

HP grant transforms classroom teaching through technology

Mobile computers enable independent learning, freedom from classroom constraints

At Brookfield High School in Ottawa, Ontario, Canada, an HP Technology for Teaching grant has changed the way technology is being used in the classroom.



"Students with access to HP Tablet PCs are doing more work. They're more engaged in exploring and learning," says Beverly Wilkinson, a science teacher at the school. "Teachers are becoming facilitators for learning. It's a whole new classroom dynamic."

HP customer case study: HP Technology for Teaching Grant creates interactive classroom environment

Industry: K-12 education

Objective:

Enhance K-12 education through mobile technology access in the classroom.

Approach:

HP Technology for Teaching grant provides HP Tablet PCs, digital projectors, digital cameras to expand classroom learning opportunities.

Educational benefits:

- Classroom becomes more interactive
- ESL students freed from note-taking to become interested learners, researchers who can concentrate more on classroom lectures
- Special education students enabled to communicate more effectively
- Collaboration facilitated among teachers
- A "bank" of learning resources is created for teachers



HP grants support education

In 2004, Wilkinson heard about the HP grant program, and HP invited her colleagues to apply. She worked with a team of five Brookfield teachers to develop a grant proposal based on studying the environmental health of Brookfield and the surrounding community.

Between 2004 and 2006, the HP Technology for Teaching program has awarded more than \$36 million in cash and equipment to support innovative use of mobile technology in public schools, colleges and universities in the U.S., Canada and around the world. Brookfield received a 2005 grant providing five HP Compaq Tablet PC tc1100 notebooks, five HP digital projectors, five HP Photosmart M22 digital cameras and a printer/photocopier/scanner for a team of teachers to use in classroom instruction.

Based on the success of this first project, Brookfield received a second grant in 2006, providing a mobile cart with an HP ProCurve Wireless Access Point and 15 HP Compaq tc4000 Tablet PCs to support an entire class of students at one time.

Wilkinson says the teachers with access to HP products for teaching quickly moved beyond the environmental study project and began integrating technology into all subject areas. Now HP mobile computing products are enabling student research, simultaneous hands-on and computer activities, online learning exercises and scavenger hunts, and making lecture notes and background materials more accessible to students.

"The key to Brookfield's success is its strategic view of how technology can be used in a school," says Hilary LaMonte, a project leader for the International Society of Technology in Education (ISTE), whose professional development program was used to help Brookfield faculty prepare for technology in the classroom. "They start with teaching and learning goals first, and then look at how technology can help."

Student benefits

With the HP products provided through the first year grant, teachers were able to present lectures and other material using the Tablet PCs and digital projector. They accessed new resources in developing lectures and classroom presentations, making them both more interesting and informative to students. They made lecture notes and other materials available to students electronically. Students can also submit lab reports and other assignments electronically.

With the second year's grant, the Tablet PCs became available to students themselves. Though the PCs have been available to students for just a short time, Wilkinson says using HP technology has already made the classroom a more interactive environment. Students no longer just copy written information off a blackboard; now they stay engaged and know they can download the lecture notes later using Blackboard software (not a part of the HP grant).

Students also create PowerPoint presentations, combining words, music, digital pictures and online resources. Several teachers at Brookfield use the in-classroom research capabilities afforded by HP technology to challenge their students.

"I heard things like 'Ooooh, that's how it works!' and 'oh, now I get it.' There were definitely some 'Ah-ha' moments."

Wanda Kilfoil, Physics Teacher, Brookfield High School

Wanda Kilfoil, who teaches Physics, recalls teaching a lesson on electromagnetism using computer simulations running on the HP Tablet PCs. "Because electromagnetism can be a very abstract topic, the opportunity to visually observe patterns and effects was extremely valuable," she says. "The students, working in pairs, were engaged for the full hour and were discussing what they were seeing. I heard things like 'Ooooh, that's how it works!' and 'oh, now I get it.' There were definitely some 'Ah-ha' moments."

Wilkinson adds, "In biology class, I might take some digital photos of viruses from the Net, give the students some websites to search, and turn them loose on a scavenger hunt." Students start by discovering

Customer solution at a glance

Primary applications:

Classroom instruction, sharing, research

Primary hardware:

- HP Compaq tc1100 Tablet PCs
- HP Compaq tc4400 Tablet PCs
- HP Photosmart M22 digital camera
- HP ProCurve Wireless Access Point
- HP Officejet 7410 all-in-one
- HP digital projectors

Primary software:

- Blackboard
- Microsoft® Office Suite with Ink Annotation
- Microsoft Windows Journal



which viruses the pictures represent, then go on to search for their symptoms and other important characteristics. “They become so excited to be on the hunt for this information,” says Wilkinson, “that they are essentially teaching themselves.”

At its core, that is what technology can do in the classroom: motivate students to explore and learn on their own. “Rather than passively listening, they’re actively searching out information,” she says.

“We do surveys about whether students enjoy a given class, and whether they understand the given material. Almost all students give us the highest ratings in classes where we’re using the new HP technology,” says Wilkinson. “They enjoy learning through using computers, and they’re learning a lot. How can you improve on that?”

ESL, special education students may benefit most

Some students benefit more than others. Wilkinson cites ESL students (those for whom English is a second language). “If you’re listening to a language that’s not your primary one, to listen and take notes at the same time is horribly difficult,” she notes. So ESL students take the most advantage of being able to download lecture notes and background readings. That frees them to concentrate more intently in class. “They can listen more effectively,” says Wilkinson. And often, listening equals learning.

In special education, students who can’t write or type well often have difficulty completing tests and homework assignments, which makes it challenging for teachers to fairly evaluate them. That reduces opportunities for follow-up teaching and reinforcement of lessons. Now, some students can use HP Tablet PCs



rather than scribbling in notebooks. “The handwriting recognition is so good they can write on the tablet, run it through handwriting recognition, and it gives the teacher a clean test to work with,” explains Wilkinson.

Re-energized teachers

Students aren’t the only ones who benefit from HP technology in the classroom. Wilkinson notes that she never liked lecturing at a blackboard (especially because she’s allergic to chalk). But she had to use it so students could follow her notes and lectures.

Now, with an HP Tablet PC and HP digital projector, she can lecture from Microsoft® Office PowerPoint presentations, or annotate existing files live while lecturing. Students can download the files later – ensuring they have better information to study and learn from.

In the classroom, she adds, technology has freed teachers from physical proximity to the blackboard. With lecture information projected on a screen, the teacher has the freedom to move among the students. That makes it easier for students to ask questions privately, enables closer monitoring of student work and facilitates better classroom management.

In addition, she says, technology enhances collaboration among teachers. “One of our main goals of this year’s project is to improve collaboration amongst our staff. Having the HP grant has focused us to meet and talk with one another regularly, and we have learned a lot from each other about making the best use of the technology. In order to share our successes with others, we have provided training sessions for our staff in the use of technology.

"In the coming semester, we will be inviting other teachers into our classrooms, and we will be holding drop-in information sessions after school. It has been a very creative year for us. It's given us a new spark, increased our creativity, and started us thinking about new ways of teaching."

Future: toward more ubiquitous classroom access

Looking ahead, Wilkinson notes that her school has already started developing an electronic database of teaching resources that can facilitate course preparation in future years. That frees teachers to continue reaching out for the most current information in their respective disciplines, or new tools to enhance their teaching.

In addition, she notes, technology opens up new resources for teaching, such as streaming video documentaries from TV Ontario and PBS.

But most important, it creates a new opportunity for learning each day. "If something of interest happens in the news that morning, we can instantly refer to the story and share relevant information from various news and information sites," she says. "As a society, we are increasingly dependent on information. Technology like we have from HP is the key to bringing the newest information into the classroom."



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