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Top 10 Returns On Investment

By
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With budgets slashed, NCLB-inspired demands for quick spikes in student achievement, and the public clamoring for proof that technology is really working in education, all eyes are on the bottom line. We polled our advisors, writers and other ed tech experts for their take on investments yielding the best returns for schools. We report our findings in the following pages.

-Susan McLester

1. **Timely and Sustained Teacher Support**
   All the technology and curriculum resources in the world will have no impact on student achievement without the guidance and tech support educators need to make it useful on a daily basis.

2. **High-Speed Internet Access**
   The digital divide is no longer just about access, but about quality of experience on the Internet.

3. **Risk Assessment**
   Can your district afford a lawsuit?

4. **Microphones for Teachers**
   Research shows that students in amplified classrooms are making significant gains in achievement.

5. **Video-on-Demand**
   Fingertip access to movies offers a powerful and immediate way to reach today's media-immersed generation.

6. **Wireless Environments**
   A new wireless networking standard is making it easier-and safer-than ever before for districts and schools to provide their users with anytime, anywhere access.

7. **Digital Projectors**
   Paired with compelling content, digital projectors have the potential to transform classroom environments into 21st century learning hubs.

8. **Data Management Tools**
   In addition to helping districts deal with NCLB, data management systems can provide schools with the ultimate return on investment: improved student achievement.

9. **Portable Storage**
   Gone are the days when applications used to support teaching and learning can fit on a 1.44MB floppy disk. Putting a flash memory drive in every student's hand solves schools' data storage and mobility issues in a pint-sized package.

10. **Online Subscriptions**
    Cost-effective, timely, space-efficient, and quick-online references and databases have become a staple of the digital classroom.

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1- Shoring Up Your Staff: Timely and Sustained Teacher Support

By Judy Salpeter

For years experts have been warning that investments in educational technology will only pay off if an adequate portion of the budget is devoted to professional development and technical support. Simply installing new hardware and applications and offering a few training sessions is not sufficient.

If left on their own to troubleshoot the technology and to independently explore its potential to make their challenging jobs easier, few teachers will actually find the time to learn how to use the new tools. And if the technology does not get used, schools can never hope to see any return on their investment.

But how are districts providing such vital support in these financially strapped times? On the more costly but effective end of the spectrum is on-site professional development. In a few determined districts this takes the form of a full-time staff development professional for every school. For example, in Hampton, Va., where a state mandate requires there to be one professional development provider per 1,000 students by the 2005-2006 school year, the district will soon have a full-time position in each of its secondary schools and one shared by every two elementary schools. In the four Hampton schools where a full-time professional educator is already in place, "technology is being used more and is being used as a part of the curriculum," says technology director Georgianna Skinner.

The Richland School District 2 in Columbia, S.C., has also made an ambitious commitment to providing in-house support for professional development. There is an instructional technology specialist in every school with responsibilities that include participating in team planning meetings, modeling and providing support during technology-enhanced lessons, offering guidance on school technology purchases, setting curriculum for the computer labs, and leading after-school and summer workshops.

Richland CIO Debra Hamm acknowledges that the ITS initiative is costly, but sees it as an essential way to ensure that the district gets a return on its substantial investment in technology. "This return comes in terms of student achievement and the use of productivity tools that save teachers time," says Hamm. In a number of districts where there is a full-time person on-site to provide professional support, the cost is partially offset by other services that same expert provides-including grant writing to generate much-needed new income.

Not all districts feel like on-site support is affordable, however. Darrell Walery, director of technology for Consolidated High School District 230 in Orland Park, Ill., says that his district has recently moved away from a one-per-site model of professional development, primarily for financial reasons. According to Walery, the in-house approach had major strengths, including on-demand, customized help for teachers who might otherwise be reluctant to use the technology in the classroom. On the other hand, he points out, it was not perceived as the most efficient solution because there was inevitably down time when the professional educator's services were not needed. Furthermore, with budgets tight, it seemed like a luxury to provide one-on-one support for teachers when a group learning experience might have been just as valuable to them.

In District 230 and many other districts across the country the challenge these days is to figure out how to maximize the effectiveness of a small team of shared technology experts. Successful approaches include a variety of options. (For more on those, access the full text of this article at http://www.techlearning.com/story/showArticle.jhtml?articleID=52601632.) While opinions on what makes for the best, most cost-effective approach to technical support and professional development vary greatly from school to school, there is widespread agreement on one basic tenet-that a sound investment in these two areas is essential to the successful implementation of technology in schools.

Cost:

According to the latest American Federation of Teachers survey, the average U.S. teacher salary was $45,771 in 2002-2003. For other support systems, prices vary greatly.

Link Up:

Generation YES Project
www.genyes.org

Atomic Learning
www.atomiclearning.com

My eCoach
www.my-ecoach.com

Tapped In
tappedin.org/tappedin

Tips for Implementing Timely Support:

- Offset the cost of a full-time support person by having them perform other services, such as grant writing or evaluating digital curriculum products.
- When planning to implement any of the support systems named above, keep in mind that your long-term strategy should be to have all teachers eventually be experts in technology integration.
- Some options to consider include: district resource sharing, just-in-time tutoring, help desks, online professional communities, student teams and train the trainers models.

2- Get the Big Pipe

By Susan McLester

"Having instant access to multimedia allows teachers to use the Internet during those amazing, unscripted, teachable moments," says Elizabeth Ross-Hubbell, director of the Montessori School of Denver, Colo. "If a discussion comes up spontaneously and I know of a great virtual tour, National Geographic clip, or BrainPOP movie that pertains to the topic, having broadband access makes utilizing these resources possible in the fast pace of the teaching day."

For kids who've got a high-speed Internet connection at home, having the same advantage in the classroom is key to holding their interest. And for the many who don't, instruction that integrates the resources of broadband access, along with a teacher who knows how to use it, goes a long way toward putting them on the empowered side of the digital divide.

Ross-Hubbell, who trains educators, also points out how broadband has enabled sustained, high-quality professional development. "Communities of practice are becoming a recognized and viable method of training and networking, often more cost- and time-effective than face-to-face workshops or conferences," she says. Sharing PowerPoint presentations, student-created photos and movie clips, and a variety of other sophisticated products with a broad group of peers depends on high-speed access. With a teacher's busy schedule, waiting for these Web sites and resources to download via dial-up can be discouraging.

Ross-Hubbell looks toward a future where videoconferencing is comfortably integrated in professional development: "Imagine a faculty meeting that included a live video conference with one of today's top education leaders, for example. Or imagine having a role model read a story live over the Internet to the students."

Although experts agree it pays off in the long run, the short-term price tag for broadband can be discouraging. Knowing and weighing your options, such as DSL, cable, and network (for guidance on this, see the How-To column) is a must, and partnerships can be a key to affordability. Community networks, for instance, can bring advanced telecommunications to underserved areas and distribute costs in a win-win situation that encourages communication and collaboration among schools and local businesses.

The Blue Valley USD in Overland Park, Kan., took on a huge task when they contracted with Sprint back in 1997 to bury fiber-optic cabling to connect all schools and district sites. With a mission to provide a single digital network for data, telephone and video, the district, still working on their three-phase plan, has already realized numerous ROI benefits.

Bob Moore, executive director of information technology, points out one of them: "A goal was to place a phone in every classroom. Had we stayed with a leased line phone system, it would have cost the district $350,000 more each year for the same level of service we have today with the VoIP system."

Cost:

Bob Moore of Blue Valley USD in Overland Park, Kan., tells us, "There really is no way to give an accurate cost because there are so many factors: size of district, number of sites and schools, established area or new development (in terms of roads), number of public entities you have to work with, and so on. Having said that, in 1998 when we installed our network, the initial total cost for fiber, network electronics, and installation was about $4 million."

Link Up:

- Recent research: "Children, the Digital Divide, and Federal Policy," Kaiser Family Foundation
- Technology & Learning articles:
  - "Overcoming Barriers to Rural Access: Some Preliminary Policy Recommendations"
  - "Online Training: What's Really Working?"

Implementation Tips:

- High bandwidth is not enough. You also need Quality of Service, especially if you are going to run voice or video on the network. Latency or lag time can be a problem if the electronics you buy are not capable of QoS.
- Plan out your network infrastructure over several years, as well as applications you may use the network for.
- Prepare to deal with a tug-and-pull between your network engineers and end users. The engineer will consistently tell you that they are afraid of running out of bandwidth, while admitting that you are only using a small portion of it currently. At the same time, end users will always come up with new bandwidth-intensive uses.

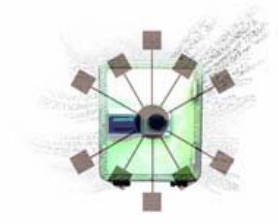
3- Safe and Sound?

By Susan McLester

The recently released *2004 Computer Security Institute/ FBI Computer Crime and Security Survey* reports the following facts about their nearly 500 respondents:

- A majority of institutions allocate just 1 percent to 2 percent of their IT budgets to security.
- Major cybercrime financial losses are due primarily to end-user mistakes and abuse.
- 50 percent of the institutions surveyed do not know the total monetary loss suffered due to electronic system intrusions.

It's alarming how in the dark most institutions still are about the risky state of their networks. For schools and districts dealing with increasing amounts of sensitive student data, and with more and more of that data moving in and out of the district's firewalls due to NCLB reporting requirements, education institutions are more vulnerable to mishaps and hackers than ever before.



As Robert Richardson, educator and editorial director of the Computer Security Institute, told attendees at *T&L*'s Tech Forum last October, "Awareness is not an extra when it comes to successful computer security."

Conducting a district-wide security audit can be an eye opening-and very necessary-experience for educators in all roles. In general, the process involves the following steps:

1. Identifying and classifying assets, including hardware and software.
2. Assessing threats and vulnerabilities, which can be classified into natural, human, and environmental categories.
3. Evaluating controls already in place and whether they are technical, policy, or personnel oriented.
4. Analyzing, deciding, and documenting controls and how to implement them in a cost-effective way.

The topic of security is one *T&L* continues to cover in every issue. For step-by-step plans, detailed security audit procedures, wireless security awareness practices, and more, see the links in the accompanying sidebar.

Cost:

This varies greatly. Some items to consider include:

- Hiring an outside firm to conduct an audit or dedicating in-house personnel time to create and implement your own.
- Conducting district-wide awareness training around security issues and setting up systems to refresh that training on a regular basis.
- Purchasing software and hardware to beef up your network security.

Additional Resources:

- Cybersecurity for the Digital District
- Computer Security Institute
- Center for Education and Research in Information Assurance and Security

SECURITY AWARENESS TIPS FROM CSI'S ROBERT RICHARDSON:

- Establish clear policies and distribute regular hard copy and e-mail reminders of both policies and rationale.
- Reward those who do the right thing.
- Rapidly changing user populations require constant training. There's no such thing as repetition.
- Educate your staff. Users with a clear understanding of what they need to do and why they need to do it tend to do the right thing.

4- Speaking Up

By Susan McLester

Sometimes it's easy to overlook the obvious. So it was an "aha" moment when I walked into classrooms at the Ocoee Middle School outside Orlando, Fla., and observed teachers outfitted with wireless microphones directing their highly engaged students. Ocoee principal Dr. Katherine Clark reported a remarkable 40 percent decrease in discipline problems at the end of the first year of microphone use.

As it turns out, there's lots more evidence that an amplified classroom is directly tied to student achievement. Both organizations such as the American Speech-Language-Hearing Association and the Acoustical Society of America, and companies such as Audio Enhancement, Califone, and Phonic Ear offer large bodies of consistent and convincing research. Among the facts and findings:

- More than 1 million U.S. children suffer from some kind of hearing loss.
- Kids' auditory networks aren't fully developed until age 15.
- Poor acoustics often caused by hard-surfaced floors and noise from heating and air conditioning systems, as well as additional ambient noise, reduce speech intelligibility to less than 75 percent in most classrooms.

This not only compounds challenges of hearing-impaired students, but also creates barriers for those with normal hearing who don't have the life experience that adults use to fill in the gaps. And students who can't focus on the spoken word inevitably lose their desire to learn.

Studies comparing traditional classrooms to audio enhanced environments tell us that students in classes where teachers wear mikes are likely to achieve a minimum 10 percent overall gain in standardized test scores, especially in subjects relying heavily on verbal instruction. Also making significant gains are ELL and at-risk students, who exhibit increased time on task. As well, teacher absenteeism decreases, with microphone equipped educators reporting less strain, vocal fatigue, and overall stress.

Cost:

$995-$1,500 per classroom.

Link Up:

The American Speech-Language-Hearing Association
www.asha.org

Audio Enhancement
www.audioenhancement.com

Phonic Ear
www.phonicear.com

Califone
www.califone.com

Implementation Tips:

The following are courtesy of Audio Enhancement CEO Jeff Anderson.

- Make sure you purchase infrared. There are some FM radio systems out there, but they are prone to interference from both other teachers and outside sources.
- Make sure that you purchase at least four speakers per classroom. The idea is to have speakers placed in multiple locations throughout the classroom. The best placement is in the ceiling.
- Pay for professional installation and training. It is worth the small cost.

5- Moving Pictures

By Amy Poftak

With subscription digital Video-on-Demand service, teachers are no longer subject to anybody else's schedule-not the television station, not the library media center, not the colleague who promised they'd send a copy of last month's Nova. They can simply log on to their computers and choose from thousands of short educational video clips-from a Shakespearean soliloquy to animal life in the Amazon-to weave into daily instruction.

There's good reason to believe this is a valuable investment for schools. Research has consistently shown educational television and video make a significant impact on student

achievement. A recent report from the Corporation for Public Broadcasting outlines evidence from dozens of independent studies that video reinforces text-based material, appeals to multiple learning styles, increases student engagement, and has a positive effect on teaching.

Add to that the short, bite-sized format of VoD, and you have an appealing convergence of technology and pedagogy. "The clip format makes it easy for teachers to do exactly what the National Teacher Training Institute says makes video effective: using small doses tied directly to a teaching concept," says Hall Davidson, director of educational services for KOCE-TV, PBS, in Orange County, Calif.

The largest commercial player in the education VoD market is Discovery Education, who last year acquired United Learning and over the summer snapped up Rainbow Educational Media and AIMS Multimedia. All told, they have roughly 35,000 video content clips and 3,000 full-length video titles in their collection. While United Learning's unitedstreaming and AIMS's DigitalCurriculum.com services continue to operate independently, they will most likely be offered as one product in the far future.

Struggling to keep up are public broadcasters, some of whom are concerned that Discovery is taking on Wal-Mart-like proportions. A consortium of Midwest stations offers Chalkwaves, a regional VoD service. And WGBH in Boston plans to debut a national VoD service, PBS Digital Classroom, in the coming school year. That said, many public broadcasters are forging successful partnerships with Discovery. New York's PBS stations, for example, offer unitedstreaming to the state's K-12 schools free of charge.

Regardless of the service provider, Video-on-Demand is clearly the next stage in the evolution of educational video-one that's already being embraced by an estimated 40 percent of school districts. If you have a high-speed infrastructure, it's worth taking a look.

"The clip format makes it easy for teachers to do exactly what the National Teacher Training Institute says makes video effective: using small doses tied directly to a teaching concept."

Cost:

unitedstreaming annual site licenses range from $995 to $1,495. The company has statewide deals with Georgia, Iowa, Louisiana, S.C., and N.Y., and is offering a special promotion to districts that don't have the service yet (one school per district gets free use of the service until June 2005). DigitalCurriculum site licenses range from $995 to $1,695.

Link up:

"Television Goes to School: The Impact of Video on Student Learning in Formal Education"
www.cpb.org/ed/resources/videoclassroom.html

Sprint's video management and delivery solution for schools
www.sprint.com/education

Chalkwaves
www.chalkwaves.org

Implementation Tips:

KOCE-TV's Hall Davidson provided us with three tips for maximizing the VoD experience.

- Solve bandwidth issues by downloading-not streaming-video segments. Burn the files onto CDs and keep them in your library the way you would store VHS tapes. If the Net goes down or your computer crashes, you'll have a backup at the ready.
- Be aware of the rights on the material you download. unitedstreaming content, for example, is copyright compliant only if you are a subscriber. For more on copyright issues, see www.techlearning.com/db_area/archives/TL/2002/10/copyright.html.
- Enliven classroom presentations by incorporating video media into programs such as PowerPoint, HyperStudio, MovieWorks, and ImageBlender.

6- Wild for Wi-Fi

By Jane Bloomquist

Imagine a student in a greenhouse, finding a new insect using her wireless-enabled laptop to research it on the Internet as she's observing it, and then capturing that data and being able to immediately share the excitement of that particular knowledge quest with others. Or think about a teacher or administrator walking around a class, entering assessment information on his handheld and automatically sending it to a central database in real time. By providing the anytime, anywhere access end users have come to expect, wireless technology facilitates teaching, learning, and school management in a way not possible via traditional wired networking.

Until a few months ago, even though wireless implementations cost less than wired environments, investing in wireless technology was risky. Concerns about security, interoperability, and scalability were paramount, but the passage of a new wireless standard, 802.11i, overcomes many of these. The new standard uses Wi-Fi Protected Access, or WPA2, which is compatible with some existing wireless hardware (equipment such as access points and wireless LAN cards purchased in the last year or so and certified for WPA) and all new wireless equipment certified by the Wi-Fi Alliance. When combined with a RADIUS authentication server, WPA2 will protect the wireless environment and allow the incorporation of multiple wireless technologies in schools.

The real advantage of 802.11i is how seamless it will appear to the end users. Once authenticated, users will be able to move around a school without reauthenticating. The encryption will be dynamically changed in the background faster than a hacker could break it. And since the new standard relies on user authentication, it is hardware- and vendor-neutral. Users can employ the same methods to connect multiple devices, such as desktops, laptops, tablet PCs, and handhelds, and they can shop for best pricing without worrying about incompatibility.

Equipment Costs:

Wireless network interface cards: $80-$200; access points: $300-$1,000; RADIUS server: $2,000 and up.

Link up:

Wi-Fi certified products
www.wi-fi.org

Open source RADIUS server and software
www.freeradius.org

Wireless LAN Book for Enterprises
www.trapezenetworks.com/bookPDF

"Secure Your Wireless Network"
www.techlearning.com/story/showArticle.jhtml?articleID=18900787

Implementation Tips:

- Always look for Wi-Fi Alliance certified equipment approved for WPA2 when making purchases.
- Employ the strongest encryption available. Standard encryption key lengths are 128, 192, and 256 bits; longer is more secure.
- Continue to employ normal security measures such as monitoring access (looking for rogue devices and unauthorized users) and segmenting networks (using firewalls and virtual LANs).

7- The Power of Projection

By David Warlick

There are two reasons why permanently mounted digital projectors can be a potent investment for classrooms, and both reasons hinge on the way that this technology straddles two worlds. First, projecting computer-generated information on a wall or whiteboard closely mimics a technology that teachers have confidently used for many decades-the chalkboard. It enables them to deliver teacher-assembled content to an entire class far more compellingly than ever before.

Second, providing classrooms with projected, multimedia content bridges a gap between our curriculum and the information world that our students inhabit. This is a world where information is dynamic, in motion, and accessible independent of time and space. In a word, the information "glows."

In order to get the most value from projectors, however, they must become an integral part of the classroom. If a teacher must check it out from the media center, position it in the classroom, rearrange desks and other furniture, run cables, calibrate the projector to a screen, whiteboard, or interactive whiteboard, adjust zoom and focus, and troubleshoot the ubiquitous problems, then it will remain an "extra"-a novel activity for students and used only a few times during the school year. This is a bad return on investment.

The other factor for success involves the content itself. If students are seeing little more than bulleted lists and generic clip art, then they will remain uninspired. It is essential that any staff development associated with implementing projectors in the classroom include not only

hardware operation and presentation software basics, but also skills in accessing multimedia content, manipulating and customizing that content, and designing information to produce the most effective communication.

Cost:

Projectors range from $900 to over $5,000, depending on the feature set. Installation costs vary widely. Keen Gravely, technology projects coordinator for Nash-Rocky Mount Schools in Nashville, N.C., reports the wiring, mounting hardware, and labor costs of installing projectors in his district's aging buildings cost between $800 and $900 per classroom.

Link up:

Projector reviews, news, and case studies
www.projectorcentral.com

Compare projector prices
www.projectorsprojectors.com

"Before You Buy: Digital Projectors," Technology & Learning, October 2004
www.techlearning.com/story/showArticle.jhtml?articleID=49901363

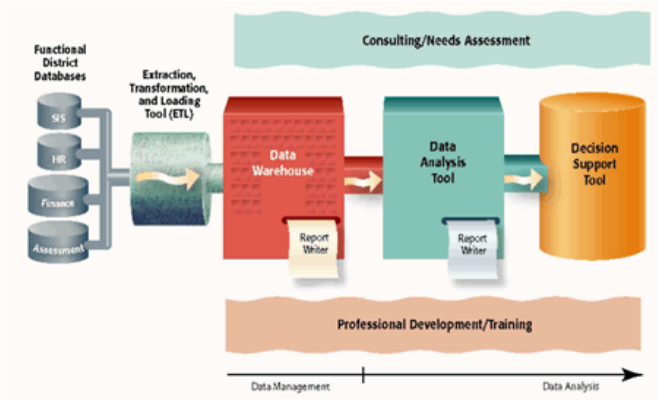
Buying Considerations:

- Ray Bailey, Jr. of CamCor, an audio visual firm, reports that 1200 lumens has become the minimum acceptable brightness for most classrooms.
- If a projector is going to be used predominantly with a desktop computer, says Bailey, then native SVGA resolution (800x600 pixels) will usually be sufficient. However, most laptops are designed for higher resolutions, i.e., XGA (1024x768 pixels).
- If projectors are to be permanently mounted, make sure they are constructed for this type of installation.

8- Analyze This

By Amy Poftak

We won't even pretend it's possible to do justice to the topic of data management tools in a couple paragraphs. For one, it's a category that encompasses several kinds of technologies, including student information and assessment systems, data warehouses, and data analysis applications (see diagram below). Second, every district's approach to data management is different. Some have developed relatively simple, in-house solutions, while others are investing hundreds of thousands of dollars in system-wide implementations.



***This illustration is based on two figures from* Making Sense of Data *by* Eduventures, Inc.**

Whatever solution, or combination of solutions, your district selects, the bottom line is that data tools have tremendous potential to transform the school environment. By being able to find relationships that were previously hidden-learning which teachers require targeted professional development, for instance, or how subgroups of students are performing on specific content areas over time-schools can change instructional practices accordingly and target future investments more wisely. And, oh yes, they can also meet the reporting requirements of No Child Left Behind.

Cost:

Prices for the various data management systems available on the market vary widely depending on the scope of the system, the size of the district, whether it's on-site or hosted, and many other variables.

Link up:

Technology & Learning articles:

"How to Perform a Data Makeover"
www.techlearning.com/schoolcio (August 2004)

"Data: Mining with a Mission"
www.techlearning.com/showArticle.jhtml?articleID=18311595

"Student Information Systems Demystified"
www.techlearning.com/story/showArticle.jhtml?articleID=19400338

"Digging for Data"
www.techlearning.com/db_area/archives/TL/2003/03/whatworks.html

"The Administrator's Guide to Data-Driven Decision Making"
www.techlearning.com/db_area/archives/TL/2002/06/guide.html

Other Resources

Consortium for School Networking's data-driven decision making initiative
3d2know.cosn.org

Reviews of software used to analyze student data
www.csos.jhu.edu/systemics/datause.htm

Data warehousing and data management solutions
www.blegroup.com/supertechnews/may03.htm

Warehouse Buying Tips:

Excerpted from Todd McIntire's "Eight Buying Tips: Data Warehouses," available at www.techlearning.com/story/showArticle.jhtml?articleID=26806926.

- Before you do anything, decide what data elements are needed for your analytical purposes and determine the frequency with which you need to refresh the warehouse.
- Look for companies with specific experience integrating data from student information, special education, human resources, and finance systems, as well as data from Microsoft Excel, Microsoft Access, comma-separated values, field-length flat files, and tab-delimited formats.
- Make sure the vendor explains in detail how they intend to protect the physical and electronic security of your data.

9- Storage to Go

By Kathy Schrock

Flash drives. Pen drives. Pocket drives. Thumb drives. They go by any number of names, but USB flash memory drives are fast becoming an indispensable tool in schools. Connected via a USB port to a computer, these devices let users store large amounts of data and files on a tool about the size of a stick of gum. As students move from classroom computers to terminals in the library media center to home PCs, they're able to take their work with them wherever they go. The memory drives customarily come in three basic sizes-64MB, 128MB, and 256MB-and cost about $0.50 per megabyte of data storage capability.

Flash drives are an appealing investment for schools trying to manage the large amounts of data coming in and out of today's classrooms. The increased use of digital pictures, creation of digital video, and complex hypermedia presentations with graphics and sound require students to have an efficient way to move around big files. Many schools have server storage space for students and staff, but the flash drive

solution allows them to access their data at home. Burning data to a CD-R or DVD-R is another solution for carrying large files, but USB ports are more common on school computers than CD burners, so the flash drives are better suited for most school settings.

There are specialized solutions available with some devices that expand their usability. The Migo www.4migo.com), in a flash drive format, includes specialized software on the flash drive which allows students to carry their Outlook calendar, contacts, and other data on the drive and access it from any computer running Outlook. In addition, when working on a word processing document stored on the Migo, students can choose to synchronize any changes with the existing document on their primary computer. This function is reminiscent of the Windows Briefcase function.

Another innovative addition to the basic USB flash drive is included with Iomega's Micro Mini USB 2.0 (www.iomega.com) flash memory drives. Iomega includes ActiveDesk applications on their Web site, which are executable programs students can run directly off the flash drive. For example, students can run a simple Office-type suite, run music software, and convert graphic files directly from the flash drive itself.

Some schools have started requiring students to have flash drives, while others are using them as fundraising opportunities instead of selling wrapping paper and magazine subscriptions. The low cost, ease of use, and minimal technological set up for IT departments in schools (no drivers needed for any Windows operating system newer than Windows 98) makes the USB flash drive storage solution a win-win solution for students and schools.

Equipment Costs:

Generally $32-$128, depending on how many megabytes you buy. The Migo starts at $99.95 and the Iomega Micro Mini 64MB USB 2.0 drive sells for about $30.

Link Up:

A review of 14 USB flash drives
reviews-zdnet.com.com/USB_Flash_Drives/4520-3240_16-5128560.html

Cool technology gadgets for educators
kathyschrock.net/magic

Implementation Tips:

- If your students currently wear ID tags on a lanyard, look for a USB flash drive that can be attached to this lanyard. The connector should attach to the main section of the flash drive, not the cap.
- Consider purchasing a USB extension cable to allow easy access to the USB ports on the back of the computer or consider adding a USB hub that would allow students to easily transfer data from one drive to another.
- Encourage students to personalize their flash drives with permanent marker to allow easy identification in the classroom setting.

10 — Hot off the Presses

By Susan McLester

One of the first and most welcome software applications to find a home in schools was the multimedia encyclopedia. Everybody understood what it was supposed to do and wow!-it had sound, animation, and was searchable. And when Encyclopaedia Britannica broke new ground by being the first to go online, the company pioneered a new staple for schools: the quick and timely reference tool.

Today, classrooms and libraries depend more than ever on subscription-based databases, current events and curriculum products that ensure their students are getting a broad range of the latest and the best information, in addition to acquiring the searching strategies and information evaluation skills they need. Says Kim Carter, director of Monadnock Community Connections School in Keene, N.H., "Essentially, I think the online subscriptions should provide access to information, materials, services, and so forth that are otherwise inaccessible." Services such as ProQuest and Gale allow users to search across a variety of books, newspapers, microfilm, and Web-based solutions. Such products also often offer special services such as homework help, health Q&A and business profiles. A few of Carter's additional favorites include the Art Museum Image Consortium; AP Photos Archive; SAS inSchool; and Career Explorer and Choices Planner.

Cost:

Subscriptions are usually tiered, depending on school enrollment. Career Explorer and Choices Planner start at around $900 per school.

Link Up:

"Library Automation: A Buying Guide," Technology & Learning
www.techlearning.com/showArticle.jhtml?articleID=17602661

Thomson Gale
www.gale.com

SAS inSchool
www.sasinschool.com

American Museum Image Consortium
www.amico.org/home.html

ProQuest
www.proquest.com

Tips For Implementing:

Kim Carter offers the following key questions to ask subscription vendors.

- What resources does the online service offer that students and/or faculty can't access readily and affordably elsewhere? What curriculum or instructional needs does the service meet? Do the resources complement or supplement existing resources, rather than duplicate them?
- How is the database access setup? What interactive features are included? The resources we pay for should be educational in and of themselves. Students should have the opportunity to learn the sophisticated skill set of online searching in a controlled environment, with tools and help readily available.
- Is the database accessible from school and home? Learning should be something that happens from home as well as school. Making resources accessible at point of need is critically important, especially if we truly want students to become discerning consumers of information.

Is there a different technology-related investment that your school or district can't live without? If so, we'd like to know about it. Email us at techlearning_editors@cmp.com.