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MIDWEST

From colleges to grade schools, more educators are using wireless response devices that can tell instantly if students get what's being taught

Remote controls click in the classroom

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Tribune photo by David Trotman-Wilkins

Angie Barone "clicks" her answer to a question during a class at the College of Lake County.

After lecturing for 45 minutes about different ways to clear trees from a forest, College of Lake County environmental biology instructor Cindy Trombino decided it was time to see if her students had been listening.

So with a few clicks on her keyboard, she displayed a multiple-choice question—and four possible answers—on a large screen in front of the classroom: "Which of the following harvesting methods is the least disruptive?"

Twenty students lifted their arms, aimed a blue remote control at the wall, and pushed a button as though they were changing the channel on a television. Seconds later, a bar graph appeared on the screen showing that 17 students picked D, "selective cutting"—the correct answer.

"Good. . . Now we'll see how you're keeping up," Trombino said before giving them a question from last week's lecture.

College instructors increasingly are using wireless "per-

sonal response systems," known better as "clickers," to instantly find out whether students are paying attention and understanding the material. The clickers also are used to take attendance and administer exams.

One company reports that

600 colleges nationwide are using the systems, double the number from a year ago, while another manufacturer says 705 campuses are hooked up to its version. While some professors have used them for several years, the technology has taken off in the last 18 months, ex-

perts said.

Most popular in college lecture halls, the clickers also are in elementary and high school classrooms, with about 5,000 schools wired with one company's technology, according to

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Remote controls click in the classroom

CLICKERS: Professors say participation, attendance up

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Texas-based eInstruction.

Although there has been little research on whether the clickers improve student performance, professors say attendance and class participation are up and students appreciate the quick feedback. For the first time, the technology lets professors know immediately if students—even those sitting in the back of the lecture hall—really understand what they're saying.

The system works like this: Students answer questions by pressing one of the buttons on their clicker, similar in size and shape to a television remote control. Through infrared or radio signals, their answers are sent to a receiver mounted on a wall, then fed to a computer. A summary of the responses can be displayed instantly as a graphic.

The clickers have unique identification numbers so instructors can track student responses during the semester and put together individual study guides.

Some colleges provide the clickers. While at others, students buy them—new or used—from the campus bookstore for about \$15 to \$40, depending on which device is bought and whether it comes bundled with a textbook. The software and classroom equipment runs about \$250, though some companies donate that portion and rely on the purchase of clickers for their revenue.

Locally, at the University of Illinois at Chicago, a marketing professor relies on the system for pop quizzes and to take attendance of 250 students quick-

about five professors use the devices in calculus, physics and bio-thermodynamics classes.

Calculus professor Martina Bode, who started using them about a year ago, has a set in her classroom so the 80 students don't have to buy them. After introducing a new calculus concept, she asks a few questions to gauge whether students understand. At the end of the class, she throws out a few more questions.

"I have built my lessons around the clickers," Bode said, adding that the student responses can lead to changes in the day's lecture. "Any time you have 20 or 30 percent of the correct responses, you know you have to adjust your lesson plan and spend more time on the topic. This is sometimes interesting because you ask the question and you expect 100 percent correct responses, but you don't get it."

She said that using the clickers initially created more work for her, with an extra one or two hours spent preparing the questions. With the system now in place, she just tinkers with the questions before each lecture.

In a survey last semester of 59 students, Bode found about 85 percent said the systems made them more actively involved in class. About 90 percent said Bode seemed more aware of their learning difficulties.

"It's a wonderful tool because it's an interactive classroom," Bode said. "If you have 80 students in the class, it is usually more of a lecture. This way you can actually interact with the students. It becomes a more lively classroom."

That's also true at Henking Elementary School in Glenview, which has had the clickers for about four years. The school has one set, and teachers take turns using them for vocabulary review and math tests.

"In a paper-and-pencil test, [pupils] just get back a grade or a smiley or a sticker," said Caryl Doetsch, the elementary school's technology instructor. "With this, you are reteaching at the moment the kids need it."

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At Northwestern University, calculus students divide into groups and discuss their answers to a math problem before pressing the button.

And at Henking Elementary School in Glenview, kindergartners use the clickers to choose which picture corresponds to a letter sound they're learning.

Maria Santoyo, who is taking the environmental biology class at the College of Lake County's Grayslake campus this summer, said she initially was skeptical about the benefits of the system but said it helps her know what to study. During a recent class, she got about half the answers correct and took notes on the questions she got wrong.

"It helps me to see how I am doing in relation to everyone else," Santoyo said.

'Nobody feels awkward'

Other students said they like the anonymity.

"Nobody feels awkward about not getting it right," said Jordan Davis, 18, of Lake Zurich. "She asks a question and without pointing fingers, knows how much we know."

"And how much we're listening," added Rachel Evaristo, 19, of Vernon Hills, adding that there is one problem with the system.

"I sometimes forget mine," she said. Trombino's students aren't graded on their responses but on whether they remember to bring them to class.

At Northwestern University,

Random quizzes

While most professors use the system as a teaching tool, University of Illinois at Chicago marketing professor Charles King said he uses it for random 10-minute quizzes that account for about 40 percent of a student's final grade. Students also use the clickers at the beginning of class to register their attendance, which was previously difficult to track because of the large class size.

King said the system, manufactured by Maryland-based InterWrite PRS, has cut down on paperwork because he doesn't have to grade the quizzes manually.

Eric Mazur, a Harvard University physics professor, was among the first to try a wireless clicker system about seven years ago and has written a book on the subject.

He predicts the clickers are a precursor to a time when students will use their cell phones or other personal technologies to respond to professors' questions. For now, he uses the clickers during every physics class and said it has transformed the traditional lecture hall.

"I adopted it to solve a problem in my own class. I was giving them information thinking they understood it only to find out they didn't," Mazur said. "I would never imagine the proportions it would have taken on—I mean, beyond my wildest expectations."

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