Classtalk: A Classroom Communication System for Active Learning

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ABSTRACT

Traditional methods for teaching science courses at the post-secondary level employ a lecture format of instruction in which the majority of students are passively listening to the instructor and jotting down notes. Current views of learning and instruction challenge the wisdom of this traditional pedagogic practice by stressing the need for the learner to play an active role in constructing knowledge. The emerging technology of classroom communication systems offers a promising tool for helping instructors create a more interactive, student-centered classroom, especially when teaching large courses. In this paper we describe our experiences teaching physics with a classroom communication system called Classtalk. Classtalk facilitated the presentation of questions for small group work as well as the collection of student answers and the display of histograms showing how the class answered, all of which fed into a class-wide discussion of students' reasoning. We found Classtalk to be a useful tool not only for engaging students in active learning during the lecture hour but also for enhancing the overall communication within the classroom. Equally important, students were very positive about Classtalk-facilitated instruction and believed that they learned more during class than they would have during a traditional lecture.
INTRODUCTION

AN EMERGING TECHNOLOGY, classroom communication systems (CCSs), has the potential to transform the way we teach science in large lecture settings. CCSs can serve as catalysts for creating a more interactive, student-centered classroom in the lecture hall, thereby allowing students to become more actively involved in constructing and using knowledge. CCSs not only make it easier to engage students in learning activities during lecture but they also enhance the communication among students, and between the students and the instructor. This enhanced communication assists the students and the instructor in assessing understanding during class time and affords the instructor the opportunity to devise instructional interventions that target students' needs as they arise. By facilitating a shift from a passive, teacher-centered (i.e., lecture-style) classroom, toward an interactive, student-centered classroom, CCSs help to create a classroom environment that accommodates a wider variety of student learning styles, making the learning of science a much more positive experience for students. CCSs are unique tools that teachers can use for facilitating learning and for improving students' attitudes toward science.

This article describes our experiences over the last three years using a CCS called Classtalk¹ to teach four different introductory university physics courses. In our application of Classtalk, students spend a significant portion of the class time working collaboratively to deepen their understanding of physics. Classtalk is a combination of software and hardware that permits the presentation of questions for small-group consideration, as well as the collection of answers