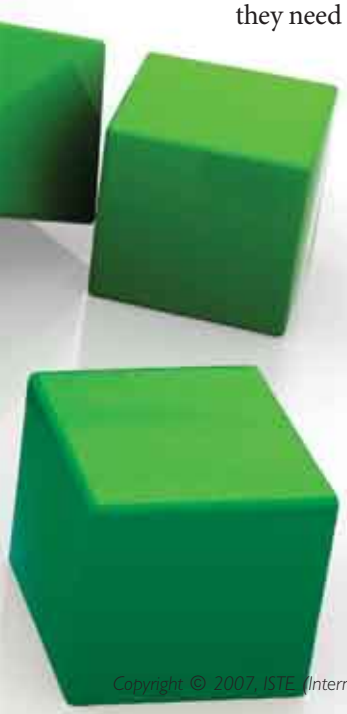
Fitting the Pieces Together

Successful Technology Integration with Laptops

By Patricia A. Yost

Two and a half years ago, our middle schools (State College Area School District, State College, Pennsylvania) embarked on a student laptop initiative that began as a pilot program and has continued to develop into a model for successful technology integration. Although we were entering uncharted waters as far as laptop technology is concerned, there were some known principles that have guided us to success.

We knew that truly successful technology integration would require a pedagogical focus rather than a technology skills focus. Our professional development, therefore, would reflect that focus. We knew that our teachers and students already possessed substantial technology skills. Our objectives, therefore, were to help students use technology as a tool for higher-order thinking and learning and to help teachers use technology as a tool for promoting higher-order learning. We knew that teachers need time to get comfortable with new technology, that they need time to develop new applications of technology for instruction, and that they need time to collaborate and share with peers. Our strategy, therefore, was to provide the time and appropriate supports to allow our teachers to become comfortable and competent technology integrators.



Two and a half years into the journey, we are pleased to observe a wide variety of high-quality technology integration happening daily in our classrooms.

- Rather than focusing on topical research, teachers are beginning to pose research questions that require students to gather information for a purpose: to make a decision, to decide between alternatives, to answer a why, which, or how question.
- Rather than using their video projectors to lecture from presentation slides, teachers are beginning to create interactive, hyperlink-infused, self-paced presentation documents that students can use to learn new content or to collaborate on a team project, in much the same way that they can use a WebQuest.
- Instead of showing full-length feature films in the classroom, teachers are beginning to use 2–3-minute video segments to illustrate a point or to show a comparison.
- Instead of limiting students to texts available on the classroom shelves, teachers are beginning to find online materials that allow them to differentiate content to meet different students' needs.
- Instead of being the "sage on the stage," teachers are directing students to high-quality Web sites, and are asking students to create meaning from what they find and to demonstrate their understanding by creating multimedia presentations.
- Instead of using word processors only as smart and efficient typewriters, students are using word processing tools to become better writers. They use the spell and grammar checkers, as well as the embedded dictionary and thesaurus, to improve their word choices and sentence construction. Because editing with a computer is less laborious than editing with a pencil, students are becoming more adept at editing as they write; they are willing to read, and re-read, write, and re-write while their work is in progress.
- Provided with options for how to demonstrate their learning, students are increasingly choosing audio, video, and image-laden projects. Where appropriate, students are selecting spreadsheet projects to illustrate points best explained through organized data.
- Increasingly, teachers facilitate electronic chats and discussions among their students, and communication through e-mail and teacher Web sites has become an accepted standard.

Defining how we got from "there" to "here" is a bit like fitting together the pieces of a puzzle. Each seems to depend on at least one other to create the whole definition of our success. There is not one true starting piece nor final piece, but instead, when all of the critical parts come together, successful technology integration happens—and keeps happening!

Our technology integration initiative began as a pilot project with eight sixth grade teachers, four in each of our two middle school buildings. What we started with those eight teachers has served as the model that we have continued to use when bringing the rest of the teachers in our middle schools on board with technology integration. What follows is an explanation of the pieces that we have organized into a complete picture.

Equipment

Like it or not, most school technology initiatives begin with equipment. It is unfortunate that many also *end* there. In our case, we begin with the following equipment in Year One of a teacher's integration experience:

- A laptop computer for each teacher
- A video projector shared between two teachers

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We then add the following equipment in Year Two:

- One cart of laptops shared between two classrooms
- Ceiling-mounted classroom projector replacing the shared video projector

The technology integration success that we have experienced would not have been possible without *some* equipment, but the following four pieces of the puzzle are also integral to the complete picture.

Teacher Readiness

Notice that, for us, teacher access to a laptop computer and a video projector precedes student access to laptops. Transitioning from a desktop to a laptop computer is optional for teachers in our school district, and not surprisingly, most teachers opt for the laptop. Selecting that option, however, includes a three-year commitment to professional development around using the laptop as an instructional tool. Year One of that training is focused on using the laptop and the video projector. We have found that one year of personal laptop and video projector use gives even reluctant teachers confidence for the next stage: integrating with student laptops.

Ongoing Professional Development

We have established a required, released-time professional development program that spans three years, and provide additional optional opportunities for technology professional development throughout the school year and during the summer.

1 *Year One teachers* have a personal laptop and share a video projector with one other teacher. Their professional development focuses on *strategies for using the laptop and video projector as instructional tools.* We provide examples of how teachers can use a three-minute video segment for instruction, and demonstrate how a slideshow of images can act as the "hook" for a lesson. We demonstrate interactive Web sites that teachers can use as instructional tools with a group in a classroom equipped with a video projector. We share strategies for teaching note-taking with printed presentation slides, and for using animations in presentations for teaching the solution to a math problem. We demonstrate teacher tool Web sites such as rubric makers and online quiz generators, and talk about how teachers can use them to help differentiate instruction.

2 *Year Two teachers* have a personal laptop, a ceiling-mounted video projector, and access to a cart of laptops that are shared with one other classroom. Their professional development focuses on *strategies for using the Internet for information gathering that fosters higher-order thinking.* In preparation for this session, we ask teachers to read some online journal articles related to formulating good questions that stimulate higher-order learning. (We use articles from Jamie McKenzie's fno.org and questioning.org) We guide teachers through some activities designed to hone their questioning skills, and provide a list of URLs to direct teachers toward high-

quality Web sites that they can use in information-gathering projects. We provide teachers with a lesson design template to guide them toward developing student-centered projects that focus on why, which, and how questions.

Year Three teachers have the same equipment access they had in Year Two. In addition, they have access to shared resources such as digital video and still cameras. Their professional development focuses on *strategies for using multimedia tools for instruction and for student-centered, project-based learning.* Because we are largely a Macintosh environment, we build our instruction around iMovie, iTunes, and iPhoto. Teachers select at least one of the tools to work with, and we provide examples of instructional uses of the tools, as well as tips for managing multimedia projects in the classroom.

In all professional development sessions, we are careful to build in at least one and a half hours of time for teachers to begin to explore possible applications of their newly learned strategies, and to network with other teachers in the session. We have found that providing this "jump start" time is not only appreciated by teachers, but is also time well spent, as many teachers leave the session ready to implement a new idea the next day!

Pedagogy

By providing each teacher with as few as two full days of released-time professional development per year, we feel as if we have been able to get substantial return on our investment of time and dollars. We have found that just getting them started, and then establishing an expectation of applying integration strategies to their instruction, is all that most teachers need. In October or November, the district gives the instruction outlined above. During these sessions, we make extensive use of teacher leaders who have agreed to demonstrate examples of their own practice as technology integrators. This strategy is highly effective, and is always the object of many thanks from teachers who attend the sessions.

Between the October/November sessions and a second session scheduled for February, teachers are expected to apply their newly learned strategies in their own classrooms. A series of follow-up released-time days are scheduled in February; all teachers attend one of the February "sharing sessions," and come prepared to share a lesson, a strategy, or something from their recent classroom technology integration experience. More than anything else that we do, this "sharing session" concept has been most key. It essentially provides two things:

- motivation and an accountability check for teachers;
- an opportunity in a face-to-face environment to see and learn from what other teachers are doing as technology integrators.

Resources and Lessons Database

The final piece of our puzzle was created in direct response to teacher requests for a way to continue their sharing activities beyond the "sharing session." Specifically, teachers wanted a way to reflect on each other's work and to share documents they had created, so as to minimize reinvention. Thus, we created a shared database on our district's FileMaker server where teachers can provide information about a lesson, upload relevant documents, note relevant Web sites, and share tips about how best to manage the lesson in a classroom. The database is searchable by course name, grade level, unit name, or lesson creator name, so all teachers can retrieve strategies and documents from across disciplines and grade levels.

What has made the database especially used by teachers is the fact that they are given time during their "sharing session" to upload their first lesson and opportunity to browse and download others' lessons.

What started out as a pilot adventure into the great unknown of technology integration with laptop computers has developed into a system of successful technology integration for us. All of the pieces have fallen into place, and at this point, our process is becoming recursive in nature, with old successes building confidence in teachers to try new strategies and create new successes!

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