

## **Making Computer Labs Work**

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With the percentage of Digital High Schools in California soon to reach 100%, we are increasingly faced with the need to discover the best design for a computer lab. Here we will not debate the pros and cons of computer labs but rather look at what are the components (hardware, software, furniture) and configurations that make up a quality computer lab. To assist with answering this question, I recently asked a Technology Coordinator's listserv (See last month's article) their tips about computer labs, and what follows is in part a result of this exchange.

### **HARDWARE**

Many coordinators felt that a single platform lab was much easier to manage and that it is not necessary to have a multi-platform lab to address the issues of a multi-platform world, especially if there is local access to another lab using a different platform. All who responded agreed that an LCD Projector is a good idea for a computer lab. TV scan converters are rarely large and clear enough for all students to benefit from its image, and LCD projectors (although still expensive) continue to come down in price. Some felt that permanently mounted units are a good idea although more expensive on the initial install, and others felt it important to have a small, compact unit that can be used in other classrooms when the lab is empty. The brightness of a projector is important and the general rule is the brighter the unit, the more expensive to purchase. Whatever projector you purchase, a good quality reflective screen will increase the brightness of your projection in exchange for a small financial investment. An interactive white board, or SmartBoard ([www.smarttech.com/products](http://www.smarttech.com/products)), was mentioned a few times as an excellent instructional tool that also helps involve students in the class presentation. If you go for the SmartBoard, be sure to fill out their simple grant application, which can save you 30% on the purchase price ([www.smarterkids.com/grants\\_intro.htm](http://www.smarterkids.com/grants_intro.htm)).

A server can easily improve the effectiveness of a computer lab. From serving applications and sharing CD ROMs to providing a location for students and staff to save their work, servers require maintenance and additional up front costs, but the benefits are numerous. If students and staff are saving their work to the server, then not only can they access their work from any computer in the lab, but if the network and server are set up to do so, students could access their work from anywhere on campus or throughout the world. In addition, you will not have to utilize floppy disks, which are slow, unreliable, easily lost or damaged, and soon will not be included in new Macintosh or PC computers. If you have a PC computer lab, install a Windows based server and if you have a Mac lab, stick with a Macintosh server. Although you can network servers in a cross platform environment, it is simplest to keep it to one platform. Be sure that your server has a robust configuration with plenty of RAM, disk space, and horsepower and store the server in a convenient, yet secure location.

One Technology Coordinator encouraged the installation of a reliable 10Base-T or 100Base-T Ethernet network with fast Internet access. If computers are intermittently falling off the network, Internet access, computer management, file sharing, and printing functions will frustrate you to no end. Stick to Category V compliant installations and utilize patch panels and keep wires tucked away in secure areas. Wireless technology has come a long way in the past year and deserves your consideration, including Apple's AirPort technology ([www.apple.com/airport](http://www.apple.com/airport)), which is a cross-platform technology.

## **SOFTWARE**

The management of a computer lab can be greatly simplified with the assistance of management software. Apple Labs should utilize the Apple Network Administrator Toolkit –ANAT ([www.apple.com/networking/anat](http://www.apple.com/networking/anat)). Version 4.0 was recently released and the client comes pre-installed with OS 9. This utility can distribute (or delete) software to all Macintosh computers on the network, rebuild the desktop, provide system configuration reports, share screens with other computers, control a remote computer, and much more. SmartStuff Software ([www.smartstuff.com](http://www.smartstuff.com)) just released LabExpert and Vision, which are the same type of utilities as ANAT but for the Windows platform. NetOctopus ([www.netopia.com/software/netoctopus](http://www.netopia.com/software/netoctopus)) is a similar utility but works on Mac, Windows and NT.

All Technology Coordinators who responded agreed that no lab should be without some form of desktop security. There are quite a few utilities available to prevent students from inadvertently or intentionally deleting, renaming, moving or otherwise messing with files and folders. In Santa Cruz City Schools we use FoolProof ([www.smartstuff.com](http://www.smartstuff.com)) because it is cross platform and provides most of the flexibility in configuration that we need. Lab management tools are well worth the cost of admission!

Some times a computer's hard drive needs reformatting or replacement. In this case you would want to use a *restore* function that would reinstall the computer operating system and previously installed software with your predetermined configurations. Apple has a restore utility that will assist you in creating a disk image of your Macintosh computer that you can store on a server or burn to a CD ROM. Using a ghost utility such as Norton Ghost ([www.ghostsoft.com](http://www.ghostsoft.com)) or Apple Software Restore ([www.apple.com](http://www.apple.com)) you can easily create a restore disk. A good article on this process is available at: [ctap.fcoe.k12.ca.us/ctap/restore.htm](http://ctap.fcoe.k12.ca.us/ctap/restore.htm). PcRdist ([www.pcrdist.com](http://www.pcrdist.com)) is a synchronization utility for the PC platform and there is a Mac Version (RevRdist) available as well that will synchronize your hard drive upon startup with a predetermined configuration.

Most Technology Coordinators mentioned that virus-scanning software should be a requirement for any lab connected to the Internet or that provides access to floppy drives. There are many utilities available to meet this need but the updates and configuration is as important as initially installing the software. New viruses are developed daily so if you don't download and install the latest definition files, you dramatically reduce the effectiveness of virus protection software. It is possible to purchase a subscription from some vendors that can help automate this process. In addition, configure the software to automatically scan removable media (i.e. floppy disks) and downloaded files.

The application suite should be the same on all computers in the lab so that no matter which computer a student works on, their documents can be opened and applications will be familiar. As your computer lab grows in age and the need for computer hardware and software upgrades and replacement occurs, it becomes more difficult to maintain the same software suite on each machine due to the ever-increasing demands that new software is placing on the installed hardware. Whenever possible, perform standard upgrades to your whole lab at once to help avoid multiple versions of applications spread throughout the lab.

## **ROOM AND FURNITURE ARRANGEMENT**

Even if a lab has all the latest equipment and software, the arrangement of furniture in the room has a big impact on the instructional potential of the lab. The first thing to remember is to not overcrowd the lab. Tripping over backpacks and squeezing between chairs is not a functional design

and should be avoided. If a lab is used to assist with the integration of technology into the classroom curriculum, then students will need workspace for reference materials and note taking, not just space for the keyboard. One Technology Coordinator recommended arranging computers in pods or groups, and others emphasized the need for group activity space and additional workspace. Some labs are set up in a “U” shape to make it possible for the instructor to see all computer screens at the same time. More often than not the computer room evolves from an abandoned room in the building and must to be converted to meet the needs of the computer lab yet stay within the confines of physical and financial resources. This does not provide the most flexibility in design and space, however it is important to look at all options when you do have some to consider. Description of an interesting model for a technology lab can be found at [rits.stanford.edu/rooms/flexlab/facility.html](http://rits.stanford.edu/rooms/flexlab/facility.html).

Some final notes from Technology Coordinators include:

- Make sure to consult on-site staff about the lab setup prior to ordering and installing
- Document as much as possible because you won't remember it later
- Maintain an up-to-date Acceptable Use Agreement and know for which students they are on file

These are only some of the considerations one should have when designing or upgrading a computer lab, however they should help you to address some of the issues pertaining to the subject and assist you in making good decisions. Remember that the best resource is your peers so utilize the ability that the Internet has provided and network with your fellow Technology Coordinators. A special thanks to the many Technology Coordinators who contributed their ideas, including David Bayne, Lane White, Juliette Hill, Corinne Carriero, and Cate Gleeson.