Chapter 6
Employing Technology to Create Authentic Learning Environments

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ABSTRACT
The increased access to technologies in schools has opened avenues to explore non-traditional styles of teaching and learning. Educational theorists and researchers have long been calling for learner-centered instruction that situates learners in activities that allow them to explore concepts and construct understanding. However, as constructivist theorists and researchers continue to show the benefits of situating learning in meaningful tasks, many barriers still prevent the use of technology-enhanced authentic activities in classrooms (Ertmer, 2005; Shaw, 2003). This chapter aims to analyze the underlying theories of authentic learning and propose methods to support classroom teachers with the design, implementation and assessment of authentic activities.

TECHNOLOGY IN SCHOOLS
Access to technologies in K-12 schools continues to increase. Each year, more money is spent on hardware, software programs and technology-related infrastructure. These vast amounts of money are being invested on educational technologies with the expectation that both teaching and student learning will change for the better. While research indicates that access to technology helps teachers reconsider how their instruction can be more student-centered (Ringstaff, Yokam, & Marsh, 1995), most technology is integrated in teacher-centered, didactic ways (Ertmer, 2005; Wenglinsky, 1999; Mann, 1999). Becker and Ravitz (2001) surveyed secondary teachers and found that less than 25 percent of them were using computers on a weekly basis to enhance instruction. In most cases the technology is used in drill and practice settings, rather than promoting process or higher-order thinking skills (Becker, 2001; Shaw, 2003).

Simultaneous with the increased access to educational technologies, education reforms have called for a paradigm shift towards more learner-centered,
constructivist-oriented learning environments (Bransford, Brown, & Cocking, 2000; McCombs & Whisler, 1997; Polly, 2008). According to McCombs & Whisler (1997; McCombs, 2003) in learner-centered environments, students:

- learn concepts by completing relevant tasks
- have some ownership of how they learn or how they demonstrate their understanding
- use appropriate resources, including technology, to support learning
- are facilitated by teachers who model and scaffold students’ work
- make connections between concepts and authentic situations

In this chapter I use the idea of anchored instruction (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990) to explicate the idea of using technology to connect concepts to authentic situations. An explanation of anchored instruction and authentic learning environments is followed with examples from K-12 schools. Lastly, implications for anchored instruction are discussed.

**Anchored Instruction**

The promise of anchored instruction, called for teachers to leverage technologies in ways to anchor learning in authentic environments. Bransford et al. (1990) contended that video discs and other technologies can be employed to anchor instruction in authentic tasks. Hannafin (1992) advocated using electronic tools and resources in open-ended learning environments (OELEs) to allow students to investigate real-life problems. Bransford and his colleagues in the Cognition and Technology Group at Vanderbilt (CTGV) (1992, 1997) provided a significant bridge from theory to practice with the Jasper series, a set of videodiscs that anchors mathematical problem solving in authentic narratives. Students watched the videodisc, then identified and solve problems that were embedded in the story. The Jasper series was the first of many technology-rich activities that attempt to situate learning in authentic contexts. CTGV’s endeavor to promote authenticity via technology has been promoted by other researchers (see Griesser, 2001; Herrington & Oliver, 1999; Shyu, 2000).

Those studies continue to support the effectiveness of student learning in technology-enhanced authentic learning environments (CTGV, 1992; Griesser, 2001; Shyu, 2000). Such an onslaught of research, however, begs the questions: what theories are underpinning the notion of authentic activities, and if authentic learning is such an effective method of instruction, why isn’t everyone using it?

**THEORIES OF AUTHENTICITY**

Anchored instruction builds off of the concept of authentic learning environments. The term authenticity has become commonplace in education, yet its definition remains obscure and undefined (Barab, Squire, & Dueber, 2000). Authentic learning environments, traditionally, describe structured activities that have meaningful context (Radinsky et al., 1998). The term “meaningful context”, however, is not the same for all people. For example, while investigating the migrating patterns of buffalo may be authentic for children in the midwest, that activity lacks meaning for students who live in a fishing village on the coast of the Atlantic Ocean. Authenticity lies in the eyes of the beholder, since an experience is authentic if and only if the learner can derive meaning from the experience (Barab & Duffy, 2000).

Authentic learning is akin to Dewey’s (1910/1978)’s notion of learning through experience, as well as Vygotsky’s theory of social learning (1987). Dewey cited the importance of learning through various experiences in life that the learner can participate in. Vygotsky (1987), meanwhile, contends that schooling should introduce learners into various communities of prac-