

**Lincoln Sudbury Regional
High School**

**Lincoln Sudbury School
District**

Grades 9 - 12

Technology Plan

2010 - 2013

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A. Introduction

Lincoln-Sudbury Regional High School is a one school district enrolling only students in grades nine through twelve. Lincoln-Sudbury Regional High School was built in 2004. The building project allowed us to purchase a vast amount of computer equipment. Currently we have over 1000 computers including laptops and 200 printers serving 1640 students and 240 staff members. There are 2 - 4 computers in each classroom, computers in the library, departmental computer labs and mobile labs for many departments. We have a great deal of hardware, but the personnel for the maintenance of the hardware and support for learning the potential of the new system is inadequate. The Educational Technology Coordinator serves as coordinator and Instructional Technology specialist. There is a network administrator and a computer technician servicing the school community. In the fall of 2010, due to federal grant monies a 0.25 FTE Instructional Technology specialist was added to the personnel. This will alleviate some of the backup of issues due to inadequate staffing over the past 6 years. An administrative database for students, staff and administration is managed by a math teacher who is released 0.25 for this work. There has been little time or money allocated for proper training. Although teachers now have computers, in every classroom they have not had time to plan for the effective use of these computers. The students must fulfill a computer technology graduation requirement, in order to prepare students for the world beyond high school.

B. Goals

One of the goals is in-line with the school goal of increased communication within the building and to the community at large. The current web site is managed by a club called the L-S Web Team comprised of students and two advisors. The teachers contribute to the web site by adding class pages, but are not required to do so. Another goal is to work with aging computers and infrastructure without funding to update hardware and appropriate personnel to meet the needs of the school. For this to occur it would the following is required:

- Increase in school wide computer technology staffing
- Professional development focused on the new technology using both face to face and on-line delivery
- Educating staff of the ethical uses of the Student Information Management system abiding by Federal, state and local student privacy laws
- Training for faculty and administrators on a new administrative software package
- Educate the L-S staff about security issues regarding the use of a computer network
- To promote a better understanding of ethical computer use throughout the building for both students and adults

The obstacle to these goals is the insufficient funding on both the state and local level. Lincoln-Sudbury will have to prioritize what can be accomplished due to diminishing resources.

C. LEADERS IN INSTRUCTIONAL TECHNOLOGY

Many educators at Lincoln-Sudbury are interested in and excited about the possibilities computers offer for classroom instruction. Over the past 2 years a wide variety of staff members have been leaders in instructional technology. This representative group has worked to establish a model for students to become computer technology proficient. The committee is also interested in providing professional development for their colleagues. Many of the group participants supply computer

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technology support for their department in a stipend position called a labervisor. There is still a need for additional staffing in the computer technology department to keep up with hardware, software and instructional issues.

Computer Technology Leaders

- ◇ **Leslie Belcher - Curriculum coordinator**
- ◇ **Jim Berry - Computer teacher**
- ◇ **Virginia Blake - Mathematics department coordinator**
- ◇ **Amy Butler - Special Educator, Special Education labervisor**
- ◇ **Donna Cakert - Registrar**
- ◇ **Scott Carpenter - Superintendent-Principal**
- ◇ **Nicole Digenis - Science department coordinator**
- ◇ **Nancy Errico-Educational Technology Coordinator**
- ◇ **David Grace - History teacher, history labervisor**
- ◇ **Conor Hanover - History teacher, history labervisor**
- ◇ **David Hosford - History teacher, history labervisor**
- ◇ **Ken Kimura - Media arts teacher, FATA labervisor**
- ◇ **Leslie Kmiec - Librarian**
- ◇ **Leslie Knight - Science teacher, science labervisor**
- ◇ **Dan Lewis - English teacher, English labervisor**
- ◇ **Mike Malone - Math teacher, computer teacher**
- ◇ **Paula Myers - Librarian**
- ◇ **Meghan Notari- Math teacher, math labervisor**
- ◇ **Carol Padden - FATA teacher, FATA labervisor**
- ◇ **Dennis Phillips - Computer technician**
- ◇ **Rebecca Reitz - Special Educator, Special Education Coordinator**
- ◇ **Paul Sarapas - Fine and Applied Technical Arts Coordinator**
- ◇ **Kim Schultz-Language teacher, language labervisor**
- ◇ **Mark Sobkowicz-Science teacher, computer teacher, computer dept. liaison**
- ◇ **Marci Stoda - Wellness teacher, Wellness labervisor**
- ◇ **Dave Walsh - Network administrator**
- ◇ **Seth Weiss - Math teacher, database administrator**
- ◇ **Matt Wentworth - English teacher, English labervisor**

D. BUDGET

Lincoln-Sudbury has been astute to provide a budget for the school wide computer technology operating budget. The budget has decreased close to 20% in the past 5 years. The new building project 04-05 year resulted in a large capital investment in hardware. This equipment and infrastructure is 5 years old. There are band-aid solution in terms of adding memory which of course still requires both time and money. Each year we plan to purchase two servers, but the replacement of computer labs and staff computers is problematic due to the volume of hardware. We have managed to keep the following line items in place for both the Academic Computer department and Schoolwide computers.

- ◇ **STUDENT HELP**
- ◇ **SUPPLIES**
- ◇ **SOFTWARE**
- ◇ **CONFERENCE/TRAVEL**

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- ◇ **REFERENCE BOOKS**
- ◇ **MAINTENANCE OF EQUIPMENT**
- ◇ **TELECOMMUNICATION & NETWORK**
- ◇ **NEW EQUIPMENT**
- ◇ **REPLACEMENT EQUIPMENT**

In regards to staffing, professional development and support, minimal funding has been available; the numbers of computers along with the increasing school population can not be accommodated with the limited present staffing. For example, in the old building there were 350 computers, 20 printers and 1600 students, faculty and staff. In the new building there is an inventory of 1625 pieces of computer related equipment, and 1900 students and staff with the same support listed below.

Staffing

- ◇ **0.5 Educational technology coordinator**
- ◇ **0.75 Instructional technology coordinator**
- ◇ **1.0 Network administrator**
- ◇ **1.0 Computer technician**
- ◇ **0.25 administrative database**
- ◇ **8 stipend departmental labervisors**

When appropriate we apply for local and global funding. We apply annually for the E-rate discounts. Outside funding opportunities require time to write which in turn takes from the time to help staff and students during the school day. Our funding issues now fall into all categories: hardware, software, staffing and professional development. The priority for funding needs to be applied to computer technology personnel, annual software updates and maintenance of the infrastructure. The entire community has become dependent upon computers. When we lose power or we need to perform maintenance work on our network, students and staff feel crippled.

E. Evaluation

Individual academic departments choose specific software for their subject matter. They work as departments to discuss what products are most successful with their students. The departments discuss computer technology on a regular basis. Although they do not have the budget for hardware, they indicate their needs to the Educational Technology Coordinator. The departments do have the authority and operating budget to purchase subject specific software.

Each fall a survey is administered to teachers for feedback regarding school wide computer technology. Based on the feedback the Educational Technology Coordinator can decide whether there is more user training necessary or whether we should abandon or revise a project. An email conference to which all L-S staff members have access allows staff members to comment on current technology in operation.

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F. Technology Integration

Teachers have been using computer technology at L-S since the early 1980s. Email is our most consistent and well used form of communication for all L-S staff members. At least 98% of teachers use technology everyday, including some of the following areas: lesson planning, administrative tasks, communications, and collaboration. Teachers share information about technology uses with their colleagues. Some staff members are exploring the use of Web 2.0 tools. However it is difficult for the computer technology personnel to support all requests with these services. Some teachers have decided to use tools outside the school network which may or may not be problematic.

According to a survey, 98% of teachers rely heavily upon the computer for their planning and everyday work. Fewer teachers engage their students in proper uses of computer technology within the classroom. Based on an on-line survey administered in the fall of 2008, 68% of the teachers use computer technology with students each week, including: research, multimedia, simulations, data interpretation, communications, and collaboration. This is an increase of 18% since 2005. Many teachers feel students already have expertise with computers based on home access to computers.

The school does have an Acceptable Use Policy posted on our website <http://www.lsrhs.net/TechHelp/newpage/information/info.html>. The district is also CIPA compliant. It is unclear how many teachers are aware of the details of the AUP. It is printed in the student discipline code.

Staffing regarding technology integration has not kept up with the district's increasing demands. The district has a 0.5 FTE district-level technology director/coordinator. The district provides 0.5 FTE Instructional Technology Specialist for 170 faculty members. The benchmark for this position is 1 FTE instructional technology teacher per 40-80 instructional staff. The district has one 0.25 FTE person dedicated to data management and assessment.

G. Technology Professional Development

In the school year 09-10 there were a few in-service workshops focused on computer technology. These included: training on our student information system, exploring Web 2.0 tools and the use of Interactive whiteboards. During the summer of 2010 different department members are continuing their work with focus groups on the integration of technology in the curriculum and working on their class web pages.

Computer technology has been at Lincoln-Sudbury since the early 80s. A few teachers in each department have advanced skills in technology integration and serve as role models to their colleagues. Each department's staff looks at new software in their discipline. Department members work together to learn and to teach with the software. The Educational Technology Coordinator and Integration Technology Specialist (the same person) works directly with both the advanced technology teachers and beginning technology teachers to help them learn more about software which would enhance their teaching.

Every year a survey is administered to the teachers regarding their technology proficiency and the types of workshops they would like available. The Massachusetts Technology Self-Assessment Tool has been reviewed by our technology integration committee. The committee feels that this tool is quite thorough however, 95% of the teachers would find it too cumbersome and a burden to fill out given their overtaxed schedules. For this reason we choose to develop a more succinct on-line survey.

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H. Student Computer Literacy

At L-S we have a student expectation, “all L-S students are able to use technology appropriately to help create, investigate, and communicate”. The graduating class of 2009 was the first class expected to complete computer technology graduation requirement. I feel confident that this new requirement will assist in fulfilling our student expectation. An exit survey was administered in the spring of 2010 for all students enrolled in one of the required courses

The goal of all courses which meet the requirement should strive to help students use computer technology appropriately to help create, investigate, and communicate. Teachers in all disciplines will still be encouraged to incorporate technology into their curriculum where appropriate. Hopefully with this two prong approach we can better meet the needs of the students. This is in alignment with State standards and nation standards. This is not intended as a check list. We want student to become independent and life-long learners. Computer technology changes so rapidly students need to acquire the ability to learn with these changes.

L-S Computer Technology Graduation Requirement

Each student has the ability to use technology appropriately to help create, investigate, and communicate. Each L-S student will be required to take a 2 credit course in one of the designated areas. Students will:

- * Acquire the ability to transfer computer skills learned in the course to other learning environments
- * Become comfortable experimenting with new computer software
- * Emphasize the ability for students to become more independent learners

In a survey with 261 students who took a course which fulfilled the requirement., 80% of the students felt comfortable experimenting with new software. 70% reported they could transfer the computers skills from the course to other situations and 68% felt they could tackle a situation with new software independently.

Teachers in all disciplines will still be encouraged to incorporate technology into their curriculum where appropriate. Hopefully with this two prong approach we can better meet the needs of L-S students in a technology driven society.

Visit the Massachusetts Department of Education Website to read the entire document Massachusetts Technology Standards - Grades 9 through 12 – Technology Standards and Expectations <http://www.doe.mass.edu/edtech/standards.html>

Throughout high school, as students take courses to prepare themselves for college and the working world, they should acquire increasingly sophisticated technology skills. Depending on the pathways and courses they choose to take, high school students will become more adept with certain technology tools than others. Moreover, as the curriculum demands more complicated learning tasks, students will discover advanced capabilities in tools such as database and spreadsheet applications.

During high school, students also should have the opportunity to use more specialized technology tools that enhance their learning. These might include simulation software, geographic information systems, computer-aided design software, or any of a wide variety of content-specific tools. In addition, students should have the opportunity to learn how to write code in a commonly used programming language.

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By the completion of high school, students should have developed an appreciation for the capabilities of technology resources, as well as an understanding of how these tools can be used for lifelong learning. In addition, students should be knowledgeable about the role technology plays in various fields of work, enabling them to better plan for their careers in the 21st century. (From the Mass DOE)

Answers to Frequently Asked Questions

Each year a list of courses which meet the computer technology requirement will be reviewed. Here is an example of courses that would meet the requirement: Creative Computing, Web Publishing, Flash, Digital Imaging, Game Programming, Robotics, CAD, Architectural Design, Introduction to Programming, Intermediate Programming, Advanced Programming, Topics in Algebra II, Topics in Advanced Math

What if a student already knows everything offered in the above courses? In the field of computer technology the change is rapid. It is highly unlikely any student or teacher is well versed in all of the above courses. Due to the nature of the ever changing field of technology the more exposure to the use of different software the more prepared the student will become.

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I. Accessibility of Technology

In the new building students have more computers to access. The old building offered approximately 5 students to 1 computer while in the new building it is closer to 3 students to 1 computer. This was a major change in terms of access. Previously to save files an account was created on need basis: now, in accordance with our Acceptable Use Policy, we have developed a system where each L-S member (student or staff) must have a network user name and password to use any features of the computer. The new system is a learning process for both students and staff members. Faculty members have access to the initial student name and password and are encouraged to teach the students how to use the system when the students enter a computer lab. Problems arise when a student who wants to use the school computers has had no teacher introduce the class to the computer lab.

In addition classroom computers, there are 6 computer labs with 26-30 computers associated with each department and one classroom with 26 computers shared by 3 departments. The library has 22 computers for student use in the main room. There is an instructional library classroom which houses a smart board and 4 desktop computers. There are 11 mobile computer labs with 15 computers each available for teacher sign up for their classes. These computers are not available for individual student sign up. Ample desktop computers and portable computers for students to use within the building.

The school acquired approximately 800 new computers in this building project. This *was* wonderful! However, now we have 800 five year old computers. Fortunately we do have a line item in the school wide computer budget which allows for replacement of equipment. This may mean that other line items such as supplies or maintenance of equipment will need to decrease. There is an annual budget process which the Educational Technology Coordinator participates in each fall for the next fiscal year.

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Along with proper planning and attention concerning hardware, the personnel needed to maintain this hardware can not be forgotten. It is of no value to have non-operating computers in a classroom environment. Administrators and support staff rely heavily upon the computers and servers, malfunctions impact their productivity. The running of a school network has become an intricate infrastructure which requires ongoing maintenance. In the old building there was a network administrator and a computer technician. They serviced 200 computers per person. In the new building the ratio is 600 computers per technician. This is astounding! Clearly more personnel resources are essential to the technology infrastructure. There are two possible directions to pursue if funding were available. Another computer technician could be hired or certain faculty members within each department could be released from teaching classes. We had a model at one time where a teacher was released in each department to help department members with both software and hardware issues. This model was effective for faculty members, but was discontinued due to lack of funding.

J. Administrative Uses

Computers have been an integral part of the administrative work at L-S. Since we are a one school district, our financial personnel is housed within the building. This department utilizes PC computers and has their own server. The computers will be replaced with Apple computers and will run a Windows environment. This will be helpful when it comes time to replace the Apple computers they can be placed in other parts of the building. The school computer support personnel assists the business office in terms of the school wide network and any emergency problems with their computers.

Other areas of administrative use include the registrar, student services, scheduling, curriculum coordinator, housemasters, counselors, nurses and special education. Over the past five years the state and federal governments have been demanding in terms of both staff and student reporting via the web. The state requires more than 52 data elements for each student be maintained on our network and transmitted during different times in the year. The registrar has taken on this task which is a large increase to her workload. There is a new Educational Data Warehouse which someone has to learn how to use. The data needed for Education Personnel Information Management System, (EPIMS) has put an increased work load on our Personnel Director, Scheduling and Curriculum coordinators. Student MCAS results dictate success plans which now have to be developed and worked into our Student Information Systems. In terms of scheduling and report cards, which were once customized in house by math teacher Seth Weiss, a new administrative package was purchased in 2002 by an outside vendor (Information Marketing Group) called iPASS. This web based software enables administrators, teachers and students to access different information. However, the implementation has been slow and has required a great deal of customization on the part of our database manager. We are also working closely with the vendor in terms of customizing the product to the way that L-S does things rather than changing our procedures to meet the software's constraints. The external forces require schools to do more while providing less funding. This has taken a great toll on our staff. This increased work takes time, energy and communication.

The Special Education department uses a web based piece of software to generate Individualized Education Programs. Training of the special education staff takes place within the special education staff with support from the computer technology staff. The counseling department has started to use a web based program to assist in college information for juniors and seniors.

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Each of these areas demand that the computer staff remain in close contact with staff members and their computer skills and requires that the computer staff learn the new software packages in order to support the faculty learning the new applications.

K. Infrastructure for Connectivity

The Lincoln-Sudbury Regional HS computer network consists of redundant gigabit fiber connections from the main server closet to each of 20 wiring closets and 10/100 Mbps copper (Category 5e) wiring to each network jack. Each classroom has between seven and fourteen network jacks which provide independent 10/100 Mbps connections to the wiring closets. We also have over 90% coverage for our 802.11b/g/n wireless networking and have planned additional coverage to provide 100% coverage inside the building with some connectivity in the courtyards outside the building. This wireless network is available around the clock and students are allowed to bring in their own portable computers which will be filtered through the L-S network. Our Internet feed for the public file, web and email servers is a 15 Mbps microwave link. For general Internet access we also have a 6 Mbps cable modem and a 20 Mbps fiber optic connection that supplement the 15 Mbps microwave link, and all three are connected through a CIPA compliant filter for the wireless and hard-wired network users.

Our main server room consists of a rack of servers providing separate email, web, DNS, database, backup and file servers all connected to the gigabit fiber network with 32 independent gigabit copper connections. We have seven separate servers for file sharing: one for each grade of students, one for faculty and staff, one for administrators, and one for the yearbook staff and students. All servers are either using RAID 1 or RAID 5 volumes for hardware redundancy and are backed up to a 1.6 terabyte tape library nightly.

Since the teachers have access to a high speed network and many computers available they make regular visits with their classes to the departmental computer labs. Two departments at L-S use the computers exclusively for their curriculum. The computer department teaches: Creative Computing, Web Publishing, Robotics, Introduction to Programming, Game Programming and Intermediate Programming. The FATA (Fine Applied and Technical Arts) program teaches courses in Digital Imaging, Digital Photography, Film, Media literacy, Architectural Design and Engineering Design process. The librarians run a ninth grade orientation on the uses of information technology with the aid of a SMART Board and teach a unit in Creative Computing. Students are required to take a 2 credit course which helps encourages them to learn more about the uses of computer technology in our society.

L. Access to the Internet outside the School Day

Lincoln-Sudbury works with students to maintain the school web site. This gives the students the opportunity to acquire skills in web publishing and design. There are definite pros and cons to this system. The positive side is the student involvement in their school web site. The negative side is that often times information is not posted or removed in a timely fashion. In order to assist in the upkeep of the website all faculty members and interested staff members are allowed access to certain portions of the web site. Ideally time and resources should be dedicated to an adult member of the staff. Currently two staff members are paid a stipend to supervise the students on the Web Team and assist staff members working on their web pages.

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Students have access to computers both before and after school hours but must be with a teacher or in the library where there is adult supervision. It does not make sense to leave expensive equipment unattended.

M. Summary

Lincoln-Sudbury is extremely fortunate to have a powerful network infrastructure and large amounts of hardware. The faculty, staff, administrators and students are eager to use the available computer technology. Hopefully more funding will become available within the next few years to support additional personnel to provide professional development along with software/hardware support.