Projecting Knowledge

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How to Transform One Classroom Computer into a Powerful Learning Tool, Part 1

Subject: Classroom management, current events, science, language arts, social studies

Audience: Teachers, teacher educators

Grade Level: K–5 (Ages 5–10)

Technology: Projection system, electronic whiteboard, Internet, Inspiration, multimedia authoring and spreadsheet software

Standards: *NETS•S* 3; *NETS•T* II (http://www.iste.org/standards)

As former elementary teachers and current faculty members at Southwest Missouri State University (SMSU), we have observed and experienced changes in the use of computer technology in today's elementary classrooms. As we continue to talk to more and more classroom teachers across the state about their use of computers in the classroom, we notice common issues. These issues are complex, yet seem to boil down to one simple question: "So, what do I do with one computer in my classroom?"

In this three-part series, we describe three approaches to making optimal use of your one computer:

Part 1. whole-class activities using a projection system
Part 2. activities for the computer learning center as one of several structured learning centers in the classroom
Part 3. individual or group activities during independent study time

Of course, an activity may start with the whole class and finish up as independent study, so these techniques may overlap. For each approach, we describe several instructional activities for the one-computer classroom. Along the way, we point out several suggestions to help you be successful. For example, having parent or grandparent volunteers or even older students in the classroom may provide the needed personnel to help with more intricate programs or tasks, such as helping students with their computer tasks while you work with the rest of the class. Additional support not only provides release time for the teacher but has added benefits for the students, including more one-on-one attention, immediate feedback, and adult role models.

How Can I Get the Whole Class on One Computer?

A powerful tool for engaging the whole class in a variety of learning experiences is a projection system. Pictures from the computer screen become wall-size, giving all students in the room equal access to images and information. Taking technology one step further and adding a touch-screen whiteboard can make computer materials interactive. Students can point and tap, making learning choices and receiving immediate feedback. An electronic whiteboard has the power of a mouse built into the screen, which allows the speaker to access the computer without being at the console.

Another feature of this technology is the ability to write on the screen. Written comments, arrows, underlining, or highlighting focus students' attention on key points. Some systems even allow you to save what you've written as text to give to students later, freeing them from frantically taking notes when you'd rather have them paying attention and grasping larger concepts rather than minute details.

One problem with these systems is the high cost. Although prices continue to decrease, projection systems may still be prohibitive for many schools. Consequently, many teachers are collaborating to secure grants to purchase technology.

If you have a projection system and an electronic whiteboard or touch screen, you can use them to support learning in several ways:

- sharing instructional materials with the whole class at the same time
- projecting large images that act as a focal point, keeping the students' attention
- allowing students to take active roles in learning by physically interacting with the information (e.g., pointing to specific projected information, using touch-screen feedback)
- organizing and sequencing the instructional input to more closely match your students' needs
- providing immediate access to information on the Internet, which increases your students' abilities to discover by allowing them to research topics further and find answers to their questions as they come up in class discussions

You can use the whiteboard to show all of your students things they couldn't see without the computer, connect them to resources they couldn't connect to, and take them places they couldn't go.

What Can We See?

Multimedia presentations are powerful learning tools you and your students can create. Developing multimedia presentations takes time, but the rewards are well worth it. You can present information to students in interesting and meaningful ways and sequence them according to their class needs. You can move from the single textbook approach of whole class instruction to providing numerous resources for class learning.

Many of your colleagues have created presentations and posted them on the Internet or shared them by e-mail. One seventh-grade teacher used a poignant PowerPoint presentation sent to him by e-mail after the September 11 attack to prepare the class for a discussion about the events. Students were mesmerized by the photos in the presentation, and it allowed them to stop, carefully analyze, and discuss the tragedy. For the students, this learning event was more substantial in deepening their understanding than seeing repeated TV snippets.

Students can also benefit from learning how to develop their own presentations. At Greenwood Laboratory School (at SMSU), fourth graders developed Mystery Animals presentations. They worked in pairs to select an animal, research it, and create their presentations. They included habitat, food, defenses, and other information in the form of an information game. The students then shared them with the class, allowing peers to gather clues and make guesses. The teacher used this interesting activity to build students' knowledge before studying ecosystems. Later, the student teacher added the presentations to the class Web site. (***Editor's note:*** Find this and other URLs under Resources on p. 45.) Posting class projects on the Web has two major benefits: it gives students an authentic audience for their work and it allows other students to use your students' work as resources for learning.

What Resources Can We Connect To?

The Internet provides a wealth of information for you and your students. We've compiled some in this article. Here's an important tip for in-class Web use: Be sure you type in the address correctly, or you may end up someplace inappropriate. It is essential that you preview sites before sharing them with your students. Saving the Web addresses to a disk or in a word

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processing file not only saves time but also ensures you get to where you want to go and much more quickly. You can integrate the Web into discussions of current events or specific content areas, including science and language arts.

Current Events. Visiting Web sites for current events may help students gain a more realistic perspective of a phenomenon occurring in their communities and the world. Classes may read the coverage in three different newspapers about the same event, discuss the similarities and differences, and then create Venn diagrams (perhaps using Inspiration) to illustrate them. Grade 4–6 teachers could also ask students to use a spreadsheet program to complete a semantic feature analysis (which allows students to examine related concepts and make distinctions between them according to particular criteria across which the concepts can be compared). What the local newspaper or current events magazine can initiate, the Internet can strengthen and build on with teachers' planning. The Online Newspaper Directory is an excellent resource for finding newspapers from around the world. A social studies teacher we work with uses Time for Kids for the daily news. The highlight of the morning was to visit the Poll Zone and add their class's vote.

Science. Content areas are enhanced through both student-centered and teacher-supported resources found on the Internet. Do you remember when the teacher response to student questions was "Let's look it up in the encyclopedia?" In many classrooms today, the response to "What does a _____ do?" is "Go Ask Jeeves." Classes can brainstorm keywords for the Ask Jeeves Kids search engine, and try them out. Teachers can model how to seek out information, discriminate between what is factual and what is fictional, and "think aloud" while demonstrating for the class. With practice, individual students can take the role of teacher and guide the class through this process. As students become stronger at using learning tools, such as the Internet or CD-ROM encyclopedias, they take control of their own discovery and often delve deeper.

For instance, in a second-grade science class, children were studying weather. The teacher had prepared a lesson filled with pictures of clouds, some she had taken with her digital camera and some she found on the Internet, to support their learning about the types of clouds. In the middle of previewing a cluster of cumulus clouds, one child asked how tall cumulus clouds could get. Carefully, the teacher led the class to the Ask Jeeves Kids search engine, and they typed in "how tall are cumulus clouds?" The search sent them to a cloud identification page, from which they chose to link to a cloud classification index, which gave them their answer. Some of our favorite sites for answering kids' questions include Zoobooks, National Geographic Kids Magazine, the CIA World Factbook, and Discovery.com.

Language Arts. An interesting and activity-packed way to integrate the computer into your literature teaching is visiting an author's or publisher's Web site. Many children's book authors (e.g., Jan Brett, Mem Fox, Eric Carle) have wonderful sites for the class to explore. Often authors have tips for writing, some history about the story line of a particular book, and activity pages. Looking at Web sites as a whole class can inspire a variety of questions and spontaneous ideas that reinforce the themes or structures of the book. For example, when a first-grade class looked at the Jan Brett Web site, they discovered masks for the characters from *The Hat.* Immediately they begged the teacher to print them so they could act out the story they had read. The Internet is a wonderful way to show your students resources outside your classroom. It can also take them to places outside the classroom.

Where Can We Go?

The Internet can take your students to places you could never afford to (or even be able to) visit, through Webcams, online museums, and virtual field trips.

Webcams. A wonderful contrivance available on the Internet is the Webcam. Webcams are live cameras with synchronous feed for immediate viewing through your Web browser. They bring the focus of the camera's eye on location right to the students. You can find Webcams by simply typing "Webcam" or "animal cam" into your favorite search engine. For instance, Webcams can bring the fourth graders directly to a specific ecosystem and watch a particular animal in its native habitat. Seeing pictures, watching an animal in the wild, and reading online material all give students the real experience of researching and they begin to see the Internet as a tool for inquiry. (***Editor's note:*** You'll probably want to do a Webcam search on your own time. Search results may include sites not suitable for your students. See the Resources section for directories that will help you narrow searches. Read more about Webcams in "Virtual Vantage Points," *L&L* March 2001, pp. 14–17.)

Online Museums and Exhibits. You can find a wealth of museum resources

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to motivate even the most uninterested student. Students' can view collections of art, relive important historical moments of the past, and examine prehistoric artifacts. The Smithsonian Institute in Washington, D.C., is just a click away, no matter where your classroom is located. Taking whole-group instruction back to individualized application is a natural progression in this example. Assign each student a particular topic or a special exhibit to explore and let them collect and gather "artifacts"; create and place their artifacts in a multimedia presentation complete with pictures, movie clips, and text; and present their findings to their classmates.

Virtual Field Trips. Through virtual field trips, students enter new learning situations by visiting places near and far. Together, students and teachers can explore historical, geographical, or scientific interests. They can travel across the country, around the world, or into outer space. Opportunities for virtual field trips are limitless and time and cost effective. For example, you can take a virtual excursion through the human body, visit The White House (which has suspended all in-person tours since the September 11, 2001, attacks), or into a tropical rain forest. (***Editor's note:*** Read more about virtual field trips in "Virtual Field Trips through Videoconferencing," *L&L* April 2002, pp. 10–13.)

Where Do We Go from Here?

Enhancing daily instruction with whole-group exposure to computerized information and the Internet using projection equipment can stimulate even the most reluctant learner. You need to be careful in choosing appropriate materials and practice with the technology to feel confident with the system. By structuring the lessons using a word processing program or multimedia authoring software, you can more easily manipulate the transition through the material. Using the computer and projector for large-group learning adds organization, motion, and unlimited resources to your old overhead projector.

As an added benefit, when unexpected questions come up during class discussion, the teacher and students can quickly research the answers, taking advantage of the teachable moment. Students are no longer limited to resources in their classrooms or school library but have a myriad of virtual resources at their fingertips.

Read the next two articles in this series, which discuss using a computer learning center (coming October 2003) and using the computer for independent study (coming November 2003).

Resources

General

Ask Jeeves for Kids: http://www.ajkids.com
CIA World Factbook: http://www.cia.gov/cia/publications/factbook/
Discovery.com: http://www.discovery.com
Mystery Animals: http:/www.faculty.smsu.edu/c/ckj271f/mysteryanimalppt.html
National Geographic Kids Magazine: http://www.nationalgeographic.com/ngkids
Online Newspaper Directory: http://www.onlinenewspapers.com
Semantic Feature Analysis: http://edweb.sdsu.edu/triton/guides/SFA.html and http://curry.edschool.virginia.edu/go/readquest/strat/sfa.html
Time for Kids: http://www.timeforkids.com
Zoobooks: http://www.zoobooks.com

Literature

Author! Author! Children's Book Authors and Illustrators on the Web: http://www.bethanyroberts.com/childrensbookauthors.htm
Jan Brett: http://www.janbrett.com
Eric Carle: http://www.eric-carle.com
Mem Fox: http://www.memfox.com

Museums

Museums Online 1000's of Educational Art History Science Links: http://www.museumstuff.com
Smithsonian: Kids: http://www.si.edu/kids

Virtual Field Trips

Fly Me to the Moon: http://www.lauriefowler.com/moon.htm
Historical Tour of the White House: http://www.whitehouse.gov/history/whtour/
Science in the Rainforest: Take a Walk in the Rainforest: http://www.pbs.org/tal/costa_rica/rainwalk.html

Webcams and Webcam Directories

Eagles Online—Northeast Utilities: http://www.nu.com/eagles/default.asp
Earth and Moon Viewer: http://www.fourmilab.ch/earthview/vplanet.html
Earthcam—Webcam Network: http://www.earthcam.com/
Leonard's CamWorld: http://www.leonardsworlds.com/camera.html
Webcam Central: http://www.camcentral.com

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