

Executive Summary

Shutesbury Elementary School (SES) serves preschool and elementary age children in the town of Shutesbury. Incorporated in 1761, the rural Town of Shutesbury is located in Franklin County and encompasses 27.18 sq miles with a population of 1,800. As the only school in town, SES is the focal point for accommodating 157 children from Pre-Kindergarten to Grade 6. The school facility hosts a plethora of academic and extracurricular activities daily.

Introduction: Historical Background

Technology planning has always been an important component of the educational process at Shutesbury Elementary School (SES). Committed to improving student learning through the use of computer technology, funds were expended to equip classrooms with Apple IIs in the 1980's. When the school Building Committee drew up blueprints for the building renovation and expansion project in September 1994, it allocated funds for internal network wiring and the purchase of new computers as part of the Furniture and Equipment Budget.

The technology program has grown significantly since those early days. The first five-year technology plan (1997-2002) established a sound foundation to sustain growth and integration at SES. Success is directly attributed to:

1. The established local school/district priorities, guided by a timeline for implementation, and a realistic fiscal plan
2. A system for ongoing evaluation and program improvement that:
 - a. Maintained current status of district technology
 - b. Gathered input from the school community
 - c. Carried out annual review of software, hardware, networking and professional development needs
3. Used technology to support project-based teaching and a student-centered classroom.
4. Used technology to improve recordkeeping and promote data-driven decision-making.
5. Utilized technology to meet the educational needs of a diverse student population.

In 2003-2004, a T1-line was implemented to enable high-speed Internet access for teachers and students. In addition, a wireless port was installed to provide increased flexibility of network access in some locations around the school. Every classroom had at least two network-connected, Internet-ready, multimedia computers. The computer lab contained 3 scanners, two laser printers (one color and one black), an overhead LCD projection system for group lessons, and 24 workstations (consisting of Macintosh OS X-based eMacs (15) and iMacs (8), and one Windows XP Professional Dell).

With grant monies, a second lab (dubbed the Mini-Lab) was established to accommodate the research, writing, and desktop publishing needs of students in grades 5/6. This technology hub consists of five Macintosh OS X eMacs, one color laser printer, and one wireless base station.

In keeping with our efforts to replace older less versatile equipment with newer more powerful machines, the Macintosh server software was upgraded to the latest version of the Macintosh OS

X operating system (v.10.4.x). In addition, a more robust firewall was installed that provided content filtering functionality as well.

Efforts to align the technology program with the ***Recommended Instructional Technology Standards*** (<http://www.doe.mass.edu/edtech/standards/itstand.pdf>) were initiated. Grade-appropriate instruction in keyboarding, scanning, image editing, digital photography, word processing, spreadsheet operations, information management, desktop publishing, electronic presentations, and Internet research were introduced. The goal was to provide opportunities for meaningful learning. Emphasis was placed on teaching students to work ***with*** computers rather than concentrate on teaching them ***about*** the technology. Technology was used to complement, reinforce and extend the standards-based curriculum in each classroom. Activities in the lab were designed to facilitate higher-order thinking, reinforce inquiry-based learning, and provide a strong foundation for the wide range of academic skills students must possess. Students were taught legal and ethical practices related to technology use and safety.

Technology progress continues as the 2006 – 07 School Year began with the implementation of school-wide email for staff. Email is now the standard method of internal communication and is often used for school/community correspondence. To further facilitate the use of technology, ten new computers were purchased to provide one Type A/B computer for almost every teacher. In addition, several resources were redistributed from the lab to classrooms to provide greater accessibility. Investments in iPODs and digital video cameras were made to further expand access to multi-media tools.

Vision and Mission Statement

Mission, Vision, and General Technology Goals

Shutesbury Elementary School is a dynamic learning community. Its mission is to lay foundations in the many critical areas of our children's education. We strive to nurture each child's curiosity, growth, and development, and to foster a lifelong love of learning.

(Shutesbury Elementary Mission Statement)

Shutesbury Elementary School values the development of the whole child. We strive to cultivate a lifelong love of learning, while nurturing intellectual curiosity, academic growth, and aesthetic sensibility. Guiding values at the school underscore the importance of community. We want our children to become caring, respectful, and ethical citizens. We foster the development of critical thinking because our youngsters should become wise decision-makers capable of independent thought and rational problem solving. We frame instruction around student-centered teaching practices in a physically and emotionally safe environment to give all children the confidence they need to take on new challenges and responsibilities. We encourage quality work and meaningful achievement, so that everyone can experience the powerful sense of accomplishment that comes from caring deeply and working hard.

Charged with teaching our students to access, manipulate, and analyze information in greater depth than ever before, Shutesbury Elementary administrators, teachers, instructional aides, paraprofessionals, and parents strongly support the integration of technology with our core

curricula to deepen and enrich learning. To equip our young learners with the technology skills they need to manage, store, and sort the information overload they confront on a daily basis, and to prepare them for challenges they are likely to face as young adults, we focus on digital tools that facilitate effective organization, exploration, and communication.

Technology makes learning more relevant in an electronic age. It enhances and extends classroom teaching, enabling students to access, apply, share and present information in very effective ways across a varied and extensive range of subject areas. It helps teachers customize instruction to meet diverse student needs.

All students at the school benefit from the increased availability of flexible technology supports for reading, writing, research, science, social studies and math. Integrating technology tools allows us to extend the pool of flexible instructional opportunities available for learning success. For example, evidence from teacher assessments indicates that the quality and quantity of student writing improves across the learning spectrum when students use computers for writing. AlphaSmart keyboards, word processors, text-to-speech screen readers, word predictors, and graphic organizers allow students to produce more and better work than possible with just paper and pencil. They spend less time handwriting multiple drafts and more time revising their work to elaborate, enrich, clarify, and organize ideas. They draft longer, neater text with fewer spelling and grammatical errors. Their work becomes easier to proofread and edit.

Visual learners who struggle with organizational issues benefit from brainstorming with concept mapping software. Learners, who experience difficulties with fine motor coordination, spelling, note-taking or handwriting, appreciate how technology tools give them more time to focus on ideas, express thoughts, and revise written work. Advanced students, quick to master the concepts and ideas presented in class can use the self-paced, semi-autonomous instructional design of subject-specific software to attain even higher levels of academic achievement.

At Shutesbury Elementary, technology tools support educational practice, motivate learning, improve attitudes toward learning, and facilitate assistive intervention. The emphasis we place on technological fluency has increased since 1997 because scientifically-based research conducted as a result of the No Child Left Behind Act of 2001 shows a positive relationship between effective technology integration and higher student achievement (Waddoups 2004).

We believe it is crucial to ensure that our students, teachers, instructional aides, and paraprofessionals have every opportunity to use computers and related equipment to enhance the learning environment, provide compelling classroom teaching and learning tools, and improve administrative efficiency.

TECHNOLOGY GOALS 2007-2010

To provide a road map for continued technology integration at the school over the next three years, this ***Technology Plan (2007-2010)***: 1) identifies technology resources that support specific curriculum objectives, 2) proposes that we continue to align our technology resources with the ***Massachusetts Recommended Pre-K-12 Instructional Technology Standards*** (<http://www.doe.mass.edu/edtech/standards/itstand.pdf>), and 3) outlines the methods we intend

to use to assess the extent to which we have successfully integrated appropriate technology supports throughout the curriculum.

The SES technology goals focus on four primary areas:

1. Network/Technology Access – Maintain or add new technology to ensure that system accessibility is preserved with emerging technologies. Critical success factors include:
 - a. Technology Budget
 - b. Technical//Instructional Support
 - c. Hardware and software upgrade/replacement plan
2. Professional Development - Provide high quality professional development to all staff to promote effective administrative and instructional use. Critical success factors include:
 - a. Identify staff technology competencies
 - b. Define professional development approach
 - c. Action plan
3. Curriculum - Continue to align our technology program with the MA DOE recommended instructional technology standards and explore new ways in which technology can be integrated into the curriculum. Critical success factors include:
 - a. Establish and publish SES Technology Curriculum Guide
 - b. Research and expand technology resources to make learning more accessible for all students
 - c. Investigate electronic curriculum database tools (such as MassONE) to enable shared lesson plans
4. Communication - Utilize technology to foster and maintain school/community partnerships by ensuring timely, comprehensive information access via:
 - a. School website
 - b. Email
 - c. Voicemail

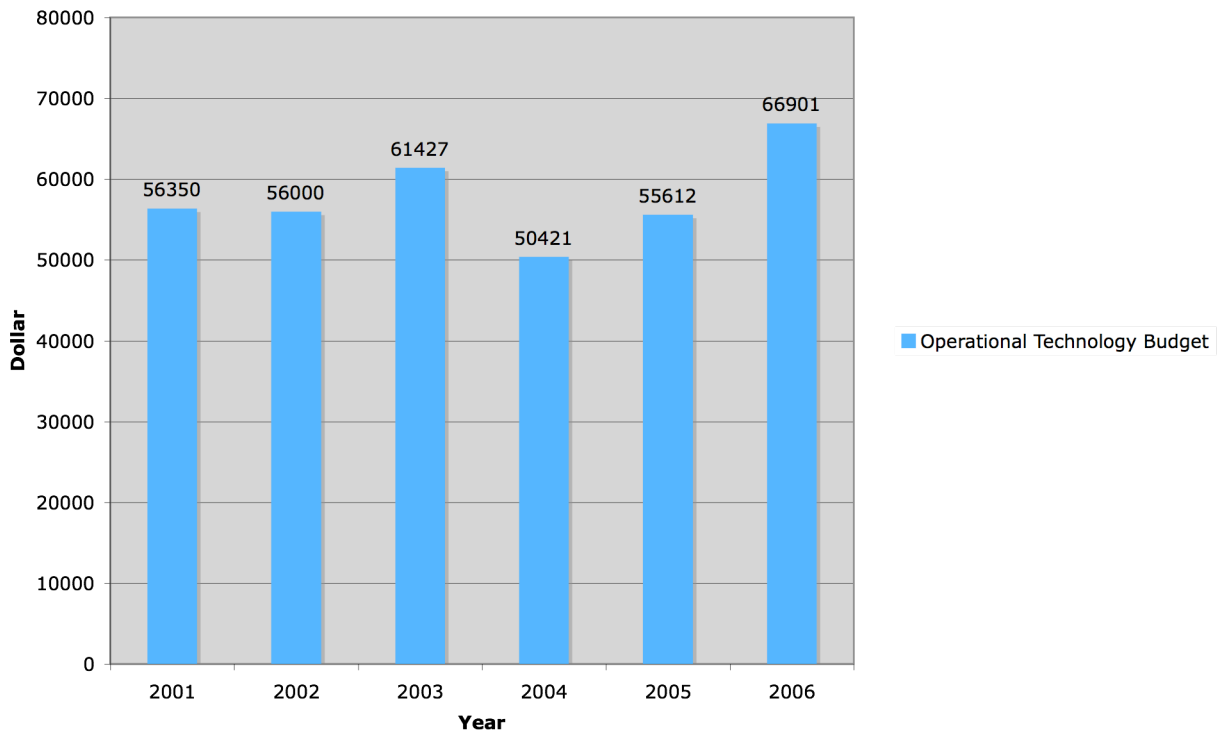
NETWORK/TECHNOLOGY ACCESS

At SES, the ratio of students per Type A computer is 7.91 and the ratio of students per Type A/B computer is 3.11. The current infrastructure for connectivity is adequate at this time, supporting network access from all locations within the building. Our goal is to maintain access and improve the student-computer ratio by continuing to add/replace equipment as technology changes. Additionally, we will seek to acquire portable and/or handheld electronic devices as it is considered to be an important component of extending accessibility.

Technology Budget

As demonstrated through history, SES is committed to provide funding to sustain technology access. The following graph shows that the School's operational technology budget averaged \$57,785 over the past six years.

SES Technology Budget History



In addition to local funding, SES has actively sought and acquired federal, state and private resources to supplement budget needs whenever possible. The School was quite successful in FY02, FY03 and FY04 when it received \$30,000 per year in grant funds to support technology integration projects. For the past nine years, Shutesbury Elementary School has received E-Rate funding to procure telecommunications and Internet services. The portion of expenditures not covered by E-Rate discounts is covered by local funds.

Next year's local technology funding is expected to remain level funded. Funds include line items for technology support, hardware, software, professional development, maintenance and networking.

Technical/Instructional Support

At Shutesbury Elementary, we make a commitment to provide timely in-class technical support with clear information on how to access that support so that technical problems do not cause major disruptions to curriculum delivery. As such we offer application technical support on an as needed basis whenever teachers, instructional aides, paraprofessionals and staff ask questions about or have problems with software installed on their computers. When equipment malfunctions, we try to resolve the problem as quickly as possible or provide alternate solutions until a replacement is in place.

Staffing for the technology program at Shutesbury Elementary consists of one FTE Technology

Coordinator/Computer Teacher whose responsibilities include: troubleshooting and maintenance, K-6 technology instruction, integration, professional development, State and Federal reporting. To assist with this comprehensive responsibility, a parent volunteer group of 10 members was formed in the Fall 2006 to provide assistance to the Technology Coordinator. This pool of volunteers offers a breadth of knowledge ranging from hardware troubleshooting expertise to web development and instructional software design. Additional technical support is available from corporate vendors such as Apple Education and Crocker Communications or other technology coordinators within Union 28.

Technology Inventory and Upgrade/Replacement Cycle

The technology coordinator keeps an updated inventory of school hardware and software, ensures that all maintenance agreements with technology vendors are renewed and/or updated and stays alert to infrastructure needs.

Adequate availability of computer hardware and software is essential for successful implementation of Shutesbury Elementary's technology program. New system software and updated computer applications constantly add features that require more powerful computers with additional memory. Some of our older computers cannot run the latest software. Others must be adapted to work with new printers, scanners, storage devices and digital cameras.

Computer repairs can be costly so whenever we purchase new equipment, we also buy an extended warranty on parts and labor (if available) to safeguard our technology investment. When warranties expire and equipment stops working, it's often more economical to retire the equipment than repair it. Whenever possible, we disassemble older non-working computers to remove working components and keep those items on hand to use for replacement purposes.

Technology is a dynamic environment rapidly changing with the introduction of new tools to access and manage the ever-expanding world of information. The specifics of school and district technology goals will certainly change as we perceive new needs and refine our views of technological literacy. Therefore, in order to maintain an acceptable level of computing power, maximize limited funds and eliminate costly repairs, Shutesbury Elementary believes that a technology replacement plan is required.

The SES technology replacement plan is based on the following order of priorities:

1. Mission critical application status
 - a. Primary network servers and equipment related to infrastructure
 - b. School-level administration systems (student admin, email, web hosting)
2. Instructional objectives
 - a. Individual Education Program requirements
 - b. Student computer access ratio (lab and classroom)
 - c. Software requirements driven by instructional goals
3. Administrative processing requirements such as
 - a. Staff workstation and office automation tools
 - b. Library CIR/CAT system
 - c. Data reporting/assessment systems such as Testwiz, WJIII, etc.

The computer replacement cycle will begin by evaluating equipment older than 5 years and will replace machines in order of priorities. If equipment remains in working order and continues to provide instructional value, computer purchases will enable us to improve the computer-to-student ratio. The projected operational budget includes funds to replace or add up to 12% of the current inventory.

Activity	Timeframe	Completed
Upgrade CIRC/CAT server, software and workstations	Summer 2007	
Purchase workstations	Spring 2007	
Upgrade SPED testing software	Spring 2007	
Upgrade Microworlds software	Spring 2007	

PROFESSIONAL DEVELOPMENT

Staff Technology Goals

In keeping with the ISTE National Educational Technology Standards (NETS) and Performance Indicators for teachers, specialists and paraprofessionals

(http://cnets.iste.org/teachers/t_stands.html) SES believes that educators at the school should be prepared to meet the following technology standards and performance indicators:

- Demonstrate a sound understanding of technology operations and concepts
- Plan and design effective learning environments and experiences supported by technology.
- Implement curriculum plans that include methods and strategies for applying technology to maximize student learning.
- Apply technology to facilitate a variety of effective assessment and evaluation strategies
- Use technology to enhance productivity and professional practice
- Understand the social, ethical, legal, and human issues surrounding the use of technology in PK–6 schools and apply that understanding in practice.

Professional Development (PD) History

The technology team at SES provided teachers, instructional aides, paraprofessionals, and administrators with annual technology professional development. In 2002-03, four technology workshops were offered with at least 50% of the staff benefiting from hands-on presentations. In 2003-04, a mini-workshop on Windows XP was conducted with informal, one-on-one instruction provided weekly. In 2004-05 two full-day technology professional development workshops were offered during the school year and three full-days of workshops during the summer. Approximately 30-40% of the staff participated in one or more of these full-day trainings. About 90% of our teachers, instructional aides, and paraprofessionals benefited from (albeit informal) one-on-one technology training. In Fall 2006, email training was offered to all staff.

Professional Development Approach

Past efforts were successful in providing introductory courses to staff on basic computer concepts and productivity tools. However, changes in current staffing dictate the need to offer these courses again. After evaluating other models and considering the needs of SES staff, we believe that the professional development program should center on specific curriculum projects to further encourage integration. Shutesbury Elementary is known for its success in implementing project-based teaching models. Its curriculum was especially known for infusion of the Arts and outward-bound activities. By designing staff technology PD around curriculum projects, we anticipate a smooth transition of integration and believe that the critical issues identified by the North Central Regional Educational Laboratory (NCREL <http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te1000.htm>) will be addressed. Due to the school's small size, customization of training is possible. By personalizing staff instruction on a project-by-project basis, we can better ensure that the conditions required for systemic change are in place. An example of this was demonstrated in the recent adoption of the TERC Math Investigations series. Kindergarten students began their study of shapes in the classroom using blocks. They continued to develop that knowledge with the *Shapes* program to reinforce patterns, encourage experimentation of geometric rotations and explore visual and spatial concepts.

We believe that technology professional development must be *relevant, timely, authentic* and *useable*. Technology must be relevant to the task of teaching and beneficial to student learning. Training must be provided in a timely fashion to allow staff sufficient time to establish skills before utilizing it in instruction. Technology must supplement curriculum objectives and not be the goal. Technology tools must be accessible and support must be available to the classroom environment.

To further facilitate technology integration across curriculum, staff training will incorporate:

1. Concepts of universal design
 - a) Utilize technology strategies in assessment and evaluation, and
 - b) Demonstrate ways to harness technology to improve personal productivity and optimize professional practice.

The goal to promote staff technology use to improve student learning requires effective training and support. We expect to sustain technology support and professional development to staff following the mentoring model that works so well at our school. However, as the demand on educators' time continues to soar, coordinated staff availability for training becomes more of a challenge. In addition, technology knowledge varies greatly among staff. Hence, to achieve our professional development goals, alternate delivery methods of training will be investigated. Webcasts and online training options may help to fulfill individualized learning needs. Onsite and off campus courses will be made available as appropriate.

Needs Assessment

Our professional development plan begins with an assessment of staff needs. It is based on competencies listed in the *Massachusetts Technology Self-Assessment Tool* (http://www.doe.mass.edu/edtech/standards/sa_tool.html). These needs were identified through formal requests and observation.

To accomplish our goals, the following topics will be included in the SES professional development plan:

Basic Computer Topics	Timeframe	Completed
Email	Fall 2006	√
Basic Computers	Summer 2007	
PowerSchool	Fall 2006	√
Powerpoint	Spring 2007	
Digital camera/Images	Summer 2007	
Web content	Fall 2007	
Internet research/evaluation	Summer 2007	
Internet Safety	Spring 2007	
Technology Curriculum Projects		
TERC Math Investigations	January 2007	
US History – Grade 5	Spring 2007	
World Geography – Grade 6	Spring 2007	
iPOD audiobooks	Winter 2006	

This list represents topics identified to date and is subject to change as needed.

CURRICULUM

Technology Curriculum Goals

Technology-based learning activities integrated with classroom curriculum can transform learning and help students do their work more efficiently and quickly. Technology also has the power to motivate interest and deliver instructional supports. In our efforts to foster higher-order thinking and reinforce inquiry-based learning, we will continue to strengthen and develop our technology curriculum to align with content standards set by the state for all subject areas across all grade levels.

With the *Massachusetts Recommended Pre-K-12 Instructional Technology Standards* as our guide, the technology program at the school will enable students to:

1. Demonstrate proficiency in the use of computers and understand the of concepts underlying hardware software and connectivity (***Standard 1***)
2. Demonstrate responsible use of technology and have an understanding of ethics and safety issues in using electronic media (***Standard 2***)
3. Demonstrate the ability to use technology for research, problem-solving, and communication (***Standard 3***)

Background

Technology education at Shutesbury Elementary provides instruction in word processing, spreadsheet operations, electronic presentations, scanning, image editing, file management, keyboarding, and Internet research. Students learn to operate and take care of the equipment. They also learn about the social, ethical, and legal issues surrounding the use of technology (including copyright, plagiarism, and personal safety in cyberspace). Students are taught how to search for information, question its reliability, check multiple sources to ensure accuracy. Students' progress with respect to technology skills is informational and is measured by assessing project results and observing student performance.

Technology staffing at SES changed last year when the school consolidated two positions into one. Tech support went from one 1-day/week FTE tech coordinator and one full-time (5-day/week) technology aide to one full-time technology coordinator/computer teacher position. As a result, prior efforts to develop and publish the SES Technology Curriculum guide were not completed. Lesson plans and related documentation were intermittent at best.

Curriculum Next Steps

To facilitate systemic technology integration, a comprehensive IT curriculum guide must be established and published. It must be shared and be accessible to all staff to enable classroom integration. One mechanism for sharing may be via the MassONE network tools. In addition, pre/post tests will be established in an effort to quantify and measure student skills.

It is important to note that the technology curriculum should research and explore new technologies and resources. It should look to incorporate technology tools such as iPods, blogs, gaming technology and other delivery systems that promote teaching and learning.

A proposed timeline for these activities follows:

Task	Timeframe	Completed
Technology Curriculum Guide	Spring 2008	
Mastery skill level rubrics	Summer 2008	
Electronic lesson plan repository	Summer 2008	
Research and expand technology resources	Ongoing	

Communication

The school website is updated weekly and provides notification of upcoming events and general school information. With community input, it is currently being evaluated for redesign with the intent to make information more readily accessible and relevant. We recognize that the school site needs to be comprehensive and frequently updated. To meet this goal, conversations have been initiated to evaluate the feasibility of utilizing a content management system to distribute publication responsibilities. For this approach to be successful, we would need to ensure adequate staff professional development and access.

As indicated earlier, school wide email was implemented at the beginning of this school year. It is presently limited to staff only. Email use by students for school-related projects is possible and requires close monitoring and supervision.

Last month, the school phone system was upgraded to provide intercom/paging features as well as voice mail. All three methods of communication are fully utilized to enhance the home and school partnership.

Access Outside of the School Day

Students in our AfterSchool program regularly visit the technology lab to use the computers for educational play and homework. Children who request permission to use the Internet for research purposes or to complete homework assignments can do so as long as we have their signed Internet Use Agreement on file and there is sufficient supervision by AfterSchool staff.

We do provide some staff with laptops so that they can access current technologies, software, and the Internet for classroom and professional use beyond the school day. At Shutesbury there are currently four Windows XP Professional Dell laptops and two Macintosh iBooks (one running OS 9.x and the other running OS X) on loan to staff. We hope to expand laptop availability to more teachers and specialists as funds permit.

Evaluation

This plan is subject to annual review, revision and updating in response to benchmark achievements in areas such as infrastructure, broadband Internet access, and instructional delivery and also in response to the development of new tools for teaching and learning. Each year, Shutesbury Elementary tech staff, principal and superintendent evaluate the progress the school has made in implementing its technology plan in an effort to learn from past lessons, review our progress in meeting state and local technology benchmarks, and consider revisions in relation to changes in local curriculum, technology, policy (local, state, and national level), financial circumstances and any other relevant developments.

To plan for next steps, we distribute an annual parent survey inviting comments about the technology curriculum and present our technology plan to the School Committee. In addition, we consult with classroom teachers to determine both curriculum, instructional technology and technology training needs.