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Getting Results With Laptops

What does the latest research on mobile computing tell us about teachers, students-and testing? By Saul Rockman

At least one of every six U.S. districts now has some form of laptop program in one or more schools, encouraged by both the falling prices of computers and the positive public perception generated by promoting such an initiative. For the past decade I've led a research group that's focused on the study of ubiquitous laptop computing in which we looked at approximately 50 schools and districts around the country.

Perhaps not surprisingly, recent findings confirm and emphasize existing research showing that teaching and learning change in consistent and reliable ways when laptops are introduced into the school environment. We see more project-based learning, increased student motivation and experimentation, and higher rates of peer mentoring. Some of these shifts can be tied to an overall lower student to computer ratio. But we've found that with laptops, specifically, the behaviors appear earlier and are more pronounced, especially among special education and ELL students.

Here are some key points that have surfaced, based on extensive quantitative and qualitative research that included classroom observations, interviews, focus groups, and surveys.

Learning environments are transformed.

Educators involved in laptop programs overwhelmingly promote collaborative learning and at the same time provide individualized instruction. This often means students and teachers move around more. Instead of staying put to do seatwork, students gather together to work on projects, which frees teachers to roam about the room helping those who have problems or need remediation. In addition, learning in laptop classrooms is often more self-directed: the majority of teachers responding to a spring 2004 survey say they now let students decide what materials and resources to use in their projects.

Assessment techniques change.

Teachers in laptop classrooms are more willing to assign presentations and multimedia products to students, and score them using customized, project-driven rubrics and even self-assessments. In one study more authentic assessment has grown out of a shift toward problem-based learning-where students examine complex local issues with multiple solution options. There's a new emphasis on process, and not simply assessment, when students make presentations on the results of their studies to business and community leaders as well as classmates and teachers.

Teachers look to a variety of sources for training.

Professional development has shifted from one-time, all-purpose training to a model tailored to teachers' individual content area and pedagogical needs offered on an as-needed basis. It also targets specific technology skills and is provided by teachers, university, business partners- and even students themselves.

Mastery is no longer solely the province of technology gurus.

In addition to consulting with students, laptop teachers tend to seek and offer advice to each other across grade levels and content areas, reducing the need to rely on training from outside sources. Again, this may be a just-in-time tip for enriching a lesson or a strategy to make optimum use of the laptops. In a recent survey we conducted where laptop teachers rated the effectiveness of training and professional development opportunities, building-level coaching received significantly higher ratings than more

formal training sessions.

Students are highly engaged.

Like teachers, students also show improved technology skills and sophistication. But this, too, varies, with some students taking to certain specialized applications such as movie making, and others using the tools as a functional, almost transparent element in their schoolwork. Some teachers report that students have greater engagement in their assigned work, fewer behavioral referrals, and higher attendance-positive trends that other research has substantiated.

Productivity increases.

Students develop better organizational skills because they now need them to keep track of what's on their computer and to accomplish complex project work in a timely manner. Over half of one program's teachers report the laptops have helped students organize their work. What's more, they see these changes happening very early on- soon after the sixth-graders entering middle school first get their laptops. Teachers also report that some students, on their own, use a calendar program to set up due dates and daily reminders.

Attitudes toward writing improve.

In a recent survey measuring students' attitudes about writing, 76 percent of students said they enjoy writing more on the laptops than on paper; 80 percent indicated the laptops make it easier to rewrite and revise their writing; and 73 percent said they earn better grades for laptop work. The data demonstrate shifts in not only students' writing attitudes, but also in their practices- changes we've also observed in language arts teachers' writing instruction strategies, and in the attitudes and practices of other content area teachers.

OK, But What about Test Scores?

Unfortunately, one desired outcome of laptop use seems to remain stubbornly beyond the efforts of researchers to capture it: improvement on standardized achievement tests. The current Holy Grail of any change in educational practice seems to be producing a corresponding improvement in student performance on these tests. There are isolated examples of test score increases but they are slippery: neither consistent nor necessarily tied to the use of computers. But researchers may soon be able to document such a correspondence in connection with writing, because teachers and students in laptop programs are quick to see the benefits of word processing, and writing performance is actually tested on a statewide basis.

One explanation of the lack of a connection between computers and achievement may lie in the nature of instructional tasks. Much of what teachers are asking students to do is not closely linked to what's assessed on the standardized tests used today. Searching for information on the Internet, organizing it, writing and making presentations, communicating with others, and collaborating in producing a product- all are skills desirable in the world of work but difficult to measure in cost-efficient ways.

So it follows that the majority of the substantive, positive changes we've found are in the acquisition of 21st century skills that will allow students to thrive in the digital workplace. Many of the results we've recorded- such as increased engagement, motivation, self-direction, and technology proficiency- are enough to provide administrators, especially those that work in at-risk environments, with enough of a solid rationale to commit a hefty investment. Beyond that, deeper, broader changes to the traditional classroom learning model, such as the shift to more student-centered, project-based pedagogy, suggest that a laptop program can supply the needed impetus to alter the status quo and get the entire community thinking about the key elements to successful school reform.

Saul Rockman is president of Rockman Et Al, an independent research and consulting firm specializing in technology and learning.

Research on Laptops

By Marian Campbell & Jerry Woodbridge Observations and Reflections in a Laptop Classroom

At Switzerland Point Middle School, Marian Campbell, Linda Markhum, and Della Thompson are the laptop classroom grant team members. These three teachers represent the science, social studies, and language art disciplines respectively. We'll focus on Marian Campbell, who wrote the grant to incorporate technology in her classroom.

I found her students busily at work on their animal projects. According to their assignment sheet, each student had to research a) the animal's physical description, b) habitat & range, c) diet & feeding, d) growth & reproduction, e) behavior, f) predator, g) related species, and h) interesting facts.

The illustration below is an example of a completed lotus square on the Florida Cooter. The animal project emphasized organizational and research skills, as well as finding images and graphics. The students had to collect data and references from the Internet, books, or CD-Rom encyclopedias so that a website eventually could be created about the short-tailed shrew, bobcat, or black widow spider. Students were working at various stages of the project. They were researching websites, taking notes, collecting images, typing up their rough drafts, printing work, or beginning the development of the website.

Using Inspiration, one student had developed a Food Web of his animal that would soon be placed on his website. Students were using the computer as a productivity tool and there was quite a bit of productivity going on in this 50-minute period.

The students were operating under a "real world" deadline of "tomorrow!" so they could begin instruction on their website the next week. There were three things that were due the next day: 1) the lotus square, 2) their Keeping Track of Reference worksheet, and 3) the rough draft of the information gathered about their animal. If the students finished early s/he could place 10-12 images of their animal in the image folder. The students would begin their website next week using Site Central website development software.

Meanwhile, Mrs. Campbell was busy taking attendance, asking about students' missing assignments, collecting interims and appropriate use contracts, which specify how students had agreed to treat their laptop. As students completed their work and printed out their rough drafts for Mrs. Campbell she checked them and told them to stamp their work with a rubber "Good Work" stamp and turn into the 4th period bin. This teacher also stopped and modeled "a good example of student work" to the class so everyone saw a completed version of what was expected by the due date.

The students asked a "laptop graduate" for help as needed. Laptop graduates are those with laptop experience who help students out when they have a problem. When I asked one why he enjoys this type of activity, he simply replied, "You learn a lot. You can make Web sites." Note that he was emphasizing the importance of student construction in learning. He was engaged and enjoying the process of learning as much or more than the content.

Mrs. Campbell had found a way to inspire her students' creativity while also addressing the Sunshine State Standards and science content that her sixth grade students needed to know.

In creative classrooms, teachers are mindful of state and local standards, but they approach required topics with a playful enthusiasm that inspires students to learn. They prompt students to think deeply, pose questions, and pursue big ideas from many perspectives.

Another student had completed her assignments midway through the class and was ready to begin her

Web site on Bobcats. To my question "Why do you enjoy this laptop experience?" she replied, " I am learning more about bobcats than I ever knew before. I like getting the pictures. Other students can learn more about bobcats and they can use the information. I never created a web page before. It's like a new experience."

After the observation, Marian Campbell gave background about the laptop program at her school:

A Teacher's Reflection of the Website Process and the Laptop Program This instructional delivery model has been in place in our elementary feeder schools for several years with much success. This is my first year. Last spring, the opportunity arose in our county to introduce a middle school model. All middle school teachers were informed of the opportunity and were encouraged to be among the first to pilot this program. I entered, and my school was awarded one of the six-laptop "teams".

What were the resources you used for this animal project? "My team consists of three teachers who share twenty-eight laptops, two printers, a scanner, a digital camera, and several software titles. In order to share the equipment, we decided to set up a lab inside our building (since we are in portable classrooms), and take turns using the equipment. We met at the beginning of the year to plan two integrated units, one for each semester. The first unit was a Florida Animal unit. As the science teacher on the team, I began this study by dividing students into small groups, and telling them to discuss with their group what kind of information they would want to share with someone who knew nothing of animals.

Students were given large pieces of chart paper to write their ideas. Then, each group was asked to share what they had decided was important to know about animals. These "main ideas" included what an animal looks like, what it eats, where it lives, how it behaves, how it grows, related species, and interesting facts. I then invited the children to use their laptops to find information about their animal. Students collected their notes on a visual concept map (lotus square). They were then required to use these notes to write a report about their animal with all the subheadings for the purpose of creating a web page about their animal. All of the web pages together would be part of a Field Guide to Florida's Animals.

Once students completed their web research, Mrs. Markum [Social Studies] took students to the lab to work on a geography project. Students were asked to identify the range of their animal on a large map of Florida and color it in. They also created a mini poster about their animal's habitat and range using draw/paint software. These pages were collected and bound into a book. Finally, Ms. Thompson [Language Arts] gave students an opportunity to use their information to write a variety of poems. This collection of animal poems was also bound into a book. Students really seemed to enjoy this long-term project, and especially stated that they liked being on the computers every day. Though most had little experience using a computer for creating web pages, organizing and creating files, or using search engines to find information, students were willing to "jump right in" and give it their best effort. We found that daily exposure to the laptops greatly increased their confidence and technical abilities.

What were the benefits of a laptop classroom? Students really seemed to enjoy this long-term project, and especially stated that they liked being on the computers every day. Though most had little experience using a computer for creating web pages, organizing and creating files, or using search engines to find information, they were willing to "jump right in" and give it their best effort. We found that daily exposure to the laptops greatly increased their confidence and technical abilities.

What are some technological and management tips you would offer the novice laptop teacher? There are a few issues that have made working with the laptops a challenge. Our laptops are wireless; however, by the time of my last class the batteries on some begin to lose charge. Knowing this to be inevitable, I set up tables along the wall with cables ready for immediate connections to electricity. If a student notices that his/her computer is losing charge, they simply leave their seat and move to the "wired" tables.

Another issue is the task of connecting the laptops to the cart where they are charged for the next day. If too many students are allowed to handle this task, there is greater risk of something happening to the cables. I selected responsible students in each class, and taught them how to correctly connect the laptops to the cart. I shared this list with the other teachers on my team. These are the only students who handle this task. It is also a good idea to have student assistants in the lab to help other students. A few of my students are graduates of the elementary technology program, so they help other students with problems that may arise. They are familiar with most of the software titles we are using this year, and they are competent at trouble-shooting. If they can't solve the problem, then they seek help from me.

Students are required to stay in their seats and are not allowed to carry their laptops around (with the one exception of hooking up to electricity). I assign printer duty so that students are not running up to the printer to pick up their work. Instead, it is delivered to their seat by the student helper. This eliminates the possibility of accidentally dropping or knocking a computer off a desk. Students who neglect their laptop, or use it inappropriately, may lose a day to as long as a week without computer privileges. They know I would send them to the library with an alternative assignment. So far, I have not had to remove a student from the laptop lab.

What were the challenges of the laptop classroom? For the websites about Florida animals, students word processed their rough drafts and final copies of their animal reports, Inspiration software to create a food web for the animal, and Site Central for the website itself. Students used Google as the main search engine to find links about the animals. In addition, they were encouraged to use the school library for printed resources, and electronic encyclopedias to get information. Technology is just one of the many tools we use in the laptop class. It does not replace written material, nor is it the only methodology I use with my students. There is still some direct instruction, and there are frequent "check-points" where students are asked to stop and share what they have discovered with the rest of the class. These open discussions/debates lead students to share research, draw conclusions about the topic, and have opportunities to defend their own research. After this time of reflection, students may find that their work needs revision.

With over one hundred students using the same twenty-eight computers, it was necessary for students to learn how to save and organize their files, create folders, and organize favorite Web sites. This turned out to be quite a challenge, since students are often quick to "Save" before they notice where they are saving the work. Teaching students how to find "lost" files is a very important technical skill. Naming files is also a very valuable skill. Since each computer is used by as many as five different students, it is imperative that students learn naming conventions that will safeguard their efforts.

Another important issue for creating the web pages was "borrowing" graphics and pictures from the Web sites of others. Site Central has a good library of graphics, photos, and clip art, and I encouraged students to explore their options here first. Most found it necessary to go to the Internet to locate pictures of their animals. I gave students a template for keeping track of their references, and required that they write the URLs for any web site they used for their project. I discussed the importance of Emailing the host site's author and getting permission to use the pictures, but for this project, I didn't require that they do this. Instead, I asked them to list their references on their web page.

To teach new technology skills, I connect my laptop to an LCD projector, and I demonstrate what I want them to do. My goal, eventually, is to provide written tutorials for each software title. When we first started out with the laptops, much time was required to teach the technology skill needed to complete the project, and I felt frustrated about not being able to cover the science standards I was required to cover.

What did you wish you knew before you started teaching in a laptop classroom? I was not able to predict the amount of time needed to teach students basic computer skills. Even with daily exposure, children "forget" how to carry out certain tasks and need reminders. Occasionally, I feel more like a technology teacher than a science teacher because I am spending so much of the period solving technical problems. However, I am simultaneously modeling problem solving, collaboration, cooperation, and patience! My students have been quick to learn how to fix the problem themselves to some degree,

although for serious technical issues there is an on-campus technical expert.

To introduce new software, I connect my laptop to an LCD projector, and demonstrate what I want them to do. Students are immediately given time to practice using that software. Children are natural explorers and, given the opportunity, will learn anything they need to know to solve a problem or complete a task. Having said this, it is important to remember that they are children, and they still need guidelines and a lot of encouragement. Most importantly, they need to know what is expected of them. Setting up a rubric for performance ahead of time is very beneficial, and it is a good idea to allow students input into this process. It makes learning more relevant, and more their own.

Has the school made a commitment to keeping the laptops running with up-to-date programming? My county and my school are committed to providing cutting-edge technology for the students and teachers. They recognize, however, that it is not the technology that will enhance student learning and ultimately change the methodology that teachers use in their classrooms. Instead, focus is on what we want students to know, and we simply use all the tools available to us to accomplish the greatest learning. Our laptop teams meet every other week to share best practices, learn new skills, and share concerns about the program.

Learning with laptops gives my students the opportunity to construct their own meaning, explore individual paths to knowledge, and provides vast amounts of information at their fingertips. With laptops and Internet access, students can visit a museum anywhere in the world, perform a virtual dissection, exchange data with students from anywhere in the world, and create multimedia presentations for a world audience. The possibilities for learning are endless, exciting, and exhausting! Though my first year has been a little rough, I am glad to be a part of this effort to empower young learners.

Many of the issues surrounding the use of laptops with children will never go away. As with any new teaching model, and especially models that involve highly technical tools, there are bound to be bumps in the road. I am not absolutely certain that student achievement is higher as a result of my laptop model, but I plan to examine this. One of the ways I will do this is compare students' standardized test scores with last year's scores. I hope to see that the types of activities I ask students to do on their laptops enhances their learning by making them better readers, writers, and problem-solvers. I do know that my students love using the laptops. At the end of every quarter, I ask them to write their reflections about learning. Most of them have cited the laptop program as one of the "good" things about school.

We are still very much in the infancy stage of laptop learning at our school. We have a long way to go. Since each middle school team was allowed to define its own model of implementation, there will be opportunities at the close of the school year to examine models that were effective and change models that were less effective. We will meet this summer to discuss goals for next year and will receive more training on integrating learning using technology. Our goal is this: To meet the needs of a diverse population of learners and to prepare them for life in the twenty-first century. Technology must have a role in this very worthwhile endeavor.

12 Tips for Launching a Wireless Laptop Program

The technology director for East Rock Magnet School in New Haven, Conn., a federal government test site for laptop learning, shares his secrets to a successful wireless laptop program implementation.

By Domenic Grignano

1. Build a Wireless Foundation

The first option for creating a wireless infrastructure is to mount access points on portable laptop carts. The second, and better, choice is to strategically place access points throughout the entire school

building. In addition to making it possible for special education students who are routinely pulled out of their regular classrooms to use their computers, providing 100 percent wireless coverage also ensures maximum flexibility in emergency situations-when the heating goes down in a classroom, for instance, and kids have to relocate to the library or cafeteria.

2. Choosing a Laptop

Please do not choose the cheapest model out there because of budget constraints! This can backfire. The following are essential technical requirements: brand name computer with a 3-year warranty; 512MB; built-in wireless cards; durable construction (magnesium alloy case); long battery life; clear and visible screen from all angles; and lightweight for ease of use.

3. The Correct Cart

A sturdy and durable cart for housing your laptops is crucial. Another way to think about it: with laptops costing \$1,100 to \$2,000 each, one cart protects over \$30,000 worth of school assets. With that in mind, the model you choose should offer secure construction with strongest possible locks, built-in charging capabilities with surge suppressor, fully welded construction, long power cords, and reconfigurable module shelves.

4. Network Infrastructure

Your laptops will work at peak performance if these conditions are met: proper CAT 5 wiring; fiber optic backbone; quality network switches and access points; high-speed broadband connection; and reliable and efficient servers.

5. Foolproof Configuration

Here are four simple steps for avoiding configuration glitches: (1) before you give out any laptops decide on all the curriculum products and other software you'll be using during the year and make one perfect copy; (2) create a clone of this perfect image by copying to CDs for installation; (3) install the image to all other laptops for deployment or when a laptop fails; and (4) install desktop security software on all laptops to prevent hacking.

6. Additional Security Measures

Assign individual usernames and passwords to students and staff members, as opposed to a generic one. Then configure a personal drive (P drive) for each user so they can save work to the school's server instead of relying on a hard, floppy, or thumb drive. Finally, be sure to label all your laptops and cart shelves using an automatic labeler with self-adhesive tape. This eliminates confusion and provides an added measure of accountability.

7. Storing and Charging

Storing your laptops in a safe and secure cart (see tip #3) will prevent theft. It's imperative that students are trained to return their laptop to the same marked shelf every day and be responsible for plugging them in the charger.

8. Professional Development

Provide staff with their laptops first and train them months in advance of student deployment. At East Rock, for example, the staff had the summer to play with the laptops and then received two months of professional development. Continual training-weekly or monthly sessions with the technology facilitator-should be scheduled throughout the year. A useful approach is to meet with small groups of laptop teachers for two-hour sessions within the school day or after school.

9. Parent Orientation

Send out a letter informing all parents that their child will be using a laptop and a mandatory meeting will take place. At the meeting, give parents a taste for what the laptops will be used for by presenting sample lessons, homework assignments, and Web sites. Provide them with the Acceptable Use Policy and have them sign a permission form allowing their child to participate in the program.

10. Student Deployment

Give the laptops to students on a gradual basis (e.g., one grade level every two weeks). Training should include a big-picture discussion about how the technology actually works, rules and regulations such as how to carry the laptop and acceptable uses, and instruction on basic keyboarding and networking skills.

11. Staff Buy-In

Teachers will be convinced laptops are useful and effective in the classroom if there's ongoing professional development; the technology facilitator is available on an as-needed basis during the day; and broken or malfunctioning laptops are fixed within a few days (having five loaners available for every 100 laptops deployed is recommended).

12. The Biggest Secret of All

The technology coordinator needs to model 21st century lessons to teachers and show them how to transform traditional teaching methods by substituting the use of laptop instruction—for example, integrating reading, writing, social studies, and technology literacy skills into one one-hour lesson. In short, don't make technology an add-on to teachers' already burdened load of instructional tasks! To see sample lessons, visit <http://www.eastrock.org/units.htm>.

Domenic A. Grignano is the technology facilitator and systems engineer at East Rock Magnet School in New Haven, Conn.

A New Take on Tablets

By Eric Svetcov

Until recently, tablet PCs have been niche products that were underpowered, fragile, lacked compelling software, and didn't have the functionality of a standard laptop or desktop computer. This is no longer true. The now-robust technology, once relegated to the medical and financial services markets, is finally making inroads in K-12 education at prices comparable to the traditional laptop. Here are some questions to help you decide whether tablet computers should be in your future.

Why should I consider a tablet PC? If you're considering purchasing a notebook computer, you should at least consider a convertible tablet. A convertible tablet computer is able to do everything a normal Windows XP laptop can do and has the added functionality of being able to directly interact with the screen using a stylus (see next question).

What can I do with a tablet PC that I can't do with a laptop?

For this question, let's ask the experts in the field who have chosen tablet PCs over notebooks. James Polzin, assistant superintendent of Hinsdale Township High School District 86 in Illinois cites two primary reasons his district went with tablets:

- students can use the stylus to annotate documents in the digital texts they read, and
- the "digital ink" function lets users handwrite directly on the screen and have notes appear as they are written, or be converted from handwriting to text.

George Tuttle, technology consultant for the Pocahontas Area Community School District in Iowa, adds some other reasons:

- with a projector in the classroom, the tablet can function as a notebook and interactive whiteboard (using a standard VGA cable, hook your tablet to the projector and everything you write on the tablet will appear on the wall), and
- compelling new student learning tools designed specifically for the tablet PC, such as xThink Calculator and xThink MathJournal (www.xthink.com).

Students and teachers can do almost everything on a tablet PC that they can do with a regular piece of paper (except fold it into an airplane-tablets are not very aerodynamic). Students can take hand-written notes on a tablet and then file them as regular documents. Teachers can use the tablet as an interactive whiteboard and then convert the class sessions into Acrobat files to publish on the Internet. Students can send a teacher a homework assignment via e-mail and then the teacher can mark it up just like they always have, albeit with a much larger color palette.

What's better: a traditional slate tablet or a convertible tablet with integrated keyboard?

Tablets come in two basic flavors:

- Traditional tablet or slate tablet with no keyboard or pointing device (other than the stylus). An external mouse and keyboard can still be used, but these input devices are not integrated. Advantage: these tablets are typically quite light and thin. Disadvantage: lack of integrated keyboard and monitor stand. Vendors selling traditional slate tablets include Fujitsu, Gateway, Motion Computing, and NEC.
- Convertible tablets with integrated keyboard and mouse. These units are heavier and thicker than their slate tablet counterparts. Most convertibles have a hinged screen that allows the system to either lie flat in the tablet configuration or swing around into a traditional laptop configuration should you need the keyboard. Advantage: fully featured notebook plus tablet. Disadvantage: weight. Vendors selling convertible tablets include Acer, Fujitsu, Gateway, HP, Toshiba, and ViewSonic.

Most of the educators I spoke with feel the convertible version is a better choice for schools, but districts would be wise to weigh the advantages and disadvantages of both designs for their intended use.

Is screen size important?

Once again we turned to the experts. "Hinsdale primarily looked for portability to allow students to carry the tablet PC from class to class," says Polzin. "Screen size was not a priority." On the other hand, Tuttle found screen size to be very important: "14 inches was key since that is the size of a normal laptop."

Test-Drive It

You've chosen the tablet PC you believe will work best at your school. Now what? Once you decide on one of the various models of tablet PCs, have your vendor of choice send you a demonstration unit (they will be very interested in doing this, especially if you don't buy systems from them right now).

It's true you will be sucked in by the cool factor once you receive your chosen tablet. Fight it. Put it through a few sample days at school with you and then hand it over to a trusted teacher for a day or two and then have him or her report back. Then pass it to a trusted student and let them use it for a day or two. Repeat the test with a traditional notebook. If the student and teacher are not raving about how they want a tablet at the end of this test, then maybe the tablet isn't right for you. If the feedback you are getting indicates you should choose a different mix of features, take a look at the matrix, and demo a different unit. If tablets are clearly wrong for your environment, keep this article, wait another year or two, and then follow this process once more.

Eric Svetcov, CISSP, is president of Palint Technology, Inc. and former director of technology for St. Ignatius College Preparatory in San Francisco.

Tech Tips

Establishing Rules for Laptop Use By Leilani Carbonell-Pedroni

When students are engaged in an activity or lesson, discipline problems are usually minimal. Many

teachers find that technology is an invaluable resource that focuses student's attention and keeps them on task. However, without clear expectations on classroom guidelines and procedures, the class can become chaotic. Here are ways to make sure students are focused.

- Invite students to participate in creating rules for laptop use. This builds a sense of ownership and caring for how the laptops are handled.
- Charge laptops before coming to school. Additionally, you will need to think of what a student can do to recharge their battery or "plug in" to an outlet
- Establish a warm-up at the beginning of the class that uses their laptop on a regular basis.
- Use infrared capabilities, if available, where teachers can electronically send out assignments and collect homework instantly in class. If this is not the case at your school, determine the means of turning in work.
- Determine designated times when laptops should/should not be used.
- Decide on a way to get students' attention and how they can get your attention when students are busily working on their laptops,
- Develop procedures for printing or saving work that all students use.
- Ensure that students are on task when on the Internet rather than surfing the web.
- Create special rules for working with partners or groups.
- Provide shutting down instructions at the end of the day.

Laptop Security

By Jane Bloomquist

Built into all wireless access points are configuration tools to help secure the network. An important step is to change the network name configurations-also known as Server Set Identifiers, or SSIDs-from their factory defaults, which typically allow complete open access. To do this, open the AP manager application that comes with the product. The default screen for the application usually provides a space to change the network name. If not, you can find it by clicking through the tabs. Be sure to avoid using an obvious SSID such as the name of your school or district. Also, turning off the broadcasting feature adds an extra level of safety by not revealing the SSID to potential intruders.

Multi-Tasking In the Classroom

By Susan Brooks-Young

Q: We piloted a wireless laptop program at our middle school this past year. We're still evaluating the program to make adjustments for next year, but already teachers are complaining that students surf the Web during instruction. Some want to require that students keep their laptop covers closed during lectures, but doesn't that defeat the purpose of having the laptops for taking notes and so forth?

A: Do you remember listening to music or watching television when you did homework in middle and high school? Were you able to listen, watch, and work at the same time? We didn't use the term multi-tasking, but that's what we were doing.

When you give students (or adults for that matter) a computer, they're going to use it! But this doesn't necessarily mean they're not paying attention. Today's youngsters are accustomed to sending Email, instant messaging their friends, and carrying on a conversation simultaneously. Rather than making laptops off-limits, teachers need to reconsider their lesson design. By coupling mini-lectures with hands-on supporting activities, teachers are able to continually redirect the students' attention to the task at hand, even though they may occasionally 'wander off' to check out a Web site or check Email.

Using a Tablet PC for Productivity and Professional Practice

By Susan Brooks-Young

Q: I use a desktop computer in my office, a laptop for teacher observations, and a PDA for walk through checklists. Isn't there some way I can consolidate and have the computing power I need in one

mobile device?

A: A tablet PC might be the answer for you. Tablets are available in two styles: the slate and the convertible. Slates allow you to write directly on the screen using a digital pen, enabling you to enter text while sitting or standing. The tablet's handwriting recognition software 'reads' what you've written and can convert the text into a word-processing document. A docking station, which is purchased separately, allows you to add a keyboard and other peripherals to the slate. The convertible style tablet includes the slate feature, but also comes with a keyboard that can be accessed by lifting and swiveling the slate to make a laptop. This type of tablet can also be docked to use peripherals. Many tablet owners report that this system has become their primary computer.

The technology that makes tablets unique has improved greatly over the last two years, and tablets are increasing in popularity. Slates can be purchased for less than \$1000. While convertibles are still more expensive than a conventional laptop, the price may be worth it for educators whose needs match the unique capabilities tablets offer.

Resource Links

Cutting the Cord: Wireless Computing Comes of Age

<http://www.cosn.org/resources/compendium/3.pdf>

By Kristen Hammond and Judy Salpeter

Laptops for Learning

<http://etc.usf.edu/L4L/Index.html>

The Laptops for Learning Task Force

Laptops for Learning

<http://www.naesp.org/ContentLoad.do?contentId=1265>

National Association of Elementary School Principals

Networking Without Wires

http://www.techlearning.com/db_area/archives/WCE/archives/wirelswt.html

By Judy Salpeter and Jerry Crystal

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