

The National Teaching & Learning FORUM

Volume 18

Number 3

March

2009

CONTENTS

- **EDITOR'S NOTE**, p. 3.
- **Clickers**, James Rhem, Executive Editor, p. 1. Instead of creating chaos, faculty find that when everyone gets a remote control (and you ask good questions), everyone ends up on the same channel.
- **EVALUATION: Rate My Professor & Professors Strike Back**, James Rhem, Executive Editor, p. 5. The professors who "strike back" at students about the anonymous ratings on these web sites had interesting things to say about student evaluations when we interviewed them.
- **ESSAY: What Are the First Words You Write on the Board?** Joe Hoyle, University of Richmond, p. 8. Set high standards right from the start.
- **DEVELOPER'S DIARY: On Knowing and Knowing About: Educating in Fractal Patterns XXVII**, Ed Nuhfer and Steven Fleisher, California State University–Channel Islands, p. 9. A deeper look into deep/surface learning.
- **AD REM . . . : The Problem Solver's Apprentice**, Marilla Svinicki, University of Texas–Austin, p. 12. It is not the algorithms that solve a problem; it is the thinking that goes on behind the scenes.

Clickers

James Rhem, Executive Editor

Clickers have been quietly marching over the horizon of attention for several years. Only early adopters, however, and schools with enough money and vision to try them have come to understand that, far from being simply the latest new gadget, they offer students a pedagogically powerful blend of intimacy and anonymity that can move them from passive to active learning with the click of a button (and a battery of well-crafted questions).

Rapid improvements in the technology and especially the publication of Derek Bruff's *Teaching with Classroom Response Systems: Creative Active Learning Environments* (Jossey-Bass, 2009) seem poised to place clickers in faculty consciousness across the board. The attention the book has already received offers some index of the growing interest in clickers. Bruff has already been profiled by the online newsletter *Inside Higher Education* and the *Chronicle of Higher Education*.

How They Work

For those who don't know, clickers are hand-held devices similar to the remote controls for

televisions and other media devices. They can send a specific electronic signal to a central receiving station connected to a computer equipped with software that tabulates the responses and can then display the distribution of answers on a bar graph.

In operation—especially in quantitative fields with concrete correct and incorrect answers—a professor presents a multiple choice or true/false question.

Students respond by pushing buttons for answers (a), (b), (c), and so on. Then, normally, the professor shows the bar graph of how the class answered. Quickly, students can see where they stand in terms of how well they understand the material, and

(just as importantly) where their classmates stand, and where they stand in relation to these peers. And students get all of this very specific feedback on their learning without risking a moment of embarrassment. The anonymity of the system allows students to confront little important truths about their progress (or lack of it) without risking a thing.



Faculty schooled a few generations back when shame and guilt were felt to have at least some pedagogical value—that is to say, in a time when students felt ashamed to make a poor grade or come to class unprepared—the ascendance of this new teaching environment may seem strange. However, as the emphasis in education has shifted over the centuries from building character to simply learning, it all makes sense. (And, of course, whether shame and guilt actually built character remains an open question.)

Anonymity's Advantages

The anonymity is “pretty important,” says Derek Bruff, who teaches mathematics and serves as assistant director of the Vanderbilt Center for Teaching. “Students are often hesitant to speak up in front of their peers,” he says. “A key element in that is the desire not to be wrong or foolish in front of their peers, especially in a class where there are right/wrong answers. In other classes, they don’t want to stand out or be the one with the strange opinion.”

Peer pressure, says Bruff, “dampens conversation.” The anonymity that clickers provide is one way of dealing with that. “It’s not the only way,” Bruff concedes. “There are professors that are able to create a safe environment where that’s not a problem.”

If escaping peer pressure and taking refuge in anonymity prove such positive elements in teaching and learning, a question that comes immediately to mind is, where do cooperative learning and other small group activities fit in? The answer? On the next click, so to speak.

Offering an answer via the clicker establishes a “buy-in,” says Bruff, a commitment not simply to an answer but to the learning process. With this threshold crossed,

passivity has begun to be left behind. The anonymity allows cumbersome emotional baggage to be left behind as well, lending both a purity and a more animated sense of mission to the next step, the familiar “think-pair-share.”

The “Think Moment”

“We use the think-pair-share method a lot here,” says Bruff, “think, talk with one, talk in the larger group. There’s more risk at each stage, but giving students a warm-up experience is important because many need that moment. If a hand in the first row goes up to answer a question, their thinking is stopped. The class is then moving on. Maybe they needed 30 more seconds. Giving the ‘think moment’ is helpful. Then, in the pair, they get to practice saying what they think, and they get to hear other

Giving students a warm-up
experience is important
because many need that
‘think moment.’ If a hand in
the first row goes up to answer
a question, their thinking is
stopped. The class is then
moving on.

thinking which then sharpens theirs.”

The silent, private “think moment” operates like moving from warm water to hotter and hotter baths in a hot spring, for example, or from shallow water into deeper and finally into strong currents where one may have to swim against the tide intellectually.

Just as this technologically enhanced learning environment intensifies the focus on learning and recognizing where everyone stands in the process moment to moment, it also intensifies the

THE NATIONAL TEACHING & LEARNING FORUM

Executive Editor:

James Rhem, Ph.D.
2203 Regent Street, Suite B
Madison, WI 53726

Editorial Advisory Board

Jonathan Fife, Director Emeritus
ERIC Clearinghouse on Higher Education

Gabriele Bauer, Director
Center for Teaching Effectiveness
University of Delaware

Pat Hutchings, Vice President
The Carnegie Foundation
for the Advancement of Teaching

Susan Kahn, Director
Urban Universities Portfolio Project
Indiana University–Purdue University
Indianapolis

Wilbert McKeachie
Professor of Psychology, Emeritus
University of Michigan

Edward Neal, Director
Center for Teaching and Learning
University of North Carolina–Chapel Hill

Christine Stanley
Executive Associate Dean
College of Education & Human Development
Texas A&M University

R. Eugene Rice
Senior Scholar
Program in Leadership & Change
Antioch University

Marilla Svinicki
Professor of Psychology
University of Texas at Austin

Editorial correspondence:

James Rhem
2203 Regent Street, Suite B
Madison, WI 53726

Subscription information:

The National Teaching & Learning Forum
2203 Regent Street, Suite B
Madison, WI 53726

The National Teaching & Learning Forum
(ISSN 1057-2880) is published six times
during the academic year by James
Rhem & Associates, LLC — December,
February, March, May, September,
October.
One-year individual subscription: \$59.

Periodicals postage paid at Madison, WI

Postmaster: Send change of address to:
The National Teaching & Learning Forum
2203 Regent Street, Suite B
Madison, WI 53726

Copyright © 2008
James Rhem & Associates, LLC

DUPLICATION BY PHOTOCOPYING
OR OTHER MEANS IS STRICTLY
FORBIDDEN.

<http://www.ntlf.com>
March

Editor's Note:

The seminal article “Cognitive Apprenticeship: Teaching the Crafts of Reading, Writing, and Mathematics” by Allan Collins, John Seely Brown, and Susan Newman had just appeared in 1989 when the *Forum* was being created. A discussion of this exciting piece appeared in the first issue in the “RESEARCH WATCH” department. It’s gratifying to see it cited again in **Marilla Svinicki’s** AD REM . . . in this issue. As Marilla makes clear, it’s modeling the connections between operations—how to use the tools of thinking—that can sometimes be the most important aspect of teaching. Certainly, when I reflect on my own doctoral education, that modeling seems to me the most important education I got. Through some miracle, I was uncharacteristically wise enough to select the toughest mentor in the department, and through yet another miracle, found the tenacity to hang on and learn all that I could about how a brilliant person went about scholarly work. It was humbling and exhilarating all at once. And yet there was something that felt very simple about that apprenticeship. On reflection, it reminds me of the way a brilliant actor’s merely turning over his hand can crystallize the meaning of a scene in a drama, perhaps the meaning of the entire play, or the way in which a jazz genius like Louis Armstrong or Sarah Vaughan’s refusal to actually voice the final note of a song can lead one to hear it more profoundly than the ears ever could.

Yes, deep learning can be very emotional, meaningful, moving stuff. The DEVELOPER’S DIARY in this issue by **Ed Nuhfer** and **Steve Fleischer** touches on the felt, but little discussed, intersection where some of this learning takes place, the intersection between “knowing” and “knowing about.” I found it an important distinction and a moving essay. I think you will too.

I suppose if I were to name an overall theme for this issue, it would be connecting with students. Certainly, that’s something that the skillful use of “clickers” or student response systems makes more possible moment to moment than ever before. **Derek Bruff** of Vanderbilt University has written a very readable and useful book on clickers, and spoke with me at length about what he learned, both in using clickers himself and in speaking with many other faculty who have.

One of the great frustrations of student evaluations is that seldom do they allow faculty to connect with students. Most are summative evaluations and offer faculty little that might help them improve their teaching. The somewhat obnoxious web site **ratemyprofessor.com** and its cousin “**Professors Strike Back**” seem at first to offer little of value either, but when I spoke with a half dozen faculty who’d made “strike back” videos for the site, I found faculty have a lot of interesting and potentially valuable things to say about teaching and evaluating it.

Finally, some time back **Joe Hoyle**, a distinguished teaching fellow at the University of Richmond, sent the *Forum* a collection of one-page pieces he’s written over the years about various aspects of teaching. The whole collection of simple, sage advice is available free for download at <http://facultystaff.richmond.edu/~jhoyle>. We reprint one of his essays that may also be seen as connecting with students. In it Hoyle shows how he sets high standards early on, showing students who he is and what an A from him will mean.

— James Rhem

burden on faculty to become “agile teachers.” For example, when clickers first began to be used, showing the bar chart of student responses immediately was expected. As their use has grown and influenced faculty understanding of group behavior and learning patterns, whether to show or not to show the graph has become an important “thinking-on-your-feet” decision. Even if most students agree on a correct answer, how deeply do they understand the reasoning behind it? Sometimes, to make sure their learning goes more deeply, faculty withhold the results and ask students to turn to their neighbor and talk out the reasons for their answer, especially if their neighbor gave a different answer.

“When I have that happen,” says Bruff, “I tell my groups, ‘Even if you agree, talk it out because you could both be wrong.’ I want them to test themselves a little bit.”

It’s the “thinking-on-your-feet” challenge that burdens faculty. “That’s a roadblock for some faculty,” says Bruff. “They want ‘ballistic teaching,’” he says with a laugh. “Launch lecture, and once it’s off, it’s off on its way.” Clickers offer lots of chances for mid-course corrections, but their use also demands something of a chess player’s mentality of knowing not only how the pieces move, but which move to make next for maximum advantage. Sometimes, the best move does turn out to be “creating times for telling,” says Bruff (using a phrase coined by Schwartz and Bransford), time for a little lecture students need and which skillful use of clicker questions can lead them to want. For example, anticipating a common misconception, faculty may ask a question experience has shown them most students will answer incorrectly.

“The instructor then reveals the correct answer,” says Bruff, “often through a demonstration. The students are surprised most of them got the answer wrong and it makes them want to hear why the right

answer is right and the answer they gave is wrong.”

Making Good Questions

Successful use of clickers turns on the skillful use of good questions. “Writing good questions I would have to say is the hardest part” of teaching with clickers, says Bruff. But it’s also the most exciting part because it causes faculty to become intensely intentional about their teaching moment to moment, not just lecture to lecture. “That’s why I like to talk about clickers with faculty,” says Bruff, “because it generates this kind of conversation: ‘What are my learning goals for my students?’”

There are content questions asking for recall of information, conceptual questions seeking evidence of understanding, application questions, critical thinking questions, and free-response questions. When and how



to ask the right kind of question in response to where the students actually sitting before the faculty member are becomes the proof of good teaching in that moment.

One of the most interesting aspects to emerge from the use of clickers has to do with the flexibility of the multiple choice question to stimulate thinking and learning. “Many people think of the multiple choice question as being only about factual recall,” says Bruff, but the one-best-answer variation probes much deeper. “A really good teacher can write really good wrong

answers to a question,” says Bruff, ones that key into common student difficulties with material. “When I write a multi-choice question, I’d really like 40-60% of my students to get it wrong. And I’d like them to be split between a right choice and several wrong choices, because then that means I have tapped into some misconceptions that are fairly common and need to be addressed and the question is hard enough to be worth talking about.”

Metacognition and Confidence

Some of the problems that have emerged in using clickers have also turned out to reveal opportunities for increasing student learning or rather student learning about their own learning. Bruff, a mathematician, began to ponder how much confidence he could have in student learning reported via true/false questions or even some

multiple choice questions. In a true/false situation, for example, students might guess and have a 50% chance of lodging a correct answer. Multiple choice questions might be constructed to include an “I don’t know” option, but then the matter of discouraging student engagement becomes an issue. Students might retreat to the

safety of an “I don’t know” answer rather than commit to a response they felt uncertain about. Pondering this problem has led a number of pioneers in clicker use, like Dennis Jacobs at Notre Dame, to marry self-assessments of confidence levels with decisions about right or wrong answers. So, for example, in Jacobs’ system (where clicker responses are graded) a correct answer in which a student indicated high confidence would receive five points. An incorrect answer that a student had expressed high confidence in would

receive no points. On the other hand, an incorrect answer in which a student indicated low confidence would receive two points.

“If a student gives a right answer,” says Bruff, “but realizes they aren’t confident in it, they have a little metacognitive moment thrust upon them: they have to ask themselves ‘Why wasn’t I more confident in my answer? What are the standards of evidence in this field that would allow me to be confident in my answer?’” By the same token, a student aware enough of his own learning to express low confidence in an incorrect answer receives partial credit for sensing that he didn’t know, thus encouraging him as a learner rather than thumping him for getting something wrong. With this system, he gets both the positive and negative points to be made through the question.

Creative Options Everywhere

One of the strengths of Bruff’s book on clicker use lies in the wide range of faculty examples he includes. That range evinces impressive imagination and commitment among faculty to improving student learning, itself a pleasure in reading the book. And, while the dominant use of clickers falls in scientific fields, the book includes rich examples of skillful use of clickers in humanities courses as well. Moreover, while clickers offer the most efficient means of collecting student responses, the overall emphasis falls on collecting those responses and on the dimensions of psychology, motivation, and cognition involved in their use. Hence, Bruff includes discussion of some low-tech means of collecting student responses as well.

With clickers, as with so many other new technologies, the greatest benefit seems to lie in the way they uncover new means of improving one of the most ancient of transactions—teaching and learning. Socrates would be proud. ■■■

Contact: Derek.bruff@vanderbilt.edu