

By MELISSA W. KAYE

Integrating Technology in Schools

From computers in the classroom to video streaming, Penn State aims to help revolutionize K-12 education

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When the U.S. Department of Education released its National Education Technology Plan last January, outgoing U.S. Secretary of Education Dr. Rod Paige noted, "Indeed, education is the only business still debating the usefulness of technology. Schools remain unchanged for the most part, despite numerous reforms and increased investments in computers and networks. The way we organize schools and provide instruction is essentially the same as it was when our Founding Fathers went to school."

George Washington or Thomas Jefferson may have been perplexed by enhancements made in schools over the last 50 years or so—such as television monitors and computers—but Paige's sentiment holds true: There needs to be more action in states and districts to prepare today's students for the opportunities and challenges in the future. Penn State is working to help make this happen—placing a high priority on initiatives that aim

Technology



Computer use among young children is commonplace.

to transform K-12 education with technology.

Computers for All

Nearly all students use computers and more than half use the Internet either at home, work or school, according to the National Center for Education Statistics. The use of technology begins at young ages: 67 percent of children in nursery school are

computer users, as are 80 percent of kindergarteners. The National Center for Education Statistics attributes the commonplace usage to the installation of computers and Internet access in public schools and in a majority of households with children.

Still, while computers may be available in schools, there hasn't been enough technology to make a serious difference until now, says Dr. Kyle Peck, associate dean for Outreach, Technology and International Programs in the College of Education. "We're beginning a new stage in transforming K-12 education with technology," he said. "We need more than just a few computers in the classroom to do that."

Peck is leading an effort at



Penn State to encourage and guide school districts to create classrooms in which every student has a computer, or an environment coined “one-to-one.” “If everyone has access to a computer, that’s when there’s a real breakthrough,” said Peck.

A Faster Pace

The U.S. National Education Technology Plan suggests that school districts build partnerships with higher education institutions (see box, next page), and the Penn State Center for One-to-One Computing in Education aims to help facilitate that. The effort includes a Web site (<http://1to1.ed.psu.edu/>) that provides resources for effectively implementing a one-to-one environment, as well as

resources for promoting one-to-one access. “Penn State is working to become the focal point for research and support for schools moving one-to-one,” explained Peck.

According to Peck, every month a new district, state or county is going one-to-one. For example, in the state of Maine, each seventh and eighth grader was given a laptop, as part of then-governor Angus King’s Learning Technology Initiative. In Henrico, Va., the district deployed laptops to all students from sixth to 12th grade. And in Pennsylvania’s Quaker Valley School District, every student in grades four through 12 has a laptop.

“Kids are used to things happening at a fast pace at home, and they tune out if things are moving too slowly in the

classroom,” explained Peck. “They want to be active, and they should be.” The technology allows the students to produce such high-end projects as Web sites, digital movies or DVDs.

In the socioeconomically diverse area of Quaker Valley, the distributed laptop is the first computer for some of the students. “Students say they have more time to spend on a better-quality project,” said Dr. Joseph Marrone, director of administrative services for the Quaker Valley School District. Marrone spoke at the kickoff conference for the One-to-One initiative at Penn State last April. Another conference will be held next spring.

Teaching Responsibility

Entrusting laptops and the Internet to students is not without its challenges: In Henrico, Va., laptops had to be recalled and modified to curb misuse by students.

“Good teachers take this as an

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Teachers’ Priorities

Teacher educators from more than 50 teacher preparation programs throughout Pennsylvania this summer attended “The 21st Century Integration Summit for Teacher Educators” at Penn State. Here are their priorities:

- Create new forms of student assessment
- Create instructional strategies that encourage higher-order thinking skills
- Use technology to support student-centered learning
- Use data to help customize teacher instruction

opportunity to teach responsibility,” explained Peck. He added that schools should have sophisticated blocking software. Other issues need to be considered: “Schools need to think about such matters as insurance, repair, replacement policy and power,” said Peck.

To create a visual resource for one-to-one schools and for those considering it, Peck—with Eva La Mar, a middle school teacher in Springfield, Ore.—has organized a 24-hour period this fall for schools to document their one-to-one learning environment. Oct. 26 is “A Day in the Life in One-to-One Schools,” in which schools are encouraged to capture images that show how the technology is put to use in their classrooms. The results will be available for the public to see through the initiative’s Web site.

“Many school districts considering one-to-one programs are looking for data and a clear ‘picture’ that they can share with their teachers, parents, school board members, administrators and greater community,” said La Mar.

Streaming Video Enhances Information

Providing the latest technology to classrooms in an effort to enhance learning is also a goal of Penn State Public Broadcasting (PSPB). PSPB is working with the Penn State Center for Science and the Schools (CSATS) to develop curricula with video streaming materials, including one about the Swift Gamma Ray Observatory—the satellite that Penn State designed in conjunction with NASA. The curriculum, introduced this fall in schools, includes



Teens produce high-tech projects.

National Action

The U.S. National Education Technology Plan recommends seven key steps for schools to take in order to prepare today’s students for tomorrow:

- Strengthen leadership, such as through partnerships with higher education institutions and businesses
- Consider innovative budgeting
- Improve teacher training
- Support e-learning
- Encourage broadband access
- Move toward digital content
- Integrate data systems to increase efficiency

QuickTime movies showing the retrograde motion of Mars.

“The movies introduce the ideas of satellites and why they are important,” said Dr. Babs Bengtson, director of PSPB’s Educational Services.

In addition, portions of PSPB’s “PA Energy” DVD will be used for a curriculum, titled E-21, about sustainable energy production.

“Using various mediums in teaching reinforces and enhances

the information,” said John Vincenti, coordinator of special projects in the Penn State Department of Mechanical and Nuclear Engineering. Vincenti and CSATS’s director Dr. Bill Carlsen have developed material for the energy curriculum, including energy-themed coloring books for younger students, as well as recycling experiments. The curriculum will be ready for schools next spring.

PSPB also trains teachers on how to use video streaming in the classroom through a contract with United Streaming, an education digital library. “Doing the training is our way of getting schools in our service area ready for our own streaming video projects,” said Bengtson.

In another project, expected to be completed in 2007, PSPB is partnering with the Corporation for Public Broadcasting, the Pennsylvania Department of Education and public broadcasting stations WLVT (Lehigh Valley) and WGBH (Boston, Mass.) to create a Web site portal in which both teachers and students will be able to easily access educational materials, including videos.

How are teachers responding to the technological revolution? In some cases, it can be overwhelming and difficult to learn. But after they get it, it can be a rejuvenating experience.

“The typical teacher is willing to do anything to make a difference for the kids,” said Peck. “It can take a while until teachers really understand. Then, it gives a whole new perspective on things.” ♣