



Using Technology Effectively: Teachers Tell What Works and Why

In this issue, three Northwest teachers describe how they have successfully used technology to support teaching and learning. Steve Freeman, who had already discovered the power of "Believe It or Not!" ® columns to stimulate interest in research among his Title I students, found that the Internet enhanced the process in a variety of ways. Chris Junghans, who used e-mail to connect his German-language students with students in Germany, noted that "grammar study was less of a chore when directed, in part, at clear communication with 'keypals' in another country." And Jeanine DuBois, who once aspired to nothing in the educational technology realm beyond typing tests on a Commodore 64, says she now "drools over incorporating technology into my lessons."

In addition, we are introducing three new *Circuit* features. In each issue, Inside Wire will focus on news from a particular corner of the NETC region. We are leading off with Idaho. Our NETC Representative Profile debuts with Cathy Parise of Washington's Office of Superintendent of Public Instruction (OSPI) as its first subject. And our first NETC Staff Profile focuses on Rick Simms, who came to us in August as a Multimedia and Internet Specialist.

—Seymour Hanfling
Director

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"Believe It or Not!" ® Technology is Working in the Classroom

By Steve Freeman

It all started in 1984. I was leafing through a book that reproduced some of the "Ripley's Believe It or Not!" ® columns once so popular with newspaper readers. The columns, as many of us recall, focused on odd events and phenomena around the world.

On one page of the book, my eyes fastened on an image of a rifle embedded in a tree. The accompanying text identified a man in Chehalis, Washington as the tree's owner.

Chehalis is less than three miles from Washington Elementary School in Centralia where (then as now) I taught remedial reading in a Title I program for grades four through six. I had been working with my students on research skills and decided to challenge them to find the tree. They didn't, but I found an exciting means for students to improve both language arts and research skills by investigating the basis and background of the Ripley's ® columns.

Those investigations continue in my classroom to this day. Over the years, new technologies including the Internet have enhanced the research and reporting process, made it more efficient, and brought additional benefits to the students. But independent of any advance in technology is a crucial key to continuing project success: Researching the facts and reporting their findings encourages kids to become creative problem solvers while practicing a long list of reading, writing, and research skills—without really thinking about them! This would be true even if the only tools used were books, notepads, and typewriters.

The Early Years

When I initiated the Ripley's ® projects, I asked the students to choose topics of interest that met the following criterion:

- They contained a geographic location, or
- They concerned a person of historic significance, or
- They concerned a known scientific fact or creature.

This basic guideline (which we still use today) was meant to eliminate "Believe It or Not!" ® columns with themes that offered few if any clues as to where to begin the search to determine the basis of a story.

I instructed the students to begin their research using printed information resources in the classroom, such as encyclopedias, almanacs, and atlases. After exhausting these, they looked for someone to write to for help. They sent letters of inquiry to embassies, mayors, chambers of commerce, judges, and other people who might be able supply answers.

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Students took all their notes and drafted all their letters by hand. They keyed final letters into Apple IIe's (we began with just one). When those letters left our classroom, they all traveled by "snail mail" (i.e., the U.S. Postal Service), and at times the students were convinced the snails had died!

We used our computers as publishing tools for the research. Beginning with word processing software, we later created a Hypercard stack. Along the way, we incorporated a scanner and a Canon XapShot camera into the process. Each student added his or her picture and a very brief personal information page.

Integrating New Technologies

These early projects were certainly effective in helping students develop research and language skills. Furthermore, they had the satisfaction of publishing their research results for a limited audience of classmates and family members.

Nevertheless, some project components—e.g., the manual note taking and the "snail mail"—were very time consuming. Today, the Internet, together with other technologies, reduces the time factor and enhances the process in other ways—some of which I did not anticipate.

Students still begin searching with our in-house print resources. I ask them to do this for two reasons. Research skills using books will continue to be a needed skill for these students because Internet access outside the classroom may not be available to them for quite some time. It also provides them with a knowledge link between written information and the Internet.

But the in-house print resources are now supplemented by atlases and encyclopedias on CD-ROM and most recently the 108-year set of National Geographic back issues on CD-ROM. Students often take their notes and compose their inquiries on AlphaSmart portable word processors, then port them over to their Web pages.

When they expand their research to the Internet, they are able to search literally to the far corners of the earth, and they frequently find pictures and detailed descriptions relating to their projects. While looking at the available information, they note e-mail addresses they might write to later. And when they do write, they often receive replies within a day or two.

One benefit of the Internet research that I hadn't foreseen is what I call the "bird walks": Students searching on one topic often find a link that takes them to something they hadn't expected in some other far-off corner of the world. This can lead to a whole new project.

Despite such clear benefits, it soon became evident to me that using the Internet as a research tool was tapping only part of its power. We asked for and received permission from Ripley Entertainment Inc. to publish the Ripley's® information which started the research, and today, our students have the thrill of sharing their research reports with a worldwide audience on the Internet.

Add to that the fun of receiving an envelope full of goodies or a personal e-mail response from a far-off place, and it's hardly surprising that they are truly excited about doing research! Technology has become an integral part of their classroom and their lives.

For more information, follow the "Research Projects" link from [Washington Elementary School's Title I home page](#) or send Steve Freeman an e-mail letter (sfreeman@www.centralia.wednet.edu).



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NETC Staff Profile: Rick Simms

The path that led Merrick "Rick" Simms to his current position as Multimedia and Internet Specialist at NETC began in a highly unlikely place—a Las Vegas lounge.

In 1974, on a break from art-related classes at California State University—Chico, he struck up a conversation with a man who expressed interest in his photography experience. Although picture-taking was just a hobby, something Rick said must have made the right impression. The man invited him to interview for a well-paid position at the Atomic Energy Commission's Nevada Test Site.

Rick got the job, quit school, and moved his family to the desert. Three years later, his specialized photography experience at the Test Site helped him land a plum position in the Bay Area at the federal government's Lawrence Livermore Laboratory. There, surrounded by some of the world's top scientists, he entered such cutting-edge fields as laser holography and Star Wars technology. Eventually, he led Livermore's electronic and film imaging team.

But then the art bug bit again. While still working at Livermore and taking sculpture and ceramics classes on the side, he learned that Cal State—Hayward was about to launch a computer art curriculum. It sounded exciting—a chance to combine his artistic and technical sides. When he signed up for a class in the new program, he discovered that he could combine images of fruits, vegetables, and a face mask into a human form, then send it running across his monitor. It was enough to hook him on computer art forever!



Rick Simms

In 1993, after he took his first college degree, Rick and his wife shocked their friends by leaving their secure jobs and acting on a longtime dream of moving to Oregon. Rick entered a visual design program in the fine arts at the University of Oregon and his wife became assistant to the president at nearby Lane Community College.

At the University, Rick immersed himself in three-dimensional computer graphics, animation, typography, layout, design, and photography. He earned two additional degrees: a bachelor's and a master's in fine arts. He also taught classes under a graduate teaching fellowship—an experience that would someday help him relate to the concerns of the educators served by NETC.

That someday came just one year after Rick left the University. He arrived at NETC just in time to lend his considerable talents to completing the Networking Issues in K-12 Schools CD-ROM. Since then, he has coordinated production and distribution of the "Best of NETC, Volume One," a package sent to every school in the NETC six-state region which includes not only the CD-ROM, but a variety of print and video resources.

For Rick, these initial NETC projects have been both interesting and professionally rewarding. "I'm proud," he says, "to be part of an organization working in education that is comprised of people who are extremely knowledgeable, talented, dedicated, and passionate about their work. It's easy to understand why NWREL and NETC have such an outstanding reputation, not only in their region but nationally. I look forward to new challenges NETC has to offer with anticipation and continued enthusiasm."

Rick Simms can be contacted at simmsm@nwrel.org



NETC Representative Profile: Cathy Parise

For Cathy Parise of the Washington Office of Superintendent of Public Instruction (OSPI), involvement in educational technology is an extension of her artistic, creative side.

The former drama, speech, English, and journalism teacher had some experience with large computers in the early 1980s while living in Alaska and working as a travel agent between teaching jobs. But that exposure did not inspire her to buy a computer or seek ways to use computer technology in the classroom. She just wasn't interested in learning another "foreign language."



Cathy Parise

But then came 1984 and the debut of the Apple Macintosh. This, Cathy saw, opened creative possibilities. After buying her own Mac, she was hooked on the challenge of discovering how she could use it to do things differently. She also carried it to school and tested its potential with the yearbook staff and her English students.

In 1990, Cathy returned to Washington, her home state, and took a job with the Boeing Company. There she became involved with interactive video instruction. This inspired still more thoughts about the potential of educational technology. Seeing how enthralled adult learners were with the technology, she considered what exciting things she might have done if she'd had such tools in her Alaska classrooms.

In 1993, Cathy finally had a chance to apply her own creativity to helping other teachers make creative use of technology. Arriving at OSPI, she found herself in what seemed at first an odd position: She was the only non-"techie" on staff who was focused on educational technology.

But as time went on, she kept discovering other people with creative, artistic backgrounds who had joined this emerging field. She concluded it was because the technology let them do the kinds of things that drew them to creative pursuits in the first place. The digital tools are always changing, always exciting, and always unpredictable. In fact, when doing presentations, Cathy has often been grateful for her background in drama. After all those years doing improvisational work, knowing how to stand up and wing it during "technical difficulties" has been a real boon!

At OSPI Cathy helps school districts around the state with technology planning, and she is involved in updating the state's own plan. In connection with her management of TLCF (Technology Literacy Challenge Fund) and state competitive grants, she leads many grant workshops. In addition, she oversees Washington's contract with the Educational Technology Development Center (serving the entire state), and she works with the directors of nine Educational Technology Support Centers (one in each of Washington's Educational Service Districts).

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Cathy has enjoyed serving as a NETC representative, and as part of her role, she has made a point of searching for ways that states served by NETC can combine their talents and resources to further educational technology goals. She is very much a fan of NETC's gatherings for preservice educators.

For Cathy, involvement in education is extremely fulfilling. "It's the constant learning," she says, "and the knowledge that what you do impacts so many people at such a high level." But she admits to some envy of the kids now growing up who are going to "take technology eons ahead of us."

She identifies herself as a futurist who looks at Star Trek and says, "It's real, it's our kids' future, and I'm so jealous!"

Cathy Parise can be contacted at cparise@ospi.wednet.edu



INSIDE WIRE: News From Idaho

Debra Dirksen, Ph.D., is an Educational Technology Specialist with the Idaho State Department of Education (ISDE). In that capacity she works with Rich Mincer, Idaho's representative in the NETC Consortium. With this interview, Debra is helping us to launch the "Inside Wire," a feature that will allow us, in each issue of the Circuit, to explore what's happening in a particular corner of the region served by NETC.



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What are the most important things happening in Idaho's educational technology arena?

Perhaps the most important is the continued support of technology by the Idaho Legislature. Districts have, by and large, made good use of the state funds for hardware, software, technology support, training, networking, etc.

Another high point is a project that is underway to fund statewide access to a number of online databases suitable for K-16, several of which have access to full-text documents. This is being proposed by the State Library, and is titled LiLI (Libraries Linking Idaho). If funded, it would involve a yearly expenditure of just less than \$500,000. But it would save many millions of dollars over what it would cost for districts to subscribe to these services separately.

Teacher certification is a third important area. The State of Idaho Board of Education recently adopted the foundational standards developed by ISTE (International Society for Technology in Education). By the year 2001, Idaho schools will need to show that 90 percent of their teachers have passed any of three assessment procedures (two of which are currently approved) to certify that they meet these foundational standards. Otherwise, the schools will not receive their yearly accreditation from the state. As a result, universities and school districts are working feverishly to train and certify teachers.

Can you give one example of a particularly exciting activity now underway in Idaho schools?

Some science teachers are implementing a program called "Science Solutions." Students identify problems or questions in the community and address them using their science knowledge and their technology skills. Using high end programs such as ArcView, 3-D Studio, or Microsoft Visual Basic, students research and find solutions.

The students are addressing issues such as recovering navigable streams which have become polluted, developing busing maps for their district, cataloging research on the Yellowstone ecosystem, and developing disease-resistant seed potatoes. They are doing "real-life" research and presenting to groups of adults who listen to them as if they were experts. [For more information on this project, contact Mike Winston, Shelley High

What technology-related projects are underway at the Idaho State Department of Education?

First, we are involved in preparing a public school library manual that integrates technology. Carolyn Mauer, our library specialist, and I are working on the manual with six school librarians from across our state, a public librarian, a representative of the Idaho Council for Technology in Learning, and Della Matthis, a librarian who is also the NETC Consortium representative from Alaska. Idaho and NETC have discussed ways to disseminate the manual, including its possible use as a text in library media classes at the university level.

Second, we recently completed the first stage of a statewide evaluation of the impact of technology integration on Idaho teachers and students. This project was funded in part by NETC. To complete the study, I worked with graduate students from Idaho universities to complete 378 interviews. The results were very positive. [*For more information on the evaluation, contact Debra at the e-mail address shown at the end of this article.*]

What else would you like to report about the state of educational technology in Idaho?

We are moving forward with technology, focusing on the integration of technology with the curriculum. Instead of using technology as an educational Band-Aid, we in Idaho are working to use it as a tool for learning.

For more information about Idaho programs, contact Debra Dirksen at ddirksen@sde.state.id.us or 208-332-6976.



E-Mail: Using It as an Intercultural Communications Tool

By Chris Junghans

I teach German at Chief Joseph Middle School in Bozeman, Montana, and from 1994 to 1997, I taught it at C.M. Russell High School in Great Falls. At both schools my students have shown me just how valuable e-mail can be in enhancing language study and intercultural understanding.

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Before I describe how the project evolved during its first year at C.M. Russell and why I believe it was successful, let me provide some of the history that brought us to using online technology. My interest in e-mail began, oddly enough, when a friend showed me how he used the online service Prodigy to keep his long-distance romance alive. My wife and I are not Montana natives, and we have many relatives and friends out of state. Intrigued by e-mail's potential for our personal communications, I set up an America Online (AOL) account at home. This was in the fall of 1994.

It was not long before I discovered a state educational electronic bulletin board on AOL. There I found a notice about the start of an e-mail exchange program called The Transatlantic Classroom (TAC) (<http://www.tak.schule.de/>). It was sponsored by the Koerber Stiftung, a private German foundation based in Hamburg (<http://www.stiftung.koerber.de>). Although TAC was created to encourage e-mail between students in the "sister" cities of Hamburg and Chicago, the organizers accepted C.M. Russell High School into their restricted and teacher-moderated listserv.

The TAC letters began appearing en masse in my personal AOL account. AOL gives each subscriber five e-mail addresses, so I switched the TAC mail to another personal address. Coincidentally, our high school began offering access to AOL in the library through a single computer and a very slow modem. Between this connection and the AOL account at home, I was able to receive, print, and distribute e-mail from German students, as well as send e-mail from my students to them.

Because AOL is big in Germany, we were able, in some cases, to use return receipts to check when our e-mail was read. The eight-hour time difference between Montana and Germany was manageable, and we were even able to hold live keyboard "chats" with German schools.

Getting and sending student e-mail was a drag-and-drop, copy-and-paste operation for me. I often felt like a part-time postmaster. Students would prepare their letters using word processing software in the computer lab, then save them to their school-issued diskettes. They would bring me those diskettes individually, and I would copy their letters into a single folder. Then, usually at home, I would copy the folder

contents into the text of an e-mail message, assign a title, and send it to the e-mail address of the German school we were writing.

I also sent a copy to the TAC listserv address. Because they were fellow TAC subscribers, our correspondents in the German school normally received two copies of each set of letters. However, it was useful to do things this way since the letters exchanged in TAC were not only student-to-student and class-to-class, but—by program design—open to all participants. As a result, some students not addressed directly in our letters would send us responses.

Open letters sent to the listserv from both sides of the Atlantic created an ongoing bulletin board-like discussion of topics introduced monthly by TAC organizers and participating teachers. Topics of intercultural interest were selected, such as immigration, free-time activities, and school schedules. Nevertheless, students were always allowed and encouraged to take the discussion in the direction they wished. Between the open forum of the listserv and school-to-school contacts and relationships, there was never a shortage of topics or individuals to address.

In contrast to the pen-pal relationships that are still established between language classrooms around the world, e-mail is faster and in some cases even cheaper (certainly when there is already an Internet connection in the school). It was not uncommon to receive next-day or second-day replies, and we could realistically expect to hear back within a week. Anyone who has tried to hold the interest of high school students knows the significance of this quick turnaround.

Instead of long summer vacations, students in Germany have one- and two-week breaks during the school year. This scheduling difference occasionally took its toll on our own students' expectations for responses to their e-mail letters. However, it did bring a deeper understanding of the differences between the German school system and ours.

Even with "user-friendly" textbooks that allow them to pretend they are in another country, students of a second language must exert some serious, sustained effort. For my students, the leap from communicative classroom exercises to real communication (via e-mail) with native-speaking Germans definitely led to increased enthusiasm. Grammar study was less of a chore when directed, in part, at clear communication with "keypals" in another country.

Students are sometimes more influenced by the opinions of their peers than the lessons of their teachers, but in our project, I found peer influence worked to the learners' advantage. "Listening" closely to peers describe life in Germany really helped our students understand that country's culture.

Our classroom was the first in the building to have Internet access, and the carryover effect of that pioneer status extended far beyond e-mail. The room quickly became a research site for students seeking information in every academic field. It also became a site for self-directed students seeking college and

scholarship information, hobby and gaming sites, and just about everything an intellectually curious young person might want to know. A wide variety of school clubs—especially the speech and debate team—considered our Internet connection invaluable. Our humble but connected German classroom thus became a center of cross-curricular, as well as cross-cultural, learning for students throughout our school.

At the end of the school year, I received one of the best indications that what had transpired between the American and German students via e-mail was more than just a classroom assignment. Students with no an e-mail connection outside of school exchanged mailing addresses with their new German keypals. In some cases, they persuaded parents that an Internet connection would be valuable for more than computer games. And some of the students obtained e-mail addresses from free online services, such as Hotmail (<http://www.hotmail.com>), to keep up their correspondence.

Managing the first year of the TAC e-mail program involved a fair amount of work for me, but seeing students head off for vacation with such signs of continuing enthusiasm was surely enough to warm a teacher's heart—almost as much as three months of summer sun and rest.

For more information, contact Chris at junghans@montana.edu

Foreign Language Resources on the Internet

In addition to the Web site of the Transatlantic Classroom (see accompanying article), Chris Junghans recommends the site of the Montana Association of Language Teachers.
<http://www.homepage.montana.edu/~junghans>

The Alta Vista Translation Service, will translate your own or Internet text back and forth between English and five other languages.
<http://babelfish.altavista.digital.com/cgi-bin/translate?>

"World Yahoos," (linked from the bottom of Yahoo's homepage), which focus on information of special interest to particular nations and regions, feature many foreign-language sites. <http://www.yahoo.com/>



Going Solo: Creative Ideas for the One-Computer Classroom

By Jeanine DuBois

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I've become one of those teachers who drools over incorporating technology into my lessons. But I wasn't always that way. Six and a half years ago, I felt overwhelmed. The idea of trying to blend digital pictures, slide shows, interactive telecommunications, and the Internet into my teaching was somewhere between unheard of and downright terrifying. Back then, all I wanted was to type tests on our library's Commodore 64—without having it go haywire before I saved. Since it took 15 minutes to save one document, it was a race against the clock.

A district policy (a very smart policy!) allowing teachers to take a computer home over the summer turned my attitude around. That summer, I signed up for several Macintosh classes through the Math Learning Center at Portland State University. And I played. I made greeting cards with graphics. I created a database for addresses and birthdays. I wrote letters, drew pictures, and even made spreadsheets for keeping track of grades and attendance. This playtime often stretched into the wee hours of the morning.

As I explored and experimented on my Macintosh, I relived the joy of discovery every day. And I formed an opinion: Kids learn computers fastest because they play. Likewise, we teachers need time to play and become comfortable—even excited—about our computers in order to extend their usefulness in classroom instruction.

Over the next few years, my classroom computer use evolved exponentially. At first, the best I could do was to calculate grades, keep attendance, and create handouts and tests with graphics. During that time I learned an important lesson: This contraption was not a mysterious beast that would suddenly self-destruct. What a relief! I just needed time to become secure.

Once I developed some confidence, if only a teensy bit at first, I found that even one computer in a classroom added to my ability to differentiate curriculum, thus challenging my gifted students and assisting my struggling students. I found that a single computer could both enrich instruction and level the playing field, benefiting all my students. A student whose vocabulary was far above the rest of the class, for instance, could use the SAT prep program to stretch herself. A student whose motor coordination made it nearly impossible to write an essay was no longer inhibited by a physical handicap. Through membership in the Portland Macintosh Users Group, I discovered countless programs—many of them public-domain (free) or shareware (inexpensive try-before-you-buy)—that can be used for individualized student instruction. Today, many people discover these resources by surfing the Internet.

Often the classroom computer serves as a tool added to my arsenal of books and other materials. When writing an essay centered around a quotation, for instance, my sophomore language arts students use both *Bartlett's Familiar Quotations* (the book) and *Quotable Quotes* (the Macintosh program). When doing consumer research on a prospective purchase (anything from a pager to a car to a bread machine for Mom or Dad), my junior English students might access *Consumer Reports* online (<http://www.consumerreports.org>) to find a key issue missing from our collection. Other times a CD-ROM may provide an additional resource. The *Time Almanac*, for example, includes original articles dating back to the early 1900s. A U.S. atlas and a world atlas are also available on CD. The World Wide Web, too, may excite students with the latest discoveries in space or in a university across the world. Sites rich in information useful to students include NASA's Jet Propulsion Lab (<http://newproducts.jpl.nasa.gov>), the MayaQuest visit to Mayan ruins (<http://www.classroom.net/>) and the U.S. Holocaust Memorial Museum (<http://www.ushmm.org/>).

Early on, I discovered that my Macintosh could use a large-screen TV if I connected a \$300 presentation device (Presenter Plus Mac/PC Multi-Frequency) between the computer and the television. Initially, this became a way to present textual information—such as vocabulary due dates or lists of ideas generated during a class brainstorming session—in a visual form. The next day, the material could be printed out for absentees, who could retrieve it from the daily absence folders.

The computer/TV duo became a great way to assist visual learners. Whether I presented a chart for organizing data or a brief slide show previewing a lesson, visual students could see where we were going and better fit the ideas into a mental framework. On occasion I even created a literature review game with student-generated questions about stories and literary techniques. (You can view my Sophomore Review Game on the Web at http://www.ttsd.k12.or.us/schools/thsjdubois/short_story_review.html).

If you are blessed with having a multimedia-capable computer, the range of possibilities is endless. I have used movies such as *The Black Stallion* and *The Natural* to teach visual literacy. Students write about and discuss examples of visual literacy observed in the film: zooming for emphasis, juxtaposing scenes to show relationships, foreshadowing to create suspense, lighting to set a mood, camera angle to create an illusion, and so on. When we finish, I give them a visual-literacy test, one in which I have embedded stills from the movie into a ClarisWorks slide show along with enlarged text questions. This extends their understanding, challenges their thinking, and reinforces their awareness of an entirely new way of seeing.

An equally exciting multimedia adventure is making tutorials for prominent characters in Shakespeare's *Julius Caesar*. These instructional slide shows acquaint readers with the characters by presenting information, character motivation, and brief film clips, which students watch before acting out the characters in their reading groups.

Eventually, I became confident enough to require students to include in their term project some aspect of technology—a digital image, a graph, a Web page—that was entirely new to them. Once a week they had class time to work on the project—and yes, we did have access to a computer lab. But we could have scheduled the work throughout the week, giving several students a chance to use the classroom computer each day. Some projects, such as a vocabulary slide show and quiz, became a study resource for other students.

My experiences have taught me that the one-computer classroom truly has the potential to be dynamic, with new possibilities unfolding as time, creativity, and comfort allow. Perhaps most exciting of all is how the computer opens the door to new roles and relationships: student-as-instructor and teacher-as-facilitator.

Jeanine DuBois teaches language arts at Tigard High School in Tigard, Oregon. [You can visit her educational Web site](#) or contact her by e-mail (jbdubois@teleport.com).

This article is reprinted from the Spring 1998 issue of Northwest Education, quarterly magazine of the Northwest Regional Educational Laboratory.



Embracing the Unknowns of the Future

Gerald Ford was president as I approached the deadline to declare a major during my college years. I remember wondering why I couldn't find any subject area that really suited me. Since my last two job titles have been Technology Coordinator and Instructional/Multimedia Designer, it's no wonder that my plight was so difficult in 1975!



Cathy Carson

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Imagine the challenge now facing teachers and children. How many year 2000 graduates will have jobs in positions with equipment that has yet to be invented? How can we adequately prepare children for the workplace when we don't even know what it will look like in 20 years and when many of our schools cannot even offer a glimpse of the Internet to their students?

One answer is to practice good teaching by fostering growth in critical thinking, problem solving, inquiry, and teamwork in the classroom. Certainly the integration of technology supports these skills and often provides motivation for some reluctant learners. The use of technology in and of itself, however, does not guarantee that good teaching and learning are taking place.

We need to encourage both children and teachers to be risk takers with the skills necessary to embrace the unknowns of the future. How else can we expect anyone to go from a B.A. in French to an M.Ed. in Educational Technology?

Cathy Carson is an Instructional/Multimedia Designer at NETC.