Chapter 7
Active Learning Strategies in Technology Integrated K–12 Classrooms

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ABSTRACT

Active learning is central to student retention and application of learned information. Research indicates that technology has reshaped the classroom environment and some of the teaching methods that traditionally supported active learning are no longer compatible with the emerging technologies. The question is; how best can teachers promote active learning through the use of technology? With technology flooding the school learning environments, teachers need effective strategies that promote active learning. Using research-based theories and literature review; this chapter extends a new definition and critical components of active learning in the context of technology integrated classrooms. Further, the chapter offers active learning strategies aligned with technology tools that could be used effectively in K-12 classrooms to promote active learning. Finally, the chapter opens up a discussion for potential new research that could be conducted to explore in depth some of the strategies using a large sample size stratified by grade levels, content areas, and geography.

INTRODUCTION

Computer technology has become a prevalent feature in K-12 classrooms, and has altered the surface of the educational terrain in the U.S. (Aldrich, 2002; Collis, et. al., 1996; Jenkinson, 2009; Wood, Specht & Willoughby, 2008). Research indicates that billions of dollars are invested in the schools to buy the most current technology on the market (Amiel & Reeves, 2008; Bohlin, 2002; Chen, 2004; Shieber, 2014). The questions are: Are teachers integrating these technologies effectively for teaching and learning processes? How best can teachers promote active learning through the use of technology? Does technology increase student performance? There are so many questions that educational researchers are working hard to answer. In this chapter only one question would be addressed: How best can teachers promote active learning through the use

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of technology? This question is fundamental to effective and meaningful technology integration in the classroom. The question that needs to be addressed first is: What is active learning?

Without appropriate definitions of terms, concepts, and strategies related to computer technology integration into teaching and learning processes, technology will not promote active learning; neither will technology increase student performance. Research indicates that when teachers are not able to define terms or concepts, in most cases, they are not able to integrate effectively that specific concept(s) into teaching and learning (Ntuli & Kyei-Blankson, 2010). Therefore, being able to define a concept is one of the major indicators that one has the knowledge about the concept and is able to apply it. Before extending the active learning working definition, this chapter begins with a brief background of the study.

BACKGROUND

Research indicates that even though teachers are aware of the benefits that technology offers in teaching and learning processes, most teachers are hesitant to integrate technology due to reasons including; lack of relevant technological knowledge (TK), and technological pedagogical knowledge (TPK) (Lawless & Pellegrino, 2007; Ertmer & Ottebbreit-Leftwich, 2009). Ntuli (2010)'s K-3rd grade study reveals that most teachers are aware of cognitive developmental gains that technology may bring in young children; however, what stopped teachers from integrating technology frequently was the lack of developmentally appropriate technology knowledge and recommended strategies. In a more recent study, Pamuk (2012) found that despite well-grounded technology backgrounds, the pre-service teachers understudy lacked technology pedagogical experiences and that leads to very limited use of technology during practicum. Based on this study and literature review that offer similar findings (e.g., Bingimlas, 2009; Ertmer, 1999; Hew & Brush, 2007), it can be concluded that teachers lack technology integration strategies that promote active learning. In addition, teachers need strategies on how to differentiate pedagogies depending on different technology tools, content, and grade level.

Current research also indicates that the problem of technology integration in K-12 classrooms is still far from resolved (Bauer & Kenton, 2005; Ertmer, 2009; Mueller, Wood, Willoughby, Ross, & Specht, 2008). One of the reasons may be that teachers learn about instructional technology tools in isolation of teaching strategies, content, and the authentic classroom experience (Chan & Lee, 2007; Friedman & Kajder, 2006; Ntuli, 2010). Ntuli (2010) found that more than three quarters of the teachers surveyed indicated that their experiences with instructional technology courses during teacher preparation and professional development were divorced from the classroom experience. For instance, teachers learned about the technology tools (how they work), how to create web pages, PowerPoints, etc., however, little was taught on how best to integrate the technology tools in the classroom, and how to differentiate technology strategies depending on the learners. Related literature also indicates that teachers are not using technology to support *student-centered* learning which is believed to be central to active learning and high student achievement (Ertmer, 2009; International Society for Technology in Education (ISTE), 2008). This chapter seeks to offer student-centered active learning strategies that could be used successfully in K-12 technology integrated classrooms. However, before the strategies could be discussed, this chapter provides a working definition of active learning in technology integrated learning environments.