"eMate in the Classroom -- Early Prototypes Excite Educators"
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In the bright fluorescent light of a portable classroom, thirty sixth-graders huddle in small groups behind ten translucent green eMates. The lively chatter of their voices, and the steady hum of the air conditioning, create a noisy roar. For Rodney Palmer, social studies teacher and technology coordinator, the sound is music to his ears.

"This is great!" he says, beaming. "This is the sound of kids who are engaged in what they're doing!" Palmer had agreed to be part of an early seeding of eMate prototypes and was amazed by the reception they were getting. "In all my years of teaching, I've never seen a group of students get into a lesson so quickly." The seeding was one of several conducted last summer to get early feedback on the eMate. The reactions from educators and students were then plowed back into the design effort.

The eMate concept was born out of requests from educators for an affordable, portable, computing tool geared toward education, that would address the equity and access issues most schools face. They wanted a computer that provided a core set of functionality to complement the multimedia machines that they had, or perhaps didn't have, in their schools.

Between July and December 1996, NSG's User Experience group placed ten Apple eMate 300 prototypes into elementary, middle, and high school classrooms in a variety of subject areas. Teachers incorporated the eMates into their existing curriculum while a team of researchers observed, videotaped, and interviewed everyone involved. Now, after more than a year of development, the first EVT units were in the hands of their toughest critics—students. "It's so cool!" exclaimed one fifth-grader as she opened the lid of the eMate for the first time. "I gotta have one," said another. "Please make it cheap!"

Students from all grade levels reacted enthusiastically to the eMate's futuristic look, its translucency and clamshell design. Thomas Meyerhoffer, eMate's industrial designer, worked to create a product that "ventures into an emotional space." In addition to providing solutions to ergonomic challenges (the handle, armrests, pen holders, sloping keyboard, and rugged backpack-friendly shape), the eMate design has a rare emotional appeal that attracts both children and adults. Said one East Coast teacher: "When I think of a laptop, I think of a box...but that's not a box. Is it a laptop? (She opens the lid.) Oooooh. I think I just fell in love."

The personal connection students make with the eMate translates into real learning advantages. Students who previously exhibited motivation problems have shown measurable improvements in productivity. Palmer points out that one assignment, a unit on note-taking, usually takes days to accomplish. With the

eMates, the students did it in one day. "The eMates gave them a way to focus their attention." The combination of the easy-to-use interface, the direct manipulation of the pen, and the novelty of the eMate, fuel a sense of excitement and empowerment. The students master the eMate quickly, feel good about this accomplishment, and transfer those feelings onto their work.

In many ways the Newton OS is ideally suited to students. The "instant on" feature appeals to young people with limited attention spans (and to teachers who struggle to engage them.) Students prefer the pen to the mouse for drawing and manipulating objects. The graphical interface, icons, and casual font have a simplicity that seems almost childlike. The sound effects and animation provide a sense of play without encroaching on the learning process.

Many teachers prefer the eMate's simplicity, even its gray-scale display, because it's less distracting to students than conventional computers. "I see a lot of the kids, particularly the elementary students, they have color and all of that, and all they want to do is play games with it," says one elementary school teacher. In contrast, the eMate emphasis is on organizing and communicating ideas in written form. And when a teacher needs to get students' attention, he or she can simply ask them to "close your eMates."

The eMate's long battery life quickly grabs teachers' attention. With twenty-four hours per charge, and one-hour recharge time, there's a better chance that the eMate will be available when students need it. In a third grade class using both eMates and AlphaSmart keyboards, a teacher gave the class a writing assignment. After a few minutes one of the students returned wearing a hapless expression. "All the AlphaSmarts are dead."

The eMate's portability is also viewed as a major asset by teachers. "Now technology can follow the students around, instead of the students following the technology," said one teacher, enthusiastically. Assignments begun in the classroom can be finished on the eMate as homework. This is especially important for students who don't have computers at home.

In a fifth-grade social studies class, the teacher had groups of 3-4 students, each armed with an eMate, move between ten stations within the classroom. At each station, the groups analyzed a political cartoon, recorded their interpretation in the word processor, and found modern corollaries. By the end of the exercise, they were able to beam their work to each other. "Students need to be able to move and be hands-on," explained one educator. "It's a great way to learn."

In another exercise, students used the drawing program to design personalized stationery. They quickly learned to flatten the screen to facilitate drawing and to drag out shapes using the pen. They used stamps, sometimes resizing them, to create borders and backgrounds. Finally, they printed their work. In the course of

one class period, every student in the class had mastered the drawing program and printing, and completed their assignment.

It is this benefit, the ability to put more computers in the hands of more students, that educators see as significant. Pam Fox, an elementary school principal, says, "If they have to wait for a turn on the big machine with all the bells and whistles, they may not get a turn. But with this small machine which is less expensive, they might get some hands-on experience two or three times a week which makes a huge difference."

The core application, Newton Works, allows students to do the vast majority of daily computing tasks on the eMates. With only one Macintosh in her classroom, "there's always a huge traffic jam at the computer" says Amy Bloom, a seventh grade teacher. Educators are frustrated that students are using $2000 multimedia machines to do basic word-processing. June Schiller, an elementary school principal, sees the eMate as a way out of that quandary. "The thing that takes the most time...is the writing. I don't see this as taking the place of doing that other stuff, of CD-ROM and the other, but I see it as a cheap way of doing a lot of the work that takes the most time in a classroom setting."

The eMate's back-to-basics approach makes it simple for teachers to incorporate it into existing curriculum. For example, an elementary school teacher gave her students the assignment to write a poem. A third of the students used the ten available eMates while the remaining twenty students used pen and paper. At the end of class, the ten students using eMates printed out their poems and turned them in along with the twenty handwritten ones. No modification of the teacher's lesson plan was needed. The only practical difference was the poems written on the eMates had been word-processed, spell-checked, and could be easily read by the teacher.

The concept of sharing took on a whole new meaning when using the eMate. In a high school class, students from two classes used the eMates during consecutive 45-minute periods. The teacher used the multiple user setting to allow the students' data to be stored separately within the device. The students were able to work the entire class period without taking time out to copy their data to the desktop computer. Another teacher used the multi-user classroom mode to allow groups of students within one class to share an eMate while maintaining discrete workspaces.

In classrooms where teachers used the eMate Classroom Connection software to copy and retrieve data to a desktop, students easily navigated the software. The "Dock" button on the keyboard was a useful shortcut for students. The simplified interface made the direction of data flow immediately clear. The single document transfer lasted just a few seconds, making the total interaction quick and efficient. With the option to "move" data to the desktop, the eMates can be "wiped clean" for students to use in the next class period.

Collaboration was an important element in each of the classrooms we visited. The sharing of work via infrared transmission was fun for students ("it's like magic!") and opened up new opportunities for collaborative work. One teacher had groups of students work on separate pieces of a project on different eMates and then beam them to one machine for assembly into a whole. In another class, students wrote one sentence of a story, beamed it to their neighbor who added another sentence, and they beamed it to another student, and so on. By the end of the exercise, there were ten communally-written stories of ten sentences, and a group of very excited children.

A consensus of teachers agree that the possibilities presented by eMates in the classroom are endless. Teacher requests for sample activities to serve as a "jumping-off point" led to an Apple-supplied Teacher's Guide. After a few weeks, they predict, there will be as many different ideas and approaches as there are teachers who use them. If the initial feedback from students and teachers is any indication, the reaction to eMates in the classroom will be enthusiastic indeed.

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Sidebar: "Teachers' eMate Wish List"

Teachers who participated in the early seeding of eMates offered their ideas for future applications and enhancements. Here are a few examples:

database software
foreign language modules (using text to speech)
customized stamps
journal application
utility to allow teachers to manage student information
assessment and grading programs
simultaneous broadcasting of assignments to multiple eMates
Ethernet support
curriculum modules
literacy programs
reference materials
textbook supplements
Hyperstudio equivalent
wireless connection to desktops and printers
diffuse infrared

If you are interested in registering your application, (etc.)