Winter TechNotes

Strategies for using technology with children

INSIDE

Technology & the Internet are coming of age

A Convergence

By Marty Karlin

There is a convergence happening. Technology and the Internet are coming of age. The delivery system, the tools, the resources, and the communications systems are maturing, available, and economically sensible. Online learning is emerging as a viable educational alternative for thousands of students in the state, including over 170 from Jackson and Josephine Counties. Schools, parents, and students are looking for and finding educational alternatives. State agencies, organizations, ESDs, and teachers are very interested in the development of a statewide system to accommodate web-based instruction.

Online learning can have a profound effect on the future of education and the profession of teaching. But while we're at a convergence, we're also at a crossroads. The use of the Internet for online learning can be one of two things. It can be used as a vehicle for traditional materials to be delivered to students, or it can be a form of learning and instruction that lives up to the promise of technology in education.

The next advisory board meeting will be on January 16, from 9:15-11:30 AM at the ESD or over VTEL. All are welcome.

Opportunities to use motivating, problem- or project-based units of study that take advantage of professional tools, engaging environments, varied experts, and current communications systems are available through the Internet. There are many free and inexpensive, high quality digital resources sponsored by museums, government agencies, universities, K-12 schools, districts, organizations, and commercial sites that offer activities, primary source materials, maps, images, video clips, readings, lessons, and references. Digital course content and tools are comprehensive and current, and affort teachrs great variety and flexibility.

Online schools have been around for several years. In Oregon, along with Southern Oregon Online School based at Jackson ESD, there exists SK Online, serving Salem-Keizer and surrounding districts; NW Web School coordinated by NW Regional ESD; and CyberSchool which has had several homes in its seven year existence. Linn-Benton-Lincoln ESD is looking to revitalize CyberSchool as a regional project. Willamette ESD is dipping its toe in the online waters. Other ESDs are interested as well.

Convergence (continued from previous page)

Online learning is part of the larger world of distance education. The Oregon Department of Education has been looking at distance education, though primarily from the perspective of VTEL, a synchronous form of distance instruction delivery. Synchronous means students and teachers must meet at the same time, albeit at different sites. Tens of millions of dollars, much from Qwest, have gone into developing the state VTEL system and associated sites. So far very few dollars have gone into online learning, much to the consternation of web-school proponents.

In early December Oregon Online Leaders, a three-year-old organization of online schools and state agencies, met to explore ways to share what is sharable and collaborate on what needs to be developed to create a statewide system for supporting online education. The general consensus was that, for now, regional and/or large district entities are in the best position to manage local efforts. Oregon Online Leaders agreed to the following goals:
- Create a set of recommended policies and procedures for online schools,
- Create a set of standards for instruction, facilities, teachers, and content,
- Create a central location for online content and resources available to all teachers; a central location for finished coursework; and a central student information system,
- Provide training opportunities for all teachers to teach online and to use online resources,
- Create an enrollment model for online instruction that will benefit Oregon students,
- Create a cost infrastructure and delivery model that is common and consistent,
- Create a statewide dissemination model for training of site mentors and counselors and for school support,
- Create a joint marketing plan for public school online learning.

These goals are realistic, with a little help from our friends.

Oregon Public Education Network (OPEN) is positioned to provide the backbone, servers, and technical expertise for distributing online coursework, and other materials throughout Oregon. They have the infrastructure, manage the statewide network, maintain the servers, and have the web-experts on staff.

Oregon Department of Education has recently become more sensitive to VTEL's asynchronous (anytime, anywhere) cousin, web-based or online instruction. ODE's interest means that online learning is on the state radar screen. ODE has content experts, money, and resources that can support the training of teachers and the development of coursework.

Oregon Educational Technology Consortium (OETC) has developed a network of Resource Centers, housed in ESDs and large districts across Oregon. Instructional technology experts at the Resource Centers serve as technology distribution and information hubs for their region. These OETC Resource Centers are poised to help organize the human infrastructure that is needed: to identify key people, help coordinate the training, and provide support for Oregon's teachers.

The Oregon Online Leaders group has the knowledge and skills to offer guidance to the districts and ESDs that would like to get started in online learning and provide training to teachers throughout the state. It can also play a role in coordinating interagency efforts. With these agencies and schools cooperating, all Oregon teachers, whether affiliated with online schools or not, can have access to coursework, class shells, training, and support to implement web-based teaching and learning.

Online education should, and will, become a regular part of what teachers and schools do. Schools therefore, need to begin to develop the capacity to accommodate online learning by developing the staff skills, the technology infrastructure, and the student support system necessary to make it work. Jackson ESD provides regional schools and teachers with a comprehensive service system. Support is vital as schools develop the capacity to accommodate online learning, particularly if the technology is to be well integrated into the teaching and learning.

Jackson ESD service region encompasses 20 high schools, twelve of which are currently participating in SOOS. Advisory board representatives from all schools guide the development of SOOS, and serve as facilitators at their local high schools. SOOS offers 14 core courses. The 13 teachers that are enrolled in our teacher-training program in preparation for next year gives us the confidence that we have a sufficient pool of potential teachers that so far is keeping the demand for courses and the availability of web-enabled teachers in balance.

With the ESD coordinating and providing the support system for SOOS, the cost to schools through the 2003-04 year is $83/semester course/student with the help of a grant. When the grant runs out the cost will double to about $170/student if the ESD remains involved. Other online schools charge between $260 and $350/semester course/student in addition to schools supplying their own support systems.

It's time to have conversations at staff and technology committee meetings about how online and other forms of electronic and distance learning can serve the varied time, space, and scheduling needs of your district, school, staff, and students; how it might serve your personal career interests; and how we can best use technology to serve teaching and learning.

Participation in SOOS is invited and encouraged. The next advisory board meeting will be on January 16, from 9:15-11:30 am at the ESD or over VTEL. All are welcome.

First grade alphabet quilt
Making a difference with technology

By Kary L. Rogney, First Grade Teacher
Jewett Elementary, Central Point Oregon

This past summer I spent a week in Monmouth, Oregon, at the Oregon Teacher Arts Institute. The week focused on the use of the arts in teaching in an elementary classroom. It was wonderful and well planned. During the week I came across a project that utilized technology and reinforced language arts skills. I could tell it would fit well into my first grade class early in our year. I had previously purchased a scanner, color printer, and digital camera on the Internet for only $200. These items in hand, we were ready to go.

Students were each assigned a letter of the alphabet. They were to bring in things that would match that letter's sound. For example, a student brought in a can of peas, a toy pirate, pennies, etc. We scanned the "stuff" on my scanner until we had completed every letter, flipped the images in a graphics program. *IrfanView* (free for PC) and *Graphic Converter* (shareware for Mac) are available from www.download.com and perform the flipping task and more. The items are then inserted into a Word document and printed as big as possible. Some letters were definitely easier than others.

Each image was printed on iron-on transfer paper. You can get the 8.5 x 11-inch transfer paper at any office supply store and since they cost about a dollar per sheet, I approached my school's parent organization for a little financial support. They were glad to help when they heard what we were planning on making.

Our goal was to create a quilt, piecing the letters on fabric together with other colorful fabric. Tickets to win the quilt would be sold for drawing, and the proceeds would go to help some local community service organization, like Access Food Share.

Place all items beginning with a single letter and scan away. The images will later be reversed and printed onto iron-on transfer paper for quilting.

At this moment we are beginning to put the quilt together and plan for the drawing. My class is very excited about the difference we can make in the lives of people less fortunate.

Student Thoughts

"I really liked it because I like to help other people." (BA)

"Scanning the letter 'G' was fun because I got to put the green lights on it." (TF)

"I liked how I got to help on the computers." (AS)

"It is good to use the money for the quilt to help other people get food to be healthy." (KT)

This project was adapted from Christine Gerofsky, Port Charlotte, FL. Contact Kary at *kary.rogney@district6.org*.

Text-to-speech freeware for Macintosh and Windows

Sound Practices—Hearing Voices

By Larry Francis

Seeing yourself as others see you can be a worthy goal, a rude comeuppance, a nice surprise — maybe even all of the above. Hearing yourself as others read you can be healthy in the same sorts of ways. Text-to-speech software enables you and your students to put yourselves at a distance from what you've written and think about it critically. Text-to-speech freeware allows you to do all that without spending any money.

Does it make sense? and What does it mean? are the first/last questions about any piece of writing. There may be missing words or missing punctuation or there may be words that don't sound right (the first and most important sign of a misspelling). Digital text-to-speech is perfect for this sort of proofreading task because its speech-generating algorithms are totally based on phonological and spelling conventions and totally affect-free. Robots don't pass judgment; they just call 'em the way they see 'em. Students, knowing what they meant to say, have to listen to the robots read what they wrote, try to fix those things that sound wrong, and then give them another listen. When students find something that sounds wrong and then don't know how to fix it, that's a teachable moment—and a reason for you—the teacher—to exist.

Here are a few reasons to use robot text-to-speech:

- **Without punctuation, those robots just read right on**. For your not-yet-fully-literate students, oral language is where it's at; and when they write, punctuation seems (to them) superfluous. They don't see the need or sense of it, so they leave it out, or sprinkle it in sometimes as an afterthought. But, as we literati know, punctuation marks tell the reader when to pause. Listening to robots just mow senselessly through words will establish a need for punctuation in students' minds and make that crucial eye-ear punctuation connection.
- **Evaluating robots' reading is high level thinking**. Whatever taxonomy you're a fan of, evaluative thinking is 'way up there. To evaluate performance you have to reflect on it in respect to some standards, so when children evaluate a robot's reading of something they've written, they are reflecting on their own work—one, if not the, mark of an educated person.
- **Compelling spelling**. Spelling is something everyone struggles with, some of us more, others less. And sometimes incorrect spelling is euphemized as "invented spelling." But not all misspellings are equal: some inventions work and others don't. Robots will generally output correct-sounding English or Spanish from phonologically correct spellings in either language.

(Keep in mind that all robots are limited to monolingualism.). So we can make some fine pedagogical distinctions in the area of incorrect spelling. In my book, phonetic misspellings beat misremembered juxtapositions or just plain typos and jumbles. Phonetic misspellings are inventions that show a mastery of phonics and a lack of practical sophistication in reading or simple lack of application in proofreading. The word said, for example, when spelled sed will sound right, but when spelled siad will not.

- **Robots make good curricular confidants—saving teacher time**. Hay más trabajo que vida; everyone knows that, and teachers know it most and best of all. If you have 30 students and they write something, and if you allot 3 minutes to each student's work, you're sitting down for an hour and a half. If you're a middle school or high school teacher and you have over 100 students you'll be sitting down for a loooong time. The only answer besides forgetting all about it, having kids do workbooks, and plugging them into programmed (CAI) instruction—and they all amount to the same thing; some just take more money and space than others—is to loosen the reins and have the kids do lots of writing and reading with less teacher oversight and criticism. Robots can help.
- **Robots make good tutors for struggling readers**. Often poor readers are hurried on from selection to selection without ever getting a chance to master anything. This gives them lots of experience with mediocre performance and very little practice reading fluently and flawlessly. Affectless feedback is important for not-yet-fluent readers/writers/learners who hear—or think they hear—frustration in the voices of human interlocutors when they're not getting something, even after many repetitions. Robot feedback is affectless and tireless. Students can get as many reps as they need, even more.
- **Text-to-speech freeware is available for both Macintosh and Windows** computers and is easy to install and use. Text-to-speech capability is built in to the Mac OS (and has been since Mac OS 7.5.5, maybe even before). Just open Simple Text (which comes with every Mac and go below Sound in the menu bar to voices. Pick one you like and then hit Speak All. To hear your work read this way, you need to copy your work from your word processor and paste it into SimpleText. But there is a faster, better way: the freeware HearIt! control panel. With HearIt! you can get robots to read whatever you have highlighted, simply by hitting ctrl-t. Download the HearIt control panel , drop it into the Control Panels folder in your System Folder and restart. It'll work

automatically with Apple's free text-to-speech software, PlainTalk, so you can highlight any text just about anywhere (like in AppleWorks or on the web) and get a robot voice to read it. If you don't have any voices for some reason, just download and install PlainTalk. If you want voices that know Spanish phonology, download Mexican Spanish Text-to-Speech. Once you have all your voices, if you're using MS Word 98 or better on your Mac, you can select text and go up to Tools > Speak Selection to get your text read. Actually I think highlighting text and hitting ctrl-T is easier, but you know, whatever…

Text-to-speech for Windows 95, 97, NT and on beyond is available in many different packages. But, as one Peanuts character says, "I like to get stuff free." You can find scads of applications, freeware and shareware, at download.com. ReadPlease seems to me at this point to be the easiest to use. All you have to do is highlight your text from within your word processor, paste it into ReadPlease, and hit play. The bad news is it's more cumbersome than HearIt! The good news is you can do some thoroughly nifty things like change the reading rate and font size with little slider goodies and even click on pictures to choose among four different gringo (sorry!) voices.

 Changing the reading rate in ReadPlease by just upping or downing the ever-present slider is to me its most wonderful feature, one that makes it so great for struggling readers and writers. The Mac seems to give you the opportunity to slow down the reading rate in the speech control panel, but I have never been able to make the changes stick or even apply outside the Control Panel window. The downside to ReadPlease is that you have to copy your text to the Windows Clipboard and then paste it into the Read-Please application. MoneyTree Software has a great tutorial
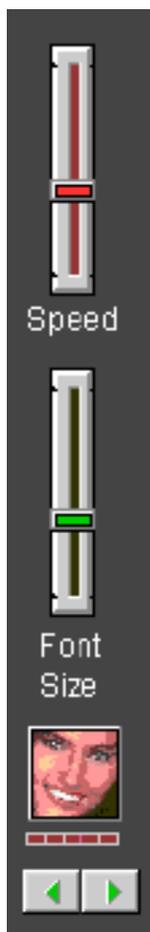
on how to use the Windows Clipboard. (See links, below.) We want kids to reflect on their own work, since reflection is essential attribute of academic excellence, lifelong learning, and all sorts of great stuff. If somebody—even a robot—will read us our own work, we can ignore the oral production part and focus exclusively on sound and sense. If the production seems off, we can fix details like spelling or punctuation to make it sound right or fix details like telling the story coherently so that the story makes sense. If we ask kids to make sure their writing sounds all right when a robot reads it before they submit it to us, we structure self-reflection into our assignments, making it more likely that we'll be looking at kids' best efforts rather than something merely churned out.

Downloads

- *READPLEASE 2002* can be previewed at *www.readplease.com* and you may download it from *www.download.com*
- *HEARIT!* can be downloaded from *http://trace.wisc.edu/ world/computer_access/mac/macshare.html#hearit* or from *ftp://ftp.mesd.k12.or.us/pub/mac/HearIt.sit.bin*
- *ENGLISH TEXT-TO-SPEECH* can be downloaded from *www.info.apple.com/support/oldersoftwarelist.html* or from *ftp://ftp.mesd.k12.or.us/pub/mac/ EnglishTexttoSpeech.sit.bin*
- *MEXICAN SPANISH TEXT-TO-SPEECH* can be downloaded from *www.info.apple.com/support/oldersoftwarelist.html* or from *ftp://ftp.mesd.k12.or.us/pub/mac/ MexicanTexttoSpeech.sit.bin*

A Few Links

- *MONEYTREE SOFTWARE'S WINDOWS CLIPBOARD TUTORIAL http://readplease.phpwebhosting.com/htmlfram edseppage/windowsclipboardtutorial.htm*
- *HEAR CASTILIAN SPANISH* (lisp and all) online at *http://www-gth.die.upm.es/cgi-bin/sintetiza2.pl*
- *BELL LAB'S TEXT-TO-SPEECH DEMO PAGE* allows you to type in and hear phrases in English, French, Canadian French, Italian, Spanish (Mexican and Castilian), German, and Mandarin Chinese and is available at *http://www.bell-labs.com/project/tts/index.html#demo*

Is your software licensed?

Paul Nelson, a teacher and frequent MACEP contributor, suggests three steps to help with licensing:

1. OETC can help by providing you with a spreadsheet of everything you have purchased with them. This, combined with your audits, will at least tell you where you are.

2. We discovered during our audits that our teachers and students were adding software. Using *Ghost* to restore workstations to the "standard approved" version is an easy way to keep your PC's legal. Of course, you can buy *Ghost* from OETC. ;-)

3. The other option is to use free software. Linux and 12LTSP are good options but you don't have to give up Windows. StarOffice from *www.sun.com* and OpenOffice from *www.openoffice.org* are good choices. For simple word processing try AbiWord from *www.abisource.com*. All three of these packages run on Windows and are free and may be passed around to staff and students. You don't even have to register.

A process approach to language as video

Video in the classroom

By Joel Brain

Could video be used to address standards? In preparation for a recent presentation, I searched OPEN's Oregon Standards and Benchmarks Database in a variety of subject areas (*open.k12.or.us/standards/search.html*). To pass, students are asked to represent, to explain, to create, to demonstrate, to describe, to design, to reconstruct–in short, to show what they know.

How do we ask students to do this? Write a paper? Take a test? There's nothing wrong with these of course; they've certainly stood the test of time. But many teachers have developed other tools of assessment. They ask kids to speak, write, draw, create a play, build models, etc. They've found, and research tends to support, that this approach allows a higher percentage of students to experience success.

Considering these alternative activities, it struck me that creating video is a natural tool for learning and assessment. It combines script writing, camera work, lighting, acting, sound effects, and music. It's truly a "process" approach. And because it includes so many modes of communication, it has tremendous potential for students with just about any kind of "intelligence."

So why isn't it used more classrooms? Maybe it's because we don't know the language really well. Sure, we're pretty good at the receiving end (some of us may even fall into the category of "couch potato") but the creating part we've never really learned. We understand the language–we just don't know how to speak it.

The language of video can be learned within in the process of creating video. That process is not unlike the writing

process. It consists of Planning, Shooting, Capturing, Editing, and Publishing. Let's visit some of the language and techniques associated with planning and shooting video, and I'll explain a few terms as we go.

Planning
- Brainstorm: do this as a group. Be open. This is very powerful for developing ideas.
- Storyboard: a visual plan for each shot in the video. Information on the storyboard includes a rough drawing of the scene, the type of camera shot and angle, info about the script sound effects or background audio, and possible transitions.
- Script: write out exactly what will be said. Be succinct.
- Timeline: include dates and times for creating and editing video (helps keep everyone on schedule).

Shooting
- Lighting: try to use natural lighting and consider having the light person use tagboard as a reflector to add fill light.
- Camera Angles: different angles evoke different emotions (low, eye level, high, or bird's eye)
- Camera Shots: a variety of shots (wide, medium, close-up) keeps the project interesting
- Camera Movement: The key is to have the camera record the movement rather than *be* the movement. Use a tripod if possible. Selective camera movement can be very effective. These include:
  > Tilt–the purposeful up or down movement of the camera, often used to accentuate height or create tension,
  > Pan–the side-to-side movement of the camera used to show a panorama or to track movement,
  > Zoom–used to create drama (zoom in) or show location (zoom out) This is often misused or overused. One video sage suggests only using the zoom when the camera isn't recording.
- Framing: (rule of thirds) Imagine a tic-tac-toe grid; rather than place your subject in the center of frame, position the subject where the lines intersect.
- Pre and Post Roll: shooting a few extra seconds of tape before and after each shot will give you some footage to work with when it comes time to edit.

There is a lot to learn here. So how do we become proficient and how do we help our students master the language?
1. Watch some video or television with a critical eye. Do this with your students; you'll learn together. Remember to turn the sound off so you focus on the camera work.
2. Take the free online Camera Composition class at

MediaSchool. (*www.mediaschool.com*) This is an excellent tutorial with great video examples of techniques and strategies.

3. Since most of us learned spoken language in the context of our lives, why not learn the language of video in your classroom while actually creating a video?

Class Period One: Planning the Project
Brainstorm ideas of "How To..." with class. For example: how to tie your shoe, how to sharpen a pencil, how to throw a football, etc.

Create a storyboard with the class. Plan a variety of camera shots: wide, medium and close-up. You'll need to demo these as you discuss them. Get a student behind the camera and connect your camera to a TV so the entire class can see what the camera operator sees. Include a variety of camera angles: low, eye level, and bird's eye. Explore the possibilities as you storyboard together. Keep each shot short: 5 seconds is good to shoot for.

Write up a short script. I suggest having an off-camera person (very close to camera) read the script if possible; not being tied to an actor speaking gives greater options for editing later and makes for better quality audio.

For this project to be successful, it's very important that you keep it very simple. Avoid any extraneous storyline; keep it to the bare essentials. It's very easy for a first project to balloon out of control. Remember the purpose is to learn the language of video, not to film War and Peace. I suggest you adhere to the following constraints:
• The filming location must be limited to your classroom.
• The length of the project should be limited. Definitely keep it under a minute. 30-40 seconds is even better. This should allow for 5 or 6 different camera shots.

Class Period Two: Shooting the Project
Shoot the video, exploring the techniques as you go. Ask a lot of questions. Remember to connect the camera to a TV to involve the entire class in the process. You'll need someone operating the camera, actor(s), a light person, a voice person, a director, and a sound effects person. Assign different students different jobs for each shot. I model the role of director on the first shot then have students take over.

Use a tripod for stability. Follow your storyboard but don't be afraid to adjust during the shoot. Some of the best ideas occur here. You want to encourage ideas but if the story line begins to take a new direction it may be time to go back to the storyboard. I'm much more willing to adjust camera shots, or angles then story line.

Try to use natural light. Direct student's attention to light and demonstrate the problem with backlight. Use reflectors (white tagboard) if necessary, filling the shadows with light. Discuss the importance of the proximity of audio source to the camera. This is particularly important for cameras with built-in microphones. Audio is often the weakest part of student video. Have the cameraperson monitor the audio with a cheap pair of headphones connected to the phone jack on the camera.

If you're going to edit later, give a 5-second pre and post roll. Otherwise, shoot several takes as necessary. If you don't have access to editing equipment your students will need to shoot the shots in sequential order and reshoot any scenes that don't cut it as they go. If you are planning on editing (to a VCR or with a computer featuring a nonlinear editing program) shoot several takes and choose the best during the capturing process.

This is a good time to connect your camera to a TV at the front of the room and critique your raw video as a group. Consider both the content and the medium. Use a content rubric to evaluate the content. To evaluate the medium, use the Video Checklist. It's easy to get sidetracked by the "showbiz" factor and forget the video's purpose.

For more information on video check out *desktopvideo.about.com* and *videouniversity.com*.

The *Language of Video* series will explore capturing, editing and publishing video in the spring issue of *TechNotes*.

Evaluate your project
Video Checklist

· Does it have a purpose?
· Does it communicate effectively?
· Is it targeted to an audience?
· Does it meet the time constraints?
· Evidence of planning
    storyboard?
    script?
· Camera work
    good pacing?
    smooth?
    variety of shots?
    variety of angles?
· Audio
    high quality?
    matches content?
· Lighting
    creates proper mood?
· Transitions
    unobtrusive?
    where noticeable they add to story?

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"There's got to be a better way!"
Teacher as researcher

By Tina Mondale

When many of us picture educational research, our heads are immediately filled with the vision of crawling through the "stacks" during our undergraduate work, looking up some obscure educational journal article, and adding it to our list of references. The information in the article was seldom readable, much less applicable to the teaching classroom we were working in. The notion of the teacher as researcher is evolving from the idea of "scientific" stereotypes to teaching professionals modeling lifelong learning to create more effective learning opportunities for their students.

you're trying to find out), and a question—something like "What are effective strategies for increasing reading levels in the middle school science classroom?"

This follows the action research model in which teachers look at areas of their teaching, schools, or classrooms that they would like to change and formulate a research question that will help support that change. Once the form is completed, just hit the submit button and within 2 days, the network information specialists at AskERIC respond to your

To help us out in this quest for what works and what doesn't, the ERIC Clearinghouse on Information & Technology, sponsored by Syracuse University, has a terrific web-based service called AskERIC located at *www.askeric.org*. The home page of AskERIC is a directory of educational research information broken into categories such as motivation, learning theory, classroom management, librarians, special education, etc. Browsing through the categories, you'll find articles, lesson plans, and web sites that match your interest. And there's more! By selecting the Ask an ERIC Expert button on the navigation bar, you can connect with online experts to get the latest answers to your curricular questions. You need an email address so they can get back to you, a topic you're concerned about, a telephone (for clarification in case they can't tell what in the world

question with ERIC database citations and Digests, Internet resources, and/or referrals to other sources of information. When I tried it out, I received 8 pages of websites, articles and digests that were directly related to my question.

Got an education question? If you are an educator, librarian, parent, or anyone interested in education, AskERIC's Q&A Service can help!

AskERIC Question Tips
- Provide a context for your question. Keywords are usually not enough.
- Avoid jargon or acronyms. (Examples: TQM, AECT)
- Help out the Eric Experts by configuring your requests to 1 per message unless the topics are closely connected.

www.booking.jacksonesd.k12.or.us/webmax/loginng.html
Search and order ESD media and software online

By Kelly Bryant

Webmax, the ESD Media Library's online catalog system, has been recently upgraded with some nifty new features. In order to use the catalog program, you will need a password and ID number which you may obtain by calling Marilyn Wilson at our booking desk at 776.8560 or 800.460.6454. Some of the upgrades of Webmax include:
- The "advanced" mode has been replaced by a more comprehensive search strategy. You can now automatically search by title, title number, or subject.
- The "simple search" mode is a word search strategy.
- New items that have been added to our collection since July 2001 are flagged.

Feel free to contact me for help using Webmax. I can be reached at 772.2751 or *kelly_bryant@jacksonesd.k12.or.us*.

Instructional Technology offers 27 different workshops during the winter and spring

We are now accepting registration for winter and spring technology workshops. Our workshops are free. Some even think they're fun. Twenty-seven different workshops at each of our three labs include troubleshooting, productivity, multimedia use and curriculum specific sessions.

In our troubleshooting workshops you can learn to maintain your computer and troubleshoot your own problems on both Macs and PCs. For productivity we are offering beginning and intermediate workshops in PowerPoint, Photoshop, Excel, FileMaker Pro, Netscape, and Internet Explorer. If you have an interest in using multimedia tools–digital cameras, video, audio, then this comprehensive workshop is for you. Here you will learn just how easy it is to have your students create compelling video projects.

For posting web pages on the Internet we have three different solutions. If your district or your Internet Service Provider allows you access to a web server you may wish to learn to use File Transfer Protocol (FTP) to get the web pages that you created in Microsoft Word (or from any other authoring program) posted on that server. You can FTP files from your computer in the classroom or at home. Alternatively, if you wish to use a free site for posting simple-to-make web pages using their template come to the TeacherWeb workshop. TeacherWeb is great if you don't have access to a web server or if you don't qualify as a power user. To create a sophisticated web site for your school or a series of web pages for a larger project then our DreamWeaver workshop is for you.

We're very proud of the comprehensive curriculum work-shops designed for various subjects and grade levels. The CGs have prepared cutting edge sessions in social studies, math, writing (see a supporting article on pages 11-13), ESL mainstreaming, and more. You will have ample opportunity to explore web resources, activities, and software tools while learning strategies to use computers and the Internet with your students.

In the Data Interpretation using Imaging Software workshop you will learn to use free imaging software for Macs and PCs where users can acquire, display, edit, enhance, and analyze images. This software can be used in social studies, science, and art classes.

Geography is part of our everyday lives. Geographic information systems (GIS) software can help learners of all ages grasp the ways in which geography matters. GIS helps students and teachers engage in studies that require and promote critical thinking, integrated learning, and multiple intelligences, at any grade level. This workshop will be held in May.

Administrators, PDAs are small handheld devices that help you keep track of your contacts, calendars, to-do lists, and more. They can also serve your wireless communications needs including phone and web access. PDAs can be synchronized with your desktop computer at the touch of a button. This workshop will address the basics of these handhelds. If you have a Palm, Handspring, or another PDA that uses the Palm operating system this workshop is for you. Bring your own PDA. We are trying to acquire some loaners for this workshop in case you haven't purchased yours by workshop time. Ask if we have any available when you call to register.

If technology is to be a functional part of your school it requires individuals at district and school levels to support the equipment and the staff. We recommend that every school select a Technology Responsible Person (TRP) to act as communicator, troubleshooter, and staff developer. Encourage your TRP to attend our special meetings specifi-cally designed to help them support your site. We are planning a VTEL meeting on January 29th so all three counties in our region can get together. Call to see if your local VTEL site is connected. If it's not scheduled for something else we can still get you on the system. In April we will be holding separate meetings in each county.

For complete workshop descriptions see our catalog that was distributed in August, or go online at *www.jacksonesd.k12.or.us* and click on IT Workshop Registration on the bottom left.

• **Marty Karlin**

Please copy and distribute the workshop schedule to your staff

Workshop	Prerequisite	Jackson	Josephine	Klamath
Technology-Interested Persons Meetings	Interest	VTEL 1/29, 4/29	VTEL 1/29, 4/25	VTEL 1/29, 4/9

Navigation, File Management, Troubleshooting

Workshop	Prerequisite	Jackson	Josephine	Klamath
Intermediate Macintosh Troubleshooting	Beg Mac Trouble	1/14, 28	2/7, 14	2/13, 20
Beginning Windows Troubleshooting	Win Navigation	1/23, 30	1/17, 24	1/9, 16
Intermediate Windows Troubleshooting	Beg Win Trouble	4/15, 22	4/1, 8	4/25, 5/2

Productivity Applications

Workshop	Prerequisite	Jackson	Josephine	Klamath
Forms, Mail Merge, Data Handling Using Excel	Beg Excel	4/16	4/18	3/5
Beginning FileMaker Pro	None	1/10, 17, 24	1/15, 22, 29	2/5, 12, 19
Intermediate FileMaker Pro	Beg FileMaker	4/3, 10	4/4, 11	4/23, 30
Personal Digital Assistants (PDAs) for Administrators 1:00-4:00	None	2/6	2/11	2/21
Beginning Photoshop	None	1/9, 16		1/17, 24
Extending Projects Using PowerPoint: From Buttons to Bloom's	Beg PowerPoint	4/2, 9	4/17, 24	4/4, 11

Internet Productivity

Workshop	Prerequisite	Jackson	Josephine	Klamath
Outlook Express Email for Windows	None	5/2	5/8	5/1
Customizing your Netscape Browser (Macintosh)	None	5/6	5/2	5/8
Customizing your Internet Explorer (IE) Browser	None	5/13	5/9	5/6
Posting Your Web Page Using FREE TeacherWeb	None	2/5, 12	2/13	4/1, 8
Create & Post Word Files as Web Pages Using FTP	Computer comfort	3/11	4/2	3/20
DreamWeaver: A Higher End Web Authoring Tool	Solid web skills	4/4, 11, 18	4/15, 22, 29	4/3, 10, 17

Multimedia

Workshop	Prerequisite	Jackson	Josephine	Klamath
Multimedia in the Classroom	None		4/16, 23, 30 5/7, 14	

Specific Curriculum

General

Workshop	Prerequisite	Jackson	Josephine	Klamath
Mainstreaming ESL Students	None	3/7, 21		
Software and Internet Resources for the Elementary Classroom	None	4/24, 5/1	4/3, 10	5/9, 16
Document Success with a Digital Camera and Word Processor	None	2/4	2/12	2/6
Data interpretation using Imaging Software	Basic graphics	5/7	5/1	4/24
Using Geographic Information Systems (GIS) in your Classroom	Computer comfort	5/14	5/16	5/15

Primary Classroom

Workshop	Prerequisite	Jackson	Josephine	Klamath
Kidspiration & Primary Writing Projects	None	2/14	2/19	2/26

Math

Workshop	Prerequisite	Jackson	Josephine	Klamath
Math Software and Internet Resources grades 3-6	None	2/19, 26	2/21, 28	2/27, 3/6

Social Studies

Workshop	Prerequisite	Jackson	Josephine	Klamath
Software and Internet Resources for the Social Studies Classroom	None	2/20, 27	3/7, 21	2/25, 3/4

Writing and Language Arts

Workshop	Prerequisite	Jackson	Josephine	Klamath
Writing Without Walls: Responding on the Web	None	2/21, 28	2/26, 3/5	1/28, 2/4
Using Word to Respond to Student Writing	None	3/4	3/19	3/7

Freedom within a structure
Ten classrooms responding online

By Nick Viani

For a full ten minutes, the barely audible scratchings of pencils were the only sounds as we wrote to the prompt. Preceded by an oral reading from Roald Dahl's *The Twits* and a brainstorming session categorizing Dahl's graphical writing style into sensory images, this 5th grade writing activity was not much different from the lesson I taught some 4th graders the week before. Or to some 6th graders before them. The process is more important than the ages of the participant. Those familiar with the "writing process" know this is just the beginning of the path to publishing.

Ten classroom teachers have each committed seven class periods to having me model how technology can impact student motivation to write, provide students with a forum for communicating with peers about their writing, and reduce hours of out-of-class reading by the teacher. So far, the results have been stunning and requests are being submitted from eager new participants.

It is the intent of this article to inform you how efficiently the project supports the use of technology in the writing curriculum, and hopefully will encourage more of you to join this online writing project. As this project demonstrates, appropriate technology makes the writing process more available and efficient:

- it follows the writing process, using a scoring guide/rubric to identify the primary trait of the lesson and subsumes "editing" as a secondary trait,
- it removes the bottleneck of one person (i.e. the teacher) having to read everyone's work,
- it structures the draft-response-draft cycle so that students are empowered to provide standards-based feedback to authors which helps with their own writing,
- it keeps track of and connects all drafts, revisions, and final copies submitted by Write Site participants,
- it's a free service of the Jackson ESD.

What's different about this project?
One thing is having a different person teaching your class for a change. And not just once but for a series of seven sessions. Another is having a mentor with nearly 20 years experience with computers taking responsibility for all the planning, prep, printing, and logistics–sort of like a field trip that visits *you*. Because the project relies on the Internet for communicating with each other, participating teachers receive their own online Write Site hosted on the ESD server and maintained by me for the remainder of the year. Probably the greatest advantage is seeing someone so familiar with instructional technology interacting with kindred spirits who have been raised digitally–your students.

Staff development offered by the ESD is gradually evolving from the more traditional "12 teachers in a lab" model to our getting involved in classrooms at the building level. We're not abandoning lab-based workshops but the learning and transfer of instructional strategies when demonstrated and practiced in your own classroom is proving to be extremely powerful. And over a span of seven sessions, a visiting teacher has a pretty good chance to get to know the children, their special learning styles, and when to employ time-tested management strategies for teachers unfamiliar with using technology in their daily instruction.

My seven visits (not including a planning session to work out logistics) closely follow a series of activities that foster freedom with a structure. Each visit introduces a sequential skill in the process and the lessons last approximately 45-50 minutes. In some instances, two lessons can be scheduled

Write Site (continued from previous page)

back-to-back, especially those where a classroom activity precedes a lab computer activity. What usually drives the schedule is the availability of networked computers. Any cluster of computers with access to the Internet will work and children may be assigned to buddy teams or assemble in small groups with others working independently elsewhere.

"I don't like my piece very much, but I'm glad it is at least interesting to some people."

It merits pointing out that only 3 of the seven sessions are computer-dependent, freeing the lab for other purposes. Listed below are the seven training lessons that combine technology with the process approach to writing:

1. Prewriting and writing the draft (classroom),
2. Transferring the drafts to a teacher's Write Site (lab),
3. Read-around activity (classroom),
4. Introduction to the response structure with independent practice in the lab or elsewhere (a very popular alternative for students with computers at home),
5. Writing and posting a revision influenced by online responses printed for each author (lab),
6. Peer-editing with the focus on conventions (classroom),
7. Writing and posting the final copy influenced by additional responses and the editing session (lab).

Responding online–a unique application of the Internet

From the beginning of this project's development, special attention was given to having students participate in the responding component. Having students respond to their classmates serves several functions:

- Students receive more feedback than a teacher is able to give them as a single reader,
- Students contribute and receive a different kind of feedback from their classmates than they do from their teacher,
- Students "hear" feedback sideways from peers (rather than top-down from teacher). Hearing from someone like you reflecting on your work is a lot like learning from yourself reflecting on your own work,
- Students practice reading writing critically by reading other people's writing,
- Helping others helps authors with their own writing; it helps students internalize reflective habits of mind.

With the ubiquity of the Internet and the refinement of browser-based editing (i.e. Hotmail, instant messaging, etc.), students are able to provide valuable feedback to their peers from anywhere there is an Internet connection (in the classroom, a lab, the library, at home or at a friend's). The key

to successful peer-response is teaching and reinforcing a response structure that powerfully empowers students and significantly reduces the workload of teachers. Bear in mind that students aren't *grading* papers but merely reflecting their comprehension of the lesson's attributes by reading (and responding to) drafts. The Internet acts as an interface with the ESD server where student writing and peer responses are stored. In subsequent sessions, students may view and print their piece with responses of classmates, teachers, other sections of a class, another school, parents (yep, they DO get involved), and distant relatives, all neatly displayed for easy revising.

Anyone familiar with teaching and computers knows how important it is for students to save their work–often. *Where* students save is another matter. Without the Internet, it's imperative that students be assigned to specific machines or at least carry floppy disks with them whenever they're asked to work with a previously saved file. Saving work to a networked database (i.e. at the ESD) eliminates the need to have students assigned to a particular workstation. Nor is it a concern if the student forgets (or loses, destroys, or repurposes) the floppy with their all-important data on it. Publishing on the Internet (i.e. onto a networked database) makes the data available for retrieval and editing from any workstation on the Internet–at school, at home, or in Italy.

Not all activities use technology

Aside from the writing, posting, revising, and responding online, two additional classroom activities are worth mentioning. The read-around activity (session 3) has each child's piece read by every member of the class, establishing an immediate sense of audience and validity for the author, and provides students an opportunity to see how others addressed the lesson's scoring criteria. Because the writing prompt is an extension of this scoring guide, as children read they're conscious of what is expected in the piece.

Another activity tied to standards is the editing session. Children are grouped into "conventions" teams (i.e. spelling, punctuation, capitalization, and usage) appropriate to
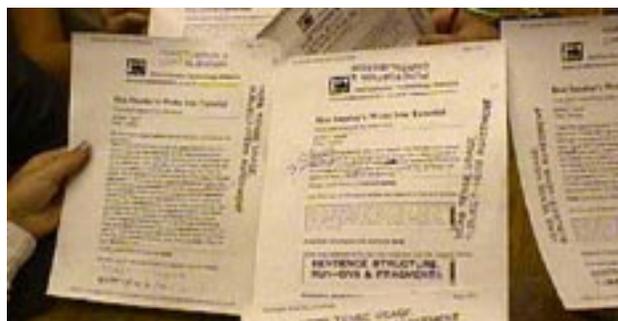
previously taught editing skills. Each team is given a folder containing roughly a quarter of the class's papers and students are given 4-5 minutes to edit only one of the papers. When they've finished, they stamp the paper with one of the rubber stamps designed for this activity and

replace the papers into the folder. When all four folders are intact, they are rotated to another editing team and the process in repeated until each paper has been edited 4 times, once by each of the four editing teams, which generally catches most mistakes. Bear in mind that the children change editing responsibilities each assignment and, most importantly, they are encouraged to identify suspected mistakes another editor may have overlooked. This is yet another timesaving activity that empowers students as editors, reinforces their proofreading skills, and reduces the time teachers read papers outside of class. When the papers are returned to their owners, authors generally have ample feedback to prepare their final copy.

Independent practice
At the conclusion of my seven-session visit in your classroom, you're on your own–in a matter of speaking. The focus of my visits is to model the web-based management of writing. What follows is independent practice and a chance to practice with a lesson of your own using a Write Site designed just for you. In fact, in our planning meeting, it's absolutely OK to replace my short writing lesson with one of yours. The content of first session is the only one that really changes–the lab activities, responding, and editing sessions are fundamentally the same. But ESD support is always there in the background–managing your Write Site.

Write Sites are for you and your students to use for a year. All writing and responses are stored on the ESD server, and editing or removing data simply requires an email to me with your request. The most common requests are to remove double entries, items posted incorrectly, and inappropriate comments. Privacy is respected and since Write Sites are assigned to teachers, the only persons aware of the sites' location are those the teacher informs–usually students and parents. To view a sample Write Site, visit the place where teachers submit writing during our Writing With Technology workshop located at *www.jacksonesd.k12.or.us:591/cpost/sows/esdws/index.html*. You're perfectly welcome to post something (try out the freewriting activity) and think how you'd like your's designed.

> "I really liked how we had friends and teachers respond to (our) writing because it helped to learn their point of view and what they think about the piece."

"Working" your audience
Students are highly motivated to post writing onto Write Sites because they're conscious of their audience. Initially, many students with access to the Internet perceive posting as another form of "chat," "Instant Messaging," or email

activity. Little (if any) meaningful feedback about revision is exchanged and responses to classmates tend to be fragments, socially flavored, and often in code. After introducing a response structure into the process, a perceptible change occurs. We use the responding framework "I heard/read, I noticed, I wondered" which you may view at *http://www.jacksonesd.k12.or.us:591/it/cpost/sows/esdws/respond.htm.* Coupled with a clear understanding of the lesson's scoring guide/rubric, students are more inclined to embellish their spontaneous (and generally positive) feedback with meaningful substance for revision.

I've noticed children around middle-school age tend to be particularly comfortable with responding activities, particularly when they are "motivated" by a participation contract that clearly defines their responsibility to the group. Younger authors, while capable of learning and performing the tasks related to technology, tend to be less interested in the social interaction employed in this project and require substantially more training to become meaningful responders.

May we customize the Write Site?
Data stored on a database (i.e. student writing) is easily displayed on a web page. In fact, with the web serving merely as an interface for stored data, there's no reason why foreign language, bilingual, or ESL classes couldn't have pages designed to meet their needs as well. This spring a classroom with a high concentration of Latino children will use a customized Spanish version of a Write Site for posting and responding by their Spanish speaking population. A group in Central Point will use a modified Write Site for compiling discussions about student literature. Featuring selections from this year's *Children's Book Award* books, secret partners will "respond" to and submit questions to a discussion about selected titles. Their contributions will be digested on a single screen, one after the other, for all to enjoy.

How do I sign up?
If you're interested in having a Write Site of your own, contact me at 776.6770 or *nick_vian@jacksonesd.k12.or.us*. You may prefer to invite me to consult with your staff how to support projects already in place, which tends to reduce anxiety of the unconvinced. You should also consider attending curriculum-specific workshops offered this spring. Bear in mind that to make something like this work in *your* classroom requires a willingness to take some risks. But you'll soon discover these management skills are nothing teachers haven't been doing forever except they're intertwined with technology. Please note there's also a significant correlation between successful web-based instruction and a commitment to other methods of online communication (i.e. personal web pages, online homework assignments, class announcements, publishing your email address so students and/or parents may communicate with you privately). This should not be a surprise, however, because communication is what this project is all about. Join us.

Year 1½ of Southern Oregon Online School

By Tina Mondale

More than 80 students are currently enrolled in Southern Oregon Online School this fall taking over 170 semester units of study. Wellness and English courses have the highest enrollments of the 12 offered this semester. Beginning in January, American Literature and World Literature will be available for enrollment.

Grades

First quarter grades for students in academic classes were posted on November 2nd. Counselors have access to grades through the student registration database. Because students complete work within their own schedule, grades reflect the work completed by that grading date. In addition, students are also given a participation grade of "S" or "U" indicating their regular contact with their instructor. Both teachers and students may view their grades by logging into their course.

Teacher training

There are 13 teachers currently taken the online training course. Teachers are developing courses in personal health, personal fitness (PE), computer science/technology, online newspaper, personal finance, and science. Some teachers are developing courses for their own buildings such as a middle school Student Orientation and Responsibility course. There has also been interest expressed in developing remedial Math and English courses.

Teachers will complete the current 20-week course sometime in February. Anyone interested in learning more about online teaching should contact Tina Mondale at the Jackson ESD (858-6723 or *tina_Mondale@jacksonesd.k12.or.us*) for information on the next teacher-training course. This course is available for 3 hours of graduate credit through Southern Oregon University.

Student Orientation

The orientation course is going well. Over half of the students have completed the orientation and are working in their academic courses. The orientation course allows students to practice skills they will need to work online such as sending email attachments, posting to a discussion group and doing research on the 'Net.

We've had a tremendous start to our second year of SOOS, thanks to schools, teachers, parents and students coming together to make this work. It takes a village to build this new model for learning in our schools, and the online village we're building has gotten off to a great start this fall.

SOOS & Online Learning

By Marty Karlin

SOOS functions as a regional service coordinated by the Instructional Technology program of Jackson ESD. Establishing a consortium of districts that participated in the creation and now in the governance of SOOS gives the ownership and involvement necessary to maintain a critical mass and a comprehensive course catalog. The Advisory Board is comprised of representatives, mostly administrators, from participating schools.

This year, SOOS is offering 12 full year and two one-semester courses. 12 high schools in 10 districts are participating. Schools sponsor a course in return for 24 student placements in our catalog. 24 is also our class size. Schools seek to identify teachers to participate in a 20 week inservice. Some teach for SOOS, some do not. SOOS teachers receive a stipend, release time, conference attendance, and lots of attention. They write or modify a course syllabus and curriculum. Schools approve the content. SOOS monitors and evaluates the teachers and courses, maintains communications, and provides technical and academic support.

As a result of a grant from The Ford Family Foundation, the cost to schools is currently $4000/year/course. Other online schools charge as much as $350/semester/course/student. The low cost allows districts an opportunity to focus their resources on school and student support systems, for wrestling with a changing culture, and time to figure out how to tap into potential income sources including homeschoolers, dropouts and other un- or under-served populations, and for special district programs.

Several years ago administrators from 2 high schools approached our team with a request to create some online courses for students who had failed a class and needed to make up the credit. We invited other schools to participate, and as the project developed, we agreed this was an opportunity to take advantage of an educational approach that aligns with contemporary education theory and takes advantage of contemporary technologies.

Online education will become a regular part of schooling. Schools are beginning to build the capacity to accommodate for it by developing the staff skills, the technology infrastructure and the student support system. Our region encompasses 20 high schools. We have a sufficient pool of potential online teachers that so far is keeping supply and demand in balance. Jackson ESD provides regional schools with a comprehensive service system. We know the regional community of administrators, counselors, and teachers

personally, and can support their teaching and technical needs. Support is very necessary as schools develop the capacity to accommodate online learning.

Students who demonstrate or are willing to acquire certain qualities are more successful with online learning. We use a questionnaire, 'Is Online Learning Right for Me?' to help counselors place students. Even so, there is a high dropout rate in online courses. We've put in place a short orientation workshop to offer students an opportunity to develop the technical skills, the procedural knowledge and the strategies to learn online. The workshop also serves as a filter to weed out those who aren't good candidates before they get into the regular classes.

Motivation for taking online courses includes scheduling conflicts, desire to accelerate, curiosity, convenience, flexibility, challenge, high interest, graduation, or a desire not to go to summer school. You begin to see the scope of intrinsic and extrinsic motivators at play.

We currently have 12 SOOS teachers, and are training 13 new teachers. Some will teach an online course for SOOS, others will create courses and teach an online course at their school. Participants are learning to use online course management software, develop online communication skills, build courses, and use Internet-based tools and resources. Teachers receive continuing, frequent, and personal support through site visits and release time to learn skills and work on courses with help from us.

For online education to work it can't live in a floating, parallel universe. It must be part of the school system and culture. School counselors must be trained to place and schedule students appropriately. Where do students go? When? How do they learn about online choices? Who is responsible for the student at the school? Who meets with online students, makes phone calls, reviews student contracts, and reviews progress reports? Students need a place at school to work with adequate technology and access. Online learning makes demands on technology systems. Students may need chat, audio, video, and email. This can put a strain on existing infrastructure and on support systems. These student needs may go beyond what services districts can offer. Students expect the work to be easy. They think that since they're out of sight, they're out of mind. A special effort to create and maintain communication systems between teachers, students, schools, and parents must be made. Parents, students, counselors, & teachers can access records and progress reports on the web. It's very convenient.

It won't necessarily be easy to accommodate online learning in schools. There may be administrative or teacher resistance. Students may expect an easy way out. Teachers may expect to re-create what they do face-to-face, and they may not be prepared for the high volume of one-to-one communi-

cation. Administrators may expect online learning to slip right in to existing systems.

Online Learning seems to be worth it. It provides options. It's a versatile learning environment. Online courses are asynchronous, therefore flexible. It can help resolve time and space issues. It can provide economy of scale for when there's not enough students or when there are a few too many students for existing sections. Students not at school, for any reason, can access coursework from anywhere at any time. Schools can serve a variety of alternative populations and programs.

It's contemporary. A university in New Jersey requires 1 online class each semester because they want students to be exposed to researching, communicating, & collaborating online… meaningfully, real-world.

Teachers from different schools are cross-pollinating— sharing ideas, best practices, lessons and resources.

Schools are getting a high level of attention, technically and educationally. High schools are getting needed technology inservice. Transfer to in-school teaching is occurring.

Support is on a personal level, we know everyone and they know us. We're available because of proximity. We seem to be a good size.

Online education can attract un- or under-served populations such as homeschoolers who can benefit schools and districts financially and academically.

There are important questions that must be addressed.
- How do we pace the growth of systems and personnel to meet the growing needs balanced with the capacity to deliver?
- How do we create and deliver quality professional development?
- How do we identify and organize course content and online resources?
- How do we establish and evaluate standards for courses, teachers, and facilities?
- How do we maximize our monetary and personnel investment in online education?
- How do we organize and coordinate services?
- How will a regional online school be financed without jeopardizing the financial health of local schools?

Online education is here to stay. If we don't do it, someone else will, and they'll take our students with them. Schools that are flexible, and can offer online and face-to-face experiences, will best be able to meet the academic, scheduling, and personal needs of today's student. Will the future be a vast online educational factory, or will it be a series of independent networks, sharing interests and resources, while operating on a simple, self-sustainable level? I think it should be the latter.

On the road with a traveling lab
Thermal pollution: an inquiry-based science unit

By Tom Glover

This is not about computers overheating, nor is it about computers corrupting the environment. It is about a really successful elementary science curriculum involving one of our two our traveling labs of laptop computers. As we hope you know by now, the ESD's Instructional Technology program has two labs of 14 Macintosh G3 laptop computers for which teachers may apply and use in their classrooms for up to a month. In addition, one of the technology specialists will set everything up and assist you with your project.

As some of you may also know, Jackson ESD is managing a grant to develop elementary science curriculum involving Crater Lake National Park. Two of the challenges faced by this grant are money and snow. Crater Lake is a trip that costs dollars–dollars rapidly vanishing from budgets–and the Park is covered in snow for nine to ten months of the year. So we are faced with the question of how to bring at least some of the ideas and concepts relevant to Crater Lake into the classroom.

Working with Janean Nodine at White City Elementary School and Pat Hix at Jerome Prairie Elementary School, we developed a science curriculum around thermal pollution using our newly purchased set of six Vernier temperature probes and supporting software.

Thermal pollution in a river means that the water in the river is at a temperature higher than normal. The problem with increasing temperatures in water is that there is an inverse relationship between temperature and the concentration of dissolved oxygen. There is, however, a direct relationship between fish populations and dissolved oxygen. What this means is that as water temperatures rise, the amount of oxygen in the water goes down. Since fish need oxygen to live, as the amount of oxygen decreases, there are fewer and fewer fish.

Thermal pollution can come from human agency or it can be natural. For example, a factory might use river water for cooling and then pump the water back into the river. Even if the water was as pure coming out as when it went in, water coming out at a higher temperature than the river would be polluted–thermally polluted. A few degrees rise in the outflow water could even create a dead zone down river from the factory. A natural case of thermal pollution occurs during drought, something we're familiar with locally. As water levels in lakes and rivers dropped, decreasing the volume of water in our lakes and rivers, we had an increase in the relative surface area, so that the water would naturally heat up more than normal. Yes, thermal pollution can be one of the side effects of a drought.

Volcanic activity can also be a source of natural thermal pollution. The very volcanic activity that has made (and seems to be still making) the Cascade Mountains can generate hot springs. Water from geothermal hot springs flowing into a stream can be a source of thermal pollution. In fact, locating a site of unknown thermal pollution could be one way of discovering new volcanic activity. When we focused our study on the connection between volcanic activity and Crater Lake and between volcanic activity and thermal pollution, the result was a four-week, inquiry-based science unit for 5th and 6th graders.

Classroom objectives

The concepts targeted are:
- learning the mechanics of how the computers and probeware work,

- reading the graphs generated by the probeware,
- relating the slope of a graph to the rate of change,
- learning the concepts of thermal pollution (temperature up, oxygen down; oxygen down, fish down),
- making predictions,
- learning the concepts of baselines and how to tell when a graph shows no rate of change (it goes "flat"),
- doing a dry run to test equipment for a field trip,
- learning how and why samples need to be taken from two distant points in a river.

Not a bad set of concepts for 5th and 6th graders to try and get in a month.

Classroom activities

The kids learn to set up the equipment, take the temperature of their hands by simply holding the temperature probe in their hand. They learn how to read the graphs, and they learn the technique for taking the temperature of water.
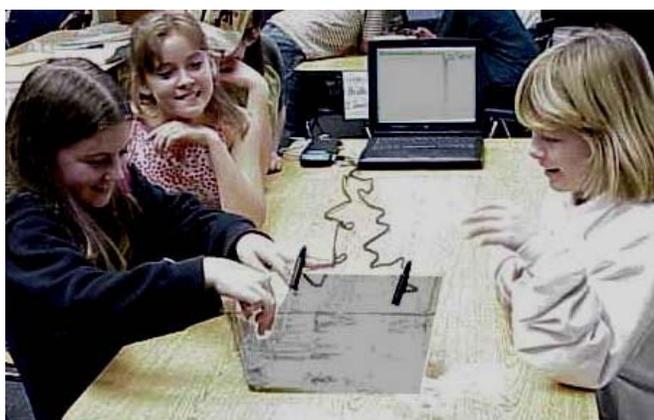
(Simple–the computer at one end of the table and the water at the other). They also learn about taking a baseline measurement before taking a measurement of a sample. We use the temperature of room air for our baseline. During this week the students discover the relationship between friction and temperature on their own–they rub the temperature probes to see who can get the highest temperature with a mixtures of glee (the highest temperature attained) and anquish (they burn a hole in their clothing used to hold the hot probe). Ah, the magic of science. It does not really get THAT hot, but the students are intrigued by this temperature-friction thing. They also tend to find out the temperature of their arm pits and other parts of their body the first day.

By Day 2 there is less freedom to explore these fascinating questions as the water is introduced and they must be careful. But, by now they are hooked, and by questioning them about the shape of their graph on Day 1, they are starting to get a pretty good idea of how to read and explain a graph. They also begin making journal entries about their observations at the end of Week 1, and will continue to make regular entries about this science project throughout the next month.

During Week 2 we mix cold and hot water to look at temperature changes, rate of change, and work with two probes at a time. A lesson on thermal pollution is presented using a PowerPoint presentation. Week 3 we work more on the concepts of thermal pollution and how to actually measure it in a river. Reviewed are water measurements, rate of change, slopes of lines, and general reading of graphs. By now the kids are usually pretty adept at the setup of the probeware, how to safely (more or less) have water on the same table as the computer, how to read their graphs, and the concepts of thermal pollution (especially as it can relate to volcanoes). They have also learned experimental procedure–the mechanics of what they need to do to check for thermal pollution.

The field trip

Week 4 is a field trip. On Day 1 of Week 4 we do a dry run in the classroom of what they will do in the field. We explain the concept of a dry run. They complete a journal entry on why a scientist needs to test equipment just like it's going to be used in the field. On day two of this final week we go to a stream or river at a park and the kids collect water samples from two distant places in the river and check the temperatures. They save their data which is compiled on a floppy disk. I then combine their data for measurements up and downstream and return the following week to show them what their different groups found. We do a concluding session about thermal pollution, oral questions and answers, and journal writing. They have made a prediction about whether the human activity at the park would or could lead to thermal pollution and on the final day this is the question they answer in their journals based on findings I present.

The field trip for Pat Hix's class is tomorrow as I write. But, the one for Janean's class was a month ago in wonderful sunny weather next to Rogue River with salmon running and spawning–hundreds of them. Not a bad way to spend a day doing science!

Instructional Technology

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