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Integration Issues for Twenty-First-Century Teachers

Desktop computers began to appear in classrooms 25 years ago. Early adopters enthusiastically proclaimed that this technology would radically change educational practice. Today, there are schools where things are not “business as usual.” However, this is the exception rather than the rule. Why are educators struggling with how to use technology in ways that actually do impact student performance? This chapter discusses critical factors in the quest to bring our schools into the twenty-first century, technologically speaking.

“I don’t see that using technology has made any difference in how well my students perform.” This comment was made recently during a workshop I was conducting for technology planning teams. Heads were nodding in agreement all around the room. It seemed to be one of those teachable moments, so we stopped what we were doing to discuss this

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comment. I asked for examples of the kinds of technology-supported instruction the participants offered. Several responded:

- “After they finish their other work, I let students play education games on the computer.”
- “My students made a five-slide PowerPoint show for their science fair project using a template I made for them.”
- “Students read a book and then take a quiz online.”
- “We go to the computer lab and I let them look for Web sites; but usually by the time they find something, our lab time is over.”

These comments are typical of the ways many teachers bring technology to their students. Nothing is inherently wrong with any of these activities as a starting point; however, in far too many instances, this is as far as a teacher is willing to go. If you consider each example carefully, you can see that the teacher has taken something s/he would have done anyway and simply automated it. For example, supplemental educational games have been used as time-fillers for decades. Now, instead of playing a board game, students play online. Science fair projects have moved from poster boards to PowerPoint slides, but the information is still presented in a linear fashion. Reading quizzes are taken online rather than on paper, but the comprehension-level questions haven't changed. Students who once might have spent their library time trying to find just the right print material now do the same thing using a search engine instead. The bottom line is that none of these activities is enhanced or made better through the use of technology. Doing the same old thing a little faster or a little more efficiently isn't going to change academic outcomes.

NEW DEMANDS FOR EDUCATION

If we were still preparing students to function in a society where basic content literacy, getting to work on time, and following directions were usually enough to ensure successful adult lives, we might be able to settle for automation of instructional tasks. But the demands that will be placed on our students when they enter the workplace are much greater. Along with basic academic knowledge, our students must now be prepared to become lifelong learners who can manage large quantities of information, solve problems, think critically, work in teams, and use technology effectively. Technology tools can help teachers design activities that prepare students to deal with expanded workplace demands, but only if those teachers are willing to become more advanced technology users themselves and implement new teaching strategies. *Lesson Learned: Factors Influencing the Effective Use of Technology for Teaching and Learning*, a report published by the SouthEast Initiatives Regional Technology in

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Education Consortium (SEIR ♦ TEC), states, “Effective use of technology requires changes in teaching; in turn, the adoption of a new teaching strategy can be a catalyst for technology integration.”

The Apple Classrooms of Tomorrow research, published in the mid-1990s and available at www.apple.com/education/k12/leadership/acot/library.html, found that teachers go through several stages of use before they are fully ready to integrate the use of technology as a teaching tool. The activities described above all fall in the early stages of use. Teachers need specific professional development to move into the later stages, where increased student performance can be attributed to technology use. However, even with this training, additional factors can impede teachers in making effective use of technology in their classrooms. Lack of follow-up after training and continuing support thereafter are issues; so is the fact that most teachers view technology quite differently than their students view it.

DIGITAL IMMIGRANTS AND DIGITAL NATIVES

What’s the Difference?

dig-i-tal im-mi-grant *n*: A technology user, usually over the age of 30, who was not born into the digital world. Digital immigrants use technology, but often attempt to bring this use into a framework they finds comfort in; for example, they might print material accessed on the Internet before reading it.

dig-i-tal na-tive *n*: A technology user under the age of 30, who was born into the digital world and is accustomed to receiving information very quickly. Digital natives are able to multitask, and they usually prefer to see graphics before text. They tend to be more comfortable working in a hyperlinked environment and when they receive frequent rewards or feedback.

One of the impediments to effective technology integration is the fact that most of the teachers in classrooms today did not grow up as technology users themselves. In 2001, consultant and author Marc Prensky coined the terms *digital immigrant* and *digital native*. If you are more than 30 years old, or had little opportunity to use technologies such as personal computers during your own childhood, you are a digital immigrant. You probably remember when cell phones were an oddity, when computer diskettes were 5¼” floppies, and when VHS tapes were high-end video technology.

In his article “Digital Natives, Digital Immigrants,” Prensky writes that learning to use technology as an adult is akin to learning how to speak a new language at the same age. Although it’s possible to become proficient

in a new language after childhood, most adult learners will speak with an accent. The same is true with technology use. Digital immigrants can achieve proficiency with new technologies; however, most attempt to use these new tools within the framework of their own previous learning. This approach leads to accomplishing familiar tasks faster, but ignores those capabilities that would enable them to approach and complete these tasks in new ways. For example, a digital immigrant might use a handheld device to take notes at a meeting, but not know how to beam the notes to others at the end of the meeting, falling back on printing and distributing paper copies later. This behavior is the digital immigrant's "accent," and Prensky argues that it is this accent that causes educators, most of whom are still digital immigrants, to struggle with technology integration in the classroom.

Today's students are digital natives. They come to us with very different technology-related experiences, attitudes, and expectations than we had growing up because they were born into the digital age; they don't know anything different. Many of them have never seen a telephone with a dial, a cash register without scanning capability, or a manual adding machine. Recent surveys show that these children spend more time using the Internet than they do watching television, and that the age group experiencing the greatest increase in time spent online consists of two- to five-year-olds! Respondents also report that the place where they have the least opportunity to use technology is at school. In some cases this may be due in part to limited access; however, even in well-equipped schools technology use is often limited.

WHEN DIGITAL IMMIGRANTS TEACH DIGITAL NATIVES

Even when students have adequate access to technology tools, teachers often insist that they draft an essay by hand before allowing them to use a word processor. Or students sit down at Internet-connected computers and then are forbidden to use the systems during the bulk of the lesson in an effort to ensure that they are on task. This tendency of digital immigrants to restrict students' use of technology, even when access is not an issue, is a major barrier to effective integration of technology in classrooms.

Teachers' common reaction to multitasking is a prime example. Digital immigrants tend to be fairly linear in their approach to work and prefer to complete one task before moving on to the next. Digital natives are accustomed to doing several things all at once, such as watching television, reviewing a Web site, taking notes, and instant-messaging friends. Based upon their own style of learning, digital immigrants often assume that multitasking students can't possibly be paying attention, and so their digital-immigrant teachers try to change this behavior. As a result, situations

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arise such as at one school where students were provided wireless mobile computing devices only to have the teachers prohibit use of the devices during most of the school day!

Technology use is no longer an optional part of life outside the classroom and should not be optional inside the classroom either. Students in the twenty-first century need daily equitable access to technology tools in their school environment, just as they have access to other staples for learning. And for students to make best use of the technology, teachers must be willing to think beyond their own experiences as students and to realize that instructional strategies designed 100 years ago to teach students to be good assembly-line workers are not appropriate in today's classrooms.

THINKING OUTSIDE OF THE DIGITAL IMMIGRANT'S BOX

While we may not be able to anticipate everything our students will need to know in the future, we can teach them skills that will serve them well now and then. Teachers can take several steps to compensate for their technology accent. Below are some suggestions.

Learn everything you can about twenty-first-century skills. A number of Web sites address twenty-first-century skills and their impact on education. The Partnership for 21st Century Skills (www.21stcenturyskills.org) and the North Central Regional Educational Laboratory's enGauge (www.ncrel.org/engauge) Web sites—which feature reports, resources, and tools for teachers—are two good places to start.

Don't settle for basic personal proficiency. Become a lifelong learner yourself. Basic skills will help you automate; learning more advanced technology skills will help you see potential you didn't know existed. For example, simple PowerPoint slides are equivalent to overhead transparencies. More advanced features including hyperlinks, movies, or online collaboration capabilities open all sorts of possibilities for more effective classroom use of this program.

Review sample lessons for ideas. It's often helpful to look at examples of how other teachers are incorporating technology use into classroom instruction that supports twenty-first-century learning skills. Some Web sites that feature lessons and projects of this type include Marco Polo Teacher Resources (www.marcopolo-education.org/teacher/teacher_index.aspx); ThinkQuest (www.thinkquest.org/), and the Handbook of Engaged Learning Projects (www-ed.fnal.gov/help/index.html).

Turn to digital natives for ideas. If you are uncomfortable about asking your own students to suggest new or better ways to design classroom projects, approach other digital natives you know. Talk to your own children, nieces and nephews, or neighbors. Ask them to describe projects that would be interesting and relevant to them and how technology could be used to enhance the learning experience from their point of view. Not only will they be happy to share their thoughts, but many will also be willing to show you how to use the technologies they describe.

Let's return to the examples given at the beginning of this chapter. How could these activities be expanded to enhance student learning? Instead of allowing students to play games, teach them to use tools such as Filamentality (<http://www.filamentality.com/wired/fil/index.html>) or TrackStar (<http://trackstar.4teachers.org/trackstar/>) to create and share their own activities based on academic content. Both sites allow teachers to design activities in which students respond to prompts or discussion questions. Forgo the comprehension level questions found in many online book quizzes and create your own using questions at higher levels of Bloom's taxonomy. Use the advanced capabilities of PowerPoint or another presentation program to encourage students to demonstrate connections in what they learned during their science fair project rather than as a basic reporting tool. And finally, to help students maximize the effectiveness of their use of online time, teach critical thinking skills for effective Internet searches as well as strategies for evaluating the quality of Web sites.

A major shift in thinking takes time. Begin slowly and build your repertoire of new skills and strategies. The problem doesn't lie in incremental change; the problem lies in little or no change at all.

ADDITIONAL RESOURCES

In addition to the resources cited above, you can learn more by accessing these online resources:

Apple Computer, Inc., Digital Tools for Digital Kids: <http://www.apple.com/education/digitalkids/>. This site takes a look at who digital kids are and how they learn. Along with the information presented on each page, there are links to video commentary and articles about twenty-first-century learners.

"Digital Natives, Digital Immigrants" at Marc Prensky's Web site: <http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf> (2001). Marc Prensky's original article in which he describes digital immigrants and their impact on teaching and learning.

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National Institute for Literacy and the Office of Vocational and Adult Education, Division of Adult Education and Literacy: <http://worklink.coe.utk.edu/>. Take a look at the needs of today's learners through the lens of adult education using links to research, news, and a Learning Activities Bank.

21st Century Literacies: <http://www.filamentality.com/wired/21stcent/>. Created to support the SBC/UCLA Initiatives for 21st Century Literacies project, this site offers a free, Web-based video called *e-literate* (<http://www.kn.pacbell.com/media/ucla.html>). There are also sample lesson plans for teaching *information*, *media*, *multicultural*, and *visual* literacy skills.

QUESTIONS FOR DISCUSSION

1. What do you see as the critical issue in this chapter?
2. What are the differences between *digital immigrants* and *digital natives*?
3. Describe an example of a "digital accent" from your own experience or observation.
4. The chapter begins with several examples of classroom activities that are commonly automated today. What examples of automation have you seen in your school/district/region?
5. How do the expanded activities described at the end of the chapter differ from the earlier examples?
6. How might the information in this chapter impact technology use in your school/district/region? List your ideas.
7. What steps will you take to think outside the digital box?