Managing Technology Resourcefully

Part I: Technology and Instruction

By Richard Weeks, RSBA

The transformative powers of digital technology to improve student learning and the resulting effect of that technology to make the business of education more cost-effective are two of the more exciting dynamics in schooling today. Before the current school year ends, new products and upgrades will be available to replace much of the technology that surrounds you.

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In the past few years, the Internet has created the biggest generation gap between educators and their students since the birth of rock and roll in the 1950s. Despite this newness, the task of *managing* modern technology is about two generations old. School superintendents, school business administrators, and others are responsible for overseeing considerable technology resources. For school business officials, the importance is underscored in ASBO International's Professional Standards, which identify information management as one of seven major skill sets in the profession.

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Approximately 80% of the appropriations in school budgets are spent directly on instruction for students. Many school business officials have job descriptions that commit their time to managing technology, including planning and supervising personnel, procuring goods and services, and handling the day-to-day user issues. With adequate financial resources, most districts have resident technologists. For others, the information technology "help desk" may be the one at which you are sitting as you read this article.

This, the first of two articles on managing technology, looks at instructional technology.

Instruction with Technology

In the early 1980s, a group of high school teachers at a high-performing suburban Boston school district convinced their superintendent and school board that two years of computer programming classes should be a prerequisite for graduation. The students had to demonstrate proficiency in writing code for the computer languages BASIC, COBOL, and FORTRAN.

For several years, the students at this school forwent traditional classes, such as foreign languages, fine arts, and literature, to meet this requirement. The teachers actually believed their students would have to write computer code to successfully operate the computers of the future.

By the mid-1980s, the start-up company Apple Inc. had reinvented technology, offering affordable personal computers with user-friendly software. Overnight, it swept away any need for consumers to learn computer languages to operate the expensive mainframe and minicomputers of the era.

All too often, school administrators are misdirected by the fleeting trends of new technology. Education historian Diane Ravitch wrote in *Left Back: A Century of Failed School Reforms* (2000, pp. 466–67, emphasis added): "Schools will not be rendered obsolete by new technologies because their role as learning institutions has become even more important than in the past. Technology can supplement schooling but not replace it; even the most advanced electronic technologies are incapable of turning their worlds of information into mature knowledge, *a form of intellectual magic that requires skilled and educated teachers*."

Research scientist Andrew Zucker recently stated (2008, p. 27, emphasis added): "Despite the existence of new media, people learn as they always have—through practice, direct instruction, projects, inquiry, hands-on experience, apprenticeships, positive and negative reinforcement, metaphors, images, life experience, and so forth. To merit widespread use, educational technology needs to meet a simple test: *Will it help schools succeed in their core mission—providing students with the skills, knowledge, and dispositions they need to be productive, responsible, well-informed citizens living in a democracy that is part of a small, 'flat' world*."

It is incumbent on classroom teachers to prepare themselves to teach their students. The responsibility for understanding the subject matter and methods of instruction, including the use of modern technology, rests squarely on their shoulders.

Many resources are available to help teachers prepare for this task. Their schedules allow them the flexibility to attend evening and weekend classes and workshops, and they have an expanded break during the summer. Most school districts provide teachers with professional development opportunities at no cost.

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School leaders must immerse themselves in their work with staff through hands-on observation and dialogue to ensure that the methods of instruction with technology are relevant. Many school districts have imposed computer literacy tests for instructional personnel, including demonstrations of their ability to do simple Internet searches, keystroke letters, send e-mails, and manage spreadsheets.

The broader framework for what occurs in our schools is established by school board–approved curriculum guidelines, individual state and federal statutes, and individualized education programs for students with special

needs. There are thousands of software products and Websites for teaching and learning, and there are also numerous digital technologies in addition to computers used in schools today.

Unfortunately, few credible studies exist to support the supposition that the use of technology has improved learning. "Educators can see technology is having an impact on learning. We just haven't been able to capture it very well with research," according to Margaret D. Roblyer, professor of education at the University of Tennessee at Chattanooga (Klein 2008).

The Internet and Online Learning

Internet-based programs are the backbone of "online learning"—an instructional medium quickly being embraced in America's schools. Whether sitting in a traditional classroom with their peers or sitting at home alone, students can access online courses through their Internet browser and move through lessons using their mouse and keyboard.

Assistive technology is a fast-growing field with new and improved techniques that are helping students learn more effectively.

But first things first. Managing the Internet in your district is like attempting to manage the rainbow. Because nobody is actually in charge of the Internet, you must ensure that your district has school board–adopted policies in place that pertain to Internet usage by staff and students. These policies should include guidelines that relate to the school district's mission and should state the schools' goals.

Four key questions frame the process of policy development, according to Charles Russo (2001):

- Are policies clearly stated?
- Do they address current legislation and statutory requirements?
- Are they local and community focused?
- Can administrators and staff effectively implement the adopted board policies?

Ask your school board to review and update the Internet usage policies every two years, paying special attention to staff and students' use of social-networking Websites. The 2000s may have ended teachers' rights to privacy. As Russo stated (2004, p. 36), "The challenge in formulating up-to-date computer-use policies is rooted in the fact that technology is several years ahead of the law and is likely to remain so for the foreseeable future."

Now, back to the actual online learning.

A typical course has three components: a "schedule" where assignments are posted; a "course room" where students type in homework, have interactive dialogue, and receive real-time assessments of their progress with teachers and tutors; and a "media room," where related digital documents, including videos and music, are stored. The various online learning vendors also offer other supplementary materials, including information that markets their own products and services.

Online learning vendors serve hundreds of American high schools that do not have the resources to offer advanced-placement courses. The other largest market for online learning vendors is subject-matter courses for students who attend small, rural public schools that cannot afford to hire enough teachers to offer a variety of courses.

Harvard Business School professor and futurist Clayton M. Christensen predicts that 25% of high school courses will be taught online by 2014—50% by 2019 (Christiansen, Horn, and Johnson 2008). Throughout the next decade, online learning vendors will successfully gain a foothold in the daily lives of America's schools, due, in part, to a lack of qualified teachers and the sharply reduced costs of online instruction, he says.

Christensen's forecasts are based on complex analytical models used previously to explain the demise of retail and service industry businesses. Online learning vendors are already well established, having captured markets in the home-schooling and charter school movements in the late 1990s. He expects these vendors to improve their products by offering instruction that is more student-centered, in part by breaking courses into modules that can be recombined specifically for each student.

Christensen states, "It is not my aim to frighten school leaders, but to urge them to treat the approaching changes as an opportunity rather than a threat."

Special-Needs Technology

Zucker (2008, p. 100) contends that "computers provide students who have disabilities with greater independence, immediate feedback, and a patient and non-threatening environment."

School business administrators are required by decades-old state and federal statutes, primarily the Individuals with Disabilities Education Act, and numerous court cases, specifically the Supreme Court's decision in *Board of Education v. Rowley* (1982), to ensure that school boards provide each qualified child with a free appropriate public education in the least restrictive environment. This may include a specially designed individualized education program (IEP) or related services to meet the unique needs of each child with disabilities. Included in many IEPs are specific requirements regarding "assistive technology," or devices and

services that help a student with a disability maintain or improve a functional capability to learn.

Assistive technology is a fast-growing field with new and improved techniques that are helping students learn more effectively. Consider the applications for a student who, because of a physical disability, needs help writing. Some devices are uniquely low-tech, such as pencils with different grips, slant boards to change the angle of the writing surface, and assorted types of paper with wider, darker, or raised lines. High-tech devices include computers with specialized programs that provide auditory feedback, changes in color contrast, or word completion with just a few keystrokes. Keyboards are available with larger or smaller keys, color-coded keys, and a function that allows writers to type whole words rather than individual letters.

On the cutting-edge of building new assistive technologies is Maysam Ghovanloo, an engineer at the Georgia Institute of Technology. Ghovanloo invented what he calls the "Tongue Drive," a collection of magnets, sensors, and wireless electronic equipment that allows disabled users to make theirs wishes known to an electronic wheelchair or a computer by moving their tongues. For quadriplegics, the tongue serves as a "joystick" that strikes the teeth as the keyboard.

Educators fund assistive technology as best they can, knowing that their efforts may pave the way for students to do amazing things now and in the future.

Next month we'll look at technology disparity, operations, and supervision.

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