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How Remote Responders Affect Teaching

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A plethora of literature spouts the benefits of remote responders. These responders, often called "clickers," are handheld devices much like television remotes that enable students to respond en masse to questions posed by the instructor.

The benefits touted include increased class attendance; an opportunity for instructors to identify and intervene early when students are not performing well; the ability to poll students on various issues facilitating discussion, identifying misconceptions and levels of understanding; a simplified way to collect student performance data because the responses are electronically tabulated; assessment by students of their own understanding of material as they see aggregated responses; rapid grading of quizzes or tests providing timely feedback to both students and instructors; less grading time for instructors; and students who pay more attention and take a more active role in the classroom.

Placing the benefits aside, there is very little literature about the administrative details or how different faculty use the device when they teach. I thought I would offer a firsthand report and assessment based on our experiences at Saint Mary's.

Administration

The system that Saint Mary's University has adopted campuswide is called the Classroom Performance System (CPS) by eInstruction. There are currently four remote responder systems on the market, and all are supported by various textbook publishers. Aligning oneself with a particular textbook publisher is quite dangerous, as it prohibits the freedom to choose any textbook and virtually wipes out the secondhand textbook market because the system requires access codes that only come in new textbooks.

However, once a system has been adopted, the time and effort needed to set up the class is minimal. When going online to eInstruction.com, the instructor sets up an account, clicks on a few buttons, gives the class a name and is done. The class is automatically assigned a class key, which students use to register their clickers.

We encountered a few problems with students registering. For example, if students leave the field that requests their name blank, eInstruction automatically identifies them with a clicker number. This does increase student anonymity, but it makes it impossible for instructors to figure out who's who, which they may want to do if they are using clicker data to assign

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marks for attendance or correct responses, or to identify students who may need extra help. Students can go back and edit their student profiles to correct this problem.

There are two different costs to students for registering. Access codes are required and can be obtained online from eInstruction for a nominal fee paid with a credit card. Initially the cost was US\$12 for us because we adopted the system campuswide. This has subsequently dropped to US\$10 due to volume. Students may also purchase the access code from the campus bookstore for approximately double the price. Unfortunately, this discriminates against those without access to a credit card. Purchasing an access code as part of the textbook solves this problem, but then only new textbooks can be used because the access code from a used text no longer works.

Teaching

Once all students are registered, the system is ready for daily use. I say "daily" because if you do not use it regularly, students may be concerned about incurring a cost for something that is not used. Eight instructors used CPS in the fall of 2005, and we met to discuss the system and share our experiences. What is most interesting is that we all use the system differently. One physics instructor, with class sizes in excess of 100 students, delivers lectures through slides and incorporates multiple-choice questions into the slides. He then uses the verbal question mode in CPS to capture student responses when each question slide appears.

Several other instructors write questions to ask students at key points during the class. Questions can be true/false, multiple-choice or numeric, and they can be with or without a graphic to illustrate the question.

As an accounting instructor, I find problem-solving exercises to demonstrate the accounting concepts more effectively than lectures. Because I happened to choose a textbook and the textbook publisher supports CPS, I have a good selection of multiple-choice questions available from the publisher's Web site.

Editing questions is easy, and I often convert a multiple-choice question into a numeric one to prohibit guessing. Occasionally, I ask students to work on questions from the textbook on their own or in groups. I can quickly set up a "fast grade" that allows me to input the answers while they are working on the questions. I then set the session to Student Lead Mode, and the students can input answers at their own pace. Students who finish quickly are dismissed early. Outside the classroom, I generate a report of each student's responses from the system.

The CPS approach can slow down the delivery of class material. For instance, one textbook question in an introductory chapter used to take a few minutes to cover because a student would typically answer my verbal questions very quickly. This could mean that the material was very simple, the student had taken the material previously or the student was especially astute. However, when I used the clickers to get students to respond, I found that one-third of them did not know the answers. Rather than quickly moving past the chapter, we spent considerably more time on it. But the payoff here is a more solid understanding of the basics of the course material, which makes the more challenging material easier to get through.

In summary, the ability to ask oral or prewritten questions; combine PowerPoint and questions; or set up rapid-grading, student-led questions gives the instructor flexibility. Classes become a mix of lecture and questions, and diverge from the original plan based on the students' responses. Students do seem to be actively engaged during the class period.

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