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In this Issue:

Technology in Distance Learning: Examples of Creative Use

In this issue, we explore diverse ways that distance learning programs can integrate technology and use it to provide student opportunities that might otherwise be lacking due to barriers of time and space. We do so by focusing on four projects, all of which operate, wholly or partly, in NETC's six-state service area:

- Tapping the potential of the Internet and other technologies, CyberSchool reaches out to high school students in Oregon and beyond.

- Alaska's North Slope Borough School District provides electronic educational pathways to students whose villages are not connected by roads.

- The satellite-based STEP•Star program offers K-12 and adult classes reaching far beyond its broadcast studio in Spokane, Washington.

- Weaving together America's largest Protestant school system, CUENet (the Concordia University Education Network) provides new opportunities for both high school and college students.

Other features in this issue include a report on educational technology in Montana, profiles of NETC representative Clint Kruiswyk and NETC staff member Anne Batey, and thoughts from Robey Clark, another NETC staff member, about Indians and school reform.

—Seymour Hanfling
Director

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In this Issue:

Distance Learning Starring STEP•Star

It's 9:30 on a Tuesday morning, and children are beginning another session of "Nihongo Fun." On a television monitor, they watch STEP•Star teacher Atsumi Tsukimori teaching elementary Japanese with the aid of furry puppets, video clips, and animations.

Later today, nearly 800 students will be tuned to a "Young Astronauts" class. Students will see instructor Dave Howe, wearing an astronaut-style jumpsuit, use a space-exploration theme to teach science and math as well as uses of technology.

Atsumi has been on camera ever since 1986, when Washington's Educational Service District 101 began its satellite-based distance education program with four classes and 231 students, all in Eastern Washington. Dave came onboard in 1991, a year after what was then known as STEP (Satellite Telecommunications Educational Programming) earned its first grant from the U.S. Department of Education's Star Schools program (see accompanying article) in partnership with state education agencies in Alaska, Idaho, Montana, Oregon, and Washington. With that grant, STEP became STEP•Star, and began a period of rapid growth. It has continued to develop with the aid of four subsequent Star Schools grants—the largest number awarded to any distance education program. Along the way, Hawaii and other U.S. Pacific entities have joined the STEP•Star partnership, and schools around the country have become STEP•Star clients.

Today, operating from a well-equipped studio in Spokane, STEP•Star serves 225,000 K-12 and adult students in 28 states. In addition to its regular K-12 offerings, the program has college-level classes for K-12 students, adult and alternative courses (some available to people in prisons or juvenile detention), and professional development courses for educators.

The technologies employed are comparably diverse. They include telephone, cable TV, e-mail, CD-ROM, and Internet. The heart of the system is one-way video and two-way audio—live satellite broadcasts from Spokane and telephone responses from the sites. Some sites receive the broadcasts through onsite satellite dishes, the majority installed by STEP•Star. Others connect via cable.

Although most STEP•Star classes are broadcast live, some, including "Nihongo Fun," are taped in advance. And schools can choose to tape the live broadcasts for later use. But even students who do not see their studio instructors in "real time" have access to them and to teaching assistants via toll-free homework hotlines. In addition, many students at the secondary and adult levels have access to STEP•Star's FirstClass Bulletin Board System (BBS), through which they can submit homework, communicate with teachers and each other, work together on projects, and engage in live discussions.

Dr. Nancy McKay, STEP•Star's Telecommunications Manager, says it's amazing how quickly students from around the country begin exchanging news over the bulletin board. And Advanced Placement English teacher Penny Cooper says geographic stereotypes fade among her widely separated students when they become virtual classmates. Building on the rapport established through bulletin board chats, Penny encourages collaborative projects. She also asks students to send pictures of themselves, which are displayed on the screen when the students phone in questions during class.

At the beginning of the year, STEP•Star sends CD-ROMs with information about course schedules and content to site coordinators at receiving schools. Nancy stresses how dependent the STEP•Star program is on these coordinators, who handle day-to-day details of classroom operation. In her previous career as superintendent of a rural school district, she observed first-hand how much a coordinator with good management skills and a caring attitude could contribute to student success.

Nancy's observation is echoed in a 1996-1997 Northwest Regional Education Laboratory evaluation of STEP•Star learning services in the Pacific Northwest and Hawaii/Pacific region: "The site visit data...highlight the critical role of the classroom coordinator. Effective onsite coordination facilitates service delivery and stimulates student motivation and enthusiasm for distance learning. Ineffective coordination leads to disrupted implementation and fading student interest."

The same evaluation notes that "For both the Northwest states and Hawaii, survey respondents indicated that their school staff had made changes or improvement in teaching strategies or classroom practice as a result of participating in the STEP•Star program. They reported, for example, that teachers were trying new approaches in the classroom and were more sophisticated in the use of technology."

Although STEP•Star clients have included schools in large urban centers, the majority of its students are in rural and remote schools. For them—and for STEP•Star students in prisons and juvenile detention centers—the program's ability to open new possibilities is particularly important.

Anne Charles, a Skills for the Workplace instructor with STEP•Star, notes the high level of class participation among incarcerated students. STEP•Star gives them a chance to be recognized for positive behaviors. Some tell her what a difference STEP•Star is making in their lives or assure her that once they are released, she will hear of their successes on the "outside." At one facility where many of the students are serving sentences for serious offenses, their levels of violent behavior have dropped since they started with STEP•Star.

For K-12 students in rural and remote areas, STEP•Star provides course choices unavailable to them locally. And, as Penny Cooper observes, kids who might otherwise rise no higher scholastically than the best fellow student in their own school are challenged to do better by STEP•Star exposure to a larger pool of talent and achievement.

Amy Massey, a former AP English student who is now a teacher herself in Newport, Washington, says, "The STEP•Star program provided me with exposure to new and relevant ideas in education while connecting me with students from several other places. Learning was both challenging and fun under the direction of Penny Cooper, who entertained and inspired us all!"

For further information on STEP•Star, contact info@esd101.net or call 800/545-5008 x2720.

In this Issue:

Inside Wire: News From Montana

In each issue of the Circuit*, we use this feature to explore what's happening in a particular corner of the region served by NETC. This time we talk to Scott Buswell, Administrator of Information Technology Support Services for the Montana Office of Public Instruction (OPI). Scott also serves as the Montana representative to the NETC consortium.*

How is Montana's Office of Public Instruction currently involved in the educational technology arena?

First, it is important to understand that the State of Montana and OPI do not direct technology efforts on a statewide basis. The people who make technology happen are the administrators, teachers, students, businesses, parents, and volunteers in the state's 460 school districts, and in multi-district consortiums.

OPI does provide limited support and some level of coordination with the limited staff we have available. One example of this is our assistance to Montana teachers who, with NETC support, began working since last year to develop a set of technology content and performance standards that identify what students should know and be able to do with technology as it is integrated into other curriculum areas. The draft standards will be presented to the Montana Board of Public Education for approval on October 12, and the final version will be posted on OPI's Internet site (http://www.metnet.state.mt.us/). For further information on the standards, contact Michael Hall by (e-mail) or by phone (406-444-4422).

OPI's most effective role in the technology arena has been it's administration of the Montana Educational Telecommunications Network (METNET) to foster communications between districts. METNET, which recently received the Governor's Award for Excellence in Performance, is truly one spot where all Montana educators can gather to share curriculum, electronic files, success stories, and to provide actual instruction. Currently a large number of projects use the system to communicate or provide instruction. To learn more about METNET and its participants, visit its Web site (http://www.metnet.state.mt.us/) or contact Steve Meredith (406-444-3563; smeredith@metnet.mt.gov).

OPI has also been working with the Montana University System, the state Department of Administration, other state agencies, and the general public to develop a Statewide Comprehensive Telecommunications Plan. Federal Engineering Inc., a consulting firm, was hired to prepare a study of what should go into the Plan, and it conducted town meetings and personal interviews with interest groups throughout the state. Education was very well represented within those groups. Federal Engineering plans to complete the study in December 1998.

Can you give one example of a particularly exciting activity now underway in Montana Schools?

Montana schools are all actively involved in technology projects, from wiring their first network, to sharing instructors across two-way interactive video networks. All of these activities are exciting because they are self-generated, and none deserves to stand out over the rest.

What technology-related projects are underway at the Montana Office

of Public Instruction?

OPI has spent several months making major internal technology changes, such as converting from WordPerfect and Lotus to Microsoft Office and changing our network operating system from an IBM LAN Server to Novell and Windows NT operating systems. As part of that process, we have been redesigning the Internet pages that we direct to school districts and the general public.

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

Montana is a large local-control state and is fortunate to have a number of gifted and dedicated educators and administrators. With 27 independent telephone companies providing services, the state's telecommunications landscape is as diverse as it's people and it's scenery. As I mentioned, technology in schools is not directed from OPI. It develops at the local level. That causes some confusion and makes connectivity a challenge, but it does have its advantages. Local schools and districts can pick their technology and determine how it best integrates into their local instructional environment. They can work with their local telecommunications providers to select the best options for their own geographical area.

For further information about Montana programs, contact Scott Buswell at sbuswell@opi.mt.gov, or 406-444-4326.

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In this Issue:

CUENet Bridges Distance for Lutheran Schools

The Lutheran Church-Missouri Synod has the largest Protestant school system in the United States. The dozen Concordia colleges, universities, and seminaries are spread through every region of the country, as are the denomination's more than 2,000 elementary and secondary schools.

Increasingly, students in this educational network are being linked electronically by an advanced two-way videoconferencing system called CUENet (Concordia University Education Network). In Spring 1998, for example, cameras, monitors, and voice-activated microphones made it possible for students in a specially equipped classroom at Concordia University in Portland, Oregon, to see and hear an instructor and fellow students at Concordia University in Austin, Texas, as the latter school hosted a shared "Calculus 2" class. Concordia-Portland, in turn, hosted classes shared by students at sister schools in Bronxville, New York, and Irvine, California. CUENet uses NetworkMCI for connections between the participating sites.

Some Missouri Synod high schools are also getting into the act. One of the pioneers in CUENet participation was Portland Lutheran High School. In January 1998, using equipment borrowed from Concordia-Portland, it linked up to that school for a shared Physics 101 class. Ten students at the high school "attended" the class with seven Concordia-Portland students, who were onsite, ten miles away, in the Concordia classroom-studio.

This fall, about 20 high schools are CUENet participants. Students attend classes that are shared either with Concordia colleges or with fellow high schools.

Through CUENet, high school students can earn credit for up to ten college-level courses during their junior and senior years. Not only do they get a jump on the next phase of their education, but they do so at per-class rates that are lower than normal college tuition.

For further information about CUENet, contact Dr. Ray Halm at cuenet@bendnet.com, or see the CUENet Website at http://cuenet.edu.

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In this Issue:

CyberSchool Helps Create a New Grammar of Learning

In 1984, Eugene teacher Tom Layton bought his first modem and used it to subscribe to an online computer bulletin board. The experience got him thinking about the potential impact of such technologies on education. Later that year, he delivered a speech in which he noted that computers and telecommunications made possible electronic classrooms freed from constraints of space and time. A teacher could have students telecommuting from anywhere on earth, at times appropriate to them. And those students could broaden their educational choices, taking courses not offered by their local schools because of budgetary constraints or the absence of teachers with specialized knowledge.

Today, Tom is deeply involved in an educational endeavor that bears close resemblance to his vision of 14 years ago. As a teacher on special assignment for Eugene's District 4J, he trains other teachers in the new world of CyberSchool, a program he began in 1995. The asynchronous, Internet-based program makes use of e-mail and listservs for student-to-teacher and student-to-student communication. It also employs RealAudio and other technologies to enhance the learning experience.

Despite its name, CyberSchool is not a school. It is a program designed to complement and extend the offerings of local high schools, where students continue to attend traditional, face-to-face classes. Under an Oregon Technology Literacy Challenge Fund grant, CyberSchool is working with OPEN (the Oregon Public Education Network) to meet the needs of small, rural Oregon schools as well as those of disadvantaged schools in the state's urban areas. Up to three students in each of Oregon's 91 smallest high schools can take one cybercourse (a $300 value) for free.

All classes offer academic credit, and while all teachers are Oregon licensed, CyberSchool is available to anyone, anywhere. When students enroll from other states and other countries, their comments on class listservs can lead to a healthy shake-up of homogeneous cultural perceptions. In a class on "JFK and the American Presidency," for example, American students were surprised when a South Korean counterpart, assigned to interview someone over 55 about the class theme, said the person questioned had no knowledge of John F. Kennedy.

While classes are taught at the high school level, some may appeal to capable younger kids or to adults making up for lost time. Layton and CyberSchool's administrator, Jack Turner, encourage parents to take classes with their children.

How do students relate to the CyberSchool experience? At the program's Web site (http://www.cyberschool.k12.or.us) is a *CyberSchool Survival Guide*, written by Mandy Roler and Heather Wall, high school students in Monroe, OR. In the *Guide*, they address ways for students to handle common challenges of distance education: establishing a relationship with teachers in the absence of face-to-face contact and keeping on track with course requirements when a class is only "virtual." But the two students also point to significant CyberSchool advantages: a chance to be independent and—for young people inclined to hold back in a traditional classroom setting—a chance to speak up (electronically) and "be who you are."

Having spent their entire lives in a "sped-up" electronic world, students expect rapid e-mail responses from their CyberSchool teachers. And, since

they are used to having a "live" teacher tell them what to do, they sometimes finish lesson one, then wait for a signal to proceed to lesson two.

Automated e-mail responses have been effective in addressing such matters. The responses inform students that their assignments have been received and direct them to proceed to the next lesson. Tom says the students don't seem to mind that the e-mail is automated. They just want a response.

Automated responses may also contain additional information for students, such as the existence of a new Web site relating to class topics. "Live" links to relevant sites may also be included in a class's own Web pages. Recognizing that students can be led far afield while clicking one intriguing link after another, some teachers include frames around their Web pages. By remaining in place as students make their research "journeys" away from the class site, the frames serve to remind them of their starting point.

Although technological tools are at the heart of CyberSchool delivery, Jack and Tom prefer to focus more on what they want the program to accomplish educationally: provide an effective complement to classroom instruction that stretches school budgets while enhancing student opportunities.

They are wary of being painted into a corner by wedding the program to core technologies or software programs that may become obsolete. At the same time, they are eager to enhance the CyberSchool experience with such add-ons as RealAudio and RealVideo. In so doing, they and CyberSchool instructors must pull back and consider the varying technological capabilities available to students. One teacher, for example, prepared RealAudio recordings of passages from Shakespeare, but also made tapes available to students who lacked sufficient bandwidth to use RealAudio.

Jack likens CyberSchool administration to refereeing a basketball game in the dark. Although he's been around public schools for nearly 30 years and knows how they work, CyberSchool is something else again. He "can't see most of the stuff."

But in another sense, as Jack reminds CyberSchool teachers, the program is always on display. Every word of every lesson of every course is available for careful inspection by anyone who visits the CyberSchool Web site.

Other programs with a strong Internet delivery component have already come and gone. Yahoo!, the Internet catalog service, includes some of the current ones in a list of K-12 distance education links (http://dir.yahoo.com/Education/Distance_Learning/K_12/). An ambitious program not included in the list is Virtual High School (http://vhs.concord.org/home.htm). A project of Hudson Public Schools and the Concord Consortium, both in Massachusetts, VHS has dozens of participating schools across the country.

Tom compares people involved in distance education technology to cinema pioneers like D.W. Griffith who, by exploring the potential of motion picture cameras to pan, fade, zoom, and so on, developed the "grammar" of a unique art form. Now educators, with the aid of tools that reduce the constraints of place and time, have an opportunity to create a new grammar of learning for the next century.

Such creation is, of course, a matter of trial and error. Some of the earliest CyberSchool classes bombed, but educators then involved in the program—excited by the chance to try new things—took this in stride. They looked to the one class that had been a clear success and used it as a model in the next phase of class creation.

Today, with its diverse list of offerings and its association with OPEN, CyberSchool is well beyond the backyard tinkering stage. But for the people involved—educators and students alike—the program still carries with it a feeling of exhilarating experimentation. One of CyberSchool's challenges, as Tom observes, will be carrying that feeling into the future—becoming "institutionalized without being calcified."

For further information about CyberSchool, contact Jack Turner at turner@4j.lane.edu.

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In this Issue:

Technology Links Classrooms North of the Arctic Circle

Covering an area larger than Pennsylvania and Ohio combined, the North Slope Borough School District serves Barrow and seven smaller Alaskan villages. No roads cut across the tundra to connect these villages with one another or the outside world. Nevertheless, many of the people in the villages are linked by an ancient Iñupiat culture centered on whale, caribou, and an intimate knowledge of the arctic environment.

In years past, some students from the North Slope were sent to boarding schools far from home. It was a "remedy" for isolation that threatened to erode their close connection to their own culture.

Then, in 1989-90, people on the North Slope considered a less wrenching response to educational isolation: a boarding school in Barrow to serve students from the seven outlying communities. Parents, for the most part, were opposed. But what else could the school district do to assure quality education for their children?

The solution was to bring the outside world to the villages. Fiber-optic cables, microwave relays, and satellite transmissions were woven into a system centered on two-way interactive compressed video technology and supplemented with e-mail and Internet access.

The system gives students in the North Slope's scattered schools nearly instantaneous access to district teachers whose subject specialties would otherwise be outside their reach. E-mail and fax messages further link the central studio in Barrow and classrooms in the villages, and the district's web site (http://www.nsbsd.k12.ak.us) provides a common forum for North Slope classes to describe and display their projects to one another and the world.

Not only does the two-way interactive video system allow a teacher in Barrow and students in outlying communities to see and hear one another, but the teacher can quickly focus on students in a particular classroom when their questions trigger voice-activated cameras. A separate monitor in each classroom displays interactive graphic images and allows for the display of computer screens from each site.

The system provides students in North Slope villages with a new means to celebrate and perpetuate their own culture. For example, a class beamed from Barrow may focus on Iñupiat legends. But at the same time, the technology allows students to literally span the globe, as when North Slope classrooms, together with classrooms elsewhere in the United States, participated in a live, interactive program with people stationed in Antarctica.

In the words of North Slope Borough School District Superintendent Leland Dishman, "Technology, in full support of a core curriculum, makes it possible for our students to enjoy the benefits and tools located almost anywhere in the world. We firmly believe that our students will, in the very near future, use computers much like their parents used paper and pencils. We are committed to using technology and all other available resources to expand the educational opportunities of our students."

For further information on the use of distance education technology in the

North Slope Borough School District, contact Greg Culbert, Technology Supervisor, North Slope Borough School District, at gculbert@arctic.nsbsd.k12.ak.us.

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In this Issue:

Star Schools: Benefiting Students Through Telecommunications

As we note in the accompanying article, STEP•Star has won five grants from the U.S. Department of Education's Star Schools program. Begun in 1988 with a focus on rural populations, the Star Schools program now benefits urban students as well. The program's purpose, as described at its Web site (see URL below), is "to encourage improved instruction in mathematics, science, and foreign languages as well as other subjects, such as literacy skills and vocational education, and to serve underserved populations, including the disadvantaged, illiterate, limited-English proficient, and individuals with disabilities through the use of telecommunications."

For more information about the Star School program and projects that benefit from it, visit the Star Schools Web site at http://www.ed.gov/prog_info/StarSchools/.

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In this Issue:

NETC Representative Profile: Clint Kruiswyk

At first glance, Clint Kruiswyk, Director of Washington Educational Service District 101's Educational Technology Support Center, seems the very model of continuity and rootedness. A Spokane native with two degrees from nearby Eastern Washington University, he has worked for the ESD ever since 1970, when it was known as an ISD (Intermediate School District).

But over those 28 years, his job has been marked by change—some of it dramatic. When he began, a major focus of his work was distribution of educational films to schools in the district. Today, as manager of the technical side of a complex satellite-based system, he is concerned with a very different kind of "distribution." He seeks to assure that all the parts are in place so students can receive and respond to their STEP•Star classes. And with STEP•Star now reaching 225,000 students in 28 states, the impact of his work reaches far beyond the region where he has always made his home.

Clint's involvement with STEP•Star (see accompanying article) goes all the way back to the project's beginnings in 1986. As the program has expanded and the technology has evolved, he has had plenty of on-the-job learning to do. That has helped to keep things interesting, but sometimes they have become too interesting, too fast. For example, during a year when the Spokane area was plagued by fire storms, the shed then serving as the project's uplink site became so hot that its air conditioner stopped functioning. No air conditioner meant no uplink, and potentially no classes. Clint saved the day by stopping at a local store, purchasing a load of dry ice, and placing it in the shed.

But such calls for quick, creative thinking go with the territory, and Clint has counted himself fortunate to be at ESD 101 and "grow with the program." He is reminded why his work is important when he hears from college students who credit STEP•Star exposure with subsequent academic success or sees kids in the STEP•Star studio, excited at the chance to see a real astronaut who has come for a guest appearance on a "Young Astronauts" broadcast.

Since 1995, Clint has shared the benefit of his experience as ESD 101's representative to the NETC consortium. Clint appreciates the opportunities this role provides to gather with other educational technology specialists, find areas of common concern, and share ideas and resources. As he says, "It makes us all stronger when we're sharing."

Clint Kruiswyk can be contacted at ckruiswyk@esd101.net.

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In this Issue:

NETC Staff Profile: Anne Batey

As she grew up in Pullman, Washington, the notion of lifelong learning and carefree summers came naturally to Anne Batey. Her mother and father both taught at Washington State University, and their wide-ranging interests were contagious. Family activities included relaxation at a summer cabin in Idaho, as well as travel and wilderness adventuring.

When her parents took a sabbatical year abroad, Anne had an opportunity to attend the American School in Teheran, Iran. That experience, together with her flair for languages, sparked an interest in a career as a diplomat or linguist. But when she entered Washington State (after post-high school adventures as a cab driver and a resident of an Israeli Kibbutz) she discovered that "hard science," and especially chemistry, intrigued her more.

During her junior year, Anne had a conversation with her father about how she might use a science degree. Well, he observed, if she became a scientist she would not have her summers free.

Eureka! Anne, who had never seriously considered a career in education, remembered all those relaxing summers with her teacher parents. With that fond recollection in mind, it was easy to agree with her father's further observation that a teaching certificate might make good sense for her. It was something concrete that would prepare her for a job she could be good at.

What began as a pragmatic choice turned out to be a good "fit." In 1978 Anne took a degree in science education and began an enjoyable five-year stint as a science teacher at North Bend High School on the Oregon Coast.

During the summer of 1980, she began work on a master's degree at the University of Washington and signed up for a class in "microcomputers for teachers" just because it sounded interesting. It was, and Anne's curiosity was piqued when the teacher mentioned that the University of Oregon offered a computer science master's program that was designed for educators. Anne entered the program and, soon after earning her degree in 1984, began her career at the Northwest Regional Educational Laboratory (NWREL) in Portland.

Over the years, her assignments at NWREL have varied widely, but some initial projects-conducting computer-integration workshops for teachers and designing science-literacy software-were predictive of roles she has filled since 1995 as an Associate in NWREL's Northwest Educational Technology Consortium (NETC). For example, she worked closely with Washington's ESD 112, providing staff development for its TELDEC project. TELDEC (the acronym stands for "Technology and the Essential Learnings - Developing Effective Classrooms") has turned several dozen classrooms in Southwestern Washington into building-level models of how technology can be used to support integrated curricula that is aligned with Washington's "essential learnings" content standards. Anne has enjoyed her site visits to TELDEC classrooms, where the enthusiasm and creativity of students and teachers are much in evidence.

With TELDEC now well established, much of Anne's time is devoted to working with other NETC staff on developing multimedia tool kits. The kits are still in the planning stage, but the central idea is to focus each one on a single classroom and share how that classroom is effectively integrating technology. A video about the classroom will be linked to either a Web site

or a CD-ROM that reinforces its message and expands its information by creatively using digital sight and sound.

The multimedia wizardry of today is a far cry from the glowing letters and simple graphics in the educational software that Anne helped to develop in the early 1980s. But, as she observes, some of the issues from that time remain with us today. "We have an ongoing struggle to keep proper focus. There will always be new tools, and it's easy to be mesmerized by their tricks. The real challenge is to connect a tool and its tricks to the needs of kids and their learning."

Anne Batey can be contacted at bateya@nwrel.org.