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**TECHNOLOGY
& LEARNING**

A photograph of students in a computer lab. In the foreground, a young woman with curly hair is looking towards the camera. Behind her, other students are seated at desks with computers, some looking at their screens. The background is slightly blurred, showing more of the lab environment.

PC MANAGEMENT IN THE CLASSROOM
KIDS, COMPUTERS & CONTROL

Practical information, tips and tricks for managing your school's computer lab.

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INTRODUCTION

Supporting Education with NetSupport

In 2003, the national ratio of students to instructional computers in public schools had reached 4 to 1*, an all-time high. As the use of computers and the Internet in schools grows, so does the need for managing the learning process in networked classrooms.

As schools continue to provide better access to computer hardware, networks, and Web resources, the complexity and magnitude of the jobs facing district staff increases exponentially. IT personnel must juggle software deployment, network security, and other technical issues. Teachers are required to manage students using computers in a lab or multi-desktop classroom to ensure they're learning and spending time on their assigned tasks. With those challenges in mind:

- How can schools manage multiple desktop systems effectively?
- How can educators monitor computer usage appropriately?
- What are the cost benefits of including lab management software in your technology plan?

This eBook answers these questions, provides practical information, and links to additional resources. Management issues are less complicated when the right tools are in place.

I hope you enjoy this eBook. Please [give us feedback](#) to let us know what topics you would find interesting in future eBooks.

Jo-Ann McDevitt, Publisher

* according to Market Data Retrieval

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MAXIMIZE
Their Potential



Network Training
Software

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Built on industry-leading remote control, NSS allows a teacher to monitor all student workstations simultaneously or display his own screen to the classroom for centralized instruction.

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Download a free classroom trial today and find out how two million students have gone to the head of the class with NetSupport School.

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www.netsupport-inc.com **SCHOOL**

TECHNOLOGY
& **LEARNING**

Computer Lab Management Software

By Wesley A. Fryer

Cultural pundits have observed that on its face, technology can appear more on the side of "anarchy" than on the side of "control." This observation is validated in educational computer labs, where the level of teacher control over the learning environment is often different than in the traditional classroom. Open ended, constructivist investigations are desirable at times in instructional settings, including computer labs, but the anarchic nature of technology often manifests itself in school computer settings in less positive ways. When students are working on computers it can be difficult to get their full attention (have them fully "disengage" from the visual images and content on the monitor) and to make sure they remain on task during the lesson. Distractions abound online for young and old alike: from the temptation to check email to click on a website banner ad.

"Computer lab management software" can have several meanings: it can refer to software like Foolproof or Fortres that "locks down" the computer and only grants users access to limited software features. In the context of this article, however, "computer lab management software" refers to programs used by a teacher in the course of a lesson to maintain student attention and enhance instructional delivery. Screen sharing is a typical feature of lab management software, allowing the teacher's computer screen or another student's screen to be shared with every other computer in the lab. Effective use of computer lab management software can make a tremendous, positive difference when teachers use a computer lab for



instruction. Use of computer lab management software is included in the online curriculum for the workshop "[Strategies for Managing School Computer Labs and Classroom Computers](#)".

Lab Management Software Features

Using lab management software to present a technology-infused lesson can completely change the way a teacher presents content and teaches skills. Instead of straining their eyes to see small details on the screen at the front of the room, students can look at their own monitor in front of them and comfortably see the teacher's demonstration. When it is time to get everyone's attention, the teacher can "blank" student screens (make them all black), thereby preventing them from continuing their work. While some lab management software programs offer more advanced features, the following are the basic features that all should include.

Screen Sharing: Making all computer screens in the room show the same image, usually the instructor's screen. Many management programs allow sharing of other screens as well, so if a student has created something the instructor wants to show everyone, this can be accomplished quickly. When screen sharing is disabled, all student computers return to their previous screens.

Blank Student Screens: This is invaluable for getting student attention and providing class instructions. The blank screens command causes all computers in the room except the instructor's to turn black (or another color) and sometimes display a message. Some

option of displaying a custom image. While screens are blanked, students cannot see anything on their own screen or continue to work.

Remote Control: Depending on the instructional setting, this feature may have more "gee whiz" value than practical use, but many programs allow instructors to take remote control of a student's computer to demonstrate a task. This feature may be more helpful to technical support staff who need to make configuration changes or even installations on remote computers than to classroom teachers.

Unique Room Codes: Lab management programs, when initially setup on "client" (student) and instructor computers, permit a unique name or number to be assigned for the classroom where the computers are located. This way, instructors can choose to control only the computers physically located in the same classroom. Multiple computer labs or classrooms in the same building can use the same lab management software for computer control with different room codes and not interfere with each other.

Access to these lab management features is extremely helpful, whether the students using the computer are young or old. In fact, as many staff development presenters know, it can be even more difficult to teach technology skills to adults (especially teachers) than to young people. When an instructor wants to limit off task behavior (like surfing websites unrelated to the presented lesson), encourage time on task, or present oral instructions to students, these software tools are wonderful additions to a technology-infused learning environment.

Windows XP Professional and some other Windows-based operating systems include an optional feature, Remote

Most students love to chat on their computers: typing text messages to each other as they would in an online chat room.

Desktop Services, which allows for remote control of desktop computers. Microsoft has even released a free [Remote Desktop Connection Client](#) for Mac OS X allowing Macintosh computers to remote control a variety of Windows-based computers. These remote control features can have instructional applications, but do not permit the same class-wide screen sharing and other capabilities of the lab management software options discussed in this article.

Advanced Features

Some management programs offer additional features with wonderful instructional benefits for classroom teachers and students.

Shut down or restart computers: It can be time consuming at the end of the day to shut down all the computers in a lab or classroom, or to restart them before the next class. Some programs offer the ability to shut down or restart an entire lab simultaneously with a few mouse clicks on the instructor computer. Installed Network Interface Cards (NICs) in each computer must support this feature for it to work.

Transfer a file to all student computers: If a school file server is available and a "shared folder" has been created allowing student as well as teacher access, files for a particular lesson can be opened from the network. Some lab management programs allow for the distribution of files directly to the hard drive of every computer in the lab,

however, and some can even retrieve modified and saved files from the student computers to the instructor computer at the end of class.

Chat: While some teachers may think this feature is superfluous and unneeded, chat capability included with lab management software can be invaluable for a variety of reasons. First, most students love to chat on their computers: typing text messages to each other as they would in an online chat room. A major difference between an online chatroom and a chat environment provided by a lab management software program is that the participants are controlled: only those students physically in the room can participate in the chat. As a reward for staying on task or completing a lesson, students can be given five minutes of chat time at the end of the period. Students desperately need guidance and instruction on what is appropriate and safe to disclose in an online chat environment, so in addition to motivating students, chat sessions can also provide them with invaluable digital safety skills. For more information about online safety issues, visit [GetNetWise](#).

NetSupport School

NetSupport School is a classroom instruction, monitoring and polling tool that enables teachers to train students in the computer lab, simply and effectively. Teachers and trainers can easily demonstrate, monitor, quiz and interact with their students. NetSupport School is simply the perfect instruction, monitoring and support tool for modern networked classrooms, training labs and libraries. NetSupport School New Version 7.5 combines market-leading instruction capabilities through remote control with all new testing/polling modules and

application/Internet monitoring functionality. With NetSupport School, teachers can demonstrate applications in real time, show their screen to students' screens, create customized tests, manage application and web usage, monitor student progress, nominate group leaders, digitally send out and collect coursework, annotate the screen, perform online chat and much more. For Windows classrooms. Download a free classroom trial today. [Click here](#) for more information.

New desktop management software, NetSupport DNA, provides educators a multi-function, easy-to-use cost containment tool. NetSupport DNA provides educational institutions with a PC management solution that enables them to establish IT asset management programs in a reasonable timeframe and within a sound budget. DNA features include hardware and software inventory, software distribution, application and web metering, query-based reporting, a help desk component and remote control functionality. As an out-of-the-box solution for Ed-Tech managers, NetSupport DNA eliminates hidden implementation and training costs. NetSupport DNA enables teachers to execute and distribute software to multiple PCs, track laptop and software inventory, restrict software applications, block websites and monitor web site usage. NetSupport DNA sets the standard for out-of-the box desktop asset management.

"NetSupport School has been a tremendous asset to my computer classes and to our lab directors. It has provided an easy and efficient way to monitor and communicate with computers on our school network. We highly recommend it!"

Jon Halvorsen
Technology Coordinator & Teacher
Tahoe Truckee High School

Conclusion

Billions of dollars are spent annually to purchase and upgrade school computers in the United States. Sometimes, the individuals ordering these resources, however, do not adequately consider instructional needs.

Access to and use of lab management software by a teacher can make a TREMENDOUS instructional difference in the classroom. Given the total amount of money invested in technology in school districts and the relative benefits of lab management software, the cost of such software is minimal.

Technology integration evangelists should make administrators, district technology planners, board members, and others involved in the purchasing process aware of the availability, desirability, sizeable benefits and reasonable cost of lab management software. By doing so, hopefully these software tools can be made more widely available to educators at all levels providing technology integrated instruction in computer labs or regular classrooms. ■

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The IT Guy

Computer Lab Policies and Procedures

Question: I am looking for a comprehensive Policy and Procedure document for students in a computer lab.

The IT Guy says:

There are a wide variety of lab policies available online. The [Riverside Brookfield High School Computer Lab policies and procedures](#) are representative as well as the [Reeths-Puffer High School Library Media Center](#). In an elementary setting, the [Will L. Lee Elementary School's Computer Use Procedures](#) are excellent. ■

Options for Controlling Internet Access

Question: What options are available for controlling student access of the Internet?

The IT Guy says:

One of the goals of every school's computer literacy curriculum and campus policies should be helping students learn to be responsible and ethical users of technology tools. To this end, schools need to foster perceptions of individual accountability for online behavior just as they do for face to face behavior.

As human beings, we tend to act differently in a situation where we believe we are truly anonymous and not accountable. Rather than creating a stifling, locked down computing environment where no student can make a mistake because the software and system configurations will not permit it, school computing environments must strike a balance between meeting federal regulations for protecting minors from inappropriate online content and

creating a completely open and anonymous virtual environment where accountability is non-existent.

Several different commercial products are now available which monitor and record every keystroke, website URL, and instant message or chat phrase typed by a student or staff member onto a school computer. Investing in "big brother" software like this may sound Orwellian, but it does not have to be. Using a mixture of sound instructional practice and student discipline management strategies, as well as available technological solutions, educators must find ways to create academic computing environments which have both a substantial level of freedom for students and staff, and clear lines of accountability for computer users that are clearly understood.

Many school and library computers are so "locked down" that they leave no room for student decision making, when it comes to the ethical choices which are present online and elsewhere in computing environments. This alternative is a poor choice because it leaves students ill-equipped to deal with the realities of non-filtered, completely open home computing environments which are available to growing numbers of children each day. Education about appropriate computer and network resource usage must extend beyond the walls of the classroom into the community, as adults as well as young people strive to stay abreast of ever-changing waves of technology. ■

Maximize Computer Up-Time

Question: How can we maximize lab computer up-time and minimize the time required to fix problems by technical support?

The IT Guy says:

Like death and taxes, software and hardware problems with computer lab equipment is inevitable. Hours of time can be wasted on a regular basis fixing problems that crop up from the unintentional as well as intentional actions of students as well as school staff, if sensible policies supported by administrative purchases are not followed.

Some schools opt to lock down computers with security software to prevent students from tampering with settings or misconfiguring software. Others utilize software which restores the default condition of the computer's hard drive every time the machine is restarted: avoiding many troubleshooting dilemmas by "wiping the slate clean" with every restart. Another option is to utilize imaging software which uses a "pristine" drive image containing all necessary configuration settings and software programs. Computer imaging software solutions can be used on a periodic basis, or as-needed when a computer starts to exhibit problems or abnormal behavior. Use of imaging solutions allows for students to use computers in an open and autonomous fashion, with a minimum of restrictions. Yet the needs of the campus teachers can be readily met when something is messed up and a computer no longer behaves properly: its hard drive can simply be re-imaged. For small problems, this may seem analogous to taking out a single sniper with an atomic weapon, however, disk re-imaging is generally a consistently successful "no-brainer" strategy for fixing software problems which inevitably come up in the computer lab. ■

Applications to Install in the Lab

Question: What applications should be installed on our lab computers?

The IT Guy says:

The types of applications to install in the computer lab should be driven by the functionality required by the lab's users: both students and teachers. A web browser and basic productivity software, including a word processor, spreadsheet program, and presentation software is a given. Depending on the level and experience of the students using the lab, however, other software programs can still be installed on the computer but not immediately visible or accessible to the user depending on the network login used.

The limited size of computer hard drives used to be a substantial restriction on the number of software programs that could be installed on a lab computer, and if older computers are still in use this may still be the case. An entire clip art library may not be desirable to load onto the local hard drive in this case. Those resources can either be loaded into a shared network drive, or accessed directly from the CD when students or staff need them. Larger hard drive capacities make these restrictions less common, however.

Separate student login accounts can be established which present users with different desktop and start menu/dock icons depending on their needs. These login accounts can automatically "mount" certain shared directories on the network file server which students can use for file access and saving.

Graphic organizer software is becoming much more prevalent in educational computing labs, with good reason.

As a useful tool in the writing process, computer graphic organizers can help students formulate ideas for research, take notes, and prepare a well-organized essay.

Web publishing software has been generally limited in use to upper level courses where students learn basics of web design, but the ability for students to create websites that are published locally on school "intranets" opens up new possibilities for the publication of student work. Instant messaging and even third party email clients are likely not needed on lab computers, since users can access web mail if needed and should not enter personal account information into a public-use computer for an application like email. Newer operating systems like Windows XP and Macintosh OS 10 permit the creation of non-administrative user accounts without rights to install new software programs. Use of these limited accounts can both protect lab computers from unwittingly spreading malicious viruses (at least those which spread from executable files) or installing unwanted / non-educative software programs. ■

Lab Upgrade and Updating Differences and Times

Question: When do we need to upgrade the lab computers? Is an upgrade the same as an update?

The IT Guy says:

According to the manufacturers of many computer operating systems, the answer to the upgrade question is probably "right away, as soon as it becomes available!" The reality for schools, however, is that upgrading can involve a variety of factors in addition to financial burdens that make a persuasive case for upgrading later rather than sooner.

Whenever a new computer operating system is introduced, many computer programs which may have run stably in the past require a "patch" to be installed, or at worst a paid upgrade which restores full compatibility. This is not always the case, but the more software applications installed on the lab computers, the more likely operating system compatibility problems are to occur. For these reasons, it is generally a good idea for school campuses and districts to wait at least six months to a year before jumping on the bandwagon of new software upgrades, and doing so generally at the end of the spring academic term when the summer months can be used to fully test compatibility and performance issues.

Upgrading the operating system of the lab computers is not the same as "updating" the computers, however. Operating system manufacturers regularly release new security patches and bug fixes which are downloadable from the internet, and generally should be installed on a frequent basis: at least monthly. For the computer lab, this may mean creating a new "pristine" disk image with the installed updates and re-imaging every computer. Virus definitions should also be updated regularly, but on a weekly basis using a corporate version of antivirus software which can download updates from a shared network folder rather than directly from the internet. This can reduce bandwidth traffic rather than having each lab computer directly connect to the internet to download updates. These updates should be scheduled for late at night when no one is using the computers (if they remain on all the time) or during periods of inactivity in the lab. ■

Maximize Student Time-on-Task

Question: What are some strategies for maximizing student time-on-task in the computer lab and minimizing wasted time with non-curricular technology tasks?

The IT Guy says:

Student time in the computer lab is generally in short supply. Teaching and encouraging the use of "template files" can be an effective way to reduce wasted time in the computer lab and get students on task faster. Websites used for a particular lesson can be embedded within a template file, which can be a word processing, presentation, or graphic organizer file. Another benefit of using a template file is that every student, upon opening the file, gets his/her own "untitled" copy of the original file, which is not alterable by a student double clicking it.

Saving template files in a network folder to which students only have "read" access is also an effective strategy. Teachers can place files for their lessons in the template directory, but students cannot delete or change those files if their network rights are "read only" for that folder.

Teaching students to always save their file first when starting a project can also save a lot of time and headaches down the road. Students as well as teachers must learn to make two fundamental decisions every time they save a computer file: what to name the file (NAME) and where to save it (LOCATION.) Lab computers can be configured by default to save student files in a public shared directory, or in the student's home directory (if students logon with unique userids and passwords), but the speed value of this configuration should be weighted against the dire need for every computer user to learn about file management. Students as well as teachers must

understand how to save files in different locations, and if the lab is configured to "do all the thinking for the users," their individual levels of computer literacy could be lower as a result. ■

Classroom Teacher Role in the Lab

Question: What is the best role for the classroom teacher when students use the computer lab?

The IT Guy says:

Many schools still have "computer teachers," who are expected to teach students a variety of computer literacy skills that now extend well beyond simple keyboarding. Many classroom teachers are accustomed to this paradigm, and have not felt compelled to learn computer skills themselves or expect them of their students because of it.

The most beneficial role for the classroom teacher in the computer lab, however, is to be the principal facilitator of learning. Rather than staying out of the lab and letting a computer teacher or aide supervise the students in their computing tasks, the classroom teacher should be involved with a hands-on approach in designing and teaching lessons to students in the computer lab. Because few schools today have a "1 to 1" correspondence between computing devices and students, the computer lab offers a unique time of day when a 1 to 1 correspondence generally can exist. Optimally, teachers should (with the assistance of a campus technology integration specialist) design lessons for students to do in the computer lab which are aligned with other curricular studies and objectives. The classroom teacher can explain the lesson and provide structure via one or more student template files, but spend the majority of time in the lab facilitating student work and assisting students as needed. ■

Pompano Beach High School Case Study

School Background:

Pompano Beach High School is part of the Broward County, FL School System, the nation's fifth largest school district.

Most high school students simply surf the Net, but Oracle Internet Academy students at Pompano Beach High School have the power to *control* it! During the 2-year OIA program, students learn the highly marketable skills of data modeling, SQL programming, and Java. Courses also count toward the Oracle Certified Professional certification.

IT Challenge:

The goal of Pompano Beach High School was to find and implement a computer-based training solution for use in its teaching classrooms.

The primary objectives that the school required for success were to provide an effective means for disseminating information to the students and controlling student access to the PC during instructional time.

NetSupport Solution:

"The NSS software was initially installed in our tech lab where approximately 30 students were studying data modeling and SQL programming through the Oracle Internet Academy, a program that gives students the opportunity to receive entry-level certification while still in high school. Oracle provides an online curriculum that I then broadcast to the students' workstations. Based on the success of our use of the NSS software in this lab, we purchased a site license for all the labs in the school."



Results:

"NSS software allows us to impart information to the students in a way that's relevant to them. By using the computer to show specific slides or demos, and then 'releasing' the computers for the students to practice or do research, we are able to maintain better control of the classroom, while improving the delivery of critical concepts."

NSS has helped PBHS achieve **better classroom management, better delivery of content and improved computer literacy skills.** ■

Glossary

AUP (Acceptable Use Policy): Policy designed to limit the ways in which a computer or network can be used, including access to the Internet. Acceptable Use Policies (AUPs) usually include explicit statements about the required procedures, rights, and responsibilities of a technology user as well as the consequences of inappropriate use. Users are expected to acknowledge and agree to all AUP stipulations as a condition of system use, as certified on the AUP by the user's signature.

BIOS (Basic Input/Output System): The BIOS is a set of programs in the computer system that allow the CPU to communicate with applications and hardware such as printers, disks, keyboards, and other attached devices.

Bus: An electronic pathway through which data is transmitted between components in a computer.

Bus Mouse: A mouse that connects to a computer by an expansion board. The advantage of using this over a serial mouse is that you can free up the serial port for another device.

Cache: Pronounced "cash". An area of your hard drive or RAM that is set aside for files so that programs can either run faster or work with limited amounts of RAM. Most browsers and other applications have a cache. Two common types are memory caching and disk caching. Memory cache is a portion of memory made of high speed RAM (SRAM) instead of dynamic RAM (DRAM). Disk caching dramatically increases speed, as accessing information in RAM can be thousands of times faster than accessing a hard drive.

Client/Server: A network architecture in which each computer on the network is either a client or a server. Servers are computers dedicated to managing disk drives, printers, or network traffic. Clients are workstations which allow users to run applications.

DLL (Dynamic Linked Library): A part of a computer program that links itself to application programs as they run. This code can be shared between different parts of the program rather than having to insert it in several different places. Missing or corrupt DLL files will cause programs not to run at all or will return a variety of errors.

GUI (Graphical User Interface): Defines a format for scroll bars, buttons, menus, etc. and how they respond to the user. Makes the computer more "user friendly" because what you see on the screen is easier to understand.

Hub: A device that is a center of network activity because it connects multiple networks or devices together.

IRQ (Interrupt Request): A signal, that when received by the CPU, makes it stop what it is doing to do something else. In Windows, most hardware devices are assigned a specific IRQ number. Conflicts can occur when two or more devices share an IRQ number or when a device requires that it be the only one assigned a certain IRQ number.

Multimedia Kit: A package of hardware and software that adds enhanced sound and graphics capabilities to a computer. Usually a kit includes a CD-ROM drive, sound card, speakers, and bundled software. If you want to use the popular multimedia encyclopedias, reference materials, and games that are available, you'll need these components.

Plug and Play: Refers to the ability of a computer to automatically configure expansion boards and other devices. In theory, you can plug in a device and not worry about switches, jumpers, or any other configuration problems. This sometimes only works in theory, so that manual configuration is necessary. Also nicknamed "Plug and Pray" for the same reason.

Resources

NetSupport School - Classroom Instruction, Monitoring and Quizzing

Education World - Five educators review NetSupport School software in a real world situation
http://www.education-world.com/a_tech/tech140.shtml

"Educator's Review: Video Too Hard? Software to the Rescue" as featured in Syllabus magazine, March, 2003
<http://www.syllabus.com/article.asp?id=7370>

eSchool News Readers Choice Award Best Demonstration Software
<http://www.netsupport-inc.com/nss/eschoolnews.htm>

Educational Resources

Education World <http://www.educationworld.com/>

Teacher World <http://www.teacherfocus.com>

Kathy Schrock's Guide for Educators
<http://school.discovery.com/schrockguide>

Teachers.net <http://www.teachers.net>

Teachnology <http://www.teach-nology.com>

Ed Tech - the home of homes for this subject, especially their tremendous discussion list.
<http://www.h-net.org/~edweb/>

ISTE - The Leading Organization for Educational Technology Professionals <http://www.iste.org>

US Department of Education Technology initiatives
<http://www.ed.gov/Technology>

Educational technology,
Federal Resources for Educational Excellence (FREE)
<http://www.ed.gov/free/s-edtech.html>

EdTech Conference Calendar
<http://www.theconferencecalendar.com>

Searchable glossary of computer, network, Internet, and WWW terms. <http://www.whatis.com>

[Glossary of Internet Terms](#)
Alphabetical listing of hundreds of Internet and technical terms.

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