

Engaging Students in Large Lectures Using a Classroom Response System

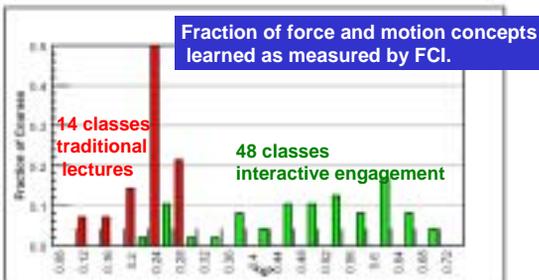


**Jo
Kurdziel**
**Ecology &
Evolutionary
Biology**

Why Use a Classroom Response System?

1. Limitations of traditional lectures
2. Engaging students
3. Feedback to students & instructor
4. Learning Gains
5. Attitude Gains

some examples from physics education research



average normalized gain as a function of course

from R. Haake

Ways in which clickers can be used:

1. Start of class quizzes on reading
2. Quick surveys on backgrounds, course issues, ...
3. Check understanding of material covered
4. Students predict results for demonstrations
5. Reveal prevailing misconception to confront/get students' attention, leading into coverage of material

You have different goals for majors vs. non-majors courses, thus different uses of clickers

What Common Classroom Response Systems Are in Use at College Level?

EduCue's PRS HITT
e-Instruction's CPS

all use IR technology
one to several receivers
each student has "clicker"
computer & software

How does it Work?

Video

Assessment of Conceptual Questions & HITT Technology

Effects on students' conceptual understanding

- pre and post tests

Effects on students' attitudes about science literacy

- pre and post surveys

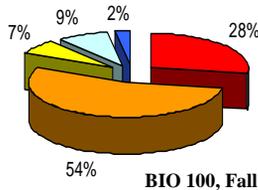
Effects on students' attitudes toward science courses

- pre and post surveys

- HITT survey 

- increased attendance (80-95%)

HITT Survey n=127 (out of 145)

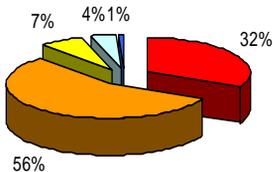


Red = SA =5
 Orange = A =4
 Yellow = Neutral =3
 Lt. Blue = D =2
 Dark Blue = SD =1

Mean +/- SE
3.96 +/- 0.08

Q1: I pay more attention to what is going on in lecture when conceptual questions will be presented and I can respond with the HITT technology.

HITT Survey

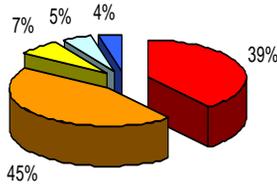


Red = SA =5
 Orange = A =4
 Yellow = Neutral =3
 Lt. Blue = D =2
 Dark Blue = SD =1

Mean +/- SE
4.15 +/- 0.07

Q2: I tend to do more thinking in lecture classes where conceptual questions are asked compared to classes where the instructor lectures for the entire class period.

HITT Survey

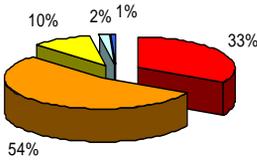


Red = SA =5
Orange = A =4
Yellow = Neutral =3
Lt. Blue = D =2
Dark Blue = SD =1

Mean +/- SE
4.11 +/- 0.09

Q4: If a HITT question is particularly challenging, and we are asked to repeat the question, I talk to classmates to check my understanding of the material.

HITT Survey

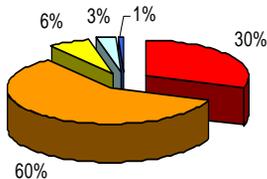


Red = SA =5
Orange = A =4
Yellow = Neutral =3
Lt. Blue = D =2
Dark Blue = SD =1

Mean +/- SE
4.17 +/- 0.06

Q5: Discussing the HITT questions helps me learn the material.

HITT Survey

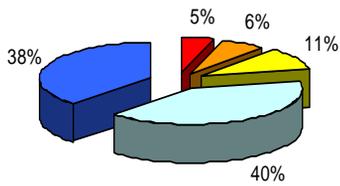


Red = SA =5
Orange = A =4
Yellow = Neutral =3
Lt. Blue = D =2
Dark Blue = SD =1

Mean +/- SE
4.14 +/- 0.06

Q6: Discussing the HITT questions helps me realize which concepts I need to spend more time on when I prepare for exams.

HITT Survey



Red = SA =5
Orange = A =4
Yellow = Neutral =3
Lt. Blue = D =2
Dark Blue = SD =1

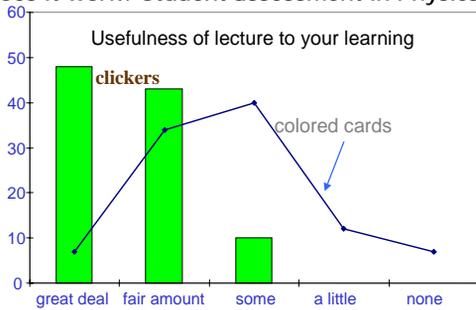
Mean +/- SE
2.00 +/- 0.10

Q11: I prefer a straight lecture approach in science courses over the newer HITT technology approach.

Clicker: Best Practices

- focus should be to enhance learning
- grades for clickers should be low (5 to 10% of total)
- avoid questions that ask for calculations
- keep level of difficulty intermediate
- use system regularly (at least 1 Q each class, 2-4 ideal)
- use with collaborative learning techniques
- exams should test conceptual understanding & critical thinking

Does it work? Student assessment in Physics, CU



line-1010 (fall '01): lots of demos, colored cards feedback, no groups

column-1020 (spr '03): used clickers, assigned seats and groups

HITT System Available for USE

in Angell Hall Aud. B

**180 clickers and 6 receivers
purchased by LS&A**
