

# Chapter 1.11

## Using Audience Response Systems to Develop Critical Thinking Skills

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### ABSTRACT

This chapter describes an approach that integrates audience response systems into the social science classroom. The pedagogy uses the technology to produce active and engaged participation, encouraging the development of students' critical analysis skills, and facilitating high-level discussion within the classroom setting. The authors present their use of multiple audience response systems, along with the results they have observed, with a view to showcasing a variety of ways in which instructors at institutions of higher education might utilize these systems in their classes.

### INTRODUCTION

Previously, in university classroom settings, student participation tended to diminish as class size grew. Class size also tended to change the way instructors could approach the material they taught. In larger settings, there was less give and take between professor and students: the instructor was likely to present the material in lecture style, and students were more likely to become passive observers. Incorporating new technologies, including audience response systems, into the classroom helps to shrink the gap between professor and student. Working with that technology in humanities and social science classes enables and leads to new pedagogies that can

help to guide students, in classes of any size, to develop more sophisticated understandings of difficult material, by helping to make the reasoning process explicit to them.

This chapter will discuss the use of these systems in classes that fall partially in humanities and partially in social sciences, focusing in particular on three benefits of the systems: encouraging active participation, developing critical analysis skills, and stimulating high level classroom discussion.

The development and use of an audience response system in college classrooms, and particularly in larger lecture sections, has accelerated beginning in the 1990s, and especially with the invention of the Classtalk system by Better Education, Inc., which encouraged, and continues to encourage, reflection and research about effective ways to use these systems (Abrahamson 1998). Initially, this increasing use of interactive response systems occurred in science (especially physics) classes, and the research on their use and effect reflects that fact. This is confirmed by the material presented in Judson and Sawanda's 2002 study of the literature, which notes at the outset that these systems have been "primarily used in science courses" (2002). Several papers are available to detail such uses.<sup>1</sup> In recent years, the literature also reflects significant and growing use of the systems in medical education.<sup>2</sup>

The pedagogical uses of the audience response systems in these science classes are well established. Burnstein and Lederman (2001) provide a list of the things the keypads allow the instructor to determine:

- a. Have the students read the text before class?
- b. Are the students paying attention?
- c. Do the students remember important facts?
- d. Are the students thinking?
- e. Can the students recognize concepts?
- f. Can the students work in a group?
- g. Can the students do numerical exercises?
- h. What do the students say about the pace and interest of the lecture?

To these points, physicist Eric Mazur has added that the electronic response systems can facilitate peer instruction, though he rightly emphasizes that the pedagogical technique can be used without the technology. We believe that using interactive response systems in the humanities and social sciences can certainly take good advantage of these techniques to improve the lecture hall experience, but also can go further, in some cases with methods that would not be available without the technology, to help students develop a sophisticated understanding of conceptually difficult and complex issues about human beings, the universe in which they live, and the relationships between the two.

We began using audience response systems in political science classes at the University of Texas at El Paso in 1998. We have used these systems both in very large sections of required introductory classes, as well as in smaller, upper-division sections that focus on understanding of political philosophy and development of analytical skills. We have made extensive use of three different systems: we began with Classtalk, a hardwired system that uses graphing calculators as response pads for students,<sup>3</sup> and have also used the wireless Classroom Performance System.<sup>4</sup> In addition, we have created our own system, "Cephalus," which uses wireless networks, and computers or pocket PCs as input devices for students.

## **Simple Things**

Audience response systems are especially helpful in large lecture classes in a couple of ways that become immediately apparent upon recognizing

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