Chapter 4

Guiding Framework and Principles for Technology Integration:
What Are the Key Questions?

Minchi C. Kim
Purdue University, USA

ABSTRACT

Promoting student utilization of technology has been a challenging and persistent theme in education for the past twenty years. Many teachers find it difficult to interpret and transform their daily routines to incorporate new pedagogies to promote such skills. Given the emergence of new technologies including social network, Web 2.0, simulations and games, and pedagogical frameworks to support learning and teaching with technologies, teachers are expected to use technology not only as an assistive tool to accomplish certain objectives, but also as a well-coordinated stage where students can learn more meaningfully and authentically. The purpose of this chapter is to discuss definitions, frameworks, and examples of technology integration and to elaborate on four key principles of technology integration: authenticity, collaboration, inquiry, and scaffolding.

WHAT IS TECHNOLOGY INTEGRATION?

Promoting student utilization of technology has been a challenging and persistent theme in education for the past twenty years. The National Educational Technology Standards for Students (NETS-S) emphasize the need to prepare students to be able to "learn effectively and live productively in an increasingly digital world" (International Society for Technology in Education, 2008). They describe six areas where students can benefit from utilizing technologies: (1) creativity and innovation; (2) communication and collaboration; (3) research and information fluency; (4) critical thinking, problem solving, and decision making;

(5) digital citizenship; and (6) technology operations and concepts.

Many teachers find it difficult, however, to interpret and transform their daily routines to incorporate new pedagogies to promote such skills.. Given the emergence of new technologies, including social networking sites, Web 2.0, simulations and games, and pedagogical frameworks to support learning and teaching with technologies, teachers are expected to use technology not only as an assistive tool to accomplish certain objectives, but also as a well-coordinated stage where students can learn more meaningfully and authentically (Ertmer, 1999; Salomon & Perkins, 1996). It is unclear what support teachers need and what principles teachers need to use in designing and fostering such stages (learning environments) using various technologies. The purpose of this paper is to discuss definitions, frameworks, and examples of technology integration and to elaborate on four key principles of technology integration: authenticity, collaboration, inquiry, and scaffolding.

CONCEPTUALIZATION OF TECHNOLOGY INTEGRATION

Definitions and foci of technology integration vary widely. According to the National Center for Educational Statistics (NCES, 2003), technology integration is defined as "the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools" (p. 75). This definition underscores the importance of everyday uses of technologies in schools for instruction and administration (NCES, 2003); yet, it does not adequately explain the complexity, dynamics, and questions involved in technology integration, such as how this integration can be accomplished and what learning and teaching activities constitute successful technology integration.

Hew and Brush (2007) define technology integration as "the use of computing devices such as desktop computers, laptops, handheld computers, software, or Internet in K-12 schools for instructional purposes" (p. 225). This definition highlights the goal of technology integration in classroom environments. More precisely, Roblyer and Doering (2010) define integrating educational technology as "the process of determining which electronic tools and which methods for implementing them are the most appropriate responses to given classroom situations and problems" (p. 8). This definition underscores both the use of technology tools and the methods involved in determining optimal instructional practices using them.

Hughes' (2005) classification delineates the three different variations in the pedagogy for technology integration: replacement, amplification, and transformation. Technology may be used to replace existing teaching practices and learning processes as a different medium with the same established goals. Technology may be utilized to amplify what teachers and students have been doing by making the process more effective and efficient (Cuban, 1988). Technology may also transform learning and teaching tasks and routines in a way that incorporates new pedagogies and technological affordances to foster student problem solving.

PROMISES AND PROBLEMS

A vast amount of research has investigated the learning outcomes and processes involved in technology integration in the classroom. Studies have demonstrated the positive impact of technology on students' academic performance when the use of technology is parallel to curriculum objectives and standardized tests (Bain & Ross, 2000). Some researchers have found that technology may enhance student long-term understanding of curriculum (Lehrer, 1993). Research also indicates that the positive influence of technology use may

Related Content

An Inquiry Into the Use of Generative AI and Its Implications in Education: Boon or Bane
Eun Ok Baekand Romina Villaflor Wilson (2024). *International Journal of Adult Education and Technology (pp. 1-14).*
www.irma-international.org/article/an-inquiry-into-the-use-of-generative-ai-and-its-implications-in-education/349233

The Impact of New Technologies on Professional Development
Sarah T. Meltzer (2014). *Adult and Continuing Education: Concepts, Methodologies, Tools, and Applications (pp. 1984-1996).*
www.irma-international.org/chapter/the-impact-of-new-technologies-on-professional-development/105354

Teaching Digital Natives Using Technology: Learning Requirements, Multimedia Design Elements, and Effectiveness
Merideth Dee (2013). *Handbook of Research on Technologies for Improving the 21st Century Workforce: Tools for Lifelong Learning (pp. 157-177).*
www.irma-international.org/chapter/teaching-digital-natives-using-technology/70160

No Adult Left Behind: Older Adults in Virtual Environments
Linda Salter (2014). *Adult and Continuing Education: Concepts, Methodologies, Tools, and Applications (pp. 1384-1404).*
www.irma-international.org/chapter/no-adult-left-behind/105316

Professional Development in a Virtual World
Richard B. Speaker Jr., Greg Levittand Steven Grubaugh (2014). *Adult and Continuing Education: Concepts, Methodologies, Tools, and Applications (pp. 419-445).*
www.irma-international.org/chapter/professional-development-in-a-virtual-world/105257