

Chapter 58

Enhanced Student Engagement Through Active Learning and Emerging Technologies

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ABSTRACT

Active learning and emerging technologies are enhancing student learning through an explicit intentional educational design such as Flipping the Classroom and Project Based Learning to empower students. In this chapter, the authors describe an active learning classroom and emerging technologies that support learning for the 21st century. Using vignettes, the authors model how the metacognitive teacher supports the use of emerging technologies for active learning using the Metacognitive Technological Pedagogical Content Knowledge Framework (M-TPACK) (Wilson, Zygouris-Coe, Cardullo, & Fong, 2013). Finally, the authors describe Blooms Taxonomy (Bloom et al., 1956) for active learning and make connections to emerging technologies and the level of integration using the SAMR Model: Substitution, Augmentation, Modification, and Redefinition (Puentedura, 2006).

INTRODUCTION

Today's students differ from the students our educational system was designed to teach. American education for students was designed for agrarian and industrial eras and it does not meet the needs of the 21st century (West, 2012). Education of the 21st century must be active, engaging, and customized to fit the needs of the individual learner. According to the Framework for 21st Century Learning (see <http://www.p21.org/our-work/p21-framework>), the most important skills for preparing students to learn in

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the 21st century include communication, collaboration, and creativity. In addition, the Assessment and Teaching of 21st Century Skills (ATC21S) organization (see <http://atc21s.org/index.php/about/what-are-21st-century-skills/>), postulated that 21st century skills are found in four categories:

1. **Ways of Thinking:** Creativity, critical thinking, problem-solving, and decision-making and learning;
2. **Ways of Working:** Communication and collaboration;
3. **Tools for Working:** Information and communication technology (ICT), and information literacy; and
4. **Skills for Living in the World:** Citizenship, life and career, and personal and social responsibility.

The ATC21S has also identified two skills that span across all of the aforementioned categories: collaborative problem-solving and Information Communication Technologies (ICT)—learning in digital networks. As a nation, we must develop students' 21st century skills to ensure that they will have a place in a global competitive economy.

Active Learning

Current research (e.g., McGlynn, 2005; Peck, Ali, Matchock, & Levine, 2006; Michel, Carter & Varela, 2009) advocates for teaching techniques that foster students to actively engage with the material presented. In active learning classrooms, the teacher or instructor sets up the context for learning (i.e., the activity, the situation, the task, the process) that engages student in active learning. Active learning is generally defined as any instructional method that engages students in the learning process. Active learning requires students to do meaningful learning activities and think about what they are doing (Bonwell & Eison, 1991). Active learning can empower students with skills and strategies for problem solving both inside and outside the walls of the classroom, or learning space. Learning is not the same as receiving information; transfer of knowledge and information is learning. Instead, it should be the development of intellectual curiosity for students as well as teaching students to learn how to learn.

Active learning has been an explicit intention of educational design since Dewey's advocacy of experimental learning nearly a century ago. Instructional design for active learning must take into consideration learning for the next 20, 30, or 40 years. Successful planning and design will support emerging technologies and technology based pedagogies. Currently, the educational system is exploring opportunities that will redefine teaching and learning. Building and classroom designers are also exploring change; they have begun to experiment with spaces that depart from the industrial era of learning, tailoring learning spaces for their students and the 21st century. Education will never again be what it was in the industrial age of learning; the possibilities for the future are exciting and populated with questions about the ideal learning space.

Several universities are experimenting with the concept of an *incubator* classroom. Incubator classrooms are new learning spaces designed to facilitate active teaching and learning. Essentially the classroom design allows the instructor to experiment with flexible learning environments and emerging technologies to enhance faculty-student engagement. This type of environment encourages active learning and fosters increased student interaction. Incubator classrooms are often designed using state of the art equipment, including some of the latest hardware and software. Auburn University, the institution

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