RESEARCH WINDOWS

The Time Is Right to Embrace PDAs in the Classroom

By Robert Kadel

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Personal digital assistants (PDAs, also known as handheld or palmtop computers) are, in my opinion, the next great step in educational technology. The educational community has spent countless hours and dollars (though still more could be spent) on providing desktop or laptop computer access to PK–16 students. Most students now have some experience with the Internet, whether through the World Wide Web or through software packages that provide their own real-time content updates. The world of the static textbook is fading.

Still, even with such technology available in most schools, students are tied to a classroom or lab setting. Laptops, though portable, are rarely used in such a fashion. Instead, they simply replace the desktop computer with a more compact design that can be packed away when not in use (or when charging). In addition, the hard disks and large color displays of laptops—which are great resources, don't get me wrong—eat up power like my four-year-old eats cookies.

PDAs, on the other hand (no pun intended), have much smaller displays to power and no hard disks to spin. The biggest electricity hogs on these small devices are the microprocessor, the display, and the wireless networking card (if installed), and yet they can still run four to eight hours on a single charge. (And this seems to be getting better all the time.) Furthermore, just like our desktops and laptops, they are capable of running several programs simultaneously (thanks to dramatic increases in on-board memory over the past few years) and holding a wealth of information (thanks to expandable memory card slots).

But I don't base my assessments on mere speculation or what I've seen in the latest online catalogs. No! I am a scientist, and as such, it is my responsibility to consider the data first and draw conclusions afterward. So let me share some of that newly published information with you.

Van't Hooft and McClain's vignettes in this issue of *L&L* about using handhelds among students with special needs could easily be applied to any and all students. From their work, we learn three things:

1. PDAs are easy to use for just about any student at any level of schooling.
2. They are mobile, which provides for learning beyond the boundaries of the classroom.
3. They are relatively inexpensive.

Yet despite being low cost, PDAs provide access to most of the types of applications that students need. Standard office applications are available for PocketPCs and Palm-based PDAs.

In the September 2003 issue of *Computer* magazine, Deborah Tatar and her fellow researchers at SRI International detailed the use of education-specific PDA programs such as Match-My-Graph, Data Doers, and Sketchy as instances of the ways PDAs can be used to envisage science and math concepts and to share these ideas with other students by beaming data, questions, and puzzles back and forth. Additionally, the authors point out that PDA technologies and applications can (and should) be tailored to meet the needs of individual learners and organized around lessons in such a way as to encourage distinct groupwork versus individual learning activities. Many applications

already make room within individual student lessons to stop and bring the students' collective attention back to the teacher and class as a whole. It is simply a matter of taking such a technological bull by the horns, using classroom management protocols that already exist.

Much of the more recent, groundbreaking research is taking place in Europe. In their *Literature Review in Mobile Technologies and Learning* prepared in 2005 for the United Kingdom's National Endowment for Science Technology and the Arts (NESTA) Futurelab, Laura Naismith and her colleagues from the University of Birmingham reviewed a range of Ed Tech projects that take advantage of mobile technologies, from PDAs to mobile phones to handheld gaming units such as the Nintendo Game Boy. (Tatar et al. defined "mobile learning" as the "intersection of online learning and mobile computing.") Naismith et al.'s appraisal includes a description of a project called Ambient Wood, where pairs of 10- to 12-year-olds are given a PDA and asked to explore two habitats, an open clearing and a wooded area. In some areas of the habitats, hidden, wireless speakers make nature sounds to attract children to a particular area. As students enter the area of the sound, the PDA is triggered by a GPS location tracking system to display information and pictures and to read a voice-over related to life in that particular part of the habitat.

Mike Sharples presented a paper at the April 2005 Conference on Seeing, Understanding, and Learning in the Mobile Age in Budapest. He described mobile learning as a new "conversation in context." In this model, students are much more free to interact with their environment than in tradi-

tional classroom-based instruction. It is a much more constructivist approach to education, which, frankly, can make some teachers nervous. "How do we control them if they're all just running around in the woods with handheld computers?" would be their refrain. But, I would reply, technology is not simply a tool for the transmission of knowledge but is, in and of itself, a method for defining the boundaries of everything from a WebQuest to an outdoor learning experience. Technology provides teachers with the ability to keep students' actions in check; to reiterate an earlier point, one must simply learn how to do it first.
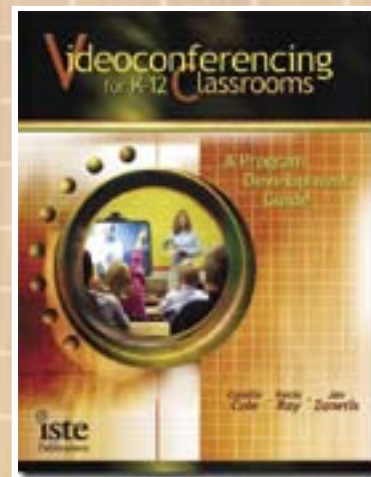
One could argue that this ability is a central issue with the use of PDAs in schools. I said earlier that I believe they are the next great step in educational technology, and I would now like to qualify that statement by adding that, technologically, that step has already been taken. It is now up to practitioners to embrace, experiment with, and learn from what PDAs have to offer to our students.

Resources

Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2005). *Literature review in mobile technologies and learning.* Report 11: NESTA Futurelab Series. Available: http://www.nestafuturelab.org/research/reviews/reviews_11_and12/11_01.htm

Sharples, M. (2005). *Learning as conversation: Transforming education in the mobile age.* Paper presented at Conference on Seeing, Understanding, Learning in the Mobile Age, Budapest, Hungary, April 2005. Available: http://www.eee.bham.ac.uk/sharplem/Papers/Theory%20of%20learning%20Budapest.pdf

Tatar, D., Roshchelle, J., Vahey, P., & Penuel, W. R. (2003, September). "Handhelds go to school: Lessons learned." *Computer.* Available: http://ctl.sri.com/publications/downloads/IEEEHandheldsGoToSchool.pdf