

172 Chapter 6 • Curriculum Development and the New Technologies

PDA's, digital cameras, and social outlets such as blogs, social networks, wikis, and email. There is no shortage of technologies, and the apps just keep coming. The ability to use these tools to do things we haven't been able to do is the challenge. It won't be an easy task to make the leap from the 19th to the 21st century. Wiles and Lundt, in their decade-old concept book *Leaving School, Finding Education* (2004, pp. 130–131) provide a list of tasks necessary for converting schools to the 21st century:

- Design new avenues for learning and communicating.
- Deemphasize standardization of the curriculum and testing.
- Acknowledge human differences and capabilities.
- Envision and construct new types of facilities for learning.
- Provide massive startup capital for technologies.
- Invest in and allocate resources for widespread training of teachers.
- Recruit and reward a new kind of learning leader.
- Allow students and teachers the freedom to network.
- Value knowledge for its application, rather than acquisition.

WHAT OUR SCHOOLS ARE ACTUALLY DOING

Some schools in the United States are moving forward in exciting ways to join other institutions in the new and technological 21st century. Varying studies indicate some common uses of technology in schools where the district has provided accessible equipment for students. Among the uses regularly reported are the following:

- Using email to communicate with other classes
- Using email to communicate with an expert or significant person
- Gathering data from the Internet for a class project
- Finding and using websites to enhance a subject being studied
- Monitoring an online expedition, project, or trip
- Reading works written by other students
- Reading websites for information related to current events
- Blogging and networking
- Taking a virtual field trip
- Joining an online project

Note that most of these activities are not interactive. Most resemble traditional schools, with the student as a passive recipient of some source of knowledge. The Internet, as a learning tool, is ideally suited to interactive learning such as the SchoolWorld Internet Education site (<http://www.schoolworld.com/>) in Australia. At this site, students and teachers can participate in interactive projects with students in schools throughout the world. Sample projects in 2001 included the Classroom Pet Exchange, Friends and Flags project, Great Debate project, Poets Corner, Postcard Geography, and World Weather Watch Project.

The more general condition for schools in the United States can be characterized thusly:

- A 2005 survey by *eSchool News Online* found that 89% of all student computer use in schools is in computer labs, indicating that creativity in using computers in school is not widespread ("Academic Impact of Technology," 2005).

- Approximately 10% of schools in the United States now have a computer for each child, and these are most likely to be found in the elementary schools rather than in the high schools. One-to-one programs were achieved by Maine in 2002 and Hawaii in 2012.
- In 2003, 86% of teachers surveyed by *eSchool* felt that computers increased student performance "somewhat or a great deal." By 2005, only 2 years later, that belief was held by only 61% of teachers surveyed. Only 58% of teachers surveyed in 2005 felt computers improved student performance on standardized tests. The organization concluded, "[we are still at the tip of the iceberg with respect to technology use in schools. . . . We need to do much better in helping teachers see what's possible" ("Academic Impact," 2005). Increasingly, it seems, classroom teachers do not see a role for computers in the classroom.
- Teachers report a lack of staff development opportunities to learn more about technology. A 2004 survey by *eSchool News* found that 31% of all teachers received no training during the past year. Only 11% of all teachers reported receiving 16 or more hours of training in that year ("Tracking U.S. Trends," 2004).
- A 2012 report by the Educational Testing Service, "The Status of Technology in U.S. Schools," noted that less than 20% of schools had access to satellite technology.
- According to Market Data Retrieval (MDR), technology spending for schools declined 24% from the 2001–2002 school year to the 2002–2003 school year. Hardware spending dropped a whopping 28% during this period ("Teachers' Tech Use," 2005).
- The National Center for Educational Statistics 2012 reported a 3:1 student-computer ratio when computers had Internet access.

Perhaps an even bigger problem than the number of computers is the lack of bandwidth in most schools. Bandwidth allows greater information flow such as movies and figures, as opposed to text only. Schools that "pulled wires" in the late 1980s and 1990s are now facing obsolescence in their delivery of data to computers. Promising for schools throughout the world, however, are new wireless systems (wifi), and most recently, Worldwide Interoperability for Microwave Access (WiMAX), which has a range of up to 40 miles. Such systems would allow districts to deliver curriculum from a central vantage point without wires, towers, or relay systems ("Argentine School," 2005).

Below are listed some of the curriculum issues concerning technologies in school that simply must be addressed before wide-scale implementation can be achieved.

- Access of schools to technology and the fairness of access among students
- How technology is being used in schools
- The effectiveness of educational technology
- Issues involved in connecting teachers and technology
- The quality of educational software
- The cost of deploying technology in our schools

PROJECTIONS

David Thornburg states quite clearly the challenge facing educators. A knowledge explosion has occurred, scattering the notion of curriculum development organized around subject matter. There has also been a technological fusion, and the power of that