Chapter 3.13
Digital Literacy and the Use of Wireless Portable Computers, Planners, and Cell Phones for K–12 Education

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ABSTRACT

Wireless technologies have transformed learning, teaching, and leading in K-12 schools. Because of their speed and portability, laptops, planners, personal digital assistants (PDAs), and cellular telephones are major components of digital literacy. In this chapter, current international trends in the educational uses of portable technologies will be discussed. The implications of newer hardware specifications and educational software applications for laptop computers will be analyzed, including inequities in student access to the handhelds. Next, the role of planners and PDAs as more recent instructional and managerial tools will be evaluated. This study also includes a review of the current debate over whether or not cell phones, especially those with photographic capabilities, should be allowed to be used by students in schools. Finally, potential uses of wireless technologies for interactive learning and collaborative leadership on a global basis will be investigated.

OVERVIEW OF DIGITAL LITERACY AND WIRELESS TECHNOLOGIES

Language acquisition and mathematics skills are the core elements of traditional views of literacy. In the new millennium, technology has become another basic skill for K-12 students across the globe. Wilhelm wrote about the focus of a 2002 Berlin conference on technology literacy in the 21st century and paraphrased the words of German Chancellor Gerhard Schroeder:

Shroeder boldly asserted that digital literacy should now take its place as a basic literacy alongside reading, writing, and arithmetic, rec-

ognizing the pivotal role of information and communication technologies in underwriting lifelong learning, economic productivity, and democratic engagement. (p. 297)

Not only in Europe, but also in Asia and the United States has there been a drastic paradigm shift towards the integration of new technologies in learning. Other nations are beginning to explore the digital advantage shared by the more technologically advanced countries.

The widespread use of wireless computers and handhelds has already had a positive impact on many schools throughout the world. Laptops and handhelds are efficient tools for individualizing instruction. Teachers and students are using them to maximize learning, especially in mathematics, language, and science instruction. Educational administrators are finding wireless handhelds to be very effective in the areas of teacher supervision, budgeting, and school safety.

What is Wireless Technology?

Wireless communication networks date back millennia. In the Roman Empire, for example, geese were used to alarm residents of fires. Napoleon implemented the semaphone signals on poles, and during the Battle of Waterloo, the Rothschilds sent carrier pigeons to London with word that Wellington was going into battle. Congolese have traditionally used tam-tam drums to communicate complex signals to other tribes in the central Congo. In the 1970s the United States established wireless satellite data links to Europe. By the late 1990s, technologically advanced countries were using wired base stations for laptops, cell phones, and personal digital assistants (PDAs).

Today, there are two primary types of wireless technology: RF and Bluetooth. Radio frequency (RF) is used as another term for 802.22a and b, which need a wired base station. Wireless does not work in RF unless there is a wireless access point in the near area. If, for example, a portable

computer has a wireless card installed, it can be connected to the Internet without having to have an ethernet cable. Wireless is for a short period of time, then a power source is needed for charging. Some school campuses use 802.11b Wi-Fi wireless LAN for wireless laptops.

With the second type of wireless technology, "Bluetooth," adapters and USB ports are used. Popularized since 2000, the primary uses of Bluetooth are for PDAs and combination cell phone/planners, the Palm Zire 71, printers, keyboards and a mouse, and headsets. There is a direct beam between two pieces of hardware, such as between two Palm Zire 71s, in which a photo can be taken and then transmitted from one Palm and received by the other.

Honan (2004) compares these RF and Bluetooth configurations:

Wireless products fall into two categories, Bluetooth and 27MHZ radio frequency (RF). Both have advantages and disadvantages. RF devices are less expensive, more widely available, and far more compatible with older Macs than their Bluetooth counterparts. Bluetooth devices have a much longer range, can transmit encrypted signals, and aren't prone to interference from other devices operating on the same frequency. Furthermore, RF products rely on wired base stations that plug into your Mac's USB port, while Bluetooth products can use either your Mac's built-in Bluetooth receiver or a comparatively small USB adapter that connects directly to the port without any wires. We prefer Bluetooth technology for wireless input devices. (p. 28)

Although Bluetooth needs fewer configurations, it tends to be slower and cover shorter distances than RF.

There are some potential difficulties with using wireless technologies. In Oak Park, Illinois, three sets of parents of elementary students are suing the district to have the wireless computer networks removed because "a bit of Internet research

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