Laptop Program Update

By Howard Levin

Students entering Steve Speier's Spanish class pull their personal laptops from their packs and begin preparing for the lesson. Some review Speier's board notes containing a combination of typed phrases and dozens of hand-drawn vocabulary words saved as PDF files from his interactive white board Notebook program. Others don headphones and listen to audio files Speier recorded specifically for this class. A couple more are reviewing their recorded voice responses to several audio prompts for homework prior to submitting this for homework. All of this takes place on their personal laptops, accessing and sending these files from the centralized electronic course conference.

In April 2004, I reported about the Urban School's integrated laptop program (see "Laptops Unleashed: A High School Experience," pp. 6–11). I talked about our fairly atypical laptop program—then in its second year—in which all students are provided a laptop for the duration of their high school experience, with little to no formalized computer skills instruction. Much has changed in the past two years as the program has matured,

achieving a new level of acceptance and sense of normalcy now that all 295 students are toting around personal laptops. In revisiting our ongoing progress, I interviewed several of our veteran teachers, all of whom experienced years of teaching without laptops and, in some cases, were deeply skeptical about a one-to-one laptop program. In general, teachers are now having students use their laptops to do more of what was previously impractical or impossible. Laptop use and the constant availability of network resources that was celebrated two years ago as a bonus is now rapidly becoming a basic assumption of all. Few question the wisdom; nearly all are finding effective and innovative ways for laptops to support learning.

Effects on Student Learning

Attempting to assess the effects of our laptop program on learning is complicated. Attributing any connection between laptops and comprehension and/or test scores is ridiculous unless a school or district is willing to retain a control group that is not exposed to any new educational advancement. We certainly won't do that.

It is, however, quite simple to examine the way laptops are contributing to various aspects of the learning process. In this light, I will examine four key areas where laptops and ubiquitous access to network resources affect the learning process: communication, organization, information, and production—using anecdotal evidence as well as results from our recent Laptop Program Survey.

Communication

The most obvious change brought by our laptop environment is soaring levels of communication. This was true two years back, but the difference now is the natural assumption of electronic communication. Student-to-student, student-to-teacher, and teacher-to-student communication by e-mail as well as Internet-based learning environments are no longer considered bonuses, they are expected.

In our survey, we asked students how often they communicate with other students about schoolwork online outside

of class: 71% reported "daily," and 24% said "1–2 times per week." When asked how often they communicate with teachers, 56% replied "one or more times per week." We suspect this number will continue to rise. The ability to ask quick clarifying questions—to both teachers and peers—is at students' fingertips, and their confidence that they will reach someone and receive help is a theme repeated often.

Teachers report new ways of capitalizing on the ease of this electronic communication. Science Chair Algis Sodonis uses his electronic course conferences to post solution sets to difficult problems. Archives of complex board work are available for students to access and the teacher to reuse. Students go through a "hierarchy of help" involving a combination of teacher questions, peer support, and access to these solutions. Sodonis reports, "This creates a very dynamic and productive first 20 minutes of class where students ask the questions they need without spending a whole period listening to me solving all of the problems."

Likewise, collaborative work is supported. Through e-mail and online conferencing, students are able to pool information and work on group projects even when not together. Previously, group projects were limited to in-class work that is easily influenced by social issues. "Student 'production' changes with a laptop program," says history & English teacher Dan Matz. Students can collaborate in new and interesting ways. "They construct their own understanding in consultation with their peers," Matz says. One of our core values demands that kids construct understanding rather than simply swallow what the teacher says. The laptop program often provides meaningful opportunities for kids to do this collaboratively.

These new communication tools enable powerful, often unintended dialogues between age groups. Electronic communication has encouraged students to step out and be heard. For example, one 10th grader recently posted the following to the school's electronic bulletin board:

> Hello everyone. I'm in the process of trying to broaden my musical horizons and I was wondering if anyone had any suggestions of some old French Jazz, like the music in the movie *Amelie* when they are in the cafe.

Within minutes she received nearly a dozen responses. The bulletin board and other online forum tools enable students to seek connections and express social and political convictions in a safe way across all grade levels.

The most powerful effects of new laptop-based communication tools are seen in foreign language instruction. "The extension of listening and speaking beyond the physical classroom has been a fundamental change," says Language Department chair Speier. Students can reinforce the critical language skills of listening and speaking through independent practice at home. "Before laptops, teachers had to do all the listening and speaking in the physical classroom," Speier says. "Now, much of this happens as homework [students listen and record their replies] freeing up time for other classroom activities."

This ease of communication also provides teachers with better feedback from students, enabling them to adjust lessons to better serve student needs. Scott Nelson, a math teacher and initial critic of the school's laptop program, sees this as a major benefit. "I am starting to use the computers to communicate more effectively with my students about math," says Nelson. "Their feedback is more honest and expedient because they are not saying it in front of the class. This helps me plan more effectively and to gauge the instruction more to the individual needs of the students."

Now that all students and teachers have laptops, the artificial boundaries of time and place have blurred in ways that support teaching and learning.

Organization

I have little doubt that students and teachers benefit from the many electronic organizational tools and anytime access to network resources. One teacher reports, "The laptop program has helped to uncover the organizational strengths and weaknesses of both students and teachers."

More than half our students report that their organization for school has improved since receiving a laptop (3% report a decline). Commonly used tools include Apple's Stickies, calendar programs, Microsoft Word's "note-
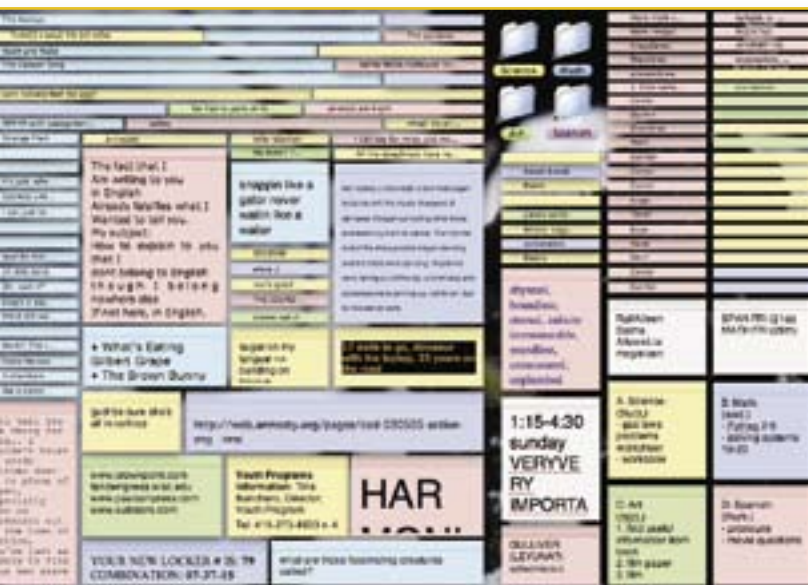
This student uses Stickies to organize everything from movies and music to class assignments.

book" view with tabs for categorizing notes, desktop folders, concept mapping software, and self-sent e-mail reminders. Although paper planners are still important for many, the days of one uniform method are over.

Teachers at Urban post a majority of their handouts, assignments, and other class information online within their course conferences. This practice was popular two years ago, but not nearly as comprehensive as today. Central electronic access is supported by the rapidly growing practice of scanning paper documents directly into PDFs and uploading them into course conferences. Students have one place to access nearly all the information that in the past was lost or simply never recorded in their notes. Says English teacher Tilda Kapuya, "Students' comprehension is enhanced by having more continuity between what happens in the classroom and what happens at home. Homework now serves to build upon class work more than ever because the laptop holds all the information together in one place."

Access to Information

In many ways, student access to information flows from improvements in communication and organization. Anytime access to a plethora of Internet resources and the "Google factor" in the hands of every student has changed the type of information used to support learning. At Urban, we see significant growth in the nature and use of Internet resources in ways that simply were not practical in the past.

Teachers direct students to information not previously available, and this is contributing to a more dynamic curriculum. A wonderful example is the Constitutional Law course. Student reading and research material is now almost exclusively found on FindLaw, a free database containing all Supreme Court decisions—including dissenting opinions—reaching back to 1893. Students not only read

the assigned cases, they can follow the complex web of precedent law that previously was not possible without visiting a law library. "Opinions cited within the cases are always live links—students can see how the justices were using particular cases by simply clicking on referenced cases," says Dan Murphy, who has been teaching the subject for more than 25 years. "This helps students understand the dynamics of legal reasoning and citation."

Teachers also often take advantage of current and immediate access to information on the Internet to add meaning and relevancy to assignments. For example, while students in Murphy's class were studying juvenile death penalty cases, he discovered a current case, *Simmon v Roper*, that had yet to be decided by the Supreme Court. He had his students review the briefs from both sides—all available online—write their own opinions, and then compare their thinking with the actual opinion when it was released by the court just days later. "The students had anticipated key arguments," says Murphy. This would have been impractical without constant access to Internet sources. Murphy has now purposely built this component of examining soon-to-be announced cases into his lesson planning.

Student Production

The progress we've seen in the areas of communication, organization, and information and how this helps the learning process is clear to most. The more powerful change—which in part is enabled by these same forces—is evident in the end products of student work (i.e., those areas of student production that teachers are most apt to evaluate). Our ubiquitous laptop environment increases the alternatives for students to demonstrate understand-

ing and therefore aids teachers in their ability to more adequately evaluate understanding. We see a wider array of assignments that give students more opportunities to practice in meaningful ways, and this leads to observable improvements in student sophistication.

Among the most obvious areas supported by laptops is student writing. In fact, more than 67% of Urban students report that word processing represents "the best use" of their laptop. Teachers report specific improvements in students' ability to express more ideas and to better edit their work. "Essays are more tightly written than ever," reports history teacher LeRoy Votto. At the same time, Votto points to students' increased attention to the craft of editing. "I definitely see more output—that is more words and ideas per writing assignment with the computer," says Votto.

Science teachers also report that student data analysis from labs is often much more sophisticated and authentic now that they have own laptops with powerful software and communication tools. Students often transport their active data into Excel or directly into Word. This helps them determine which data are the most valid since they often continue to work computations within spreadsheets as they take shape in the final report. That is, editing continues throughout the process, and editing is direct evidence of student thinking. Reports physics

Since I paint representationally, I always work from photographs. Recently, my work has become extremely personal and I insisted on using photographs of myself, a process that has been essential in clarifying the ideas behind my art. I use a digital camera and import the images onto my computer, from which I print the photographs to look at when I paint. Sometimes I may change around the contrast in iPhoto or Photoshop to get a better sense of shadows and highlighted areas. I painted the large, disturbing mass of emaciated bodies from images from the Victoria Secret website (since I soon ran out of ways I could imagine girls in really disturbingly sexual poses), and also from Google images. But I don't know how compelling a reason for computer use that is.
~Claire

Recent graduate Claire describes how technology influences her artwork in this composite of several of her paintings.

teacher Sodonis, "These are finer data analysis skills which are familiar to all scientists and unusual in most high school labs."

Two years ago I reported the use of online discussions in English, a technique that periodically moves oral discussions into written dialogues about literature. This practice helps empower the less orally confident student to air ideas and thus receive feedback. Since then, the department has fully embraced the efficacy of those early experiments. Says English teacher Cathleen Sheehan, "Unlike an oral discussion, in-conference postings give me greater insight into how students are processing the reading and responding to it. I can ask them to look back at a given passage and guide them as well as give them feedback on spelling and punctuation as needed." This enables Sheehan to be more purposeful in her advice, as well as more deliberate in her assessments. "I can evaluate them more efficiently," she says. Likewise, English chair Jonathan Howland reports, "My students are more alert and observant members of a discussion as well as better writers on account of their ongoing involvement with online conferences."

Teachers are also finding more creative and multisensory ways for students to demonstrate their understanding. Among the simplest tech-

niques is to allow students to submit some work as voice files as opposed to traditional written essays. For instance, Matz asked his freshmen to record as a homework assignment a verbal response to an essay prompt. Although several students complained that it took them longer because they insisted on writing their thoughts out first, several other more verbal learners demonstrated a level of understanding that Matz previously could not gauge. Matz also reported his own evaluation process was faster because he could more quickly type notes and observations while listening to these "essays."

Often the powerful effect of laptops lies hidden behind student work that, on the surface, shows no sign of computer technology. I became intrigued by this last spring during the school's annual year-end senior art show. Our campus was filled with beautiful paintings, drawings, sculpture and installation projects, none of which, except the photography, evidenced any use of computer technology. I interviewed several students, simply asking if they used any technology to generate the ideas for their art. I was pleasantly shocked by the results. They all mentioned some intriguing use of their laptop, whether it was to search for images, process digital photography for modeling, or simply to brainstorm journal-style to develop their ideas.

Sam talked of video-taping his friends in everyday conversations, importing the digital movies and editing in iMovie. He watched and listened repeatedly until he was inspired to create a series of striking large-format portraits. Another student, Claire, painted a series of stark images of gaunt women, again with no evidence of technology use. But Claire's statement (left) is perhaps the most elegant testimony for laptop use I've ever heard.

Conclusions

Teachers and students almost universally embrace the benefits of laptops to the learning process at Urban. However, some concerns persist, mostly regarding distraction among mainly the younger students. Only a handful of our incoming ninth graders experienced laptops in their middle school classrooms, therefore freshmen's first few weeks at Urban are fraught with struggles over excessive e-mail use, gaming, and Internet surfing. We generally find the novelty wanes rapidly for the vast majority of students as academic expectations become more pressing. Although we do not filter or restrict access in any physical ways, we periodically remotely monitor use and report students caught gaming during class to their classroom teacher. In more extreme cases, the Dean of Students becomes involved, because we treat this not as a technology issue, but as a behavior/focus issue.

For the most part, however, our laptop program is smoothly making the transition from its earlier experimental phase to one where use is truly seamless, ubiquitous, and normal. The reported advantages are also helping to support a truly dynamic curriculum filled with a sense of new possibilities.

Howard Levin is director of technology at the Urban School of San Francisco. He recently delivered the keynote address at the Laptop Institute in Memphis. Howard's work with Urban's oral history project (http://www.tellingstories.org) earned an NAIS Leading Edge award for technology in independent schools. Find out more at http://www.howardlevin.com/.