

# Chapter 6

## Using CPS to Promote Active Learning

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### ABSTRACT

*According to Meyers and Jones, active learning theory originated from two fundamental premises: learning engagement and learning styles (1993). When students are actively engaged in the learning process, they learn better. What can an instructor do to achieve this goal? This chapter will discuss one of the approaches – the integration of the Classroom Performance System (CPS), and will cover three aspects: 1) incorporating CPS based on active learning theory, 2) discussing student positive feedback on CPS use experiences, and 3) sharing CPS best practice with other educators to promote active learning from teaching, design and administration perspectives.*

### INTRODUCTION

It has been a challenge for teachers to engage students in active learning, especially in large lecture classes. At the University of Houston, most of undergraduate core curriculum courses are offered in large classes. It is very difficult for the instructors to involve students in the process of learning. The main teaching method is lecturing and normally there are no classroom activities. This kind of large class often requires additional personnel to manage

the classroom attendance and grading, but still, the retention rate and student learning outcomes present a tough challenge. Some faculty members have been trying to integrate instructional technology to facilitate student learning, for example, to stream lecture content, or produce podcasts and upload to iTunes, or convert the PowerPoint presentations to a flash movie and upload to YouTube for on-demand replay. To a certain extent, it helps some students review the course content and make up missed classes. But, this kind of technology will not promote creative learning, critical thinking, neither will it improve interactive communication between instructors and students.

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The Classroom Performance System, or “clickers,” as they are commonly called, offers a management tool for engaging students in the large classroom (Caldwell, 2007). There are several similar products available from various manufacturers. While the brands may differ, their functions are basically the same. CPS is a product from eInstruction. The University of Houston started a CPS initiative in fall of 2005. It was used as an instructional tool to enhance classroom interactive learning. Faculty members work together with instructional designers to effectively integrate this classroom technology into both teaching and learning. A lot of classroom activities were designed based on active learning theory to engage students in classroom learning and to address different learning styles. A formal research study was conducted to solicit feedback from students’ learning experiences in summer of 2006. This pilot class had a total number of 21 students. The data collected from the study provide valuable information regarding clicker course design and the efficacy of active learning. Then, clicker technology was expanded on campus and used in large classes for registering attendance, integrating classroom activities for active learning, and providing instant feedback for teaching and learning for the course delivery improvement. A research study was incorporated in the process of clicker technology implementation.

This chapter will cover three sections. Section I of this chapter will discuss the rationale of research framework – active learning. Active learning as an effective approach to address passive learning, this section will talk about the existing issues in large lecture classes, the reasons that active learning approach is used through CPS technology to address those issues. Section II will discuss the data collected from the latest research study in spring of 2008. The data will show how the clicker activities were used to promote active learning from the perspectives of learning engagement, developing student skills, high-order thinking, and teacher’s instant feedback on student learning.

Section III will share the best practices of clicker use from teaching, design and administration perspectives, how to accommodate clicker activities into lecture content and incorporate activities in the learning process.

## **ACTIVE LEARNING AND CPS**

### **1. Active Learning**

The major characteristics associated with active learning as summarized by Bonwell and Eison (1991) as: 1) students are engaged in learning activities instead of passive listening; 2) instruction emphasizes the development of student skills rather than just the transmission of information; 3) students are involved in higher order of thinking and receive immediate feedback from the instructors, and 4) greater emphasis is placed on the exploration of attitudes and values to increase student motivation in learning. From these characteristics, we can easily see that active learning is shifting the balance from teacher-centered lecturing to student-centered learning. Students learn to a greater depth of understanding when they are actively involved in the process through activities, interaction with other students, critical thinking and increased learning motivation.

“Active learning does not diatribe against lecturing” (Meyers & Jones, 1993, p. 5). Quality lectures are absolutely necessary in guiding students in their learning of new knowledge through enlightening important concepts and providing examples for further understanding. “Good lectures justify themselves by ‘dramatizing creation of knowledge’ and by ‘interpreting that knowledge’ to listeners” (Meyers & Jones, 1993, Corder, 1991, p. 9). The key issue here is what students should do with the lecture materials, mechanically memorizing or digesting content through various activities for thorough understanding. “The strategies promoting active learning are defined as instructional activities involving

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