Chapter 36

Challenge-Based Learning Using iPad Technology in the Middle School

Christie Bledsoe
University of Mary Hardin-Baylor, USA

Jodi Pilgrim
University of Mary Hardin-Baylor, USA

ABSTRACT

Instructional models such as Challenge-Based Learning (CBL) reflect changes in traditional methods of teaching. CBL, developed by Apple, promotes problem-based learning, where collaboration and hands-on learning are key elements in the process (Larmer, Ross, & Mergendoller, 2009). Today's learners must develop information literacy and media literacy skills to communicate by way of 21ˢᵗ century tools, and new instructional models reflect these changes. The integration of technology in the classroom has affected education models in elementary and secondary schools across the nation. This chapter presents a mixed-methods study of a middle school involved in a one-to-one iPad initiative. In order to promote student-centered instruction through the use of technology, the middle school adopted a CBL model of instruction. This examination of teachers' concerns with pedagogy and technology depicts readiness for integration and implications of new innovations. The process of change and technology integration is addressed in this chapter.

INTRODUCTION

Technology spending in United States K-12 schools averages four hundred dollars yearly per student (Johnson, 2012). Yet, research indicates that technology is not effectively integrated into the curriculum (Bannister & Vanatta, 2006). Some teachers experience uneasiness with technology and avoid its use in regular instruction. In addition, many skilled teachers do not include technology in daily lessons (New Media Consortium Horizon Report, 2010). The National Education Technology Plan, *Transforming American Education: Learning Powered by Technology*, called for increased practical technology use in

the classroom in order to enhance student learning, adopt effective practices, and use data and information for continuous improvement (U.S. Dept. of Education, 2010). Educators in many school districts are addressing this goal through the adoption of one-to-one technology initiatives.

The definition of one-to-one (1:1) typically refers to a school that provides a take-home laptop computer or tablet for every student within some grade span of the school system (Sauers & McLeod, 2012). The issued device supports student learning in the classroom and at home. According to the New Media Consortium (NMC) Horizon Report (New Media Consortium, 2012), mobile apps and tablet computing are major contenders to change the face of classroom learning. More than 1,000 1:1 projects exist in the United States involving Apple devices in which each student had access to a laptop or iPad (Apple Events, 2012). However, as Bill Gates stated, "Just giving people devices has a really horrible track record" (Gates, 2012, para. 8). This chapter describes one district's iPad initiative and an intentional decision to change modes of instruction within a middle school so that technology tools were used to promote student-centered instruction. District leaders recognized a need for an instructional model to enhance teaching and learning in conjunction with the iPad initiative, and they adopted a CBL instructional model, which emphasized 21st century skills. The rationale supported learning opportunities in which student engagement and student interaction with the core curriculum promoted exploration of real-world problems and meaningful solutions (Belton Independent School District, 2012).

The presence of technology in schools will only increase, and the changing instructional models will continue to impact education. How is the infiltration of technology impacting pedagogy? How are students and teachers handling change that occurs with 1:1 initiatives? The objectives of this chapter are to show how instructional models and 1:1 technology initiatives affect classroom practice. With technology initiatives and standards as the driving force for pedagogical change, this chapter begins with a rationale for varied models of instruction. A review of 1:1 programs and contemporary models of education follows, with an emphasis on student-centered instruction as a way to enhance 21st century learning. Finally, a study involving CBL and a 1:1 iPad initiative in a middle school highlights topics for educators to consider when preparing for learning in technology-centered environments.

BACKGROUND

Traditionally, the American education system consisted of classroom learning with the teacher delivering content and a textbook as the primary source of information. Technology in the classroom has already changed instruction, and its impact will increase as daily life and workplace skills require individuals to be more literate in the use and application of technology. Many students access technology on a daily basis via home and mobile devices. A relevant education will include acquiring technology skills. Daily life is inundated with technology through social and news media. However, to utilize technology effectively in an academic manner, today's learners must develop information literacy and media literacy skills to communicate by way of 21st century tools.

According to The International Society for Technology in Education (ITSE), "simply being able to use technology is no longer enough. Today's students need to be able to use technology to analyze, learn, and explore. Digital age skills are vital for preparing students to work, live, and contribute to the social and civic fabric of their communities" (ITSE, 2012, para. 2). ITSE developed the National Educational Technology Standards (NETS) for student success in a digital age. The standards include skills related to creativity and innovation; communication and collaboration; research and information fluency; criti-

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