Chapter XV
Technology as a Classroom Tool: Learning with Laptop Computers

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ABSTRACT

Laptops and other ubiquitous devices in the classroom provide powerful opportunities to integrate technology as a classroom tool that supports student learning. However, effectively using laptops to achieve learning outcomes can be a daunting task for teachers and students—at least initially. This chapter examines the research on one-to-one computers and outlines learning outcomes that can be achieved when technology is used as a classroom tool. Sample lesson plans are provided to illustrate specific learning outcomes and highlight technology literacy issues, for both teachers and students participating in wireless classrooms. The integration of laptop computers into the curriculum can create collaborative, student-centered learning environments and increase student and teacher technology literacy.

INTRODUCTION

"Whether it's called a laptop program, one-to-one computing, ubiquitous computing, or 24/7 access, schools and school districts around the country are exploring the benefits and challenges of what happens when every student has a laptop computer" (Rockman, 2003, p. 24). One of the challenges of integrating laptop computers as classroom tools is the impact on

the technology literacy of both teachers and students. As technology is merged with the curriculum, the definition of literacy evolves to new levels.

This chapter examines the research on one-to-one computers in the classroom, describes learning outcomes that can be achieved when technology is used as a classroom tool, and outlines technology literacy for students and teachers in a laptop environment. Sample lesson plans with specific learning outcomes are included to provide authentic examples of using technology as classroom tools.

TECHNOLOGY AS A CLASSROOM TOOL

Taylor (1980) categorized the use of computers in classrooms as tools, tutors, or tutees. In the 1980s, very few classrooms had computers for student use. A common configuration was to have a computer lab where students could work with computers once or twice a week as *tutors* (such as integrated learning systems) and *tutees* ("teaching" the computer by writing programs).

In the past 10 years, the number of classrooms with computers and Internet access has increased dramatically—due to a decrease in the price of computers, the E-rate program, and the proliferation of technology in our society. "In fall 2001, 99 percent of public schools in the United States had access to the Internet. When NCES first started estimating Internet access in schools in 1994, 35 percent of public schools had access" (Kleiner & Farris, 2002, p. 3). Although Taylor's categories are still useful today, the emphasis in many schools is shifting towards using computers as classroom *tools*.

As a tool, the computer can be used in classrooms to save time, access information, communicate effectively, and engage students in critical thinking. As Jonassen stated: "Carpenters use their tools to build things; the tools do not control the carpenter. Similarly, computers should be used as tools for helping learners build knowledge; they should not control the learner" (1996, p. 4). When using technology as a tool, students can focus their energies on higher-order tasks, and teachers can focus on facilitating learning.

STUDIES RELATED TO LAPTOP COMPUTERS

For technology to be an effective classroom tool, it must be available when needed—just as other classroom tools (such as pencils and paper) are accessible within a classroom. Providing laptop computers for students in a classroom is one way to address this issue, and laptops and other wireless technologies are being purchased by more and more school districts. The Quality Education Data report that was published in 2004 stated that during the 2004-2005 school year, "about half of the districts in the country will have portable wireless labs on carts (or COWs) to bring technology directly to students in their classrooms" (Quality Education Data, 2004, p. 1). This report was based on 493 surveys that were submitted by randomly selected public schools in the Quality Education Data's National Education Database (a registry of over 4.3 million educators). Using computers as a classroom tool has finally become a feasible option for many schools.

In the past few years, several large-scale implementations of laptop computers (such as Microsoft's Anytime Anywhere Learning Program and Maine's Learning Technology Endowment) have taken place (Lemke & Martin, 2003; Rockman et al., 2000). In addition, smaller laptop initiatives can be seen in schools and districts throughout the world.