3. offering students parts of all technology available in the district.
4. utilizing all distance learning capabilities available within the district.

TEACHER INSTRUCTION GOALS

To enhance the use of technology in **Teacher Instruction,** ECSD will:

(Goal 1)
…….implement Staff Development Programs for Classroom Use of Technology

Strategies: The district will accomplish this goal by…….

1. providing standard staff development for all teachers on technology basics during district in-service days.
2. providing staff development for all teachers on technology basics with off-site technology training opportunities.
3. providing staff development for all teachers on technology basics using the District's satellite and compressed video systems.
4. providing staff development for all teachers by establishing a technology mentor or technology team at each building site.
    A. Technology mentors or technology teams will be trained to teach peers through on-site workshops or through off-site conference and workshop attendance.
    B. Technology mentors or technology teams will be allowed release time to provide training to classroom teachers during regular class time.
    C. Technology mentors or technology teams will be given compensation to provide training to classroom teachers during preparation or non-school time.
5. supporting a professional training network consistent with the guidelines set forth by the State of Nevada and other agencies.

(Goal 2)
…….continually strive to upgrade its technology.

Strategies: The district will accomplish this goal by…….

1. scheduling an annual review by the district's Technology Committee of existing and available technology.
2. gathering and disseminating current technology information to all classroom teachers.
3. budgeting for new technology.
4. establishing technology committees at each building site to review existing and available technology.

(Goal 3)
…….provide teachers adequate access to technology.

Strategies: The district will accomplish this goal by…….

1. supplying instructors with the necessary hardware and software.
2. providing instructors the capabilities for remote access to curriculum information.
3. scheduling classes and classrooms to maximize teacher usage.
4. maintaining a technical assistance infrastructure.

ADMINISTRATIVE TECHNOLOGY GOALS

To enhance the use of technology in **Administrative Technology**, ECSD will:

(Goal 1)
…….Implement staff development programs for Administrative use of technology.

Strategies: The district will accomplish this goal by……

1. providing training in electronic management materials that will facilitate administrative use of technology.
2. supporting a professional training network consistent with the guidelines set forth by the State of Nevada and other agencies.

(Goal 2)
…….Implement the ability to communicate through technology with other district personnel and educators.

Strategies: The district will accomplish this goal by…….

1. providing district personnel with necessary hardware and software.
2. maintaining a technical assistance infrastructure.

(Goal 3)
…….ECSD will provide district personnel with the ability to access information.

Strategies: The district will accomplish this goal by…….

1. providing the necessary technology to implement the State of Nevada Technology Plan.
2. electronically accessing Federal, State, and Local government information and services.

(Goal 4)
…….Provide educators with the electronic means to manage the non-instructional aspects of the classroom.

Strategies: The district will accomplish this goal by…….

1. providing the district personnel with necessary training.
2. providing educators with necessary hardware and software.
3. maintaining a technical assistance infrastructure.

(Goal 5)

…….to implement a standard District wide Administrative software system.

Strategies: The district will accomplish this goal by…….

1. providing district personnel with necessary training.
2. purchasing standard administrative software.
3. developing software-licensing standards.
4. maintaining a technical assistance infrastructure.

(Goal 6)
…….to implement a standard District wide computer platform.

Strategies: The district will accomplish this goal by…….

1. providing the district personnel with necessary training.
2. developing a plan to move to a district wide computer platform standard.
3. purchasing standardized district wide computer platforms.
4. developing a plan for hardware and software purchasing.

INSTRUCTIONAL TECHNOLOGY VISION STATEMENT

Technology is pervasive: a tool for communication, information, and learning. Technology, used as an effective tool for teaching and learning, is the norm rather than the exception throughout the district.

- Every student has adequate access to technology resources for research, problem solving, and communication.
- Technology is integrated into the curriculum to enhance student learning.
- Every student has the opportunity to learn technology skills to further his or her academic goals and to prepare for citizenship in the twenty-first century.
- All teachers and staff are provided with appropriate training for the integration of technology into the classroom.

Successful learning activities depend on more than just the technology. Certain conditions are necessary for schools to effectively use technology for learning, teaching, and educational management. Physical, human, financial, and policy decisions greatly affect the success of technology use in schools.

A combination of essential conditions is required to create learning environments conducive to powerful uses of technology, including:

- Vision with support and proactive leadership from the education system including: the School Board of Trustees and administration
- Educators skilled in the use of the technology for learning
- Content standards and curriculum resources
- Student-centered approaches to learning
- Assessment of the effectiveness of technology for learning
- Access to contemporary technologies, software, and telecommunications networks
- Technical assistance for maintaining and using technology resources
- Ongoing financial support for sustained technology use
- Policies and standards supporting new learning environments

This plan is designed to provide the framework to guide the District in establishing enriched learning environments supported by technology. The resulting learning environments provide opportunities for students to use technology to find and apply current information and resources, and to apply their academic skills for solving real-world problems. These environments engage students in activities that have educational technology skills and relevant curricular content interwoven. Traditional educational practices no longer provide students with all the necessary skills for economic survival in today's workplace. Students must apply strategies for solving problems and use appropriate tools for learning, collaborating, and communicating. Today's learning environments must incorporate strategies and tools that prepare students for their futures. The following chart lists characteristics representing traditional approaches to learning and corresponding strategies often associated with new learning environments.

ESTABLISHING NEW LEARNING ENVIRONMENTS

Incorporating New Strategies

Traditional Learning Environments	New Learning Environments
Teacher-centered instruction	Student-centered learning
Single sense stimulation	Multisensory stimulation
Single path progression	Multipath progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Student-centered learning
Passive learning	Information exchange
Factual, knowledge-based, literal thinking	Active/exploratory/inquiry-based learning
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real-world context

The most effective learning environments meld traditional approaches and new approaches to facilitate learning of relevant content while addressing individual needs. The resulting learning environments should prepare students to:

- Communicate using a variety of media and formats
- Access and exchange information in a variety of ways
- Compile, organize, analyze, and synthesize information
- Draw conclusions and make generalizations based on information gathered
- Use information and select appropriate tools to solve problems
- Know content and be able to locate additional information as needed
- Become self-directed learners
- Collaborate and cooperate in team efforts
- Interact with others in ethical and appropriate ways

It makes each of our schools larger. It makes each of our schools more effective. It lets us offer students experiences and information they wouldn't otherwise have.

- Middle School Teacher

INSTRUCTIONAL TECHNOLOGY PLAN 2007-2010
INTEGRATING TECHNOLOGY INTO THE CURRICULUM

Eureka County School District is designing an approach to education where curriculum, assessment and instruction are structured in a way that prepares students with the wide variety of skills they need for success in life after graduation. Technology has and will play a major role in shaping and achieving the goals and objectives necessary to fulfill that vision. Our approach to this performance-based learning system is based upon three principles.

Principle One: Design Curriculum to Meet the Long-Term Needs of Students.

The curriculum our students will learn in school will be carefully developed and articulated PreK-12 to parallel the skills graduates need to be successful for the rest of their lives. It will include the content skills, and abilities identified as essential by national organizations, state requirements, and business recommendations.

The computer and media curriculums will be written emphasizing these major program outcomes throughout a student's educational career: 1) be comfortable using a computer, 2) possess computer literacy, 3) possess basic input skills, 4) be able to use general computer applications (spread sheet, databases, word processing, desktop publishing, etc.), 5) be able to use technical tools (scanner, modem, CD-ROM, etc.), 6) be able to access, process, produce, and present information using a computer, 7) be able to adapt to technological change, 8) understand the importance of computers in the workplace, 9) be receptive to and able to adjust to future media hardware and software developments, 10) be able to analyze and interpret information.

In addition, the articulated PreK-12 technology/computers/media curriculum will be organized into course or grade level outcomes that will define exactly for students, parents, and teachers what students will need to know, and be able to do, in order to complete a course or grade.

Principle Two: Assess Students' Success on the Curriculum for Competency and Performance.

Our assessments will be designed at two levels (competency and performance) to determine students' success in learning the curriculum. Competency assessments determine whether students have learned the "knowledge" of the curriculum. Performance assessments determine whether students can achieve "results" (solve problems, produce products, and give performances) using the knowledge they have learned. It is obvious that technology will be an invaluable tool in helping instructors to assess students' success in both of these areas. Performance assessments also provide a means of determining whether students are able to use what they have learned to make presentations, and give performances, develop word-processed documents, design artistic products, develop technical products, complete electronic productions and computer programs, solve problems, and complete long-term, complex tasks.

In order for students to demonstrate performance and competency they must have the task management skills, process skills, and life skills to complete tasks in an effective and efficient manner. Integrated within all PreK-12 curriculums will be these critical skills: Students must: 1...Work well with others, 2...Possess positive work habits, 3...Be productive thinkers and workers, 4...Routinely produce quality work, 5...Use technology effectively.

In cooperation with the District's counselors and the District's school-to-careers programs, classroom teachers will begin by teaching and evaluating these productivity skills throughout the school year by presenting productivity lessons, using a productivity rubric to rate students' productivity skills, and sharing that rating with students and parents. Eventually teachers will learn to include the productivity skills automatically as part of the teaching and reporting process in all grades and courses, and students will learn to assess their own productivity strengths and weaknesses and set goals to improve these skills which includes the effective use of technology.

Principle Three: Engage Students in Learning in a Manner that Prepares Them to Succeed in All Levels of Assessment.

Once careful plans have been made to assess students' possession of the curriculum at all levels, teachers will begin combining traditional instructional methods with additional skills and strategies (including the use of technology) to engage students in learning to achieve results. Instructors will learn about scheduling, developing student ownership, understanding different learning styles, using many resources (including technology) to assist learners who have special needs, making instructions more active (including the use of online resources, CD-ROM, and active and interactive video), planning units that focus on all levels of assessments, managing cooperative groups, integrating instruction, incorporating different forms of assessment (including electronic portfolios), and managing their time better.

The attention to effective use of technology in all three principles of our approach to improving our students' education will foster a learning environment in which students learn not only the technology, media and computer curricular competency objectives, but also the skills and attitudes necessary for success in a world of technology-based business and industry**.**

INFORMATIONAL LITERACY

"The ability to access, process, and communicate information in order to solve problems and make decisions."

"To live, learn, and work successfully in an increasingly complex and information-rich society, students must use technology effectively."

ECSD understands that students need to be prepared for the Information Age of the 21st century. Using technology to solve problems and think critically is an excellent use of technology in the curriculum. Rather than giving students tedious tasks to get them to use technology, think about how technology can be used to enhance information literacy and authentic learning experiences. To be prepared for a future characterized by change, students must learn to think rationally and creatively, solve problems, manage and retrieve information, and communicate effectively. By mastering information problem-solving skills students will be ready for an information-based society and technological workplace.

Research on restructuring schools calls for the teachers' role to change from a textbook lecturer to that of a coach. Students become active learners who create their own knowledge after interacting with information from a variety of resources. Learning which results from use of multiple resources is often referred to as resource-based learning.

Research-based learning requires that students are effective users of information regardless of format. Print resources such as books and magazines as well as electronic resources such as computer databases and the Internet will be used by students. Students will master information literacy skills when teachers guide them as they use information with a discipline and through a unifying project. Learning is assessed by observing student demonstrations of ability, knowledge, and competencies. In a fully functioning performance assessment setting, student portfolios and assessment techniques are used to measure outcomes or competencies.

To become effective information users, students must have frequent opportunities to handle all kinds of information. Locating, interpreting, analyzing, synthesizing, evaluation, and communicating information should become a part of every subject across the curriculum. Learning environments should be structured to allow students unlimited access to multiple resources in the classroom and beyond the school walls.

All school educational personnel are actively involved in identifying the learning needs of the students, developing teaching units, and guiding their progress. The students' experience with information moves away from learning traditional library location skills taught in isolation. Rather, the student learns information literacy skills, embedded in the core curriculum. Once acquired, a solid foundation of information literacy skills will prepare students for a lifetime of learning.

SPECIAL NEEDS LEARNERS

Technology is an excellent tool that students with disabilities may use to access programs and information to enhance learning. When developing the STEP plan, the technology committee included technology provisions for special needs learners within ECSD. While the main focus in this section may be on the disabled, the plan also provides for learners who are classified as gifted and talented or exceptional.

The following are a few examples of why special needs learners must be considered when planning for technology implementation.

ECSD will implement any of the following mechanisms based upon need sited from the Director of Special Services.

Visual Impairments

This includes students who are partially sighted or have low vision, as well as those who are blind. Problems include inability to see the screen, orient on the keyboard and read computer printout as well as the inability to write and read printed information. Adaptive technologies, which the technology committee believes, could be adapted for this area in technology are:

- Speech synthesizers
- Large Monitors
- Braille embossers and printers
- Scanners and scan-reading software

Physical Impairments

This includes students who have limited or no use of their hands and who experience difficulty in writing, holding books or papers, and turning pages. Adaptive technologies to be implemented include:

- Voice recognition systems
- On-screen keyboards
- Enlarged or mini keyboards, trackballs, and joysticks

Hearing/Speech Impairments

Generally, students with hearing and speech impairments have little difficulty using computers, but they can still benefit from emerging technologies that include:

- Communications software which displays dialog on computer screens
- Speech output devices
- Visual displays and printouts

Learning disabilities
Some disabilities that affect learning include dyslexia, dysgraphia, dyscalculia, language deficit and attention deficit disorder. Adaptive technologies are available to enhance the learning capabilities of students with learning disabilities.

Exceptional Students

Students who are recognized as gifted and/or talented create yet another challenge for ECSD. Teachers want students to expand their knowledge base, and to develop creative and complex thinking processes, while challenging them to realize their full potential. Technology can be used in a variety of ways to improve the curriculum for talented and gifted students. Access to the Internet can bring enormous resources into each school, including but not limited to:

- Weather maps and forecasting
- Astronomy and geography
- Music, the arts, and literature
- On-line discussion and news groups
- Internet E-mail

Programs of enrichment and acceleration usually involve the greatest amount of curricular adjustment, but they also have the greatest effect on student learning. National evaluations show that students enrolled in accelerated classes outperform non-accelerates in the same age and IQ by almost one full year on achievement tests.

ECSD is committed to seek, create, and maintain robust, expansive programs that challenge all learners. This allows every student the privilege of exploring learning vistas, regardless of personal disability or gift. ECSD is currently using many of Microsoft Windows95 accessibility features embedded within the program to enhance the skills of disadvantaged students. Using this standardized program language as a building block, the district can educate all students through the use of technology and technological distribution.

INSTRUCTIONAL/CURRICULAR TECHNOLOGY PRIORITIES

- Develop a district-wide strategic plan that includes a vision for teaching and learning, and strategies to achieve it. These strategies will address curriculum and instruction, assessment, technology, professional development and resources. This plan will clearly define the educational goals of the district.
- The district's plan will establish and support an educational model that accommodates a variety of instructional styles, including basic skill development, direct instruction, experiential learning, collaborative learning, and project-based learning
- Integrate the use of technology into the performance assessments projects outlined at each grade level K-12.
- Develop technology skills scope and sequence across all grade levels.
- Hire a full time district curriculum specialist with expertise in the areas of technology and project-based learning to coordinate, mentor teachers, and develop technology enhanced lessons in a project-based learning environment.

INSTRUCTIONAL TECHNOLOGY PRIORITIES

Priority One: Access

Equitable access is the primary key to the effective use of technology. Putting the right tools in the right place with appropriate support helps to ensure that students and staff benefit through their use. Appropriate and available technology tools will allow students and staff to achieve their educational and productivity objectives.

Recommendations:

- Ensure that every student has access to technology that provides the greatest benefit to his or her learning.
- Purchase and install a laptop computer wireless technology solution at each school for student anywhere, anytime learning.
- Provide the capability in each classroom for teachers to make classroom presentations on a large screen or monitor.
- Allow appropriate email access for students working on projects that require communication with individuals outside of school.
- Provide access for students to computers, software, and video technologies
- Develop strategies to maintain an up-to-date hardware and software inventory.
- Create scope and sequence technology skills across grade levels.
- Ensure the scheduling of classes and classrooms to maximize student usage with technology.
- Expand distance learning opportunities for students and staff.
- Establish a method for providing Internet and email access to Crescent Valley Elementary School.

- As an incentive to teachers willing to commit to classroom technology integration, upgrade classroom computers and infrastructure that can support up-to-date software, and provide Internet access for students.
- Install compressed video capabilities a Crescent Valley Elementary School to facilitate classes between the Eureka schools and CVES.

Priority Two: Staff Development, Training, and Support

The job of staff members is much more demanding today than it was ten years ago. Adults need time to experiment and to become comfortable with new job-related techniques and with supporting technology. Staff members need to be supported in this learning process. They need time to learn to use technology and how to manage the use of technology in the classroom.

Recommendations:

- Continue the Teacher Training Learning Series program with emphasis on the integration of technology into the curriculum.
- Create a Technology Professional Development Position with emphasis on training teachers on how to integrate technology into instruction and incorporating project-based learning methods.
- Ensure that technology training includes authentic tasks to demonstrate how to apply technology in education.
- Hold teacher learning days for curriculum integration of technology.
- Provide staff development training during in-service days.
- Provide incentives for teachers to integrate technology into the classroom.
- Provide additional support for integrating technology into the classroom.
- Utilize the staff development resources within the Northeast Nevada Technology Consortium.
- Establish a floating substitute to free staff during the school day to participate in technology professional development.
- Modify school schedules to allow minimum days on a regular basis to provide professional development time.
- Modify the role of the District Technology Director to focus more specifically on the instructional use of technology.
- Establish teacher competency standards for technology and use them to screen applicants and establish performance goals for staff.
- Establish more professional development opportunities through the use of compressed video and satellite.

Priority Three: Curriculum Integration

To ensure that technology is effectively used in classrooms, a clear connection must be made between technology and the curriculum. Units that integrate technology into the core curriculum and correlate with the standards will ensure teachers use technology to its fullest advantage.

Recommendations:

- Implement the technology teaching Scope and Sequence for grades K-12.
- Enhance core curriculum units with technology connections.
- Develop an online database of model lesson plans and projects.
- Produce teacher-ready core units with integrated technology applications.
- Develop accountability mechanisms to ensure that all teachers use technology to support academic goals.
- Purchase up-to-date instructional software to support and align with the outcomes of the district's strategic plan.
- Incorporate a variety of technologies (voice, video and data) into the curriculum to support virtual opportunities to learn where students might not otherwise have access to real world opportunities. For example, virtual field trips, WebQuests, and other distance learning opportunities.

The following school site instructional technology guidelines are to be funded contingent upon adequate funding sources. The Technology Committee understands that this document is a "Living" document and as technology changes, so could the following guidelines.

SCHOOL SITE INSTRUCTIONAL TECHNOLOGY GUIDE

EUREKA ELEMENTARY SCHOOL

- Purchase additional software licensing to allow twenty-five computer workstations access to the CCC SuccessMaker software.
- Provide classroom workstation CCC SuccessMaker licensing
- Install at least two networked multimedia computers with Internet access in each classroom.
- Install one print server in computer lab
- Purchase and install 16 wireless laptop computers with mobile cart.
- Purchase additional thinking skills software.
- Purchase site license for Inspiration software.

- Upgrade library software
- Purchase new student/staff computer systems to replace existing computers within a five-year cycle.
- Upgrade computer workstations to Windows98 or higher operating system.
- Purchase instructional software.
- Purchase two digital cameras to be used on a checkout basis.
- Upgrade existing workstations to Microsoft Office 2000 or higher.
- Modify school schedule to allow minimum days to provide professional development time for teachers in a reliable, accountable manner.
- Develop a school/community Internet Web Portal for the distribution of school related information to the home and community.
- Purchase classroom presentation devices or large screen computers to provide teachers a tool to demonstrate how to use technology to students within the classroom.
- Purchase headphones.
- Provide two sets of computer software reference materials on current applications for staff checkout.
- Upgrade existing telephone system to newer integrated system.

CRESCENT VALLEY ELEMENTARY SCHOOL

- Provide a total of twenty computer workstations in computer lab with access to the CCC SuccessMaker software.
- Provide classroom workstation CCC SuccessMaker licensing
- Purchase and install 8 wireless laptop computers with mobile cart.
- Install one print server in computer lab.
- Upgrade teacher's printers
- Upgrade library software system.
- Purchase site license for Inspiration software.
- Install at least two networked multimedia computers with Internet access in each classroom.
- Purchase new student/staff computer systems to replace existing computers within a five-year cycle.
- Upgrade computer workstations to Windows98 or higher operating system.
- Purchase instructional software
- Installations of high-speed digital T-1 service for Internet, E-mail access.
- Upgrade existing workstations to Microsoft Office2000 or higher.
- Modify school schedule to allow minimum days to provide professional development time for teachers in a reliable, accountable manner.
- Develop a school/community Internet Web Portal for the distribution of school related information to the home and community.
- Upgrade telephone system

- Purchase classroom presentation devices or large screen computers to provide teachers a tool to demonstrate how to use technology to students within the classroom.
- Provide two sets of computer software reference materials on current applications for staff checkout.
- Provide a technology position in computer lab/library.
- Purchase headphones
- Install compressed video capabilities to enhance curriculum and staff development.

EUREKA COUNTY HIGH SCHOOL

- Install at least two networked multimedia computers with Internet access in each classroom.
- Purchase new student/staff computer systems to replace existing computers within a five-year cycle.
- Purchase and install 24 wireless laptop computers with mobile cart.
- Upgrade computer workstations to Windows98 or higher operating system.
- Install 4 print servers in computer lab and 1 print server in media lab.
- Purchase instructional software.
- Upgrade existing workstations to Microsoft Office2000 or higher.
- Modify school schedule to allow minimum days to provide professional development time for teachers in a reliable, accountable manner.
- Upgrade library software system.
- Develop a school/community Internet Web Portal for the distribution of school related information to the home and community.
- Purchase site license for Inspiration software.
- Purchase classroom presentation devices or large screen (Destination) computers to provide teachers a tool to demonstrate how to use technology to students within the classroom.
- Develop a technology multimedia lab by expanding the School to Careers program.
- Provide two sets of computer software reference materials on current applications for staff checkout.
- Upgrade existing ParentLink system to enhance out-bound dial capabilities to parents and community.
- Upgrade existing telephone system to newer integrated system.

EUREKA COUNTY SCHOOL DISTRICT ADMINISTRATION OFFICE/DISTRICT

- Upgrade District networks operating system to WindowsNT 2000 or higher.
- Upgrade District Exchange Server (E-mail) system.
- Upgrade existing workstations to Microsoft Office2000 or higher.
- Expand the District's Internet web site to include teacher technology ready lesson plans.
- Provide one set of computer software reference materials on current applications for staff checkout.
- Install one print server at district office.
- Provide continuous upgrades to student information system.
- Upgrade district's financial systems software and hardware.

Until recently schools could rely on the tools they have always used - paper, pencils, and books - to accomplish their basic mission of equipping students with the skill and knowledge they need to be productive citizens. Today, that is no longer true.

- District Superintendent, Northwest Regional Forum

COMMUNITY/PARENT OUTREACH

The new age of shared responsibility for educating Eureka County School District students can open many doors for exchange of resources between business and schools. Technology-related activities are natural for these partnerships. Through the District's advanced School-to-Careers program and a technologically rich learning environment within ECSD schools, business and schools can serve each other well.

ECSD is developing strategies for increasing parent and family involvement with technology. Educating families to the appropriate use of technology raises the technology literacy level of parents, thus empowering them to become a true resource to their children's learning. The skill parents learn using technology will become a valuable resource in their own functioning, both at home and on the job. As ECSD adds more sophisticated communication technologies to parents, the frequency of interaction between school and parent will increase. The extended use of the Internet from the home to the school will allow parents to access online student progress reports and instantaneous grade figures. The use of email between parent and teacher will facilitate new communication standards. The use of voice mail in ECSD has demonstrated increased interaction between parent and teacher. With the proliferation of online technologies, parents will be able to monitor classroom activities as often as daily. Since parent involvement has been identified as one factor in increasing student learning, the most important result of this role for technology is the positive impact it will have on student achievement.

Community and parent participation in the STEP plan will be occurring on many levels. Many of the activities are also supported in the Technology Literacy Challenge Fund, supported by the five county consortium and Great Basin College. To gain a broad spectrum of input and support, the District will encourage the following:

- Brochures for the county concerning technology implementation and evaluations.
- School based newsletters distributed to parents and community members.
- Press releases (print and local PBS)
- Participation of business advisory groups
- Providing information to and seeking input from other school districts, regional partnerships or consortium such as the Northeastern Nevada School-to-Career Partnership, Rural Telecommunications Task Force and Nevada Education Technology Consortium.
- Provide information on District's web page.
- School newsletters for parents and students
- Back-to-School Night
- Acceptance of community members and parents to be members of the District's technology committee.
- Internet electronic mail to administrators and teachers from parents.
- School based Internet web portals to display school information to parents and community members.

- Community Learning Nights to invite members of the community access to technology related teachings and seminars.
- Internet electronic student progress reports.
- Outbound dial systems to inform parents of student absentees and school related information.

TIME TO TAKE ACTION

Increasingly, everything we do at home, at work, and at school is intertwined with technology. Almost 40 million Americans have computers in their homes. Sixty percent of the jobs that will be available at the beginning of the 21st century will require skills currently held by only 20 percent of the work force. And, says the Department of Labor, only eight of the 54 careers projected to have the most growth potential over the next five years do not require technological fluency.

"The time for schools to take action is collapsing," says Dwayne Young, Assistant Principal and former sixth-grade teacher. "There is a tidal wave of kids coming into school ready to weave technology into what they do at home, just as they will need to do when they leave school. Schools want to be at the forefront of this change, championing new techniques, utilizing new tools. We need to help teachers be ready to help the students.

The American School Board Journal, July 1999

COMPREHENSIVE STAFF DEVELOPMENT PLAN

The Eureka County School District technology committee has addressed as its priority the opportunity for staff to acquire adequate training in computerized software applications, e.g., administrative applications, Internet, etc. We cannot expect the staff of the district to fully understand and effectively utilize the technology applications without being properly trained. The Technology Committee recommends that the district urge the development of a comprehensive staff development/training plan to offer staff a wide range of training opportunities during the school year for software applications and technology curriculum integration.

An effective training and staff development program is an integral part of our technology plan. All district personnel directly or indirectly contribute to the success of each student. In order for students to have successful and productive learning experiences, the District must maintain a trained workforce.

Researchers at Educational Testing Services found that students whose teachers used computers primarily for simulations and applications that support higher-order thinking performed better than students whose teachers used computers mainly for learning games. And also those students whose teachers had professional development in technology outperformed those whose teachers didn't.

The most effective staff learning strategies requires a change in the way teachers spend their time and the ways they work together. This Plan incorporates informal support systems, partnerships, teams, and collaborative structures as the most efficacious elements in a broad-based change effort.

ECSD will include the following core components for effective staff professional development.

- Develop a strategic district plan
- Set relevant and realistic goals
- Link professional development to teacher needs, goals, and learning assessments outlined within the strategic district plan.
- Utilize Professional Development Plans (PGPs)
- Establish site based Small Group Technology Collaboration
- Establish a system for periodic review, assessment, and adjustment

The District's training system is designed to meet the diverse job-related training needs and requirements of the District. The target audience consists of three broad categories of users: administrative, instructional and support personnel. In order to meet their specific needs,

training is designed around the knowledge and skills required using the technology in their various jobs. Training bridges the gap between what the user knows and needs to know.

The following training models will be supported within the District:

- Train-the-Trainer
- Coaching and Mentoring
- Self-Study Training
- Small Groups Collaboration Projects
- On-the-Job Training
- Site Based Training
- Peer Training Model

ECSD will strive to deliver staff development in variety of ways, including:

- Before and after school technology on campus training programs
- Utilizing the services of the Technology Director
- Minimum days
- In-service day technology staff development
- Off campus training programs
- Teacher substitutes for extended training sessions

The District shares the beliefs and assumptions on staff development outlined in the *Nevada Commission on Educational Technology State Plan to implement Technology to Support Student Learning* and the *Technology Literacy Challenge Grant* program as outlined.

ECSD Comprehensive Staff Development

- Adopt a technology professional growth program with the support of the teachers that clarifies the commitment of the Board/Superintendent and staff to the value of ongoing professional development and change. The key component of this program is the individual growth plan (PGP) written within District guidelines by each teacher and then shared with the building principal. This document becomes the road map to guide each teacher's technology learning during the year.

- Encourage the use of technology study groups by which they determine the best path toward completion of the goals. Teachers gather in small groups to meet on an on-going basis to pursue shared growth technology goals as listed in their PGPs. Teachers can share ideas and strategies in developing technology-integrated lessons. Each study group will be mixed with skilled partners. Schools find that teachers can make good progress with the kinds of learning

associated with new technologies if they have skilled partners working alongside non-skilled teachers.

- Providing substitute teachers or combining classes to allow teacher study groups to meet on an ongoing basis during school hours throughout the school year. This would allow teachers to develop technology lessons together, work on Professional Growth Plans, and acquire technology skills and integration training.

- Provide beginning of the year training and staff development, new hire/refresher courses.
  At least one full district in-service day dedicated to technology training and staff development for each school. This will include in-service in new technologies deployed by the district and technology integration ideas into the curriculum. New staff and/or refresher courses offered by the district to introduce new staff members to current district technologies and refresh staff knowledge in existing technologies.

- Develop and deploy a staff development training course schedule to be offered throughout the school year.
  The training schedule will offer 1.5 hour long training in computer software related technologies. The training course offerings will be made available to all district staff. The training series which ECSD will base staff development will be known as the Technology Training Learning Series [TTLS].

- Require that the district provide adequate outside training for staff by professional trainers in areas which adequate training cannot be offered within the district.
  Professional trainers may be called upon to provide the technology staff development training when the district computer systems engineer deems that no adequate trainer exists within the district to provide adequate specialized training. For example, training for a comprehensive administrative software program.

- Expand the use of compressed video and satellite to deliver comprehensive staff development opportunities for technology/curriculum integration and technology systems training.

- Provide school on-site technology mentor or team with adequate technology training.
  It has become evident to the Technology Committee that each school needs an in-house technology mentor or team. The current and future implementation of technology in our school district warrants this need. As we deploy more technology related equipment into our school, it will become increasingly important that the school district develop a plan to train an in-house technology mentor(s) to answer and fix common problems. Each mentor will be adequately trained to handle routine problems, which may arise. The mentors would be the school's technology connection with the district's computer systems engineer to plan for training, staff development and other technology related issues within each school site. The site mentor will have the opportunity to attend training sessions offered by the Northeast Nevada Technology Consortium.

- Require that members from the district technology committee be included in all district curriculum committees.
  This would ensure that technology is incorporated into all curriculums whether new or existing.

- Provide ECSD staff members a step by step technology instruction manual on how to perform various technology user functions, which the district deems important for successful technology utilization.

- Provide teacher ready core units with integrated technology applications.

- Provide access to technology integrated lesson plans on the ECSD web site.

- Develop a FAQ (Frequently Asked Questions) manual to be distributed among district staff and posted on the district's web site.
  The FAQ would include answers to common staff questions ranging from software to curriculum applications.

- Provide all staff members' access to training materials, resource and reference books of current computer applications deployed within the district.
  The reference material would include books on Microsoft Office, Microsoft Outlook, SASIXP, SASIXP Classroom, and Microsoft Internet Explorer. These materials are important because they give users something to refer to after the training or when software is installed.

- Training on classroom use of technology.
  Just as they need to learn how to use a computer system and the applications that are available, teachers also need to receive training on the use of available instructional software and how to access other technology resources. Training on specific instructional software covers the content and value of the programs as well as how to use them. Teachers and staff need to know how the technology systems can be integrated into the curriculums they are teaching.

- Provide training to teachers and staff in the use of technology related equipment (i.e., scanners, digital cameras, and projection devices).

- Training/Technology/Software evaluation
  Computers will be used to test and evaluate software at each school building. Teachers and administrators may see software demonstrated at professional meetings. Demo software will be made available to teachers and staff to evaluate the software before purchase so that it fits within the infrastructure of our systems and the concepts in the

software fit with the learning goals of the district. Teachers and staff will also be encouraged to note successful technology practices in their classrooms that might then be replicated in other settings. These practices would be made available on the district's web site.

- Utilize the staff development training opportunities offered by the Northeast Nevada Technology Consortium.

Five County Consortium (Great Basin College) Objectives on Staff Development
Northeast Nevada Technology Consortium

Professional staff development will be focused on providing educators the skills to effectively implement the use of technology in their classroom in order to increase student learning. This can be done most effectively by providing training to teachers as close to their classroom as possible. We also believe that district and/or regional training centers can facilitate local site training opportunities and maximize limited district and regional resources.

The content of all training programs will be grounded within curriculum; referencing in technology to its use in meeting curriculum needs will ensure curricular applications of technology that enrich the learning experience. Technology then becomes a means to an end, not the end itself. Furthermore, a curriculum-based approach will create a sense of professional community, collaboration and innovative teaching practices.

To provide support for designing and implementing training, the existing resources of Great Basin College are perceived as an important element in providing support and assistance to the rural school districts. Training areas to be designed and implemented over the next several years are:

- provide/obtain technical training with various levels of training: teacher, school level technical support, district level technical support, consortium-wide support
- assist teachers in integrating technology, curriculum, and instruction
- develop regional capabilities for providing staff development, both technical and curricular
- provide customized training for individual teachers in their own classrooms
- facilitate professional communication and collaboration through technology
- promote innovative teaching practices

ECSD agrees with the basic standards set forth by the National Society for Technology in Education [ISTE] for students are divided into six broad categories. Standards within each category are to be introduced, reinforced, and mastered by students. These categories provide a framework for linking performance indicators found within the Profiles for Technology Literate Students to the standards. Teachers can use these standards and profiles as guidelines for

planning technology-based activities in which students achieve success in learning, communication, and life skills.

TECHNOLOGY TRAINING LEARNING SERIES [TTLS]

The Technology Committee has addressed as it's priority, to provide the staff with adequate training in computerized software applications, e.g., administrative applications, Internet, etc. We cannot expect the staff of the district to fully understand and effectively utilize the technology applications without being properly trained. The Technology Committee recommends that the district urge the development of a comprehensive staff development/training plan to include initial beginning of the school year on-site training and follow-up on-site training throughout the school year for software technology applications.

Because everyone comes to the District with different levels of computer experience, a one-size-fits-all training program won't work.

"The largest non-capital cost will be training, which will be absolutely necessary to ensure that equipment is used effectively. The largest group requiring training will be teachers, who will require comprehensive in-service as the district sets new employment expectations."

College Credit

Great Basin Credit

Currently Great Basin College is offering 1 undergraduate credit for trainees who wish to apply. Trainees must complete 15 hours of training instruction to receive 1 undergraduate credit. Contact the District computer systems engineer for more information.

Technology Training Learning Series Offerings

New Hire/Refresher Courses:

The following classes are offered to newly hired District employees as part of the orientation process. Currently, these individuals are selected for classes by either building principals or district officers. Employees and their supervisors are then notified of the dates and times of the classes.

Current District personnel desiring to refresh the skills offered in these classes may attend the new hire class offerings. For inclusion into these classes it is requested that current personnel contact their building principal so that space is assured for everyone.

The following classes may or may not appear in the general class catalog, but are listed here as general new hire/refresher courses.

SASIXP, Classroom

Electronic Grade Book
Workstation Network Basics
Microsoft Outlook, Electronic Mail Introduction
Microsoft Excel, Electronic Purchase Order Information
Microsoft Internet Explorer, Internet Browser Introduction
School Library Electronic Information Services

District Technology Training Courses:

Training courses are divided into three categories:

- **Three hour full-course offerings:**

Classes, which contain an overview of an entire computer application or technology, subject, i.e., (Basic Microsoft Windows95).

- **One hour mini-courses:**

Offer training in a specific area of a particular computer application or technology subject, i.e., (File Management).

- **Special Topic Training:**

Covers one specific topic within a particular computer application or technology subject, i.e., (Sending An Attachment In Microsoft Outlook). Special Topic Training is designed to last 30-45 minutes.

Peer Coaching One on One:

For individual technology instruction, contact the District's Computer Systems Engineer, 237-5373, email, eporter@eureka.k12.nv.us. A trainer will return your request for scheduling. If your school building has a designated peer trainer, you can directly contact the peer trainer for scheduling.

Site-based Instruction:

If a site desires technology application instruction for staff or large groups, please contact the District's Computer Systems Engineer, 237-5373, email, eporter@eureka.k12.nv.us.

Software Evaluation Lab:

We are currently working on making computer workstations available for software evaluation in a secured, network environment. Please contact the District's Computer Systems Engineer, 237-5373, email, eporter@eureka.k12.nv.us for more information.

TECHNOLOGY FOUNDATION STANDARDS FOR STUDENTS

1. **Basic operations and concepts**
    - Students demonstrate a sound understanding of the nature and operation of technology systems.
    - Students are proficient in the use of technology.

2. **Social, ethical, and human issues**
    - Students understand the ethical, cultural, and societal issues related to technology.
    - Students practice responsible use of technology systems, information, and software.
    - Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

3. **Technology productivity tools**
    - Students use technology tools to enhance learning, increase productivity, and promote creativity.
    - Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

4. **Technology communications tools**
    - Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
    - Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

5. **Technology research tools**
    - Students use technology to locate, evaluate, and collect information from a variety of sources.
    - Students use technology tools to process data and report results.
    - Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

6. **Technology problem-solving and decision-making tools**
    - Students use technology resources for solving problems and making informed decisions.
    - Students employ technology in the development of strategies for solving problems in the real world.

TECHNOLOGY SCOPE AND SEQUENCE

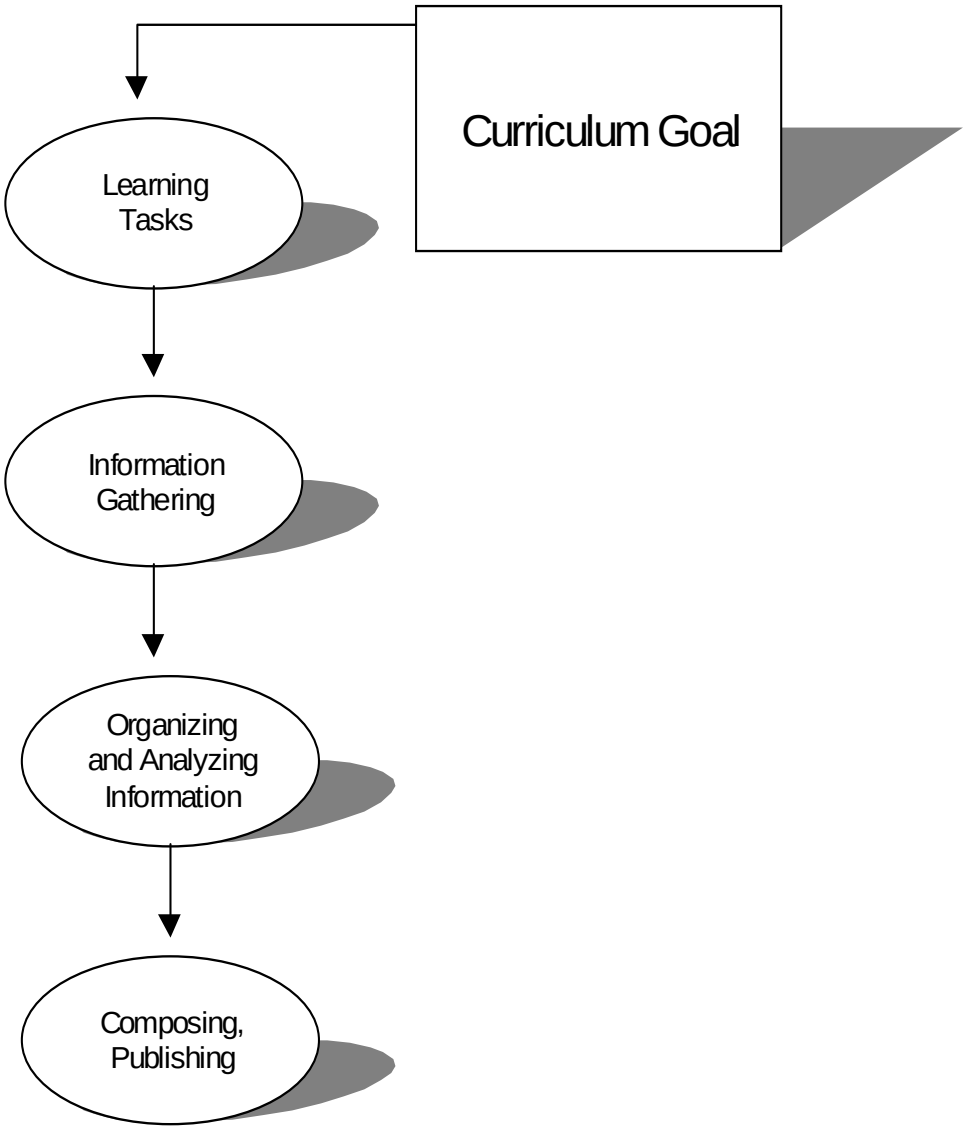
A Technology Scope and Sequence has been developed to provide a framework for teachers to weave technology into curriculum and classroom activities. The integrated use of technology can enhance teacher and student productivity, efficiency, creative expression, communication, access to information and provide technology rich learning experiences for children.

Curricular/content areas contain aspects of two distinct functions. 1) district or school site curriculum/learning goals, and 2) teacher generated learning tasks to accomplish the goals.

ECSD EDUCATIONAL TECHNOLOGY TEACHING SCOPE AND SEQUENCE

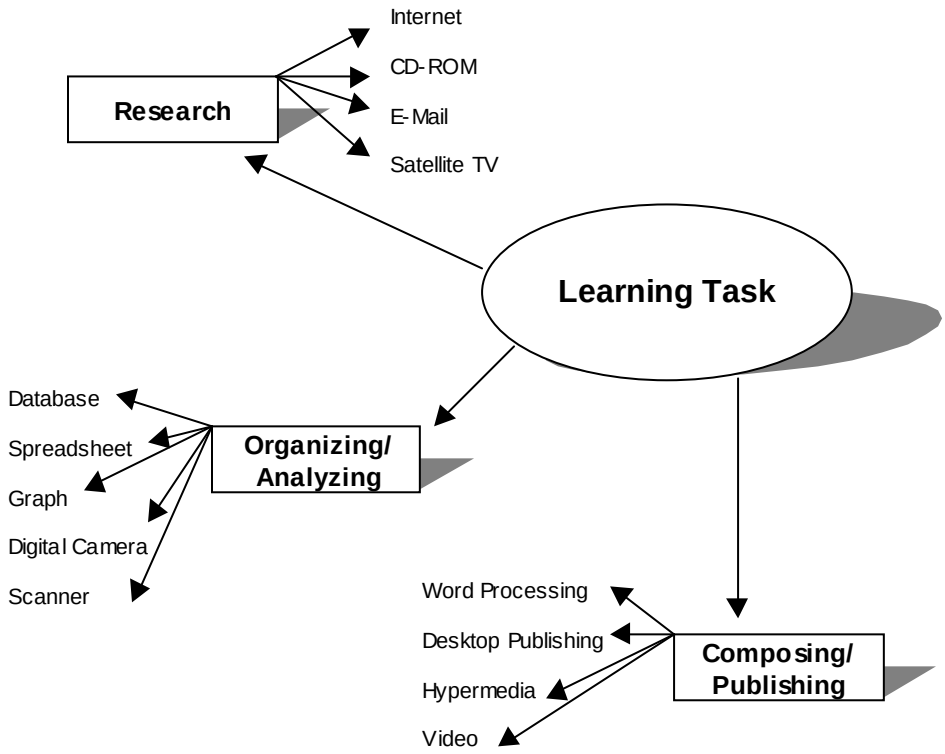
Many learning tasks contain aspects of three distinct functions. 1) information gathering, 2) organizing and analyzing information, and 3) composing, publishing

The following diagram illustrates learning tasks, which can be supported by technology.



This technology scope and sequence is divided into three sections, the key components of which are:

- Research (Gathering Information)
- Data Organizing and Analyzing (Organizing and Analyzing Information)
- Composing, Publishing



Scope and Sequence Example:

Each section of the scope and sequence contains a subject area, specific curriculum goal, recommended activities, technology specific skills, possible applications and devices, and curricular related examples.

Subject Area: Science, Social Studies, Geography

Curriculum Goal: develop students' understanding of basic meteorology and related earth science topics, reinforce geographical knowledge, and build analytical and communications skills through class presentations.

Learning Task: Exploring World Weather Patterns

The student will: figure out what makes extreme weather act the way it does, find the most awesome examples of its power, and then create a Web page to explain it all to your classmates.

Scope and Sequence Table

Level **Recommended Activities**	Technology Skills	Possible Applications	Examples/Task Related
Research Activities	Search/Navigate CD-ROM resources Basic Internet Explorer Searches	Microsoft Encarta Encyclopedia Microsoft Encarta Virtual Globe Microsoft Internet Explorer	
Data Organizing and Analyzing Activities	Basic word processing skills Cut, copy, paste Basic spreadsheet Basic database	Microsoft Word Microsoft Wordpad Microsoft Excel Microsoft Access	Outlining Note taking Data Organizing footnotes
Production/Composition Activities	Compose/Import text and graphics into electronic software tools	Microsoft Word Microsoft FrontPage Microsoft Publisher	Story/Narrative Letters Presentation Report Brochures

Sample Teaching Guide

Summary

From El Nino to killer heat waves, weather extremes capture headlines and the popular imagination. This science and geography activity builds on kids' natural fascination with weather disasters.

Your students will research exciting weather sites on the Internet.

Time Allotted

3-5 class periods

How to Begin

7. Start with a class discussion of weather extremes students have experienced personally. Ask your class: If a science reporter were to interview you about the worst weather you've ever witnessed, what would you say? What made that weather so remarkable?
8. Next, brainstorm a list of other kinds of extreme weather. Encourage students to think of as many examples as they can, from storms they've heard about on the news to events they remember from history.
9. If kids include events such as earthquakes or volcanoes on the list, go back when your brainstorming is over and ask them to think carefully about whether these disasters really fall under the heading of "weather." Together, develop a working definition of weather that includes the concept of the atmosphere and the impact of such factors as temperature, humidity, cloudiness, precipitation, wind, and pressure. Direct students toward an understanding that extreme weather, then, involves one or more of these factors occurring with unusual force or quantity.
10. Have each student choose the three most personally fascinating forms of extreme weather and list them on a sheet of paper. Collect the papers and divide your class into teams of three or four, according to weather choices.
11. Explain that each group will now become a crack team of meteorologists with special expertise in tracking, analyzing, and explaining its chosen weather extreme via a Web page for whole-class viewing.

Sample Student Activity

Description
Here is your mission: To figure out what makes extreme weather act the way it does, find the most awesome examples of its power, and then create a Web page to explain it all to your classmates. Ready to take the weather world by storm?

Step 1 *A Storm is Born*
Software: Microsoft Encarta 98/99 Encyclopedia Deluxe, Microsoft Internet Explorer 4.0, Microsoft Word 97/98
WHAT TO DO: Get to the heart of your weather extreme.
WEATHER SITES

- The Weather Channel
- National Weather Service
- University of Michigan Weather Underground
- Weather World 2010
- Memorable Weather Events

1. Launch Word, open a New document, and type in the heading "Causes of [Your Storm]." Save the Word document with a file name related to your kind of storm.

2. Launch Encarta Encyclopedia, go to Encyclopedia Articles, and use the Pinpointer to find your weather.
3. As you read through the articles you find, look for explanations of what causes your extreme weather. Copy new facts you find -- along with any graphics or photos -- and paste them in your Word document.
4. From within your Encarta Encyclopedia article, click on the More Information About This Subject icon in the top right corner of your screen. Choose Web Links, and explore the Internet for more information about your kind of storm. (You can also try some of the sites listed in the box on this page.) When you find new facts, copy and paste them in your Word document.
   Open a Microsoft Word 97/98 document to collect and organize the facts, photos, and graphics you find in Microsoft Encarta 98/99 Encyclopedia Deluxe and on the Internet about your chosen weather extreme.
5. Look for pictures, diagrams, and other images to help explain your extreme weather. Save these images by clicking your right mouse button, choosing Copy, then pasting them in your Word document. Keep track of your sources!
6. Add the best sites to your Favorites folder.
7. Discuss your findings as a group. Then, in your Word document, click on View, go to Toolbar, and choose Drawing. Use these tools to sketch a diagram showing how your storm works. Use Help if you need it.

Step 2 ***Map the Zone***
Software: Microsoft® Encarta® 98/99 Virtual Globe (Windows only)
WHAT TO DO: If you have Encarta Virtual Globe, use this optional step to find out more about the geography of your killer weather.

1. Launch Virtual Globe, click on Learn About the Earth, and scroll down to The Physical World. If your weather fits the general category of Monsoons, Tropical Storms, and Tornadoes, go to that article for lots of facts and maps. Otherwise, read through Seasons: Climate, Stars, and Earth Changes. Copy pertinent facts for your Word file under a heading called "Weather Zone."
2. Go to Map Styles on the Toolbar, choose Natural, and check out the Climate, Eco-region, and Temperature maps of your storm hot zones. Use the About This Map feature to interpret the data you're seeing.
3. When you find maps you want to keep, go to Options and choose Copy. You can then paste your maps into your Word file.

Step 3 ***One for the Record***
Software: Microsoft Encarta 98/99 Encyclopedia Deluxe, Microsoft Internet Explorer 4.0, Microsoft Word 97/98
WHAT TO DO:

1. Go back to Encarta and Favorite Web sites to look for "worst ever" occurrences of your extreme weather. You may discover that "worst" has many meanings. Is the worst

blizzard the one with the most snow, the highest winds, or the longest duration? In your Word document, set up a new heading called "Record-Breakers" to save these facts.
2. Pick one record storm to explore further. Search the Web for articles reporting on the storm as it happened.

Step 4 ***Stormy Webber***
Software: Microsoft Word 97/98, Microsoft FrontPage 98
WHAT TO DO: Pull all of your work together as a Web page.

Use Microsoft FrontPage 98 to turn your facts into a Web page.

1. Open your Word file. Organize the facts you've gathered (you might find the Outline option in the View menu helpful for this). Rewrite the material in your own words, as though you were explaining it to a friend.
2. When your editing work is complete, go to the File menu, and choose Save As HTML.
3. Launch FrontPage, choose New FrontPage Web, and click on One-Page Web. Name your web after your storm.
4. When the Navigation screen appears, click on Themes to choose a color scheme, font, and button style. Click Apply.
5. In the File menu, choose Import. Find the HTML file you created from Word, and import it. This page will now appear in the list of files on your Web.
6. Go to File and Open your home page. Choose Insert, select File, and choose your Word HTML file. The text will flow into your home page.
7. Add a Heading at the top of your home page, and smaller Headings for each subtopic (such as Causes, Zones, and Record-Breakers). Insert a Navigation bar to link your subtopics. Experiment with Animation effects from the Format menu, and Insert some Active Elements such as a Marquee of fun storm facts.
8. When your Web is complete, invite your classmates to test it out. Then work with the other teams to create one big Weather Web. Publish it to your school Intranet.

If classes aren't offered on how to use computers and technology to build skills and get jobs, it is a disgrace. Think of the future and all the skills our children will need.

- Parent, Southeast Regional Forum

ECSD EDUCATIONAL TECHNOLOGY STUDENT SKILLS SCOPE AND SEQUENCE

Technology Skills Scope and Sequence K-12

Technology Skill	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Knows procedures for proper care and use of computer hardware and software	*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*	*R*
Uses computer hardware and software in an ethical manner			*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*	*R*
Uses concept software independently	*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Identifies a variety of electronic technologies, (e.g. TV, VCR, camcorder, digital camera)		*I*	*T*	*T*	*T*	*T*	*R*	*R*	*R*	R	R	R	R
Understands technology related vocabulary	*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*	*R*
Uses technology related vocabulary appropriately	*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*	*R*
Creates word processing documents with assistance		*I*	*T*										
Creates word processing documents independently				*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Uses calculators independently for problem solving			*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*
Uses desktop publishing to create a graphic image document			*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Maintains an e-mail account with assistance					*I*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Retrieves information using LAN and WAN systems				*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Uses information retrieval systems in an ethical manner				*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Manages system configurations with assistance						*I*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Uses keyboarding techniques		*I*	*T*	*T*	*T*	*T*	*T*	*R*	*R*	*R*	*R*	*R*	*R*
Uses a variety of electronic technologies, (e.g. TV, VCR, camcorder, digital camera)						*I*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Creates a multimedia project			*I*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Use a predesigned spreadsheet to enter simple labels				*I*									
Uses spreadsheet calculations and graphs within a project					*I*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Identifies parts of a computer system						*I*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Knows the history of computers and technology							*I*	*T*	*T*	*T*	*R*	*R*	*R*
Understands computer technology ethics and security					*I*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Creates a project containing database records					*I*	*T*	*T*	*T*	*T*	*T*	*T*	*R*	*R*
Search a database to locate specific information				*I*									

I = Introduced
T = Taught
R = Reinforced

STUDENT TECHNOLOGY OBJECTIVES

1. *Basic Operations and Concepts of Technology*

Establish a basic framework of concepts and skills essential for effectively using technology tools and resources. These concepts and operational skills provide a foundation for use of technology to support learning throughout the curriculum.

2. *Social, Ethical, and Human Issues*

Students understand the historical and societal impact that technology has had, is having, and is likely to have. They understand worker issues related to automation and retraining. Students evaluate new information resources and technological innovations based on their appropriateness to specific tasks and the individual's personal preferences, requirements and resources; they are sophisticated technology consumers. Students understand privacy, copyright, licensing, and intellectual property rights issues, and they make responsible decisions and exhibit ethical behavior related to them.

3. *Productivity Tools*

Students are well versed in the use of these tools to support their productivity in a wide variety of endeavors. Topics in this domain include word processing, database, spreadsheet, utility programs, telecommunications, multimedia (graphics, animation, digital video, sound, authoring, presentation), content-specific software and tools, and emerging technologies.

4. *Technology Tools for Communications*

Students obtain information from a variety of sources and media. Students use their knowledge of information tools to deal with the exponentially increasing and rapidly changing sources of information available to them. Topics in this domain include traditional and emerging research skills, remote information resources, electronic communication, distance learning and teleconferencing, networking, and research skills.

5. *Technology Tools for Research, Problem-Solving, and Decision-Making*

As students progress through school, they continuously improve their abilities to combine and match technology tools and resources to meet the learning challenges they encounter. Students apply effective strategies to assess the credibility of information sources and to resolve conflicting information. Topics in this domain include locating technology tools and information about them, using specialized personal productivity tools, self-monitoring of effectiveness, developing collaborative skills resolving information conflict, critically consuming information,

and using intelligent agents and sophisticated search techniques to support research, problem-solving, and decision-making.

GOALS FOR STUDENT INSTRUCTIONAL TECHNOLOGY

The goals of instructional technology for **elementary schools** are to increase student achievement, provide opportunities to develop problem-solving techniques, and establish an environment where students can view and use technology as a tool to enhance the education process. Specifically, technology-related skills and concepts are taught in the elementary computer education curriculum.

Upon completing elementary school, *students* will be able to:

• Use technology and educational software in concept development and critical thinking

• Access data that can be manipulated for the purpose of determining relationships within the information

• Use technology in a variety of ways to approach problem solving.

• Use technology with greater ease in the revision/correction of written expression.

• Use creativity in communicating through desktop publishing, multimedia, and graphics.

• Use technology as a natural part of the daily work and living experience.

• Take greater responsibility for their own learning.

• Communicate and exchange ideas with others outside the school through telecommunications.

• Enhance thinking and learning through the use of instructional technology.

• Exhibit increased levels of motivation and self esteem when interacting with instructional technology and other students.

• Access technology to experience educational settings outside of the classroom through electronic field trips.

• Use E-mail to enhance the writing process by writing to express, to inform, and to persuade with local and distant pen pals.

• Improve their skills through self-paced computer programs with drill and practice.

• Demonstrate a level of competence with technology that translates into increased academic performance.

The goal of instructional technology for **junior high school** is to integrate the use of instructional technology in all curriculum areas to produce students who can use technology to communicate effectively and process information to solve problems.

Upon completing junior high school, the *student* will be able to:

• Use word processing, telecommunications, graphics, and mixed electronic media to communicate.

• Use spreadsheets to manipulate numerical data and establish parameters for solving problems.

• Use databases for information storage and retrieval.

• Use the computer to investigate and master subject area disciplines.

• Use the information super highway to access curriculum resource and take electronic field trips.

• Demonstrate a level of competence with technology that translate into increased academic performance.

The goal of instructional technology for **high school** is to apply and further integrate the use of instructional technology in all curriculum areas to produce students who can use technology efficiently and effectively to communicate. Students can gather and process information to solve problems; and who are prepared to function in post-secondary education, the world of work, and in a technological society.

Upon completing high school, students will be able to:

• Use word processing and create and manipulate databases, spreadsheets, and related applications software used in all subject areas.

• Improve the quality of their written work by expanding vocabulary and decreasing spelling and grammatical errors.

• Use appropriate technological resources available for research projects, independent research, reporting, creative and critical thinking skills.

• Use the Internet, WWW for research projects, independent research, reporting, creative and critical thinking skills.

• Create multimedia presentations.

• Use graphing calculators to integrate learning experiences in mathematics.

• Use computer applications for drawing and composing in art.

• Increase proficiency in HTML, etc. by developing Web pages.

• Access applications for word processing, databases and spreadsheets.

• Use audiovisual equipment to record activities.

• Use technology to access job opportunities through career-to-work programs coupled with distance learning.

• Demonstrate a level of competence with technology that translates into increased academic performance.

Nevada Computer and Technology Education Standards

Grades 3, 5, 8, and 12

Effective July 1, 2000

Nevada Computer and Technology Education Standards
Third Grade

By the end of the third grade, pupils must know and be able to do everything required in the previous grades for courses in technology and computers offered in public schools. Instruction in the third grade in technology and computers must be designed so that pupils meet the following performance standards by the completion of the third grade.

1. To develop the ability to use productivity tools, pupils must be able to use appropriate productivity tools, including, without limitation, word processing, spreadsheets, databases, multimedia and telecommunications, as demonstrated by the ability of the pupil to:

a) Locate and use letters, numbers, and special keys on a keyboard using the left or right hand;

b) Type and edit a document;

c) Search a database to locate specific information;

d) Use a pre-designed spreadsheet, enter simple labels values, and formulas, including, without limitation, three-cell formulas such as “2+2=4”;

e) Use multimedia software;

f) Explain the purpose of a multimedia presentation;

g) Create and save files on various storage media;

h) Identify the differences between network and stand-alone computer systems;

i) Identify a variety of electronic communication devices;

2. In the area of tools used for research, pupils must be able to use various tools of technology to research information and evaluate the accuracy and appropriateness of the information to solve problems and make decisions, as demonstrated by the ability of the pupil to:

a) Contribute an idea for a topic or definition of a problem;

b) Contribute one appropriate keyword to group of keywords for a topic or problem, and use the keyword to conduct an electronic search;

c) Work within a group to select research materials successfully;

d) Identify an organizational tool and place information within a format;

e) Participate in sharing his portion of the research with other members of his group; and

f) Summarize the research process of the class and discuss the results of the research process.

3. In the area of tools and processes, pupils must be able to identify, apply and manage various concepts, tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions, as demonstrated by the ability of the pupil to:

a) Identify tools and resources used in technology and computers;

b) Regularly select and manipulate tools for tasks in the areas of technology and computers;

c) Demonstrate the importance of safety while working with technology and computers; and

d) Regularly resolve difficulties using tools or devices with practice guided by a teacher.

4. In the area of systems, pupils must be able to recognize that systems are made up of individual components and that each component affects the operation of the entire system and its relationship with other systems, as demonstrated by the ability of the pupil to:

a) List the parts of an open and a closed loop system;

b) Given a system, explain how the parts of that system work together to achieve a desired outcome;

c) List and group technological systems, including, without limitation, construction, energy, power, transportation, biotechnology and manufacturing.

5. In the area of implications of technology and computers on society, pupils must be able to evaluate the impact and ethical implications of technology and manufacturing.

a) Explain computer piracy and its implications;

b) Use proper etiquette when using electronic communications;

c) Identify changes in the school environment and in the community that are a result of technology;

d) Discuss common uses of technology in daily life and the advantages and disadvantages provided by those uses of technology;

e) With the assistance of a teacher, list several careers which currently exist that were not in existence when the pupil was born;

f) Explain how physical environments are changed by human activity through technology

Nevada Computer and Technology Education Standards
Fifth Grade

By the end of the fifth grade, pupils must know and be able to do everything required in the previous grades for courses in technology and computers offered in public schools. Instruction in the fifth grade in technology and computers must be designed so that pupils meet the following performance standards by the completion of the fifth grade:

1. To develop the ability to use productivity tools, pupils must be able to use appropriate productivity tools, including, without limitation, word processing, spreadsheets, databases, multimedia and telecommunications, as demonstrated by the ability of the pupil to:

a) Demonstrate and use correct finger placement for basic keyboarding skills;

b) Use basic formatting techniques on a computer, including, without limitation, selection of the font type, size and color;

c) Use the tools of a computer to edit a composed document, including, without limitation, spell check;

d) Include graphic in a document;

e) Create a database using predefined fields, such as listing fields and formulas for an entry in a database or spreadsheet;

f) Enter data for multiple records;

g) Print reports based on sort and query, such as searching for certain criteria in a specific field;

h) Under the guidance of a teacher or media specialist, construct a spreadsheet;

i) Create a multimedia document or presentation to organize and present an idea using text, graphics or sounds, or any combination thereof;

j) Describe and use the file management system of a computer;

k) Explain the differences between data files, program files and operating system files;

l) Describe access privileges and demonstrate the process of obtaining access where possible;

m) Define distance learning, telecommuting and teleconferencing.

2. In the area of tools used for research, pupils must be able to use various tools of technology to research information and evaluate the accuracy and appropriateness of the information to solve problems and make decisions, as demonstrated by the ability of the pupil to:

a) With the direction of a teacher or media specialist:

1) Individually select a research topic or define a problem, give a possible outcome of the research of the topic or problem, and list available tools of technology that can be used:

2) Generate a list of keywords to conduct an electronic search; and

3) Explore hyperlinks to select and evaluate information useful to the research of a topic or problem;

b) While working in a group, identify a tool for organizing the research of a topic or problem, and place information within a format;

c) Demonstrate an understanding of intellectual property, and identify the source and content of information collected;

d) Collaboratively list sources used to research a topic or problem; and

e) With the direction of a teacher or media specialist, summarize the research process and evaluate its outcome.

3. In the area of tools and processes, pupils must be able to identify, apply and manage various concepts, tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions, as demonstrated by the ability of the pupil to:

a) List technological resources, including, without limitation, people, information, materials, machines, energy, effort, capital resources and time;

b) Demonstrate the use of tools and materials to design or develop products or projects;

c) Select and demonstrate the safe use of tools; and

d) Identify situations where incorrect, inoperable or inappropriate tools are being used and cooperatively take appropriate actions to correct such situations.

4. In the area of systems, pupils must be able to recognize that systems are made up of individual components and that each component affects the operation of the system and its relationship with other systems, as demonstrated by the ability of the pupil to:

a) List the parts of open, closed, simple, complex, micro and macro systems;

b) Cooperatively identify resources necessary to achieve a desired outcome; and

c) Given a multitude of systems, sort the systems according to the type and level of the system.

5. In the area of implications of technology and computers on society, pupils must be able to evaluate the impact and ethical implications of technology and computers on persons, society and the environment, as demonstrated by the ability of the pupil to:

a) Explain how a given object was developed to meet a human need or desire;

b) Communicate the positive or negative outcomes of technology;

c) Compare and contrast the technological developments within a given career; and

d) Discuss changes in information technologies and the effect that these changes have on the workplace and society.

Nevada Computer and Technology Education Standards
Eight Grade

By the end of the eighth grade, pupils must know and be able to do everything required in the previous grades of courses in technology and computers offered in public schools. Instruction in the eighth grade in technology and computers must be designed so that pupils meet the following performance standards by the completion of the eighth grade.

1. To develop the ability to solve problems, pupils must be able to use problem-solving processes and resources to reach a desired outcome, as demonstrated by the ability of the pupil to:

a) Describe more than one design or problem-solving method;

b) Select an appropriate design or problem-solving method; and

c) Generate a desired outcome using a design or problem-solving method.

2. To develop the ability to use productivity tools, pupils must be able to use appropriate productivity tools, including, without limitation, word processing, spreadsheets, databases, multimedia and telecommunications, as demonstrated by the ability of the pupil to:

a) Demonstrate proficiency and accuracy in keyboarding skills;

b) Type, edit and print a document;

c) Use advanced formatting techniques, including, without limitation, margins, line spacing and tabs;

d) Import graphics with appropriate placement into a document;

e) Search for and replace text without a document;

f) Create a database, define fields and enter data for multiple records;

g) Develop a spreadsheet that includes, without limitation, labels, values, formulas and functions;

h) Create a chart that visually represents data;

i) Print a spreadsheet showing the formulas used in a spreadsheet;

j) Create a multipage, multimedia presentation using text, graphics and sound to communicate a concept effectively;

k) Organize files on a computer disk, hard drive, server or other storage device;

l) Explain how:

1) A local area network, or LAN;

2) An Intranet; and

3) The Internet, operates when compared to a stand-alone system;

m) Use an available electronic communication device, including, without limitation, email, a facsimile machine, a telephone and two-way radio; and

n) Explain the advantages of connectivity for sharing information and resources.

3. In the area of tools used for research, pupils must be able to use various tools of technology to research information and evaluate the accuracy and appropriateness of the information to solve problems and make decisions, as demonstrated by the ability of a pupil to:

a) With the assistance of a teacher or media specialist, select a research topic or develop a statement of a problem, and identify the elements, scope and expected outcome of the research on the topic or problem;

b) Independently generate a list of keywords to conduct a search using electronic-based source;

c) Use hyperlinks to explore additional possible sources of information when collecting information;

d) Place information within an organizational chart;

e) Demonstrate an understanding of intellectual property by citing sources of copyrighted materials in papers, projects and multimedia;

f) Analyze selected information for reliability, authenticity, and timeliness;

g) Contribute to generating a standard bibliography while working with a group; and

h) Independently list the steps of the process of the research and judge the outcome of the research.

4. In the area of tools and processes, pupils must be able to identify, apply and manage various concepts, tools, and resources to evaluate their accuracy and appropriateness in solving problems and making decisions, as demonstrated by the ability of the pupil to:

a) List the tools and resources needed to solve a problem in a technology or computer area;

b) Demonstrate the proper use of tools, instrumentation, equipment, materials and processes while fabricating models, designs, simulations and prototypes;

c) Given a situation, describe or define the correct use of tools, processes and materials in diverse technology and computer applications; and

d) Correctly operate and perform appropriate maintenance on technology tools.

5. In the areas of systems, pupils must be able to recognize that systems are made up of individual components and that each component affects the operation of the system and its relationship with other systems, as demonstrated by the ability of the pupil to:

a) List resources necessary to achieve a desired outcome;

b) Describe how the output of one system could be the input for another system;

c) Given the systems in the area of technology, determine how those systems are controlled to achieve a desired outcome; and

d) Select and use an appropriate system to achieve a given outcome.

6, In the area of implications of technology and computers on society, pupils must be able to evaluate the impact and ethical implications of technology and computers on persons, society and the environment, as demonstrated by the ability of the pupil to:

a) Practice legal and ethical behaviors when using information and technology, and discuss the consequences of misusing such information and technology;

b) Describe how technology on career options; and

c) Demonstrate that people control technology and are responsible for the effects of technology.

Nevada Computer and Technology Education Standards
Twelve Grade

By the end of the 12th grade, pupils must know and be able to do everything required in the previous grades for courses in technology and computers offered in public schools. Instruction in the 12th grade in technology and computers must be designed so that pupils meet the following performance standards by the completion of the 12th grade:

1. To develop the ability to solve problems, pupils must be able to use problem-solving processes and resources to reach a desired outcome, as demonstrated by the ability of the pupil to:

a) Compare and contrast a variety of approaches to problem solving;

b) When given a problem, effectively design a method for solving the problem; and

c) Create, with technical accuracy, designs or models for solving problems in one of the following areas of technology:

1) Energy, power and transportation;
2) Communication;
3) Construction; and
4) Manufacturing

2. To develop the ability to use productivity tools, pupils must be able to use appropriate productivity tools, including, without limitation, word processing, spreadsheets, databases, multimedia and telecommunications, as demonstrated by the ability of the pupil to:

a) Type a multipage word processing document that is correctly formatted, including, without limitation, using headers, footers, pagination, line spacing and margin settings;

b) Use appropriate tools such a spell check and a thesaurus;

c) Create a database, define fields and enter data for multiple records;

d) Interpret reports based on data;

e) Create and print a chart that visually represents data from a spreadsheet;

f) Analyze the significance of the data that is included in a spreadsheet;

g) Create and present a multipage, multimedia presentation using:

1) Animation;
2) Digital video; or
3) Linking, with text, graphics and sound;

h) Identify the intended message of a multimedia presentation;

i) Organize files on a computer disk, hard drive, server or other storage device;

j) Compare and contrast:

1) A local area network, or LAN
2) A wide area network, or WAN;
3) An Intranet;

k) Compare and analyze the appropriate uses of a variety of electronic communications; and

l) Locate and evaluate sources of distance learning, telecommuting, and teleconferencing.

3. In the area of tools used for research, pupils must be able to use various tools of technology to research information and evaluate the accuracy and appropriateness of the information to solve problems and make decisions, as demonstrated by the ability of the pupil to:

a) State a research topic or problem and list the elements, limits and expected outcomes of the research on the topic or problem;

b) Independently generate a list of keywords for a research topic or problem, with qualifying modifiers to narrow a search of electronic-based resources;

c) Using a variety of search strategies, use hyperlinks to select information;

d) Select an organizational tool and accurately place collected information within a format to aid in making a decision;

e) Create a standard bibliography or work-cited page; and

f) Complete a rubric for the evaluation of the results of the research of a topic or problem.

4. In the area of tools and processes, pupils must be able to identify, apply and manage various concepts, tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions, as demonstrated by the ability of the pupil to:

a) Conduct research in an area related to computers or technology, and explain how new tools, materials, and processes are necessary to maintain and improve high productivity and quality;

b) Use tools, with minimal direction, to produce solutions in an area related to computers or technology;

c) Select the correct tool and process to complete a task; and

d) Under the supervision of a teacher or media specialist, correct nonfunctioning technology systems.

5. In the area of systems, pupils must be able to recognize that systems are made up of individual components and that each component affects the operation of the entire system and its relationship with other systems, as demonstrated by the ability of the pupil to:

a) Explain the evolution of a given system or process;

b) Design a model of a system to produce a desired outcome; and

c) Given a system, identify possible ways to improve the product, productivity or management, or any combination thereof, generated by the system.

6. In the area of implications of technology and computers on society, pupils must be able to evaluate the impact and ethical implications of technology and computers on persons, society and the environment, as demonstrated by the ability of the pupil to:

a) Compare and contrast the impacts of new products and services on the quality of life;

b) Given a specific technology, determine possible outcomes from the use of the technology and the acceptability of those outcomes;

c) Develop a career plan; and

d) Discuss the advantages and disadvantages of widespread use of and reliance on technology in the marketplace and in society as a whole.

Courses taught at the high school level:

Computer Literacy

A course of study in computer literacy must:

Identify potential career opportunities using computer skills and describe the skills required for such careers.

Demonstrate the ways in which computer software, hardware and peripherals may be used to meet personal needs.

Explain the ways in which the use of a computer may lead to the invasion of the privacy of a person.

Explain the relevant issues related to copyright laws, security of data and ethics in the use of information.

Explore recent historical developments of the computer and understand their implications for the future.

Require pupils to:

Demonstrate an understanding of concepts related to word processing, data bases, spreadsheets, telecommunications, multimedia presentations, graphics and desktop publishing.

Create, edit, store, and print text using a word-processing program.

Application of computers

A course of study in the application of computers must include instruction designed to teach the pupil to do the following:

Create, store and retrieve personal files by using a data base program.

Create, manipulate and make projections by using a spreadsheet program.

Create, edit, develop a format, store, retrieve and print text using a word-processing program.

Access a commercial database or a simulated database using telecommunications.

Demonstrate an understanding of applications of desktop publishing and multimedia presentations and operation of a simple computer system.

Science of computers

A course of study in the science of computers must include instruction designed to teach the pupil to do the following:

Demonstrate knowledge of method of problem solving through algorithm development.

Recognize the proper techniques of designing, documenting and correcting errors, deficiencies, or other problems with a program.

Use the proper syntax and semantics of high-level programming language.

Use basic aspects of string processing, recursion, internal search and sort methods, and simple procedures.

Demonstrate an understanding of the architecture of a simple computer system.

Operate a simple computer system

The following school site technology recommended planed items are to be funded contingent upon adequate funding sources. The Technology Committee understands that this document is a "Living" document and as technology changes, so could the following guidelines.

TECHNOLOGY RECOMMENDED PLANNED ITEMS 2000-20005

- Hardware

FY 2000-2001

Item	**Estimated Price**
Eureka Elementary School	
Purchase 1 Digital Camera	$ 500.00
Eureka County High School	
Purchase 20 multimedia computers (SB 555 Grant)	$27,120.00
Purchase 1 digital camera (School to Careers)	$ 500.00
Purchase 1 color inkjet printer (School to Careers)	$ 125.00
Crescent Valley Elementary School	
Install T1 digital line (NNTC Grant)	$ 600.00
Purchase 1 year digital T1 subscription (NNTC Grant)	$ 9,468.00
Eureka County School District	
Purchase 5 fast Ethernet Switches	$ 1,250.00
Purchase 30GB hard drive server	$ 800.00
Install AS-400 wireless connection to Eureka County	$ 7,000.00
Total Hardware FY 2000-2001	**$47,363.00**

FY 2001-2002

Item	**Estimated Price**
Eureka Elementary School	
Purchase 1 print server in computer lab	$ 150.00
Eureka County High School	
Purchase 8 wireless laptop computers w/mobile cart	$22,500.00

Crescent Valley Elementary School	
Maintain digital T-1 access (split cost w/Eureka County)	$ 4,734.00
Purchase 8 wireless laptop computers w/mobile cart	$22,500.00
Eureka County School District	
Total Hardware FY 2001-2002	**$ 49,884.00**

FY 2002-2003

Item	**Estimated Price**
Eureka Elementary School	
Purchase 8 wireless laptop computers w/mobile cart	$22,500.00
Eureka County High School	
Purchase 8 wireless laptop computers	$12,000.00
Crescent Valley Elementary School	
Maintain digital T-1 access	$ 4,734.00
Purchase 1 print server in computer lab	$ 150.00
Eureka County School District	
Purchase new computer upgrades (#2 of existing)	$ 2,600.00
Total Hardware FY 2002-2003	**$ 41,984.00**

FY 2003-2004

Item	**Estimated Price**
Eureka Elementary School	
Purchase new computer upgrades (#6 of existing)	$ 7,800.00
Upgrade telephone system	$ 10,000.00
Purchase 1 digital camera	$ 500.00
Eureka County High School	
Purchase 8 wireless laptop computers	$ 12,000.00
Upgrade telephone system	$ 10,000.00
Teacher presentation devices (4 total)	$ 10,000.00
Purchase 2 print servers in computer lab	$ 300.00
Upgrade ParentLink voice mail system	$ 5,000.00

Crescent Valley Elementary School	
Purchase new computer upgrades (#4 of existing)	$ 5,200.00
Maintain digital T-1 access	$ 4,734.00
Eureka County School District	
Total Hardware FY 2003-2004	**$ 61,034.00**

FY 2004-2005

Item	**Estimated Price**
Eureka Elementary School	
Teacher presentation devices (4 total)	$ 10,000.00
Eureka County High School	
Purchase new computer upgrades (#10 of existing)	$ 13,000.00
Crescent Valley Elementary School	
Purchase 8 wireless laptop computers	$ 12,000.00
Purchase new computer upgrades (#6 of existing)	$ 7,800.00
Maintain digital T-1 access	$ 4,734.00
Teacher presentation devices (2 total)	$ 5,000.00
Purchase 1 print server in computer lab	$ 300.00
Eureka County School District	
Purchase new computer upgrades (#2 of existing)	$ 2,600.00
Total Hardware FY 2004-2005	**$ 55,434.00**

- **Software**

FY 2000-2001

Item	Estimated Price
Eureka Elementary School	
Purchase 3 additional CCC network software licenses	$ 6,000.00
Purchase educational software	$ 500.00
Eureka County High School	
Purchase educational software	$ 500.00
Crescent Valley Elementary School	
Purchase educational software	$ 500.00
Eureka County School District	
Total Software FY 2000-2001	**$ 7,500.00**

FY 2001-2002

Item	Estimated Price
Eureka Elementary School	
Upgrade computer workstations to Windows98 or higher	$ 1,500.00
Purchase site license of Inspiration Software	$ 200.00
Purchase educational software	$ 500.00
Eureka County High School	
Upgrade computer workstations to Windows98 or higher	$ 1,800.00
Purchase site license of Inspiration Software	$ 200.00
Purchase educational software	$ 500.00
Crescent Valley Elementary School	
Purchase 5 additional CCC networked software licenses	$ 10,000.00
Upgrade computer workstations to Windows98 or higher	$ 750.00
Purchase site license of Inspiration Software	$ 200.00
Purchase educational software	$ 500.00
Eureka County School District	
Upgrade computer workstations to Windows98 or higher	$ 75.00
Upgrade Network OS to Windows2000	$ 10,000.00

Upgrade to Exchange Server2000	$	8,000.00
Update District-Wide Library System	$	15,000.00
Total Software FY 2001-2002	**$**	**49,225.00**

FY 2002-2003

Item		**Estimated Price**
Eureka Elementary School		
Upgrade computer workstations to Office2000 or higher	$	1,400.00
Purchase educational software	$	500.00
Eureka County High School		
Upgrade computer workstations to Office2000 or higher	$	2,400.00
Purchase educational software	$	500.00
Crescent Valley Elementary School		
Upgrade computer workstations to Office2000 or higher	$	1000.00
Purchase educational software		
Eureka County School District		
Upgrade computer workstations to Office2000 or higher	$	100.00
Total Software FY 2002-2003	**$**	**5,900.00**

FY 2003-2004

Item		**Estimated Price**
Eureka Elementary School		
Purchase educational software	$	500.00
Eureka County High School		
Purchase educational software	$	500.00
Crescent Valley Elementary School		
Purchase educational software	$	500.00
Eureka County School District		

Total Software FY 2003-2004	**$ 1,500.00**

FY 2004-2005

Item	Estimated Price
Eureka Elementary School	
Purchase educational software	$ 500.00
Eureka County High School	
Purchase educational software	$ 500.00
Crescent Valley Elementary School	
Purchase educational software	$ 500.00
Eureka County School District	
Total Software FY 2004-2005	**$ 1,500.00**

- **Personnel/Supplies/Maintenance Agreements**

FY 2000-2001

Item	Estimated Price
Eureka Elementary School	
Eureka County High School	
Crescent Valley Elementary School	
Eureka County School District	
Microsoft Comprehensive Support	$1,800.00
NCS SASI Support	$3,000.00
Bon Appitit Food Service Support	$1,500.00
CCC Software Support	$3,600.00
Sonic Filter/Firewall Support/Upgrade	$ 800.00
Laser toner replacement cartridges	$1,500.00
Computer/Technology hardware Maintenance	$2,000.00
Cisco Router Maintenance	$ 270.00
McAfee VirusScan Maintenance	$2,000.00

General Supplies	$1,500.00
Total Personnel/Supplies FY 2000-2001	**$ 17,970.00**

FY 2001-2002

Item	**Estimated Price**
Eureka Elementary School	
Eureka County High School	
Crescent Valley Elementary School	
Eureka County School District	
Microsoft Comprehensive Support	$1,800.00
NCS SASI Support	$3,000.00
Bon Appitit Food Service Support	$1,500.00
CCC Software Support	$3,600.00
Sonic Filter/Firewall Support/Upgrade	$ 800.00
Laser toner replacement cartridges	$1,200.00
Computer/Technology hardware Maintenance	$1,500.00
Cisco Router Maintenance	$ 270.00
McAfee VirusScan Maintenance	$2,000.00
General Supplies	$1,500.00
Total Personnel/Supplies FY 2001-2002	**$ 17,970.00**

FY 2002-2003

Item	**Estimated Price**
Eureka Elementary School	
Eureka County High School	
Crescent Valley Elementary School	
Eureka County School District	

Microsoft Comprehensive Support	$1,800.00
NCS SASI Support	$3,000.00
Bon Appitit Food Service Support	$1,500.00
CCC Software Support	$3,600.00
Sonic Filter/Firewall Support/Upgrade	$ 800.00
Laser toner replacement cartridges	$1,200.00
Computer/Technology hardware Maintenance	$1,200.00
Cisco Router Maintenance	$ 270.00
McAfee VirusScan Maintenance	$2,000.00
General Supplies	$1,500.00

Total Personnel/Supplies FY 2002-2003 **$ 17,970.00**

FY 2003-2004

Item	**Estimated Price**
Eureka Elementary School	
Eureka County High School	
Crescent Valley Elementary School	
Eureka County School District	
Microsoft Comprehensive Support	$1,800.00
NCS SASI Support	$3,000.00
Bon Appitit Food Service Support	$1,500.00
CCC Software Support	$3,600.00
Sonic Filter/Firewall Support/Upgrade	$ 800.00
Laser toner replacement cartridges	$1,500.00
Computer/Technology hardware Maintenance	$1,500.00
Cisco Router Maintenance	$ 270.00
McAfee VirusScan Maintenance	$2,000.00
General Supplies	$1,500.00

Total Personnel/Supplies FY 2003-2004 **$ 17,970.00**

FY 2004-2005

Item	Estimated Price
Eureka Elementary School	
Eureka County High School	
Crescent Valley Elementary School	
Eureka County School District	
Microsoft Comprehensive Support	$1,800.00
NCS SASI Support	$3,000.00
Bon Appitit Food Service Support	$1,500.00
CCC Software Support	$3,600.00
Sonic Filter/Firewall Support/Upgrade	$ 800.00
Laser toner replacement cartridges	$1,500.00
Computer/Technology hardware Maintenance	$1,500.00
Cisco Router Maintenance	$ 270.00
McAfee VirusScan Maintenance	$2,000.00
General Supplies	$1,500.00
Total Personnel/Supplies FY 2004-2005	**$ 17,970.00**

Category Totals FY 2000-2005

Hardware	**$255,699.00**
Software	**$ 65,625.00**
Supplies/Maintenance	**$ 89,850.00**
Total FY 2000-2005	**$411,174.00**

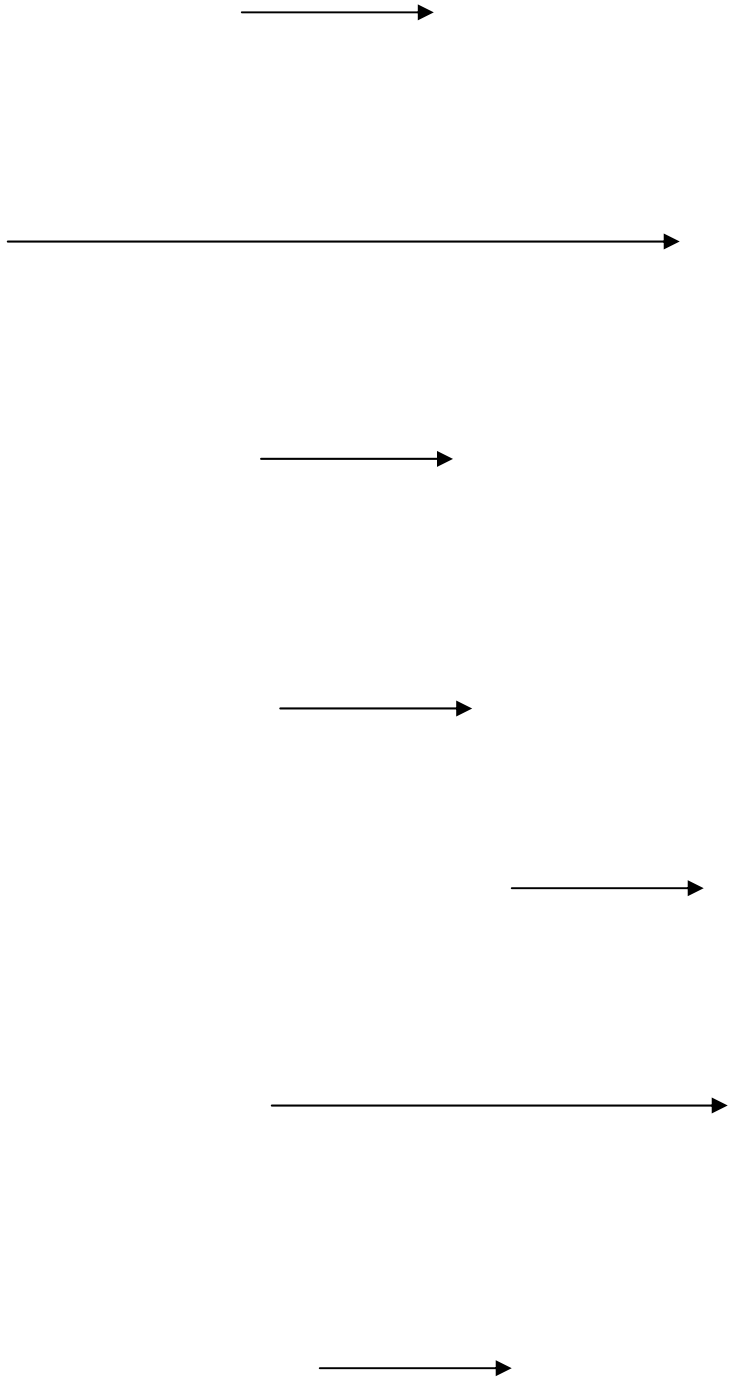
TECHNOLOGY ACTIONS AND RECOMMENDATIONS TIMELINE

Actions By ECSD	Short-Term 2000-2001	Mid-Term 2002-2004	Long-Term 20005-
Develop ECSD Strategic Educational Plan	→		
Develop a district professional development plan that addresses the key changes the district needs to make to achieve its educational vision and goals.	→		
Review the district's performance-based curriculum to determine how to implement a technology scope and sequence framework to help teachers weave the district-adopted curriculum, student-centered learning practices, and technology into a rich learning environment for students.	→		
Revise the district technology plan to provide greater focus and support for instructional technology, referencing the district strategic vision and goals.	→		
Identify resources and support needed to carry out the district technology plan,	→		

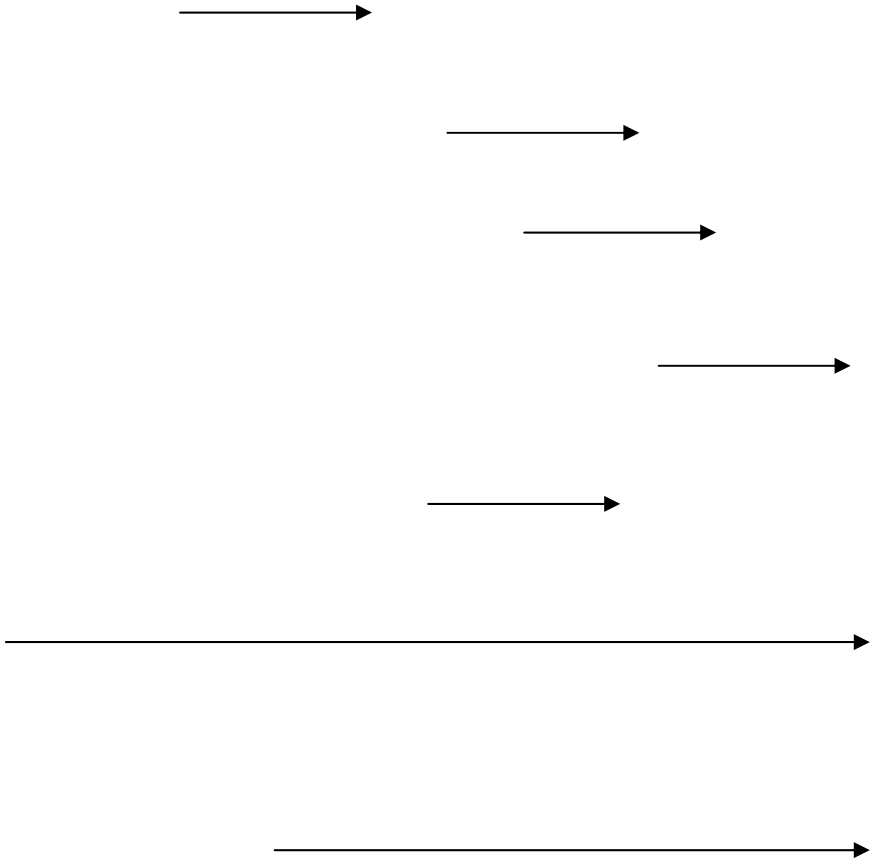
including instructional materials, professional development, and technology resources.			
Revise the district technology plan to align with the new state educational technology plan, "Implementing Technology to Support Student Learning."			
Move toward a broad-based implementation of project-based learning to support experiential learning efforts.			
Actions By ECSD	**Short-Term 2000-2001**	**Mid-Term 2002-2004**	**Long-Term 20005-**
Establish pilot programs with “willing” teachers who can serve as guides and mentors to other staff as they implement changes suggested by the district plan			
Purchase up-to-date instructional software to support and align with the outcomes of the district's strategic plan			
Ensure that each school has a technology resource teacher who can support the integration of technology in instruction and work as mentors to classroom teachers			
Investigate innovative			

ways to free up staff during the school day to participate in professional development	→		
Incorporate a variety of technologies (voice, video and data) into the curriculum to support virtual opportunities to learn where students might not otherwise have access to real world opportunities. For example, field trips (Monterey Bay Aquarium), WebQuests, and other distance learning opportunities.		→	
Implement a "unit of practice" approach to instructional planning that guides teachers through the process of incorporating technology	→		
Hire a Curriculum specialist with expertise in the areas of Technology and Project-Based Learning		→	
Actions By ECSD	**Short-Term 2000-2001**	**Mid-Term 2002-2004**	**Long-Term 20005-**
Hardware & Software			
Purchase digital camera for EES	→		
Upgrade student/staff Office Applications to Office 2000, ECSD	→		
Upgrade desktop computer workstations to Windows98/2000		→	

Upgrade ECSD computer servers to Windows2000 server and Exchange server 2000
Purchase school site curriculum software programs aligned with each schools stregtic curriculum plans
Purchase Additional CCC Software Licenses for Crescent Valley Elementary School
Purchase Additional CCC Software Licenses for Eureka Elementary School
Purchase 16 station moble wireless laptop system for Eureka Elementary School with large screen presention device
Purchase 24 station moble wireless laptop system for Eureka County High School with large screen presentation device
Purchase 8 station moble wireless laptop system for Crescent Valley Elementary School with large screen presention device



Upgrade District-Wide Library Systems
Upgrade computer lab workstations at EES
Upgrade computer lab workstations at ECHS
Upgrade computer lab workstations at CVES
Upgrade staff computer workstations, ECSD
Maintain software support maintanence agreements, ECSD
Maintain T-1 data line for CVES to allow Internet access, e-mail, and District WAN



APPENDICES

ECSD TECHNOLOGY HARDWARE STANDARDS

- **Computer Workstations**
  Intel Pentium III processor, 10GB hard drive, 48X CD ROM drive, 1.44MB 3.5" Floppy Drive, 17" Color Monitor, 128MB RAM, Surge Protection
- **Computer Servers**
  Intel Pentium III processor, Dual 30GB hard drives (mirrored) (hot swappable), 48X CD ROM drive, 1.44MB 3.5" Floppy Drive, 15" Color Monitor, 256MB RAM, Redundant Power Supply, 600w Battery Backup, SCSI Ultra F/W Controller, Tape Backup Drive

ECSD DEMOGRAPHICS/FREE AND REDUCED LUNCH PERCENTAGES

- **Eureka County High School** ***36%**
- **Eureka Elementary School** ***22%**
- **Crescent Valley Elementary School** ***36%**

*as of 2/00

INSTRUCTIONAL TECHNOLOGY EVALUATION RECOMMENDATIONS (BARFIELD REPORT)

Eureka County School District
Instructional Technology Evaluation

I. Introduction

Eureka County School District (ECSD) received support over the past two years for its educational technology program from the Nevada Commission on Education Technology through Senate Bill 482 under Sections 61.1 and 61.2, including funds for a special project to be completed during the Spring of 1999. One aspect of this special project was to be an evaluation of the district's instructional technology program to determine its current status and utilization, and to recommend improvements in the design and delivery systems in order to promote student academic achievement. This report contains the findings and recommendations pursuant to that evaluation.

ECSD is the second smallest district in Nevada in terms of enrollment, with three schools and approximately 375 students. Until recently, it has enjoyed a prosperous economic base through the strength of the local mining industry. The strength of the national economy adversely affects the price of gold, which has plummeted to an 18 year low in recent years. As a result, ECSD's economic fortunes have changed significantly in the last two years. SB 482 resources have helped the district continue to make progress on its comprehensive technology plan, originally developed in April, 1997 and updated in January 1998. Without this funding, the district may have been challenged to continue its strong commitment to the integration of technology throughout the district.

Under the direction of current district leadership, tremendous strides have been made to implement a sound technical infrastructure that can support the integration of technology into a reformed curriculum that is student-centered and performance-based. The district has been working over the last year to revise its curriculum to incorporate new state standards. In the Fall of 1999 a new superintendent will take over the reins of leadership in the district. The efforts over the last year to build a strong foundation for technology and instruction will be a significant starting point for the new administration.

II. Need for the Project

The district's extensive technology plan, The School Technology Evolution Plan, or "STEP" has provided an excellent blue print for the implementation of a strong technical infrastructure and support system within the district. The district's mission, in developing this plan, was to

"facilitate a technologically rich environment that enhances instruction, student learning, and meets administrative needs for the Eureka County School District."

Successful, life-long learning for all learners is the goal the district has tried to address using technology, with a recognition that technology is "an effective and necessary tool, capable of enhancing both the communication ability and productivity capacity" of students, staff and parents. The district technology plan recognizes that "the opportunity to develop technological proficiency will enable students and staff to maximize their access to information, enhance problem-solving skills and develop effective communication in the Information Age."

Although great progress has been made in installing a state-of-the-art infrastructure, and in using it for administrative purposes, the superintendent and staff would like to improve the use of the resources to support student learning. Year three of the district technology plan should support the best instructional use possible given the resources that have been devoted to infrastructure.

ECSD seeks, through this evaluation, to understand what must be done to make greater progress in identifying the ways in which technology can be utilized in order to improve student academic achievement.

This investigation assesses the current design, structure and implementation of the district's instructional technology program. This assessment identifies the extent to which the existing infrastructure is being used to support student learning and identifies areas of under-utilization. This evaluation also identifies and recommends best practices in instructional technology that, if implemented, can have a positive impact on student achievement. Finally, this report will provide a summary of the latest research findings on the effective use of technology to support student achievement.

This report will be used to make necessary changes to the district's technology plan as the final year of the plan begins in the Fall of 1999, and to inform the development of a new technology plan for the future. The implications of the findings and recommendations on the district's planning efforts will be coordinated with guidelines and assessment criteria established by the Northeast Nevada Consortium and the Nevada Commission on Educational Technology.

III. Expectations for Technology in Instruction

The benefits of using technology to manage the administrative functions of a school or school district are quite easy to see--student information systems, budget management systems, administrative reporting systems--make life easier for the harried administrator wearing multiple hats. School networking allows teachers and administrators to share files and applications, communicate with each other and access information resources. Schools of today, like businesses of today, could hardly function without technology.

Technology is not really new to schools. Teachers and students have been making good use of learning tools throughout the history of formal schooling. In one of the more sophisticated examples, distance learning programs, relying on a combination of video, telephone and early computer technology, became a fixture during the 1980's--long before the arrival of the World Wide Web.

But there's something different going on today. Growing numbers of education stakeholders -- including teachers, policy makers, parents, the business community and even the nation's President -- believe that new technologies can help schools address some of education's most pressing challenges. Expectations tend to be enormous.

Common Goals of Instructional Technology Programs

There are three common outcomes for an instructional technology program:

1. Technical literacy that will allow students to compete successfully in the economy of the 21st century.
2. Rapid and successful remediation for students with less developed basic skill mastery.
3. Advanced information literacy that will enable students to develop higher order thinking skills.

Each of these outcomes is distinctly unique from the others, and each could stand independently as the outcome desired by a district for its instructional technology program. Achieving any one of them is a daunting challenge unto itself. There are few ready-made solutions that work across all districts. Most districts see the need for achieving all three of these simultaneously. The question is how to do that successfully.

To answer that question, it is important to trace the roots of technology's use in education and clarify the underlying pedagogical approach that underlies each of these potential goals. The following review is summarized from a compilation of research on education technology by the Northeast Regional Education Laboratory (NCREL, 1997).

Behavioral Approach to Learning

During the mid-20th century, behavioral psychology became so infused into so many areas of education that some claim it has become the basis for the current American educational system (Berryman, 1993). Directly challenging the "social Darwinism" of the early part of the century, ironically Skinner's emphasis on learned responses, and the resulting development of programmed instruction, paved the way for more advanced instructional technologies that were to come.

Skinner was also responding to the move toward more passive instruction brought about by larger class sizes necessitated by vast waves of immigration. Building on the work of Sidney

Pressley, Skinner wanted to individualize learning and make it more interactive (Saettler, 1968) He also sought to make learning more efficient and productive. His theory of "operant conditioning" allowed for motivational factors such as immediate reinforcement, self-pacing of materials, and the sequencing of steps to reduce errors to nil from factual to inferential teaching frames (Skinner, 1958). "Teaching Machines" thus provided the means to facilitate efficiency in learning by allowing individuals to excel at their own pace. It required mastery of programmed units in order to advance in the sequential order established by the program for a predetermined body of knowledge. This later point is key in understanding some critics' claim that what programmed instruction does is "take the control of learning out of the hands of the teacher and places it into the hands of the program author, not into the hands of the learner" (Berryman, 1993).

Behaviorist (stimulus-response) theories of learning, such as those advocated by Thorndike, Hull and Skinner, defend a linear sequence of instruction. The goals of a behavioral curriculum are based on transmitting an established knowledge base in support of a "view of knowledge as an assembly of specific responses, a form of knowledge often expressed as detailed behavioral objectives in curricula and assessment" (Greeno, Collins, & Resnick, 1996).

This theory of learning is most clear today as the foundation for drill and practice software that supports the development or remediation of basic skills.

Socio-Cultural Approach to Learning

Workforce research conducted in the late 1980's identified a hierarchy of cognitive skills necessary for success in today's world of work. Berryman (1993) concludes that changes in the workplace are mandating changes in K-12 curriculum, including changes from inert learning theories and practices to active contextual learning theories and practices. Grabinger (1996) maintains that current workforce skill requirements for blue-collar positions require "the ability to apply experience and knowledge to address novel problems. Consequently, learning to think critically; to analyze and synthesize information to solve technical, social, economic, political, and scientific problems; and to work productively in groups are crucial skills for successful and fulfilling participation in our modern, competitive society."

Social learning theories provide a foundation for active learning that "encourages the growth of student responsibility, initiative, decision-making, and intentional learning . . . utilizing dynamic, generative learning activities that promote high-level thinking processes (i.e. analysis, synthesis, problem solving, experimentation, creativity, and examination of topics from multiple perspectives) to help students integrate new knowledge with old knowledge and thereby create rich and complex knowledge structures" (Grabinger, 1996).

Dewey explained the implications for educators. First, the educator must organize experiences toward a desired effect, an educational approach that takes into account one's own insight and

judgment from past experiences. Second, the educator must recognize and accommodate for surroundings that are conducive to experiences that will lead to growth (Dewey, 1939).

This theory of learning is evident in the development of technical literacy skills and collaborative learning skills that allow students to carry out a wide range of authentic tasks in project-based learning situations.

Cognitive Approach to Learning

The cognitive approach "treats knowing as having structures of information and processes that recognize and construct patterns of symbols in order to understand concepts and to exhibit general abilities, such as reasoning, solving problems and using and understanding language (Greeno, Collins, & Resnick, 1996). Gardner explains the goal of cognitive science is to "discover the representational and computational capacities of the mid and their structural and functional representations in the brain."

Learning that does not challenge students to uses these processes of the brain is passive. "Passive learning means that learners do not interact with problems and content and thus do not receive the experiential feedback so key to learning. Students need chances to engage in choice, judgment, control processes, and problem formulation; they need chances to make mistakes. (Berryman, 1993).

Berryman (1993) looks to the seminal work conducted by Collins et al. (1989) regarding cognitive apprenticeship as a way of addressing the changes that are needed in educational institutions promoting cognitive development. Collins' theory of cognitive apprenticeship is closely aligned with the development of advanced technology-based learning systems and the emergence of construtivism.

Collins (1991) claims that "technology enables us to realize apprenticeship learning environments that were either not possible or not cost effective before." He describes a set of six design criteria for building technology-based learning environments: 1) situated learning, 2) modeling and explaining, 3) coaching, 4) reflection on performance,5) articulation, and 6) exploration.

Technology applications that support a cognitive approach to learning need to have open-ended features making it easy for teachers and students to adapt and/or create the criteria for feedback loops that support the cognitive apprentice. The development of higher order thinking skills in this way is supported by technology programs that emphasis advanced information literacy methods, such as project-based learning.

Impact on Student Achievement

America has been having a love affair with the standardized test for more than fifty years now. In a recent article, *The Assessment Culture*, Education Week (June 16, 1999) traced the history of the use of standardized tests in education. Such tests work best when a predetermined curriculum is rigorously covered. Results then indicate whether students have, in fact, mastered the curriculum. We tend to call this "teaching to the test." It is commonly agreed that what students learn through more open-ended, authentic tasks is difficult to measure with standardized tests. This has led to important developmental work in alternative assessments, such as performance-based assessments, that can demonstrate what students know and are able to do.

There is a common desire to demonstrate the usefulness of technology in education by being able to produce higher test scores using it. NCREL (Tinzmann & Foertsch) conducted an exhaustive review of the literature in 1998 to answer the question, "What effect does technology have on test scores?" If higher test scores on standardized tests is the real goal of an instructional technology program, then their response is this: "Technology can improve test scores in two ways: by increasing the type of student learning measured by standardized tests, and by delivering test preparation activities."

If "student achievement" is defined more broadly to mean the acquisition other higher order thinking skills, then research results are more mixed and must be interpreted on a more refined level. "Results tended to differ according to the type of technology used and how it was implemented" (Tinzmann & Foertsch, 1998). Recently a number of meta-analyses have been conducted to determine the effect of technology on student achievement. In spite of differences in 12 studies reviewed, "each meta-analysis concluded that instructional programs that included technology showed a positive impact on student achievement, resulting in higher test scores" (Tinzmann & Foertsch). Certain factors explain why the use of some applications can lead to increased student achievement. "These factors include a match between the goals of instruction, characteristics of learners, the design of software, and teachers' decisions about implementation (Sivin-Kachala & Bialo, 1993).

IV. Plan of Operation for Conducting a Qualitative Review

To assess the current design, structure and implementation of instructional technology in ECSD, a qualitative case study of the district was conducted. This study was conducted through site visits and observations of classroom instruction; meetings and interviews with selected staff members, including teachers and administrators; review of district documents on planning and infrastructure implementation. The study was carried out in the following steps:

1. Study Questions: The superintendent, technology staff and other key individuals identified by the superintendent were asked to review and comment on an initial set study questions. Given the limitations of time and resources, these questions were to those most critical for the future improvement of the district's instructional technology program. The initial set of questions were framed by the "seven dimensions of learning"

rubric developed by the Milken Exchange on Educational Technology, and adapted in the Nevada state technology plan. Appendix A contains sample questions for discussion as identified by the state technology plan.

2. Site Visits: Draft interview formats were prepared by the contractor and reviewed by the district technology committee prior to administration with staff. This included an interview record format and sample questions. A schedule for visiting each school was arranged so that as many teachers as possible could be interviewed and classrooms observed as possible during one week.

3. Interviews and Classroom Observations: Interviews were conducted with 22 district staff, including administrators, teachers and support staff, and 13 classroom observations were conducted during the week of April 20th, 1999.

4. Surveys: Two surveys were administered to staff during the Spring of 1999 regarding their use of technology. The first was selected by the Northeast Nevada Technology Consortium and distributed to ECSD teachers and staff for completion in March. The second was developed by the contractor for this evaluation and completed by staff in early May, 1999. These surveys were compiled and analyzed using SPSS to determine descriptive statistics, correlations, and prepare charts. The two surveys were matched, where possible, and further correlations were investigated.

5. Review of District Documents on Planning and Infrastructure Implementation: A review was conducted of the technology plan developed by the district, the applications for NCET funding under Senate Bill 482, training plans, QED surveys, other documents and the infrastructure that has been implemented as a result, including hardware, software, networking, and telecommunications.

V. Results from the Qualitative Review

Most school districts across the country are working to integrate technology into their schools and classrooms. In many ways the push to achieve "every classroom on the Internet" in the 1990s is akin to the drive to automate the workplace in the 1980s. For many years, critics asked when we were going to see the benefits of the "paperless office" promised by the techno-enthusiasts. And today, critics such as Larry Cuban, professor of education at Stanford University, question whether technology is being implemented by schools at the expense of other reform efforts.

As the century draws to a close we are realizing that technology has radically changed the workplace and fueled an unprecedented level of growth in the US economy, as Federal Reserve Chairman Alan Greenspan recently commented. This level of change in the workplace did not occur until businesses figured out how to "reengineer" their business processes to take advantage of the technology. That evolution is occurring every day at an accelerating pace. The question

for education is how teaching and learning will be transformed in the next century as teachers, students, parents and communities become more technologically proficient.

Schools and districts must pay attention to the need to evaluate and document their experiences with technology to determine its impact on the teaching and learning process. Unfortunately, there are no easy solutions or cook books on how to do this when, in effect, schools have as many "technology programs" as they have individual teachers who have historically operated autonomously in the classroom to use and implement technology as they chose. This has led, in most schools, to a hodge podge of instructional technology titles, little or no coordination among teachers or across disciplines, and very diverse levels of knowledge, skill and ability among teachers and administrators. Needless to say, it has also led to diverse levels of enthusiasm as to observable benefits and outcomes based, for the most part, on anecdotal information.

A conceptual framework around which to discuss the impact of technology on teaching and learning has long been needed. That issue has been addressed by the Milken Exchange on Educational Technology and the "7 Dimensions of Learning" document produced last year. This document was used to frame the initial research questions for this study and will be used to summarize the findings from the qualitative study. Using this framework, it is possible to keep the focus on the outcomes of using technology to support teaching and learning, rather than on the technology itself.

Summary of Site Visit Findings

A four-day site visit in the Eureka County School District was conducted by the contractor in April, 1999 to interview teachers and observe classrooms in three district schools: Eureka Elementary School, Crescent Valley Elementary School, and Eureka High School. A total of 21 interviews were conducted, including conversations with 16 teachers, three principals, and two classified staff. The teachers who were interviewed represented 44% of the teaching force in the district. Two-thirds of the interviewees represented elementary schools, while one-third represented the high school. Teachers interviewed at Eureka High School and Eureka Elementary School represent approximately 30 percent of the teaching force at each school, while all teachers at Crescent Valley Elementary School were interviewed.

Each interviewee was asked about his or her personal use of technology to support classroom management and personal productivity; how and when their students use technology for classroom assignments; their views on ways to further support the use of technology in student learning; what training they need; and other comments about how the district could support technology in instruction and learning.

Some classrooms were observed at each school. Observations were made about the lay out of the classrooms, including student and teacher seating, and the placement of computers and other resource materials; the classroom climate; learning activities and objectives; interaction of teachers with students and with technology; and other details.

Observations and comments were compiled by the interviewer and summarized in a document which was sent by electronic mail to each teacher for review and correction. These files were then finalized and summarized for inclusion in this report.

Highlights:

Teachers:

- All teachers and staff interviewed were well informed about the district's efforts to expand the implementation and use of technology in the district over the last two years.
- Every teacher in the district has a computer on their desk and has access to administrative, classroom management, and productivity tools and to the Internet.
- Most teachers are becoming enthusiastic users of the technology for personal productivity, although some teachers are less comfortable with basic operations.
- Few teachers report having classes on how to integrate technology in instruction.

Computers for Instructional Use:

- Most classroom computers, other than the teacher workstation, at the elementary schools are older Apple computers that are not networked.
- At the high school, most classroom computers are Windows-based, but many are older models and few are connected to the Internet outside the Computer lab, Media lab or Career Center.

Instructional Use at Elementary Schools:

- A computer-based integrated learning system, SuccessMaker by Computer Curriculum Corporation, was installed and began to be used in March, 1999.
- At this time, students only access this application in the computer labs. However, Crescent Valley teachers report that the application will be available in the classroom next year. This will require network connections and appropriate equipment.
- Although teachers report positive impressions of the ILS software, they express concerns that its use limits the flexibility of students to use more open-ended software.
- Software available for classroom use consists mostly of electronic games that support drill and practice.
- Students tend to use classroom technology as a reward of early completion of their work, good behavior, or cooperativeness. There is some disparity in the amount of time individual students have the opportunity to use the technology.
- A greater variety of software exists in the computer labs, but is being used less now that the ILS is in place.
- Teachers generally send their students to the lab to work with the medial specialist during their prep periods. Few teachers come to the computer lab with their students.
- The limited availability of newer equipment in the classroom limits the opportunity to integrate technology in instruction.

Instructional Use at the Secondary School:

- Some teachers are making progress toward integrating technology in their instructional practice by requiring students to use technology in projects.
- Many students are developing skills in basic productivity tools and research using the Internet.
- Students have extensive access to modern computers and the Internet in the Computer Lab, Media Lab, and Career Center.
- Science, Math, Technology and Vocational teachers are providing hands-on opportunities for students to use various technologies in authentic experiences.
- Students use the technology to access college and school-to-work information and resources.
- Few examples were observed of structured project-based learning using technology.

Instructional Objectives for Technology - Elementary:

- All interviewees indicated a strong commitment to student achievement.
- At the elementary schools, teachers are very aware of state testing and accountability requirements.
- At this level, mastery of basic skills is seen as a top priority.
- As a result, there is a growing awareness of the need to use technology in appropriate, accountable ways that directly support student mastery of skills.
- Teachers have little knowledge and experience in providing directed activities for students using technology.

Instructional Objectives for Technology - Secondary:

- All interviewees indicated a strong commitment to student achievement.
- They also indicate a strong commitment to the school-to-work emphasis of the district.
- The development of technology skills seems to be the focus of the technology implementation efforts of teachers, with information literacy skills being one such skill.
- Technology helps teachers make the curriculum more interesting and relevant.
- There are few efforts to use the technology to enhance student learning, though some exist.
- Teachers have little knowledge and experience in providing directed activities for students using technology

Teacher Technology Utilization Survey

To gain a deeper level of understanding about how teachers actually use technology in their classrooms, a separate survey was administered to determine what technology teachers have available to them and what types of software they use, both for personal productivity and for use with students.

This survey was distributed the week after the site visits in April and had to be completed and returned by May 10th.

These data were compiled first in Excel and then analyzed using SPSS to determine descriptive statistics and correlations. Some items were compiled by hand. These included several questions related to use of particular applications by teachers.

Results

Twenty-five teachers responded to the survey, and 15 of these teachers completed the Classroom Software Inventory. Of the 25 teachers, 18 were elementary school teachers and 7 were secondary teachers.

The average number of years teaching of the respondents to this survey was 15.5 years. Five teachers had between 0 and 10 years of service, 6 teachers had 10 to 15 years, 7 had 15 to 20 years, and 7 had more than twenty years, with a range from 1 to 38 years.

The average class size of survey respondents was 14.9 students, with a range of 5 to 28 students.

Seventy-nine percent of teachers report having a computer at home, although 25 % do not have access to the Internet at home, 21% don't have CDROMs, and 17% don't have speakers. All teachers report having a computer for use in their classrooms with Internet access, speakers and CDROMs.

Teachers report that, on average, they have had 5.6 courses in how to use computers for personal productivity and 3.76 courses on how to use computers in instruction.

Teachers report that 71% of their students are moderately comfortable using technology, while about one fourth (25%) are very comfortable using technology.

Seventy-five percent of teachers believe that it is very important for their students to become familiar and comfortable with technology, while 25% believe it is moderately important.

Software Used by Teachers for Personal Productivity

The chart below summarizes teachers' responses when asked what applications they use at home or at school for personal productivity.

Software Tools Used for Personal Productivity

Application	Frequency	Purpose
Internet/Netscape Navigator/Internet Explorer, Yahoo	13	lesson plans, information searching,
Communications/Outlook, WinPOP	7	email, professional communication, schedule, calendar, lunch count, tracking

MS Office	2	Everything
Word Processing/MS Word	20	memos, letters, lesson plans, worksheets, tests, handouts, writing
Presentation/MS PowerPoint	4	create lessons
Classroom Management/SASI, Grade Machine, Making the Grade	22	attendance, grades, classroom planning
Other Professional/Follett-Circ. Plus	1	library circulation
Spreadsheets/MS Excel	13	charts, purchase orders, graphing, fund raising, budget
Database/MS Access	3	inventory
Printshop	2	cards, signs, flyers
Calendar Creator	1	calendars
Font Factory	1	extra fonts
Photo Studio	1	editing pictures
MS Encarta	1	research
Photo Delux	1	editing pictures
Photo Finish	1	editing pictures
MS Publisher	1	handouts, posters
PrintMaster	1	handouts, posters
MS Works	2	letters, worksheets
Other	1	information

Most teachers received a desktop computer in their classrooms within the last two school years and are learning how to use it for the own professional work. Most teachers are using SASI and one of the two grading programs on a daily basis for attendance and classroom management. While word processing is still the most common productivity application used by teachers, they are learning to use other applications to suit their individual needs and style.

Technology Available in Classrooms

Technology Available in the Classroom on a Regular Basis

Technology	Frequency Reported
Computer	69 in 22 classrooms, 76 in labs
Overhead projector	10
Monitor	19
VCR	17
Printer	21
Film or slide projector	2
Scanner	2
Satellite	1

Graphing calculator	30 in 1 classroom
Tape player	1
Infocus projection system	1
Overheard graphing calculator	1

The 25 teachers who responded to this survey report an average of 3.13 computers for student use per classroom, with a range from 1 to 9 and a mode of 5. These computers tend to be older equipment that is not multimedia or Internet capable. The ratio does not include the one on the teacher's desktop, which would bring the it up to 4 to 1. Twenty-one teachers report have printers in their classrooms.

Most teachers report have a VCR and TV monitor in their classrooms (75%), and many have overhead projectors in their classrooms (40%). Other equipment is probably present in the classroom due to a teacher's particular interest, such as film or slide projectors, tape players, scanners, graphing calculators, etc.

Teachers share a variety of other technology tools on a school-wide basis with other classrooms.

Types of Shared Equipment

Type of Equipment
Calculators
Camera
CD/Cassette player
Color printer
Copy machines
Destination station
Digital camera
Film projector
Monitor
Opaque projector
Overhead projector
Remote computer
Scanner
Screen projector
Slide projector
Stereo
Tape players
VCR
Video camera
Video disk player

Instructional Software Use

Fifteen teachers completed the Software Inventory which asked teachers to list all the applications their students use in the classrooms, the purpose of use, their rating of effectiveness, and how often it is used on a weekly basis. Since only 15 teachers made the effort to complete this document, it cannot be said to provide a completely accurate listing of all software currently used in the classroom. However, it can be considered a valid sample, and based on results, probably identifies the vast majority of applications in use.

Primary Use of Classroom Software Applications

Use	Number of Titles	Percent
Augmentation	6	9%
Creativity	7	10%
Drill and Practice	21	30%
Game	6	9%
Information Access	17	24%
Productivity	7	10%
Tutorial	6	9%

A total of 70 titles were identified by 15 teachers. Eighteen of these are information access applications that are used on occasion in the library. Productivity tools, such as word processing and spreadsheets, were cited by more teachers as being used on a daily basis. Drill and practice and game applications at the elementary level were also cited as being used on a daily basis by many teachers. Creativity software was cited as being available but rarely used in the classroom. High School students regularly make use of the Internet. See Appendix B for a summary of the software inventory.

Role of Technology in Student Learning

Teachers had a wide range of responses when asked to describe the appropriate role of technology to support student learning. A content analysis of the narrative responses of teachers indicates that most are cautious in their opinion, mentioning that technology cannot replace teachers and that it is a tool to augment or support classroom learning. Nineteen percent of teachers say they use technology in the classroom to support basic skill development, 31% say they use it to enhance or augment direct instruction, and 31% emphasize the development of technology skills.

Improvements

When asked what they should do, if anything to improve the use of technology to support student learning, most teachers indicated a high degree of readiness to engage in improvement efforts. Of the 21 teachers who made comments on this item, 52% mentioned something they could do as teachers, while 43% had suggestion about what the school or district could do. Teachers recognize they need to spend more time learning about technology and more time developing

classroom activities that incorporate technology. Suggestions for the district/school include making labs more available for classroom projects; providing greater access in the classroom to a wider range of resources including the Internet, appropriate educational software, more up-to-date computers; changes in various policies; and making time during the work day for training and staff development.

Support

Finally, the survey asked respondents to indicate what support, if any, they need to make improvements. Of 18 teachers who commented on this question, 44% said that time for more training and staff development is what they most need, and 22% indicated that more classroom resources are needed, in particular the capability to use their desktop machines for classroom demonstrations.

NNET Consortium Self-Evaluation of Computer Skills

In February, 1999 the Northeast Nevada Education Technology Consortium (NNET) administered a self-reported evaluation of staff computer skills in the five districts that participate in the Consortium (Elko, Eureka, Humbolt, Lander, White Pine). The selected instrument was developed by a school district and was included, with permission, in the U.S. Department of Education's document, "An Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms", as a recommended tool for other districts to use. The original survey includes three levels--basic, advanced and Internet Use. NNET chose to administer the basic level survey only, since it is broad and covers the levels of technology use currently employed in these districts. This survey asks teachers to rate themselves from Level 1 to Level 4 on each of twelve skill areas: Basic Computer Operations, File Management, Word Processing, Spreadsheet Use, Database Use, Graphics Use, Internet Research, Email Use, Ethical Use, Information Searching, Presentation Skills, and Technology Integration.

The survey was distributed in each district by the district technology coordinator. When completed, these were collected and returned to the NNET Technology Coordinator in Elko. As the Eureka Instructional Technology Assessment project got underway, it was clear that such a staff survey was needed and, rather than re-administer the same survey or one highly similar, the results of the NNET survey should be included in the study, if possible. Copies of the completed surveys for Eureka County School District respondents were obtained and compiled by Barfield Associates. The results include 36 cases, including 32 teachers and four administrators. Approximately two-thirds of the respondents were from elementary schools, and one-third from the high school.

The surveys were compiled by entering the data into a Microsoft Excel Worksheet. The data were then brought into SPSS for statistical analysis. Data were re-coded to form a variable "Level" to group the two elementary schools for comparison against the high school. Each elementary school was also compared against the other. Responses of teachers compared to administrators were evaluated to determine whether there was any significant difference between

these two groups. "School", "Level" and "Job were cross-tabulated with twelve independent variables to evaluate frequencies, percentages, means, significance, and correlations in the data. In addition, each of 11 independent variables were cross-tabulated with "Technology Integration", "Basic Computer Operations", "Internet Research" and "Email Use" to determine whether any correlation exists between technical skills and responses concerning technology integration skills. The inter-relatedness of all skills was tested, and skills ranked on strength of inter-relatedness.

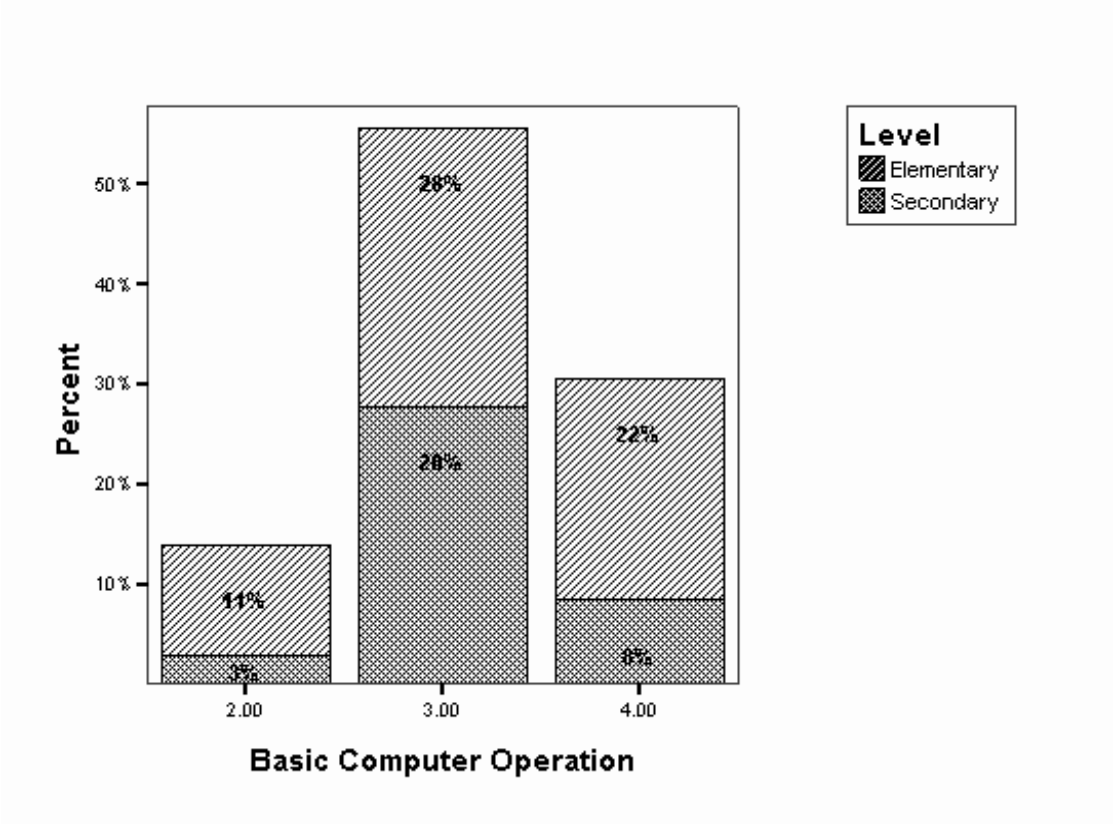
A finding of correlation or significance required a 95 % confidence level. Given the small number of individual cases included in this analysis, any finding with this level of significance can be considered to be highly reliable.

Results: Skill Levels

No significant difference was found when comparing the responses of administrators to teachers, so all 36 responses were used in analyzing the other data. Also, there was no significant difference between the way elementary and secondary teachers report their level of technology skills.

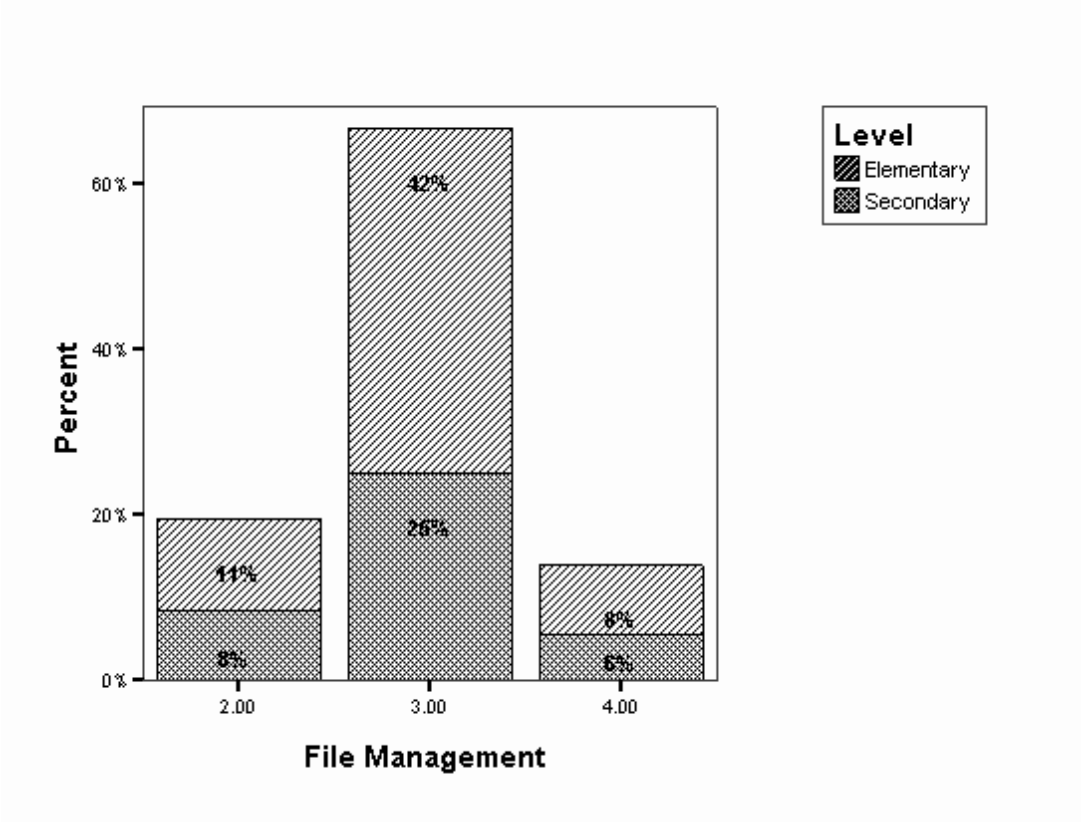
Summary of Skill Level Percentages

Skill Area	Level 1	Level 2	Level 3	Level 4
Basic Computer Operations		14%	56%	31%
File Management		19%	67%	14%
Word Processing		11%	69%	19%
Spreadsheet Use	20%	34%	37%	9%
Database Use	29%	49%	17%	6%
Graphics Use	28%	31%	31%	11%
Internet Research		28%	64%	8%
Email Use		44%	56%	
Ethical Use		33%	61%	6%
Information Searching	6%	54%	29%	11%
Presentation Skills	21%	58%	18%	3%
Technology Integration		69%	13%	19%



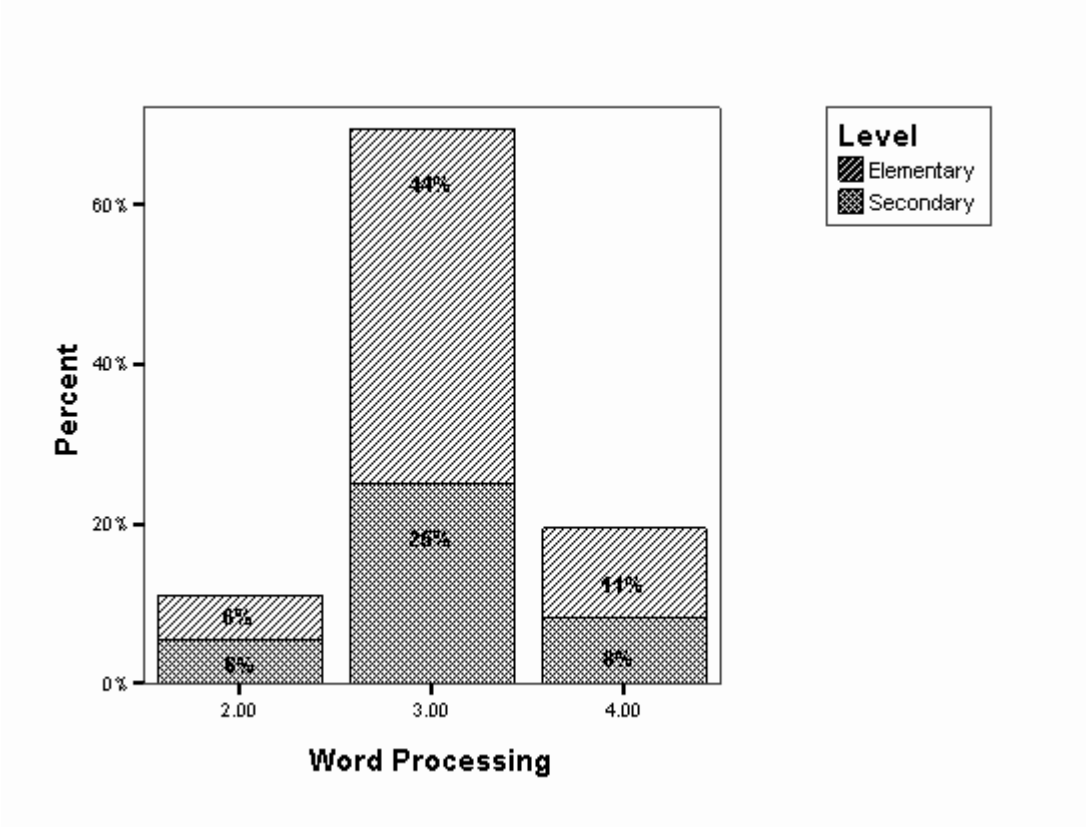
Basic Computer Skills:

Thirty-one percent of district teachers report that they have an advanced level of understanding and use of basic computer operations; 55% report an intermediate level of such experience; and about 14% of teachers report a beginning level of expertise with computer operations. When comparing the two elementary schools, more teachers at Crescent Valley believe they have advanced computer operations skills.



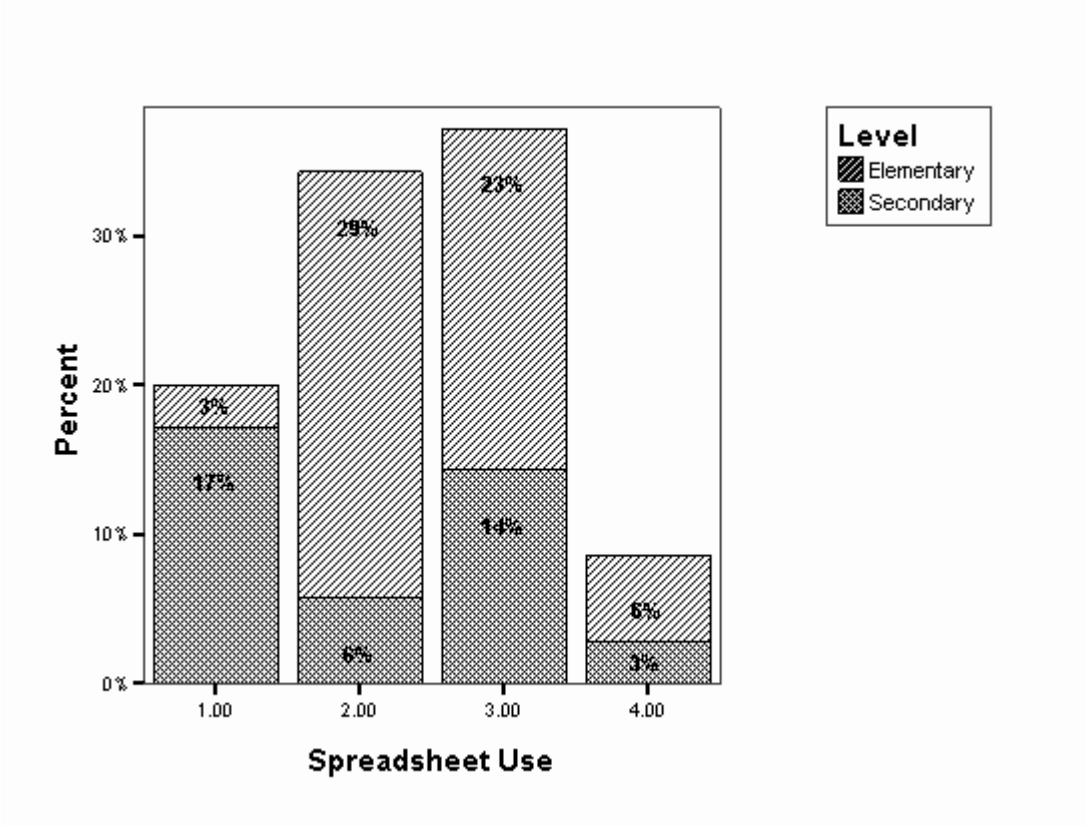
File Management Skills:

Only 14% of district teachers report they feel they can manage files at an advanced level, meaning they regularly back-up and archive their computer files, and regularly run disk-optimization/defragmentation software on their hard drives. Almost 67% say they have a system for organizing their electronic files, and can easily locate files on a reliable basis, which defines an intermediate level of skill. Almost 20% say they don't feel confident in saving files where they want them and never backup their files, basic skills in this area.



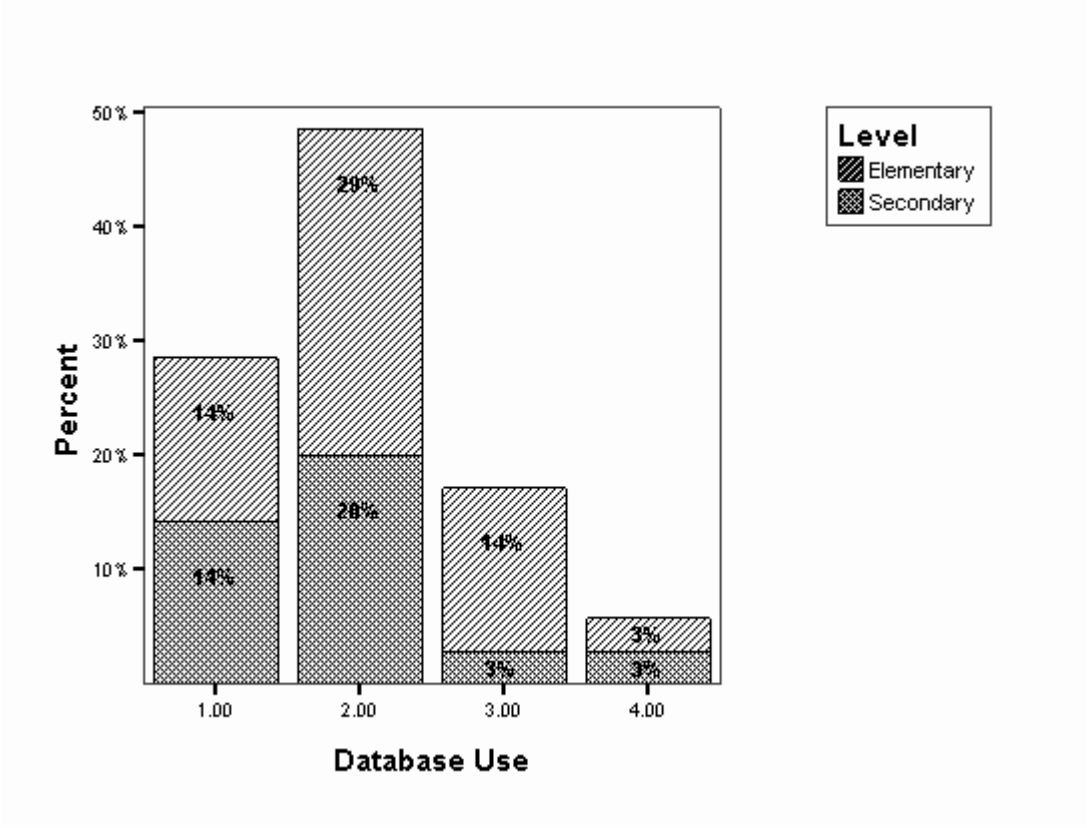
Word Processing Skills:

A majority of teachers (69%) in the district feel they can competently use word processing to make nearly all of their work look professional by performing basic word processing functions. Nineteen percent of teachers say they used word processing in all stages of the writing process with students. Only 11 percent of respondents still feel it is easier to write or type their materials rather than use word processing. Teachers at Crescent Valley report more advanced skills using word processing than teachers at the other schools.



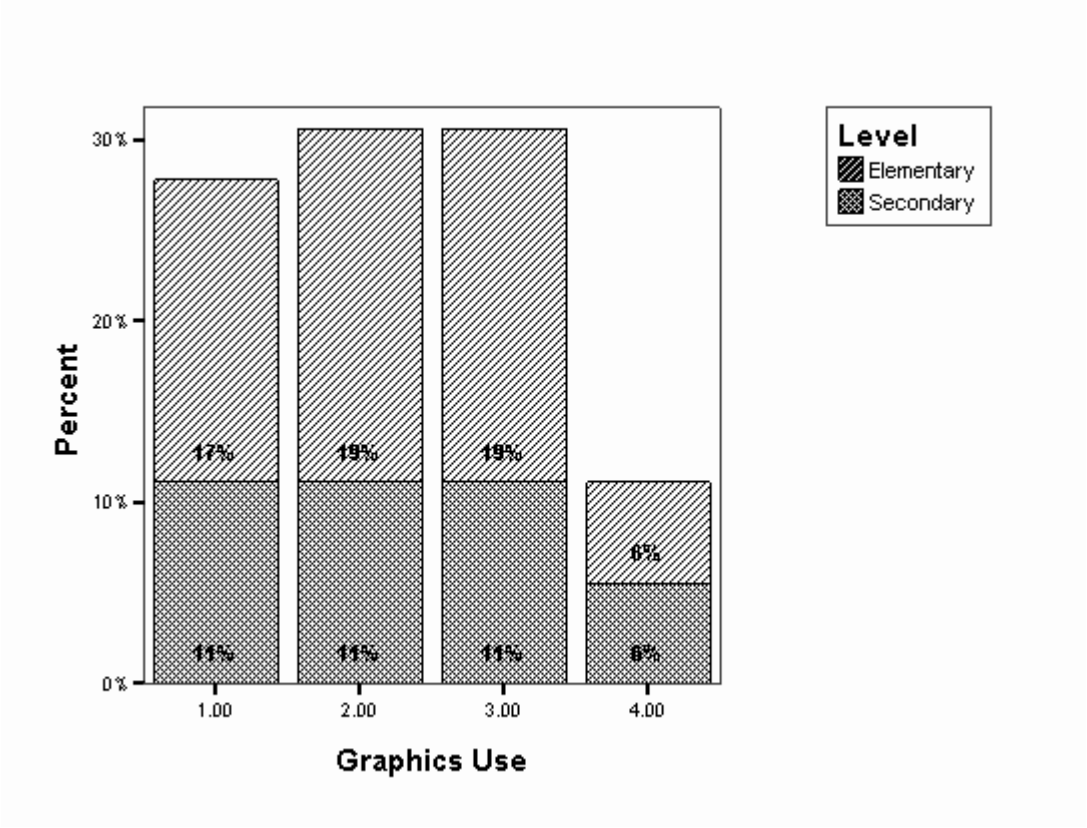
Spreadsheet Skills:

Twenty percent of all teachers report that they have not used spreadsheets and cannot identify how they could be used to benefit their work. Forty-three percent of high school teachers fall into this category, but only 5% of elementary teachers. Furthermore, only 34% of all teachers report having a basic understanding of spreadsheets and can navigate through one. This description applies to nearly 50% of the elementary teachers responding to the survey. About 37% of teachers report an intermediate level of spreadsheet skills, while only 9% of teachers consider themselves to be advanced spreadsheet users. There is a difference, though not statistically significant, in the responses of elementary and secondary teachers at the lower levels of spreadsheet usage, with more secondary teachers being unfamiliar with spreadsheets, while more elementary teachers have a basic level of skill in using simple spreadsheets.



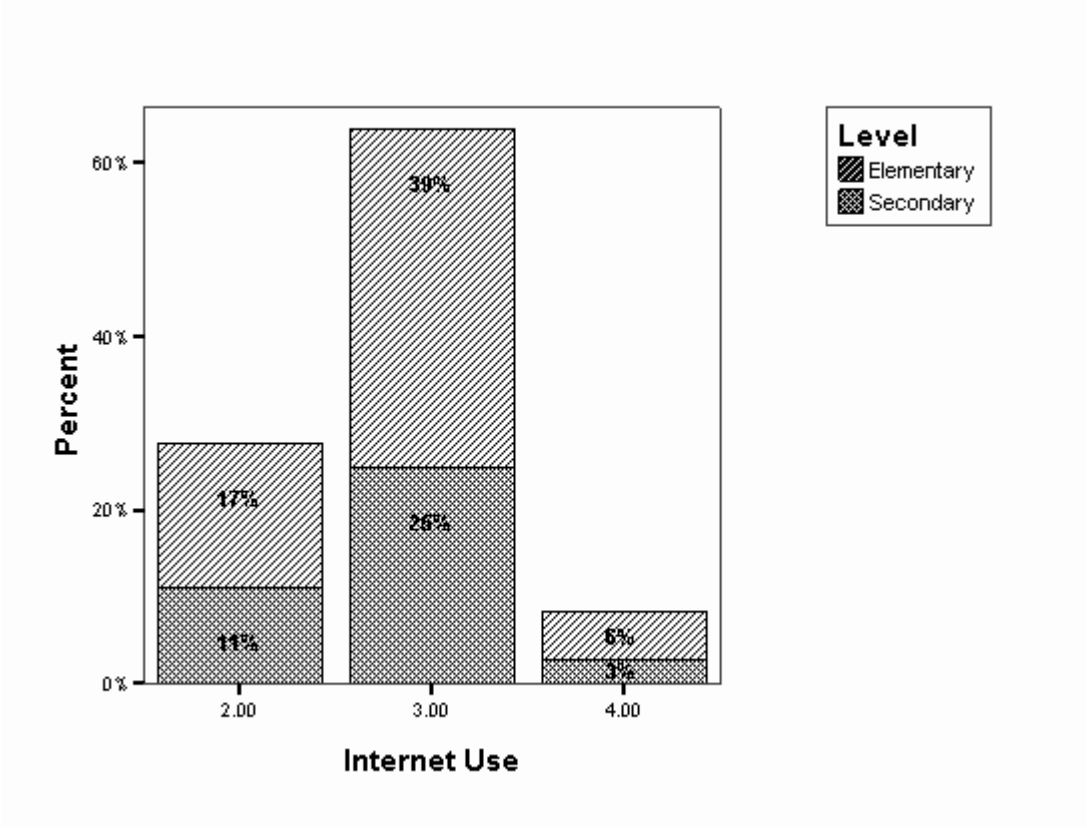
Database Skills:

Nearly 29% of both elementary and secondary teachers report that they have not used databases and cannot identify how one could be used to benefit their work. Approximately 49% of all teachers have a basic understanding of databases and can locate information using one. Seventeen percent believe their database skills to be at an intermediate level, allowing them to create a database from scratch, defining field and creating layouts to support queries. Only 6% of respondents feel they possess advanced skills that have allowed them to work with students to gather and analyze data to explore research questions. Though not highly significant, teachers at Eureka Elementary School report more familiarity with databases than teachers at other schools.

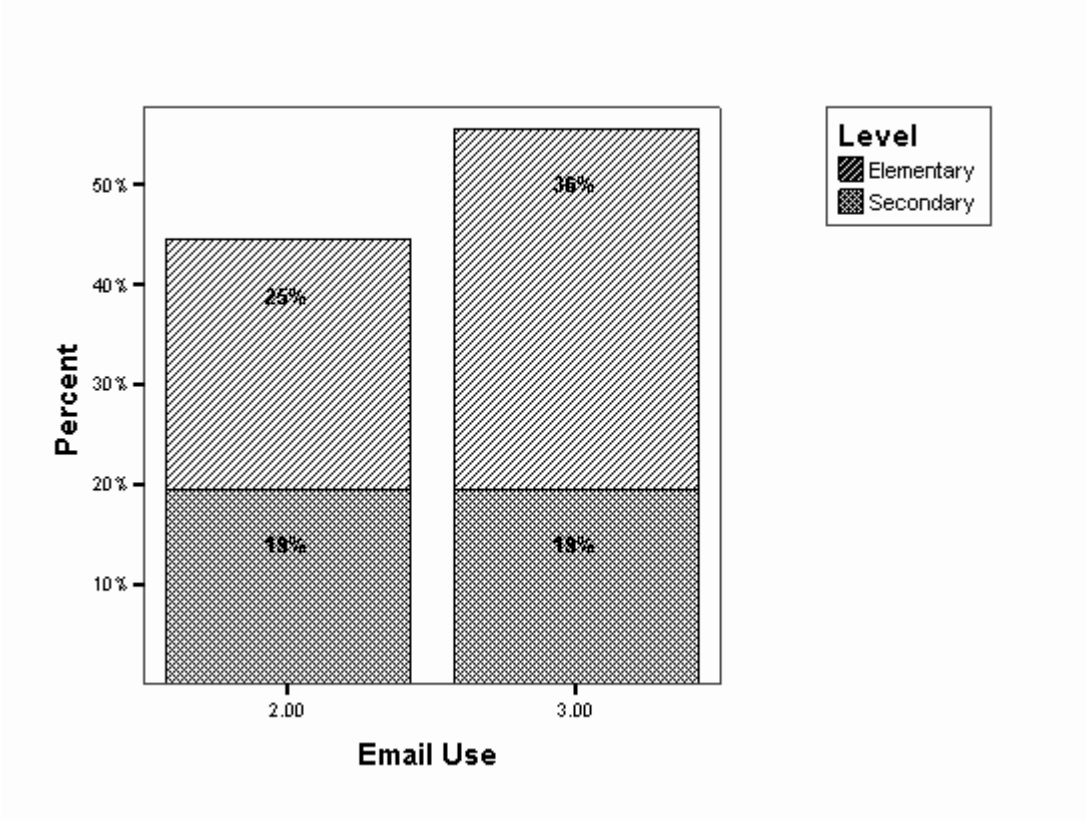


Graphics Use:

Nearly 28% of teachers report that they have not used graphics in their word processing or presentations and cannot identify the benefits of doing so. About 31% can open, create, and place pictures in documents using painting and drawing programs, and another 31% feel they can manipulate graphics to amplify their message. Only 11% feel they can use more advanced image-processing software to design documents, and promote student use of graphics.

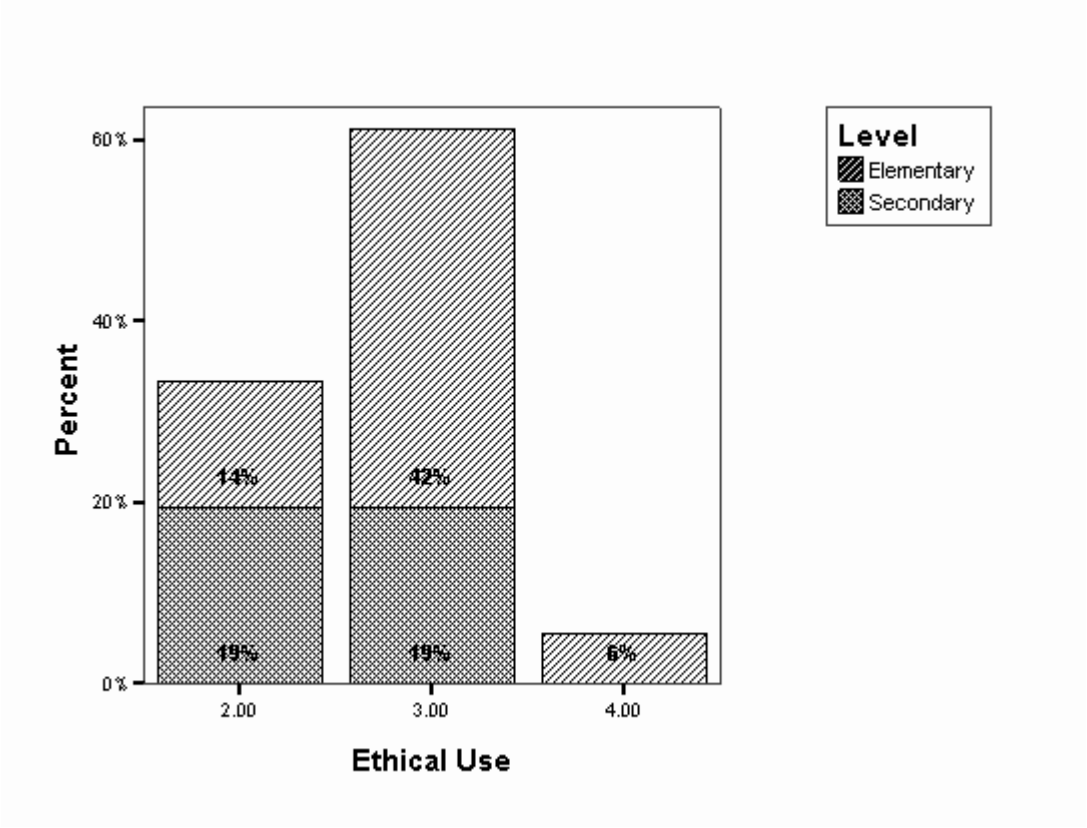


Internet Use*:*
Almost 64% of teachers feel they possess intermediate skills that allow them to make profitable use of the World Wide Web to explore educational resources. Twenty-eight percent say they know how to find basic information on the Internet, but spend little time doing so. Only 8% of teachers can create their own HTML pages and have shown their students how to mine information resources available online. Given the lack of dedicated Internet access at Crescent Valley Elementary School, the researcher expected to see a difference in reported skills between the two elementary schools in the district, but this hypothesis was not proved by the data.



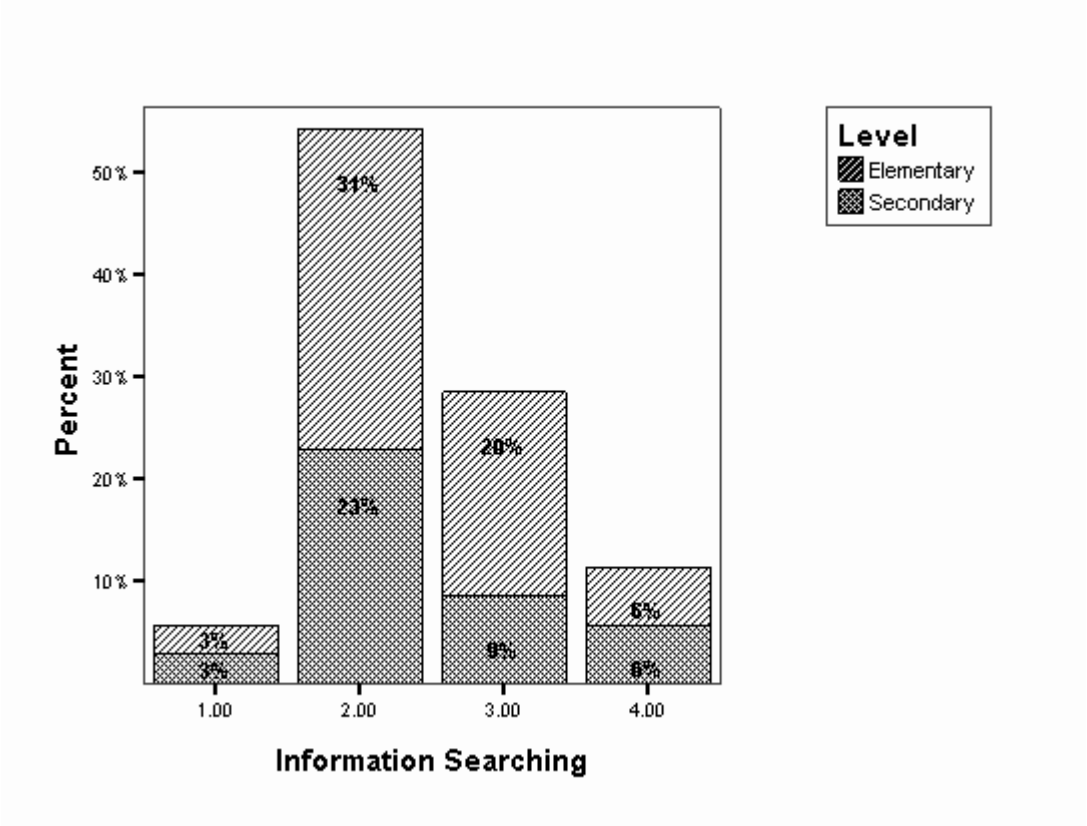
Electronic Mail:

Since students are not allowed to have email accounts in this district, no teachers responded that they involve their students in email communications outside their school. However, over 55% say they are active participants in online discussions and use email to access information and check their mail on a regular basis, intermediate skills. Forty-four percent say believe there is a large amount of information available to them as teachers and send email messages on a frequent basis, indicating a beginning level of usage. As stated above, the lack of dedicated access for email for Crescent Valley Elementary School was hypothesized t to contribute to a difference in skill levels for electronic mail, but this was not born out by the data.



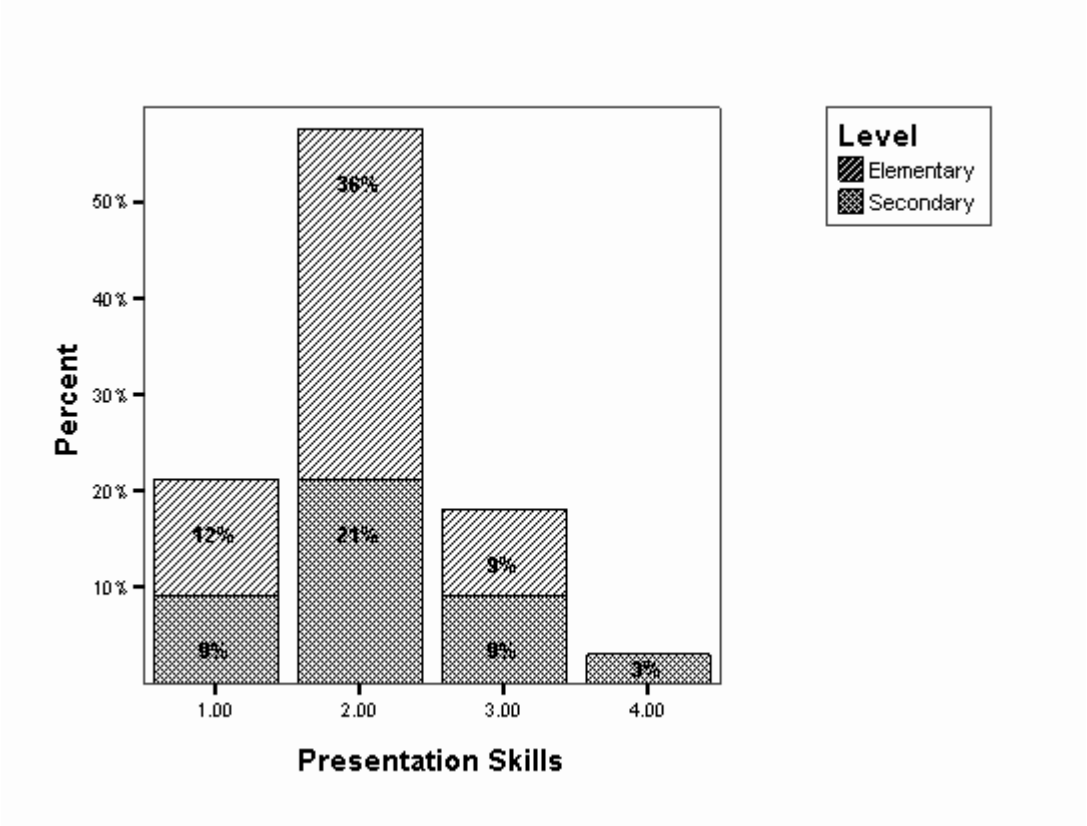
Ethical Use:

A third of teachers report a basic awareness of copyright issues, while nearly two-thirds say they can articulate a personal philosophy about the ethical issues involved in technology use and are aware of district and board policies. Only 6% would feel comfortable speaking to community and parent groups about a ethical issues involving technology.



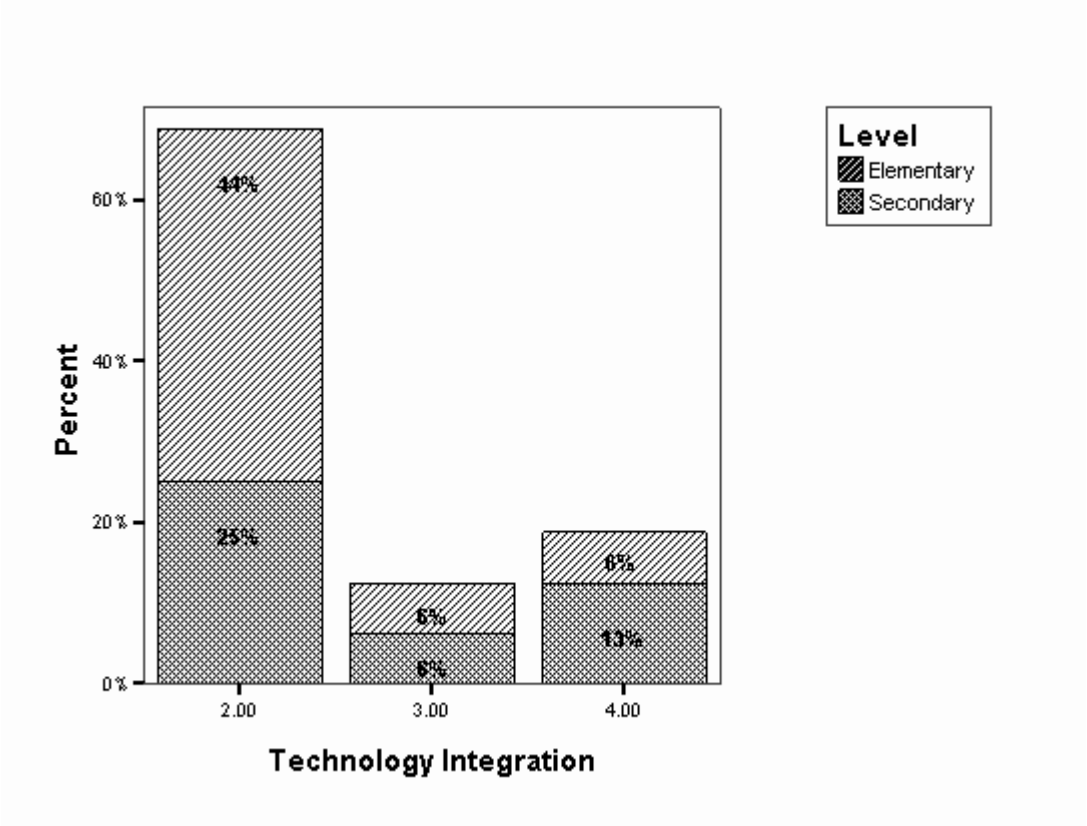
Information Searching Skills:

More than 80% of teachers have basic or intermediate skills in conducting electronic searches of encyclopedia or library software, or have learned to use logical operators to conduct more complicated searches to find information in an efficient manner. Only 11% say they have used these skills with students, and 6% say they are unlikely to seek information using electronic formats.



Presentation Skills:

Twenty-one percent of teachers do not use technology to help them save, format or share their findings from research, which indicates non-use of these skills. Nearly 58% say they feel comfortable using a single application to present their information, basic skills. About 18% feel proficient using a multimedia application to incorporate and share their findings, intermediate skills. And only 3% have facilitated student use of such programs, advanced skills.



Technology Integration Skills:

Sixty-nine percent of teachers say they would like to blend the use of new technologies into their classroom learning activities more than they do, but don't feel they have enough time or access to equipment, and need more help understanding how to do it, indicating a beginning level of skill. About 12% say they attempt to encourage their students to use new technologies to support communicating, data analysis, and problem solving (intermediate), and 19% say they frequently do so (advanced).

Correlation between Skills

One potential controversy in the construction of this survey is that there is an implied assumption that teachers must possess advanced skills in an area in order to be working with students effectively using those skills. For example, on "Database Skills", the advanced level is defined as "I can use formulas with my database to create summations of numerical data. I use the database not only for my own work, but have used it with students to help them gather and analyze data to explore research questions." The basic and intermediate levels of most questions do not ask whether teachers are using the skills they have with students.

This bias in the survey is confirmed by cross-tabulations of each question with "Technology Integration", indicating that high levels of skills with "Technology Integration" are correlated to advanced levels in each of the other skill areas.

To determine whether advanced skills actually result in higher levels of skill in technology integration, comparisons were also made between a highly technical skill area ("Basic Computer Operations") and each other skill area. Results indicate a high degree of correlation between an advanced level of skill in this area with advanced levels (indicating technology integration) in each of the other skill areas. To further investigate the concept that advance skill levels translate into greater technology integration, two skill areas determined to require less technical skill, "Internet Research" and "Email Use" were compared to other skill areas. No significant level of correlation was found between advanced levels of these area and advanced technical skills.

The strength of the inter-relatedness of the skills was tested and skills were ranked based on the results of that test as to which skills the district might focus on in conducting training to have the greatest payoff in terms of teachers actually integrating technology in the classroom. For this group of teachers, the district should focus on providing increasingly advanced levels of training in spreadsheets, databases, graphics and presentations skills to increase teacher skills and comfort in using the technology in the classroom.

Correlations

		BCO	FM	WP	SSU	DBU	GU	INT	EM	EU	IS	PS	TI
BCO	Pearson Correlation	1.000	.474**	.433**	.544**	.664**	.679**	.467**	.318	.437**	.623**	.475**	.528**
	Sig. (2-tailed)	.	.003	.008	.001	.000	.000	.004	.059	.008	.000	.005	.002
	N	36	36	36	35	35	36	36	36	36	35	33	32
FM	Pearson Correlation	.474**	1.000	.280	.420*	.247	.271	.307	.205	.471**	.377*	.222	.324
	Sig. (2-tailed)	.003	.	.098	.012	.153	.110	.069	.230	.004	.026	.214	.070
	N	36	36	36	35	35	36	36	36	36	35	33	32
WP	Pearson Correlation	.433**	.280	1.000	.406*	.463**	.427**	.231	.341*	.531**	.512**	.384*	.435*
	Sig. (2-tailed)	.008	.098	.	.015	.005	.009	.175	.042	.001	.002	.027	.013
	N	36	36	36	35	35	36	36	36	36	35	33	32
SSU	Pearson Correlation	.544**	.420*	.406*	1.000	.618**	.611**	.175	.462**	.353*	.422*	.453**	.541**
	Sig. (2-tailed)	.001	.012	.015	.	.000	.000	.315	.005	.038	.013	.008	.002
	N	35	35	35	35	35	35	35	35	35	34	33	31
DBU	Pearson Correlation	.664**	.247	.463**	.618**	1.000	.709**	.431**	.279	.375*	.655**	.678**	.566**
	Sig. (2-tailed)	.000	.153	.005	.000	.	.000	.010	.105	.027	.000	.000	.001
	N	35	35	35	35	35	35	35	35	35	34	33	31
GU	Pearson Correlation	.679**	.271	.427**	.611**	.709**	1.000	.385*	.284	.329*	.690**	.718**	.737**
	Sig. (2-tailed)	.000	.110	.009	.000	.000	.	.020	.093	.050	.000	.000	.000
	N	36	36	36	35	35	36	36	36	36	35	33	32
INT	Pearson Correlation	.467**	.307	.231	.175	.431**	.385*	1.000	.284	.267	.658**	.307	.407*
	Sig. (2-tailed)	.004	.069	.175	.315	.010	.020	.	.093	.115	.000	.082	.021
	N	36	36	36	35	35	36	36	36	36	35	33	32
EM	Pearson Correlation	.318	.205	.341*	.462**	.279	.284	.284	1.000	.356*	.247	.378*	.277
	Sig. (2-tailed)	.059	.230	.042	.005	.105	.093	.093	.	.033	.152	.030	.124
	N	36	36	36	35	35	36	36	36	36	35	33	32
EU	Pearson Correlation	.437**	.471**	.531**	.353*	.375*	.329*	.267	.356*	1.000	.301	.394*	.311
	Sig. (2-tailed)	.008	.004	.001	.038	.027	.050	.115	.033	.	.079	.023	.083
	N	36	36	36	35	35	36	36	36	36	35	33	32
IS	Pearson Correlation	.623**	.377*	.512**	.422*	.655**	.690**	.658**	.247	.301	1.000	.484**	.552**
	Sig. (2-tailed)	.000	.026	.002	.013	.000	.000	.000	.152	.079	.	.004	.001
	N	35	35	35	34	34	35	35	35	35	35	33	32
PS	Pearson Correlation	.475**	.222	.384*	.453**	.678**	.718**	.307	.378*	.394*	.484**	1.000	.676**
	Sig. (2-tailed)	.005	.214	.027	.008	.000	.000	.082	.030	.023	.004	.	.000
	N	33	33	33	33	33	33	33	33	33	33	33	31
TI	Pearson Correlation	.528**	.324	.435*	.541**	.566**	.737**	.407*	.277	.311	.552**	.676**	1.000
	Sig. (2-tailed)	.002	.070	.013	.002	.001	.000	.021	.124	.083	.001	.000	.
	N	32	32	32	31	31	32	32	32	32	32	31	32

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Comparison of Teachers Between Surveys

Responses from the two surveys were matched and some additional tests were run to determine whether years of service or having a computer at home is related to skills teachers report. Neither of these factors produced any findings of significance. Teacher skill level was compared to student comfort level, and again, there seems to be no relationship between these factors. The number of courses teachers have taken on how to use technology for personal and instructional use were compared to each skill and a positive relationship was found between the courses taken for personal use and technology integration at the .05 significance level. (See Appendix C for a compilation of all SPSS tables that were run on both surveys.)

Implications of the Results

Not withstanding the possible bias in the survey, it seems clear that teachers are still developing their personal skill levels with these technologies and have not yet begun to change their instructional practice to incorporate them on a regular basis. The survey supports the notion that training teachers in technical skills results in greater technology integration, and this practice should continue. However, greater emphasis should be placed on helping teachers translate those skills to actual classroom practice through examples and projects that focus on instruction.

The greatest barrier to technology integration is to make the unfounded assumption that teachers have to have advanced skill levels with a particular technology in order to integrate it in their instructional practice. Or, conversely, that just because a teacher has advanced skills, this will automatically translate to increased use with students.

Perhaps more important is the teacher's level of comfort with taking a risk with something new in the classroom; or stated another way, her level of comfort in using the skills she possesses with students who may have more skills or who may ask questions she can't answer. This is largely a school culture issue that has little to do with technology.

Although only one question on the survey provides teachers with an opportunity to identify possible reasons for this, other data from interviews with teachers would confirm that teachers perceive at least three such barriers: lack of time, lack of access, and lack of training.

Review of District Documents for Planning and Infrastructure Implementation

Review of District Technology Planning, 1997-1999

Rapid deployment of technology in the district over the last two years has affected all aspects of school operation, including teachers and students. Learning environments enhanced by technology emphasize more individualized instruction, a greater degree of collaborative learning, and more experiential learning. These changes are finding their way into ECSD as teachers modify their roles, as providers of information to facilitators of learning, and change their instructional practice. Such profound change does not occur easily, quickly, or painlessly, as found by teacher and staff surveys and interviews. For the most part, however, staff and teachers in this district are enthusiastically embracing technology and the future it is creating.

The district technology plan indicates that a district priority has been integrating technology into subject areas, including reading, language arts, mathematics, science, social students, and occupational education. The teacher strategies indicated in the plan to achieve this goal were 1) a staff development program to increase teacher expertise in using technology, 2) continually upgrading classroom technology, and 3) provide adequate technology access to teachers.

Student strategies were to 1) provide adequate access to technology, 2) provide technology training to students, and 3) use technology to enhance student learning and expand the curriculum. The vision for student use of technology is that "just as employers use computers to do their work, students will use computers to do their learning. The tools will be incorporated into the learning process as effective means for students to reach their goals."

Administrative strategies identified in the plan that are relevant to instruction include 1) implement the ability to communicate with staff through the district using technology, 2) provide electronic access to information, and 3) implement a standard administrative software system (including classroom management applications).

Considerable definition was given in the plan to establishing an effective training and staff development program, with the priority on "providing of staff with adequate training in computerized software applications, e.g. administrative applications, Internet, etc." Various training models that will be used to do this were listed, and a total of twelve objectives were identified. These include:

1. Provide one technology training and staff development day per year for each school to be delivered at the beginning of the year.
2. Develop a schedule of training and staff development opportunities to be provided throughout the year.
3. Use outside trainers when no qualified internal trainer exists to deliver needed training.
4. Expand the use of compressed video and satellite to each school site to deliver training and staff development.
5. Establish a trained technology mentor at each school site.
6. Establish school site technology committees to carry out district objectives and identify school needs.
7. Include district technology team members on district curriculum committees.
8. Establish a community group to address compatibility with systems in businesses and schools.
9. Develop and electronically publish a list of frequently asked questions (FAQ) about software applications.
10. Ensure all staff receive appropriate manuals and reference materials for applications in use.
11. Provide training and staff development on instructional applications.
12. Test and evaluate educational software at each building to gain feedback before purchasing decisions are made.

Eureka CSD also participates in the Northeast Nevada Technology Consortium, which has technology professional development as its primary priority, and the current Superintendent

serves as chair for the superintendents' committee that provide oversight for this effort. The components of that program that have been developed are serving as resources to the district in support of its training and staff development efforts.

Part VI of the STEP outlines the district's philosophy regarding the integration of technology into the curriculum. Three principles are identified which form the approach to curriculum, assessment and instruction.

Principle One: Design Curriculum to Meet the Long-Term Needs of Students

The emphasis here is on "computer and media" curriculum that students will receive during their educational career, which includes the following outcomes:

- be comfortable using a computer;
- possess computer literacy;
- possess basic input skills;
- be able to use general computer applications (productivity);
- be able to use technical tools;
- be able to access, process, produce, and present information using a computer;
- be able to adapt to technological change;
- understand the importance of computers in the workplace;
- be receptive to and able to adjust to future media hardware and software developments; and
- be able to analyze and interpret information.

Principle Two: Assess Student's Success on the Curriculum for Competency and Performance

This principle indicates that the district expects to see both competency in understanding technology as well as demonstrating the use of it in producing artifacts, solving problems, and completing complex tasks.

Principle Three: Engage Students in Learning in a Manner that Prepares Them to Succeed in All Levels of Assessment

The narrative for this principle indicates that it is after students have achieved or demonstrated competency with technology that they can use those skills for more advanced learning activities.

This section ends with the idea that the effective use of technology "will foster a learning environment in which students learn not only the technology, media and computer curricular competency objectives, but also the skills and attitudes necessary for success in a world of technology-based business and industry."

<u>NCET Applications for Section 61 Funding from Senate Bill 482</u>

Changes in the local economy made it difficult for the district to carry out it's technology plan during the 1997-98 school year. Fortunately, state funding for educational technology was set

aside in Senate Bill 482. ECSD submitted three separate applications for funding under Section 61 during the last biennium:

- One-time funding under Section 61.1
- One-time funding under Section 61.2
- Special Project funds under Section 61.2

Funds received under Section 61.1 could only be used to purchase hardware and upgrade existing software systems in the district that are needed to bring all schools up to Level 1 as defined in the state educational technology plan. ECSD's request for funding supported the following goals:

- Ensure that a stable Local Area Network (LAN) be maintained at each of the District's three schools by purchasing new computer servers;
- Install video and television computer monitor technology into the classrooms at the Eureka County High School;
- Install one multimedia computer into the library at each school; and
- Install additional computers in the computer lab at each school.

Section 61.2 funds were requested to support the district's technology planning process. Special Project funds were requested to install the Computer Curriculum Corporation's SuccessMaker software at the elementary schools and to conduct an instructional technology assessment.

ECSD Quality Education Data (QED) Surveys

This survey is sent to every school in the country and compiled by QED. Results are available at the QED website and are frequently cited by researchers as a kind of normative group data set for comparison of individual schools to the national average. The CEO Forum Report, for example, using the QED data. This survey asks districts and schools to indicate their progress as they implement technology to support student learning and includes questions about Internet connectivity and distance learning, planning and training, purchasing, and, for 1998-99, Year 2000 compliance.

The latest version completed by Nevada schools was returned in December, 1998. Most schools were able to include their new equipment purchases made through SB 482 funding in this cycle.

Comparing the 1998-99 survey to that of 1997-98, ECSD reported the following improvements:

- Increased the number of schools with local area networks
- Increased the number of computers with Internet access
- Increased the number of teachers and students using the Internet
- Increased information available to the community using the district web page
- Increased the amount of training made available to staff
- Improved staff skill levels using technology

Technology Training Learning Series

The first year of the district technology plan included the initial course offerings of the district's technology training and staff development program. This included seven courses on basic productivity applications and one Internet course. In the second year these expanded to ten productivity courses and two Internet courses, plus the addition of eight "mini courses" on productivity applications and one for Internet use. For the coming year, two courses on technology integration and one additional mini course for productivity have been added. These courses are taught by ECSD staff.

In addition, staff are developing "technology user functions" that specify what teachers and staff will be required to know about using technology, and a user manual of instructions on each required function. This will be distributed to staff in the Fall of 1999.

NNTC Master Training Plan

This document lays out the project plan for the Northeast Nevada Technology Consortium's efforts to provide technology training for its five member districts. This training will augment the training available to ECSD staff. There are five ECSD staff who are approved trainers for NNTC and who will be teaching courses. ECSD staff can take courses offered through NNTC by any district. This cooperative approach greatly expands and leverages the resources available to each member school.

Eureka Elementary School Educational Plan for Excellence, 1998-2000

This school improvement plan was prepared when the current principal joined the school in 1997-98. It contains a needs analysis and statement, goal statements, and timeline. It examines a variety of test data and other data and establishes a vision for student performance in its mission statement. It also establishes outcome measures and an implementation plan on how to achieve them.

Included in this document is a recognition that technology should positively impact student achievement. It cites a lack of definitive evidence to support a claim that is presently occurring in the school, and includes a goal for assessing that issue. It also identifies the shortcomings of the school's existing software inventory.

Infrastructure Inventory

Eureka County School District Office

Hardware Infrastructure:

Local Area Network: 1 – 12 port 3Com Ethernet 100 base TX hub
4 – Pentium 120 workstations
3 – Pentium 90 workstations
1 – Pentium 300 workstation

1 – Pentium 450 server serving applications and user data
1 – Pentium 100 server housing central student information system (SASI)
1 – IBM AS-400 Mainframe housing district financial/inventory information, serving 3 workstations via Twinax cable
1 – 4 port 3Com 10/100 switch
1 – 2 port Shiva dial-in access server
1 – DSI/Pinnical 2Mb wireless ethernet bridge/router for WAN connection
3 – Laserjet printers
1 – Color Inkjet printer
1 – Dot-Matrix printer

Software Infrastructure:

Network Servers:	Microsoft Windows NT Server version 4.0
IBM AS-400	Financial/Inventory programming ADS
Computer Workstations	Windows 95/Windows NT workstation

Eureka Elementary School

Hardware Infrastructure:

Local Area Network:
2 – 48 port Asante Ethernet 10 baseT hubs
2 – 8 port 10/100 base TX auto hub/switches
53 – Pentium 200 MMX workstations (networked)
10 – Apple Macintosh LC II workstations (non-networked)
5 – Apple Power Macintosh workstations (non-networked)
1 – Pentium Pro 200 server serving applications and user data
1 – Pentium Pro 200 server serving email/internet proxy
1 – DSI/Pinnical 2Mb wireless ethernet bridge/router for WAN connection
23 – Laserjet printers
1 – Color Inkjet printer
1 – Digital/Analog satellite receiver

Software Infrastructure:

Network Servers:	Microsoft Windows NT Server version 4.0
Email Server:	Microsoft Exchange Server version 5.0
	Microsoft Proxy Server version 1.0
Computer Workstations	Microsoft Windows 95
	Apple Macintosh System 7.0

Eureka County High School

Hardware Infrastructure:

Local Area Network: 9 – 12 port 3Com Ethernet 100 base TX hubs
1 – 24 port 3Com 10/100 switch
1 – 5 port 3Com 100 FX switch
2 – US Robotics 4 – port dial-in access modems
1 – 2 way compressed video codec
3 – Auto-switching TI lines for video, email, and Internet Access
50 – Pentium 200 MMX workstations
10 – Pentium 300 workstations
2 – Pentium 120 workstations
6 – Pentium 100 workstations
10 – 80486 Windows 3.1 workstations (non-networked)
4 – Pentium 90 workstations (non-networked)
1 – Pentium Pro 200 server serving applications and user data
1 – Pentium Pro 200 server serving email/internet proxy
1 – DSI/Pinnical 2Mb wireless ethernet bridge/router for WAN connection
1 – Digital/Analog satellite receiver

Software Infrastructure

Network Servers: Microsoft Windows NT Server version 4.0
Email Server: Microsoft Exchange Server version 5.0
Microsoft Proxy Server version 1.0
Microsoft Internet Information Server version 3.0
Computer Workstations Microsoft Windows 95
Microsoft Windows 3.1

Crescent Valley Elementary School

Hardware Infrastructure:

Local Area Network: 4 – 16 port Asante Ethernet 10 base T hubs
1 – 4 port Asante 10/100 switch
1 – 8 port Shiva dial-in dial-out access modem
20 – Pentium 75 workstations
20 – Pentium 300 workstations
10 – 80486 workstations (non-networked)
1 – Pentium 450 Server serving applications and user data
8 – dot matrix printers
3 – Laserjet printers
1 – Color Inkjet printer
1 – Digital/Analog satellite receiver

Software Infrastructure

Network Server: Microsoft Windows NT Server version 4.0

Infrastructure Summary:

Wide Area Network: 2 Mb wireless Ethernet WAN serving district office, EES, ECHS for Internet, email, and data sharing, connection to T1 line at ECHS
Local Area Network: EES, 10 Mb Ethernet topology w/10/100 Ethernet switch to servers
ECHS, 100 Mb fast Ethernet topology w/fiber backbone
CVES, 10 Mb Ethernet topology w/10/100 Ethernet switch to servers
District Office, 100 Mb fast Ethernet topology

Summary of Qualitative Review Findings

Professional Competency

1. Teachers demonstrate a strong commitment to student achievement and are very aware of state testing and accountability requirements.

2. At the elementary level, mastery of basic academic skills is seen as a top priority. High school teachers also indicate a strong commitment to the school-to-work emphasis of the district.

3. As a result, there is a growing awareness of the need to use technology in appropriate, accountable ways that directly support student mastery of skills.

4. The development of technology skills is the focus of the technology implementation efforts of teachers, with information literacy skills being one such skill.

5. Most teachers are enthusiastic about technology and believe technology helps teachers make the curriculum more interesting and relevant.

6. Most teachers are developing their personal skill levels with technology and are beginning to change their instructional practice to incorporate them on a regular basis.

Although a majority of teachers report they are at an intermediate level of skill with such common tasks as basic computer operation, file management and wordprocessing, most teachers report minimal skills with more technical uses of technology, such as spreadsheet, database, graphics, and presentation software. Less than 20 percent of teachers report they feel competent integrating technology in their classrooms.

7. Teachers have little experience providing directed activities for students using technology.

The greatest barrier to technology integration is assumption that teachers have to have advanced skill levels with a particular technology in order to integrate it in their instructional practice. Or, conversely, that just because a teacher has advanced skills, this will automatically translate to increased use with students.

8. Teachers are requesting classes on how to integrate technology into instruction.

9. Some teachers indicate they let students use the computer on their desk when necessary.

Learners

10. Although a high percentage of students scored in the top percentile on almost all subject areas of the TerraNova examination, the percentage of fourth grade students who scored in the bottom quartile of the reading assessment is higher than desirable; tenth grade students' math scores are also lower than desirable.

11. Teachers report that students are moderately comfortable using the technology to complete their school work.

12. There is limited access to multimedia technology and the Internet access in classrooms.

13. Students do not have access to electronic mail.

14. Students often gain the privilege of using classroom technology as a reward for early completion of their work, good behavior, or cooperativeness. There is some disparity in the amount of time individual students have to use the technology.

15. Many high school students are developing skills in basic productivity tools and research using the Internet.

16. Students have extensive access to modern computers and the Internet at the high school in the Computer Lab, Media Lab, and Career Center.

17. High school students use the technology to access college and school-to-work information and resources.

Learning Environment

18. Some teachers are making progress toward integrating technology in their instructional practice by requiring students to use technology in projects.

19. Some teachers are learning to use the technology to enhance student learning in the classroom.

20. Few examples were observed of structured project-based learning using technology.

21. Science, Math, Technology and Vocational teachers are providing hands-on opportunities for students to use various technologies in authentic experiences.

22. Most classroom computers, other than the teacher workstation, at the elementary schools are older Apple computers that are not networked.

23. At the high school, most classroom computers are Windows-based, but many are older models and few are connected to the Internet outside the Computer lab, Media lab or Career Center.

24. Every teacher in the district has a multi-media computer on his/her desk and has access to administrative, classroom management, and productivity tools and to the Internet.

25. A computer-based integrated learning system (ILS), SuccessMaker by Computer Curriculum Corporation, was installed and began to be used in March, 1999.

26. At this time, elementary students access the ILS application only in the computer labs.

27 Although teachers report positive impressions of the ILS software, they express concerns that its use limits the flexibility of students to use more open-ended software.

28. Software available for classroom use at the elementary level consists mostly of applications that support basic skill development.

29. A greater variety of software exists in the computer labs, but is being used less now that the ILS is in place.

30. Teachers at both the elementary and secondary level generally send their students to the lab to work with the media specialist during their prep periods. Few teachers come to the computer lab with their students.

System Capacity

31. Teachers and staff are well-informed about the district's efforts to expand the implementation and use of technology in the district over the last two years.

32. The district's mission statement is not widely familiar to staff.

33. The district's technology plan does not reference the district's mission statement.

34. Limited progress has been achieved on important aspects of the district's technology plan that impact teachers' ability to integrate technology in the classroom.

35. Only one school, Eureka Elementary School, has a written school improvement plan.

36. None of the schools have school site technology plans.

37: None of the schools have school site technology committees.

38. The district is currently developing a handbook to identify critical functions that technology users should be able to perform.

39. Each school has a technology mentor to support the technology needs of teachers.

40. The district has provided technical training opportunities on key productivity applications, but attendance has been low.

41. Technology mentors have offered few staff development opportunities at their schools.

42. Principals do not see themselves as technology leaders in their schools.

43. Few opportunities exist outside the district for teachers to obtain staff development to support classroom technology integration.

44. There is a high level of similarity among teachers in the district in terms of their use of technology use at home and at school, and their perceptions about improvements needed and district support.

45. The district technology plan does not specify what will be done to ensure that teachers are using technology to enhance student learning in the classroom.

46. School site use of technology applications is not aligned with intended instructional outcomes.

47. The predominant instructional style used by teachers is direct instruction, though collaborative learning and project-based learning were evidenced as well.

Technology Capacity

49. The district has implemented a strong telecommunications network, supporting connections between the district office and two school sites in Eureka. Each school site also has a local area network connecting every classroom and instructional area with administrative offices in the school. Every classroom has Internet access, although only the teacher's computer is connected.

50. Internet access at Crescent Valley Elementary School is limited to dial up access via Nevada.Net. The demand for services is so high that teachers at this school find it difficult to get a connection during the school day. Most teachers access the Internet from home using a local Internet service provider.

51. Each school has a computer lab with multi-media computers that are all Internet accessible, and the high school has a media lab in addition. There is enough equipment to allow each student to have a machine for even the largest classes. The labs are used on an assigned basis at the elementary schools, and students use the lab on the days and at the times of teacher prep periods. At the high school, the computer lab is assigned to only a few teachers, and teachers can send students to the media lab as well.

52. Instructional software tools are limited in the classroom, though more titles are available in the computer labs. Software selections are not aligned with curriculum goals.

Accountability

53. The district produces an "Annual Performance Report" in accordance with state accountability requirements.

54. An accountability system to monitor and evaluate the impact of technology on student learning is needed.

Student Achievement

55. TerraNova scores, transiency rate, truancy rate, attendance rate, pupil/counselor ratio, drop out rate, class size, discipline, teacher certification, pupil/teacher ratio, special program participation, pupil expenditures, and parental involvement are tracked to provide evidence of whether the district is implementing its goals, in accordance with state accountability requirements.

56. A method to assessment the impact of technology on student learning is needed.

VI. Recommendations

The following recommendations are made from a very broad perspective that begins with the need for identifying the educational context in which technology will be used in this district. Technology is one instructional tool to support student learning among many. It is important that

the focus of the district's instructional technology program remain fixed on the educational outcomes for students. Technology is not an end in itself, but a means to an end.

The district will begin the next school year with new leadership. This will be an excellent time to stand back and reflect on the district's current mission statement, educational goals, processes, and procedures. These recommendations are offered in the spirit of holistic planning. Many of these ideas require considerable commitment and time for implementation. Others may not be feasible due to reasons unknown to the author. A critical judgment on the part of the district on the merit of each suggestion will be needed. Then a final action plan and timeline will be needed to move forward toward implementation.

District Leadership:

- Develop a district-wide strategic plan that includes a vision for teaching and learning, and strategies to achieve it. This will strengthen the articulation and coordination of curriculum and instruction across the district. These strategies should address curriculum and instruction, assessment, technology, professional development, and resources. This plan should clearly define the educational goals of the district.
- Foster the development of principals as instructional and technology leaders at their schools.
- Establish pilot programs with willing teachers who can serve as guides and mentors to other staff as they implement changes suggested by the district plan.

Instructional Leadership:

- Establish and support a district educational model that accommodates a variety of instructional styles, including basic skill development, direction instruction, experiential learning, collaborative learning, and project-based learning.
- Implement a scope and sequence framework to help teachers weave the district-adopted curriculum, student-centered learning practices, and technology into a rich learning environment for students.
- Incorporate a variety of technologies (voice, video and data) into the curriculum to support virtual opportunities to learn where students might not otherwise have access to real world opportunities. For example, field trips (Monterey Bay Aquarium), WebQuests, and other distance learning opportunities.
- Implement a "unit of practice" approach to instructional planning that guide teachers through the process of incorporating technology into instruction.
- Move toward a broad-based implementation of project-based learning to support experiential learning efforts.

Assessment Leadership:

- Develop a district philosophy about assessment that includes "multiple measures" to provide a rounded picture of student achievement of both basic skills and higher order thinking skills.
- Establish a district assessment team made up of membership from each school to implement and support alternative assessment methods at each school.
- Acquire item analyses of the latest administration of the TerraNova test to determine specific gaps in instruction, and use the Computer Curriculum Corporation's SuccessMaker software,

already installed in the district, to focus on remediation of skills, especially for students performing in the lowest quartile.

District Technology Planning:

- Revise the district technology plan to provide greater focus and support for instructional technology, referencing the district strategic vision and goals. Develop separate two separate documents; one to reflect what needs to be done to support the technologic infrastructure, the other to support classroom integration of technology into instruction. Both documents should reference the state plan for educational technology and be mutually supportive.
- Identify resources and support needed to carry out the district technology plan, including instructional materials, professional development, and technology resources.
- Revise the district technology plan to align with the new state educational technology plan, "Implementing Technology to Support Student Learning."

School Improvement Planning:

- Develop a process for school improvement planning at each school that defines the approach and anticipated outcomes of teaching and learning for all students, and that sets forth the mission and philosophy of each school. This process should reference the district's strategic plan for both instruction and technology.
- The role that technology can play in supporting the school and its learning outcomes should be considered by school site participates to increase local buy-in and ownership of technology implementation efforts and incorporated into the school improvement plan.
- Ensure that instructional technology tools and activities are selected to appropriately align with and support specific learning objectives.
- Identify resources and support needed by staff at each school to carry out the school improvement plan, including instructional materials, professional development, and technology resources.

Professional Development:

- Develop a district professional development plan that addresses the key changes the district needs to make to achieve it's educational vision and goals. This plan should reduce teacher isolation, ground teachers in multiple instructional methodologies to support student learning, provide for a variety of learning opportunities for teachers, including on-line and distance learning options, and should establish district expectations for teacher performance and competency in the use of technology to support instruction.
- Establish teacher competency standards for technology and use them to screen applicants and establish performance goals for staff.
- Annual teacher reviews should include the establishment of technology skill development and classroom technology integration goals that will be assessed on an annual basis, at minimum.
- Provide on-going training in both instructional design and delivery support strategies. Continue to build teacher expertise using technology, especially in spreadsheets, databases, graphics, and presentation skills and their application in subject matter instruction and learning.

- Ensure that technology training includes authentic tasks to demonstrate how to apply the technology in education; give teachers projects to do using the technology for instruction to support student learning and development of higher order thinking skills.
- Provide professional development to foster better understanding of what is actually assessed by the TerraNova test and how to address identified needs in the classroom using SuccessMaker.
- Provide professional development to staff on how to monitor instruction through the use of alternative assessments.
- Provide increased development and support for the principal at each school to serve as an effective instructional and technology leader.

Professional Development for Teachers in Technology

One common issue districts face is the need to gain a clearer understanding of the challenge they face in integrating technology into instruction. That challenge is personified by the role of classroom teacher. It is only through the extent to which an individual teacher adopts and adapts technology to her own instructional practice that students will be given the opportunity to learn using technology. Students can independently learn many technology skills. But the teacher is instrumental in guiding the student's mastery of academic learning, and technology is one tool a teacher can use to aid that process.

In many ways integration of technology in instruction is synonymous with staff development. A successful staff development program for technology integration will recognize that it must be on-going and move teachers through several levels of evolution to reach their highest level of success. The research done by *Apple Classrooms of Tomorrow* (ACOT) demonstrates this teacher evolution. It begins where many "teachers are" by providing a foundation in the basic understanding of the new technology being employed. Gradually, as teachers become more comfortable using the technology, they begin to adopt it into their classroom to support their existing instructional practice. Over time, through interaction with other teachers and successful experimentation with the technology, research has shown that technology can be a powerful motivator for the reform of instructional practice as teachers incorporate project-based learning and change their roles from dispensers of knowledge to facilitators of knowledge.

Stages of Teacher Technology Utilization

Stage	**Examples of what teachers do**
Entry	Learn the basics of using the new technology.
Adoption	Use new technology to support traditional instruction.
Adaptation	Integrate new technology into traditional classroom practice. Here, they often focus on increased student productivity and engagement by using word processors, spreadsheets, and graphics tools.

Appropriation	Focus on cooperative, project-based, and interdisciplinary work--incorporating the technology as needed and as one of many tools.
Invention	Discover new uses for technology tools, for example, developing spreadsheet macros for teaching algebra or designing projects that combing multiple technologies.

(from *Changing the Conversation About Teaching, Learning and Technology: A Report on 10 years of ACOT Research*)

Technology Resources:

- Purchase up-to-date instructional software to support and align with the outcomes of the district's strategic plan. Develop a process for previewing and selecting software that is teacher-driven. Implement a district purchasing process and track instructional software from the district office.
- As an incentive to teachers willing to commit to classroom technology integration, upgrade classroom computers to multimedia equipment that can support up-to-date software, and provide Internet access for students.
- Review district "acceptable use" policies and revise as needed to all appropriate email access for students working on projects that require them to communicate with individuals outside the school. Require students and teachers to individually sign an acceptable use policy and keep it on file.
- Provide the capability in each classroom for teachers to make classroom presentations on a large screen so that teachers can demonstrate how to use the technology to students, can involve an entire class in a technology-supported learning experience, and provide teachers with increased incentive to develop their technology skills. This can be done through low cost methods, such as reconfiguring the equipment they have and/or purchasing video cards and scan converters to work with existing computers and video monitors.
- Seek out and establish an acceptable alternative for providing Internet and email access to Crescent Valley School until a dedicated digital connection is available, such as a dedicated dial-up connection solely for this school, hosting a modem at the school, or using an alternative local provider.
- Ensure that print capability is provided for classroom computers used by students.

Staffing:

- Ensure that each school has a technology resource teacher who can support the integration of technology in instruction and work as mentors to classroom teachers.
- Modify the role of the District Technology Coordinator to focus more specifically on the instructional use of technology, while maintaining the district's technologic infrastructure.
- Provide incentives for teachers to become more involved in their student's use of technology by establish rewards for effective efforts to link technology to effective learning, whether through strategic use of SuccessMaker to remediate basic skills or to through implementing experiential learning opportunities.

- Foster a school culture that allows teachers to take risks as they experiment with a variety of instructional methods and technologies to support them.

Scheduling:

- Modify school schedules to allow minimum days on a regular basis to provide professional development time for teachers in a reliable, accountable manner.
- Investigate other innovative ways to free up staff during the school day to participate in professional development, such as establishing a floating substitute, team teaching classes, and block scheduling.

VII. Exemplary Programs

Volume II of this report contains a compendium of instructional technology software, instructional models, web site, and other resources to assist the district as it moves forward.

VIII. Research on Technology and Student Achievement

Volume III of this report contains a set of articles, reports and other information that discuss the latest thinking on how technology can and should support student learning.

IX. Coordination with Regional and State Guidelines and Assessment Criteria.

The contractor will work with the district in September 1999 to ensure the selected recommendations from this report are aligned with regional and state efforts and will work with the district to revise its technology plan based on the outcomes of this project. Particularly important is to ensure that ECSD's evaluation efforts are in line with regional and state efforts.

NORTHEAST NEVADA TECHNOLOGY CONSORTIUM
MASTER TRAINING PLAN

Master Training Plan

For the School Districts of:
Elko | Eureka | Humboldt | Lander | White Pine

Overview

The purpose of the Master Training Plan (MTP) is to ensure all tasks are identified for the successful implementation of the technology training for the teachers in the northeast Nevada region. The MTP contains detailed information identifying *what* training will be performed, *who* the trainers will be, *how* the trainers will be trained, as well as *where* and *when* the training will be accomplished. The training period for the MTP is from January 1999 through June 2000. The MTP includes a plan for the research of and application for additional funding sources for the Northeast Nevada Technology Consortium (Consortium).

1. The Consortium uses a Train-the-Trainer model of staff development. A select group of technologically literate teachers attend Train-the-Trainer Workshops, where they become trainers and receive the skills to integrate technology into the curriculum and most importantly, how to train other teachers how to use technology as another tool in their daily instruction. This team of trainers is then responsible to return to their respective school districts and conduct Teacher Workshops on the application and integration skills they have acquired. This does not preclude the implementation of certain workshops directly to the teachers, bypassing the Train-the-Trainer approach.

2. The MTP is designed and maintained based on ever-changing educational technology and the related staff development requirements of the 5 northeastern Nevada school districts: Elko, Eureka, Humboldt, Lander, and White Pine. The MTP must remain flexible to satisfy these needs. The MTP provides training opportunities from fundamental computer literacy skills to technology-based lesson plans, always reflecting the needs of teachers at the delivery point of instruction.

3. Examples of training include technology awareness, computer applications, Internet resources for education, multimedia approaches to learning, and integrating technology into the curriculum. All workshops will focus on the delivery point of instruction, using technology to motivate education and augment the teachers' available instructional tools.

4. The Consortium is currently exclusively funded by a Technology Literacy Challenge Fund grant. This grant is projected to have a 5-year lifespan, but is not guaranteed. The Consortium will search and apply for additional funding sources to continue implementation of the Technology Training Plan into the next millennium.

5. It is important that we establish a method for teachers to develop new skills, demonstrate them, and be recognized for improvements. In addition, Trainers must keep abreast of changes in technology. Attending relevant conferences and Train-the-Trainer Workshops will do this. New training and policies must be established to support this kind of professional growth.

Goals and Objectives

Technology is not an end in itself. The goal for the use of technology in education is to improve student learning and enhance the efficiency of the educational system. This training effort will achieve the following results:

1. Develop a team of trainers qualified to conduct Teacher Workshops on needed technology applications in the schools.
2. Assist students to use computers and telecommunications technology to acquire the skills they need to move to their next level of education.
3. Assist teachers to use technology to enrich learning, to access information, and to collaborate with their colleagues.
4. Provide K-12 teachers the necessary technology training to successfully integrate technology into the classroom.
5. Increase the technology skills, knowledge, and positive attitude of educators (primarily teachers) so that they will be prepared to assist all students to become technologically literate and to enhance student achievement with the help of integrated curriculum and technology.
6. Provide technology-training materials for the school districts to use for the professional development of their faculty.

Definitions

The MTP includes roles and responsibilities for various groups and individual positions. Throughout this document, you will find reference to these groups and individuals. The following definitions are meant to clarify terms used in this document and identify current personnel holding these positions.

Northeast Nevada	Referred to as Consortium. The Consortiums member

Technology Consortium	organizations are Great Basin College (GBC), WestEd, and the county school districts of Elko, Eureka, Humboldt, Lander, and White Pine.
Governance Board	Referred to as Board. The Board has 6 members, the superintendent of each school district and the president of Great Basin College. The current members are Marcia Bandera (Superintendent, Elko), Neil Stevens (Superintendent, Eureka), Tony Wiggins (Superintendent, Humboldt), Leon Hensley (Superintendent, Lander), Mark Shellinger (Superintendent, White Pine), and Ron Remington (President, Great Basin College).
Governance Board Chairperson	Referred to as Board Chair. Its members elect the Board Chair. The current chair is Neil Stevens from Eureka County.
Technical Support Committee	Referred to as TSC. The TSC has 5 members, a technical representative from each school district. The current members are Duane Barton (Elko), Elmer Porter (Eureka), John Croslin (Humboldt), Bob Pistner (Lander), and Dan Noss (White Pine).
Technical Support Committee Chairperson	Referred to as TSC Chair. Its members elect the TSC Chair for a one-year term. The current chair is Duane Barton from Elko County.
Technical Support Committee Advisor	Referred to as Advisor. The Advisor is currently the Staff Development Specialist.
Staff Development Specialist	Referred to as SDS. The Consortium hires the SDS. The current SDS is Mark S. Knudson.
Fiscal Agent	Manage budget and associated correspondence. Provides Board and TSC with fiscal reports. The current Fiscal Agent is Bill McLeod from Elko County.
Train-the-Trainer Workshops.	Workshops conducted by the Consortium and meant to train a select group of teachers to become Consortium Trainers for their respective districts. These Workshops are scheduled and coordinated by the Staff Development Specialist.
Teacher Workshops.	Workshops conducted by Consortium Trainers for their respective district's teachers and in some cases other districts' teachers. These workshops are scheduled and coordinated by the Consortium Trainers under the supervision of their respective Technical Support Committee members
Instructors	Independent consultants, professors, college staff, and in some cases teachers from the region, who are qualified to conduct Train-

	the-Trainer Workshops.
Trainers	A select team of teachers who are chosen by their school districts to become experts, who will conduct Teacher Workshops.

Train-the-Trainer Model

The Train-the-Trainer Model of staff development is meant to maximize the training impact, while minimizing the amount of initial training. When implemented appropriately, the Train-the-Trainer Model will generate an exponential growth in training at the individual school level. The Consortium implements this model by choosing a select group of teachers from each school district, bringing them to a centralized Regional Training Center in Elko, and training them to become Trainers. This team of Trainers returns to their respective school districts to conduct Teacher Workshops. A team of 45 Trainers can obtain the expertise necessary to train the Regions 1000+ teachers.

Each member of the TSC selects its district's Trainers. Each district individualizes the process of selection. Generally, the number of Trainers is less than the number of schools in each district. This requires Trainers to conduct technology workshops for schools other than their home schools. In some cases, Trainers from one district may perform Teacher Workshops for another district. Each member of the TSC is responsible for determining the training needs for their district, choosing the appropriate Trainers, and forwarding that information to the SDS.

The Consortium, through the efforts of the SDS and the Regional Training Center, will provide all training necessary to prepare the team of Trainers to efficiently implement technology training in their district. The SDS will evaluate the training needs provided by the TSC and initiate the appropriate Train-the-Trainer Workshops. The SDS will stay current on the latest educational technology training techniques and strategies by reading literature, interviewing experts, and attending professional development and technology training conferences. The SDS will become familiar with other technology training efforts within the state of Nevada and when appropriate, investigate what other states are implementing. The SDS will locate effective Instructors, negotiate contracts, schedule Train-the-Trainer Workshops, advertise a training schedule for Train-the-Trainer and Teacher Workshops, notify TSC members and Trainers of training opportunities, host Train-the-Trainer Workshops, track Trainers attendance at these workshops, and compile evaluative data on Instructors and training techniques.

Trainers will leave Train-the-Trainer Workshops with a packet of information, which will allow them to return to their school districts and conduct Teacher Workshops with little or no preparation. This is a crucial step in the process. Most Trainers are teachers and have little extra time to prepare for extracurricular training efforts. For this reason, the Consortium has chosen to pay the Trainers for one hour of prep time for every two hours of workshop time. In some instances, there might recommendations to increase the amount of reimbursement for prep time. The implementation method for the Teacher Workshops in the individual district is left to the discretion of the respective TSC members. Based on the amount of training being coordinated,

some districts may require more reimbursement for prep time. This additional allowance will be considered on case by case basis. Anyone requesting additional reimbursement for prep time must submit the request on the standard reimbursement form to his or her respective TSC member. If the TSC member approves the request, he will forward it to the SDS. The SDS will submit the request at the next TSC meeting for approval. The TSC members will approve or disapprove the request. If approved the SDS will submit it using the standard reimbursement procedure.

Once Trainers attend Train-the-Trainer Workshops, it is their responsibility to return to their districts and conduct Teacher Workshops. The SDS will provide professional support for Trainers to prepare course material, lesson plans, and presentations, when needed and time permitting. The SDS will attend initial Teacher Workshops for support and guidance, when necessary and time permitting. Trainers will identify each school's training needs with help from their respective TSC member. Trainers will then locate an available classroom or lab, schedule a Teacher Workshop, advertise the workshop, notify the SDS or their TSC member to post it on the training calendar, prepare any student materials (if needed), ask students to fill out evaluation forms, send enrollment sheets and evaluation forms to the SDS. Trainers will be available for follow-up questions from the teachers once they return to their schools. This may require more prep time than originally estimated by the TSC and may suggest reconsideration of the prep time policy. TSC members will identify Trainers in their district to coordinate the implementation of Teacher Workshops.

Governance Board

The Board members are the superintendents from each of the five county school districts and the president of Great Basin College. The Board is the decision-making body for the Consortium and will:

Chairperson Responsibilities

- Schedule and conduct Board meetings
- Contact person for Liaison and TSC
- Make interim decisions at the request of the Liaison, Fiscal Agent, TSC Chair, and/or SD

Board Member Responsibilities

- Set policy & procedure
- Grant budgets & budget revisions
- Hire Consortium staff
- Selection of high poverty/low technology schools for funding
- Approve application for other funds
- Approve overall training plan for Consortium
- Evaluation of Consortium activities
- Approve professional development plan for Consortium staff
- Set & change the responsibilities of the TSC, SDS, & Liaison

- Elect chair annually, meet quarterly

Technical Support Committee

The TSC members include a representative from each of the five county school districts. These representatives are the technology specialists in their respective districts. The TSC will:

Chairperson Responsibilities

- Act as liaison between the TSC and the Board
- Schedule, develop agendas, and conduct TSC meetings
- Manage the technology issues pertaining to the TSC
- Supervise the SDS, including a semi-annual job performance evaluation of the SDS
- Review professional development opportunities for Consortium staff
- Make interim decisions at the request of the SDS
- Deliver recommendations from the TSC to the Board

Board Member Responsibilities

- Elect a chairperson from its members for a one-year term
- Develop Consortium training plans based on the districts' needs, priorities, and Consortium resources
- Implement technology needs assessment in their respective districts to determine training needs This assessment will provide a pretest and posttest scenario, allowing the Consortium to assess its success in the implementation of the MTP
- Select their district's Trainers
- Determine the training needs of their Trainers and request needed training from SDS
- Approve their district's Trainer reimbursement forms Members may choose to have principals approve these forms
- Act as point of contact for SDS regarding technology-training issues in their district
- Supervise the implementation and scheduling of Teacher Workshops conducted by their district's Trainers in order to meet their teachers' technology training needs
- Provide recommendations to the Board on technology issues related to the Consortium
- Meet monthly
- Approve TSC meeting minutes

The current committee members are:

Duane Barton	Elko (dbarton@nsnk12nvus 738-5196)
Elmer Porter	Eureka (eporter@eurekak12nvus 237-5373)
John Croslin	Humboldt (jcroslin@greatbasinnet 623-8157)
Bob Pistner	Lander (rpistner@nsnk12nvus 635-3332)
Dan Noss	White Pine (dnoss@nsnk12nvus 289-4851)

Staff Development Specialist

This is a full-time position with the Consortium This position will focus on the coordination of technology training throughout the five county school districts The SDS will:

- Act as Advisor to the TSC
- Tape record TSC meetings, compile meeting minutes, and ensure their approval at the next meeting
- Design and implement a technology-training plan for the Consortium
- Implement the Train-the-Trainer model of staff development
- Coordinator Train-the-Trainer activities with the TSC
- Assist in determination of training needs and objectives for the various workshops
- Provide professional assistance to Trainers to ensure quality training in areas such as how to conduct a technology workshop, creation of course material and lesson plans (if needed), development of presentations, location of resource material, and attendance at initial Teacher Workshops for guidance and support, when necessary and time permitting
- Develop, maintain, and distribute to Trainers the procedures for workshop enrollment and evaluation, trainer/teacher reimbursement, outside seminar registration, and consultant agreements
- Process paperwork for workshop accountability and evaluation, trainer/teacher reimbursement, outside seminar registration, and consultant agreements
- Maintain database of trainer activity, teachers trained, and workshops conducted
- Obtain qualified Instructors for Train-the-Trainer Workshops
- Schedule Train-the-Trainer Workshops at least semi-monthly and notify TSC members of training 30 days before training whenever possible
- Contact Trainers within 2 weeks of Train-the-Trainer Workshops to discuss training progress and bimonthly district visitations to observe Trainer activities
- Conduct Train-the-Trainer Workshops in areas of expertise
- Stay current on the latest educational technology training techniques and strategies
- Research technology training efforts within the state of Nevada and when appropriate, other states
- Provide Trainers with new training practices, as they become available
- Manage the application for and awarding of educational credit for Teacher Workshops, including undergraduate, graduate, and inservice credit
- Collect, index, and maintain a Technology Training Library
- Manage the computer lab in the Regional Training Center
- Develop and maintain an online educational community via the Consortium web site with teacher resources, training calendar, online classes, and interactivity with teachers
- Collect enrollment and evaluative data for Train-the-Trainer and Teacher Workshops
- Research and apply for additional funding sources for the Consortium
- Assist in creating year-end reports for funding sources, including NDOE

Mark Knudson (mark@scsunredu 753-2201) currently holds the position

Trainer Roles & Responsibilities

Their district's TSC member will select and supervise trainers There are no term limits set for trainers Trainer roles and responsibilities may vary by district

- Attend Train-the-Trainer Workshops
- Complete appropriate reimbursement forms for training stipends and travel expenses
- Coordinate with their district's TSC member to determine their teachers' technology training needs
- Schedule and conduct Teacher Workshops in their respective districts using knowledge gained from Train-the-Trainer Workshops or using pre-existing skills
- Manage the paperwork necessary for Teacher Workshops including attendance sheets, inservice credit, and college credit
- Provide their TSC member with updates on scheduling and implementation of Teacher Workshops
- Provide SDS with workshop information including dates, subject, attendance, hours, and workshop evaluations, using appropriate forms provided by the SDS
- Trainers will sign an agreement stipulating that they will conduct Teacher Workshops in their district after attending Train-the-Trainer Workshops

Trainer/Teacher Incentives

Reimbursements for training will include individual Trainer travel expenses, substitute teachers, and Trainers attending Train-the-Trainer Workshops. The procedure for reimbursements is to use NNTC form #0001, Report of Official Expenses for Staff Development. All forms will be signed by the respective district's TSC member, routed to the SDS for verification, and then forwarded to the Fiscal Agent for approval and payment.

Due to the concern over teachers being absent from the classroom, it is suggested that teachers who become Trainers will be paid for any training they receive after normal school hours, including travel time to remote schools. Training during normal school hours is covered in the budget under substitute pay. This portion of the budget may need to be reallocated to this after-hours pay depending on how many after-hours workshops the district requests. The teachers that come to workshops after-hours will have the option of other types of incentive, for example inservice credit, Great Basin College undergraduate-level credit, and BYU and SNC graduate-level credit.

Trainers are paid for every hour of training they attend Train-the-Trainer Workshops as well as every hour of Teacher Workshops they conduct. Trainers will be paid one hour of prep time for every two hours of training time for Teacher Workshops. The TSC members will consider request for additional prep time reimbursement and forward any approved requests to the SDS. The SDS

will submit the request to the TSC for consideration. If the TSC approves the request, the SDS will process the request as any other reimbursement.

Assessment and Evaluation

All Trainers attending Train-the-Trainer Workshops will fill out evaluation forms. These evaluations will be collected by the SDS and analyzed for Instructor and courseware effectiveness. Subsequent workshops will be revised and improved based on the responses from these evaluations.

This model of evaluation and improvement will extend to the Teacher Workshops in each district. The SDS will provide Trainers with an evaluation form to distribute at Teacher Workshops. The SDS will use these evaluations to provide Trainer support and get dynamic feedback from the Teacher workshop level of training. The SDS will then follow select teachers into their classrooms and observe the integration of technology at the delivery point of instruction. Adjustments and improvements will be made to the Train-the-Trainer and Teacher Workshops based on these observations and evaluations.

Beginning in the Spring semester of 1999, TSC members will distribute the Self-Evaluation of Computer Skills to their district's teachers at the beginning and the end of the semester. In subsequent year, this assessment will take place at the beginning and the end of the school year. The SDS will compile data from this assessment tool, conduct a statistical analysis, and compare the results of the control group (beginning of semester) and the end of semester data.

WestEd will conduct an overall evaluation of the Technology Training Plan.

Consortium Web Site

The SDS will develop and maintain a World Wide Web site to serve Consortium members. This web site will contain a training schedule, teacher resources, educational links, Internet safety links, homework links, links for parents, interactive forms for Trainers and teacher, online technology training opportunities, and general information about the Consortium.

The web site will house a database of lesson plans specifically reviewed and recommended by professional teachers in the region. A bulletin board will allow teachers throughout the Consortium to communicate about educational issues. The site will house collaborative projects between schools and districts.

The SDS serves as webmaster, writes the source code, and maintains the site. The site will be housed on a private web server to allow the interaction between teachers and the SDS. This is done using scripting and forms. NSN and school servers do not currently allow this type of bi-directional communication.

Grant Applications

No school district can fulfill its educational responsibilities without ensuring that its students have access to appropriate resources of the Internet and technology at every level. In recognition of the need to integrate new technology with traditional K-12 education, corporation, foundations, and the federal government have earmarked more than $30 billion in new money specifically for school technology programs.

The school districts in the Consortium do not have adequate funds in the general budget to meet the growing technological needs of the schools. The Consortium was formed in part to win grant awards. The Consortium must proactively pursue other avenues of funding to be able to successfully implement its technology plan for the long haul. The resources to transform learning are available.

The SDS will pursue additional funding through the grant research and application process. The SDS will be responsible to develop the knowledge, strategies, and technical tools needed to secure support for the Consortium's educational technology programs. The SDS will look throughout the Consortium for special needs that might allow a successful application for additional funding. Grant opportunities must be created, funding entities do not come looking for you. Key areas to focus on will be distance learning, special education, innovative applications, collaborative projects, online staff development, evaluation and assessment techniques, standards-based integration of technology, intranets, and community involvement.

The SDS will attend one grants and funding conference each year and provide grant strategy information to all Consortium members. The funding efforts of the SDS will include the maintenance of existing grants and the preparation of new grant applications. The grant application process will include multiple contacts with funding sources via letters, email, telephone calls, and meetings.