

The power of engagement

Students use HP technology to conduct wildlife refuge field research



“We knew that integrating technology into a multidisciplinary, project-oriented curriculum was the key to achieving transformational change in our classrooms, but we needed help. HP gave us that help. By providing us technology backed by resources to help us train our teachers, HP put Hughes on the cutting edge of academic excellence.”

– Jan Anderson, Principal, J.A. Hughes Elementary

J.A. Hughes Elementary

HP customer case study: With help from HP, J.A. Hughes Elementary created a project-based curriculum that turns students into researchers and demonstrates the power of student engagement.

Industry: Education

Objective:

J.A. Hughes Elementary needed technology and teacher training to realize its vision of facilitator-led, project-based curricula.

Approach:

The HP Technology for Teaching Grant provided Hughes with both the technology and professional development resources it needed to develop and implement its ideas.

IT improvements:

- Wireless tablets enable students to collect field research data
- Digital projectors allow teachers to present more compelling classroom materials

Academic benefits:

- Students’ comprehension of materials improved
- Students more engaged, enthusiastic
- Fewer discipline problems
- Test scores improved
- Teachers more comfortable with technology



When most people think of a classroom, they think of a teacher lecturing in front of a group of kids. But J.A. Hughes Elementary School in Red Lake Falls, Minn., is exploring a new classroom format that leverages HP technology within an interdisciplinary, project-based curriculum. The new approach re-casts teachers in the role of facilitator and encourages students to take fuller responsibility for their assignments.

The results have been eye-opening, ranging from a decrease in disciplinary problems to improved test scores.

A unique opportunity

The changes to Hughes’ teaching methodologies didn’t happen overnight. And the initial impetus came from an unexpected source. In the summer of 2000, a non-profit environmental group, The Nature Conservancy, acquired over 24,000 acres of land (since increased to 35,000) about ten miles from Red Lake Falls to create the Glacial Ridge National Wildlife Refuge. The goal of the refuge: reclaim land that had been used for gravel extraction, farming, and ranching and restore it as native prairie and wetlands.



The following year, after touring the refuge, two teachers from Hughes contacted the Nature Conservancy to propose that it partner with the school's students. The Nature Conservancy agreed, and the school's Glacial Ridge Project was born.

Initially, the students' involvement was minimal: they went on a field trip to the refuge and collected seeds from native prairie plants. But Hughes wanted to do more. "We were interested in trying more project-based learning and team teaching," explains Jan Anderson, Principal, J.A. Hughes Elementary. "So we began planning a research project to monitor the changes to the refuge over time."

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It was an ambitious idea: enlisting elementary school students as field researchers and expecting them to perform real-world science. Hughes knew the students were able to do it. But they also needed the right tools, and that meant upgrading the school's technology. The question was how. "The only computers we had were five to 10 years old," Anderson says. There were also budget issues. "We're a small rural community. We don't necessarily have the resources to go out and buy the kind of portable, wireless computers that our kids would need to collect data in the field."

Welcome resources

The dilemma was solved when the school learned about the HP Technology for Teaching Grant. Over the next couple of years, Hughes applied for and won two

phases of the grant; these provided resources Hughes needed to embed technology into its curricula and move toward a facilitated learning model.

One area the grants addressed, for example, was professional development. "We'd discovered that our teachers were concerned about their technology skills and training," says Anderson. The HP grant helped by funding training for Hughes teachers through The International Society for Technology in Education (ISTE).

The school determined that it needed to formalize its assessments of technology implementation, so it adopted the ISTE's Snapshot Assessment Instrument tool (part of the ISTE National Educational Technology Standards project) to document its teachers' progress in integrating technology into classroom curricula.

The HP grants also provided Hughes with technology, including HP multimedia projectors for use in classrooms and a mobile computer lab of HP Compaq tc4200 Tablet PCs. The tablets in particular enabled the teachers to realize one of the most exciting aspects of their proposed Glacial Ridge Project: field trips to the refuge so the children could collect research data.

Data collection

Today, the Glacial Ridge Project is a central piece of Hughes' curriculum.

Four times a year, the students are bussed to the refuge. Three sites have been selected for monitoring; the students are broken into teams, and each team is given responsibility for two points on each site.

Once at the refuge, the students gather information about the conditions at the sites and record it with their HP tablets. They identify and record plants and

animal species. The sites are adjacent to a wetland, so the students measure the distance from the sites to the water to determine whether the wetlands area is stable or changing.

Other data is gathered electronically. The students use HP digital cameras provided by the grant to photograph the area's plants and animals. These photos are downloaded into the tablets onsite.

Digital sensors attached to the HP tablets allow the students to collect data on air temperature, wind speed, and the amount of moisture in the soil. The school plans to expand these capabilities more in the future, by adding sensors to measure pH and oxygen levels in the water. "The ability to collect data in the field this way is wonderful," says Mickie Spurgin, a special education teacher and Hughes technology mentor. "It means we don't have to collect samples and take them back for analysis."

Back in the classroom

When the students return to the classroom, the data becomes the basis for a variety of interdisciplinary lessons. The students analyze the data, compare it to past data, and make predictions about what the refuge will be like in the future. They write reports, using the digital pictures they took in the field to illustrate their findings. When they need to present lesson materials, the teachers use digital projectors instead of relying on lectures and textbooks.

Customer solution at a glance

Primary application

- Elementary classroom education

Primary hardware

- HP Compaq tc1000 and tc4200 Tablet PCs
- Cart to house tablets
- HP ProCurve Networking Wireless Access Point 420
- HP Digital Projectors
- HP Digital Cameras

This new approach has changed students' behavior in the classroom. Students complete 90 percent of their assignments related to the glacial ridge project, higher than past average completion rates of 80 percent. There are fewer disciplinary problems, in part because students exert peer pressure on trouble-makers. "They love the work so much. They don't like it to be disrupted," Spurgin says.

The students' academic performance has improved. Math scores of students participating in the project, for instance, have risen by 10 percent. The students have a more positive attitude toward science. Teachers report that students demonstrate a better grasp of subject material.

The HP technology has also helped the teachers become more proficient in administering assessments as well. Teachers now submit student tests electronically to the school's testing organization, The Northwest Evaluation Association. "It used to take 2-3 months to get our scores back," Spurgin says. "Now we use our technology to submit the tests, so we get them back within a couple of days. It's immediate feedback that we can apply in our classrooms."

"We needed technology, but we wanted to do more than put computers in the classroom," says Anderson. "With HP's help, we were able to combine technology with a change in our approach to teaching. Our teachers are excited, our students are excited, and we're seeing improvements in student comprehension and test scores. We couldn't be more pleased."



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4AA1-3649ENW, June 2007

