

Engaging Students in Large Lectures Using a Classroom Response System

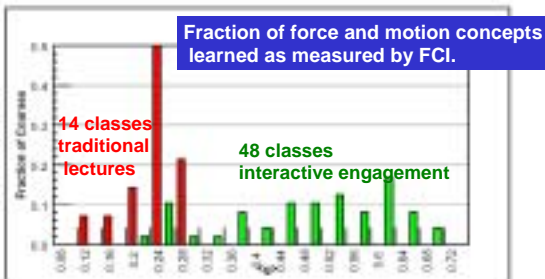


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Why Use a Classroom Response System?

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

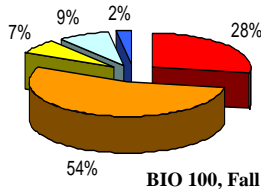
Effects on students' attitudes toward science courses

- pre and post surveys

- HITT survey 

- increased attendance (80-95%)

HITT Survey n=127 (out of 145)

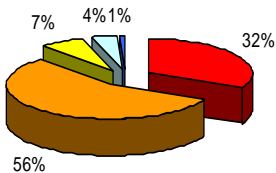


Red = SA =5
 Orange = A =4
 Yellow = Neutral =3
 Lt. Blue = D =2
 Dark Blue = SD =1

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

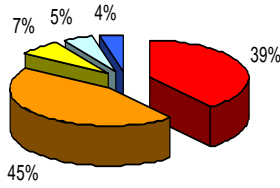


Red = SA =5
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Mean +/- SE
4.15 +/- 0.07

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

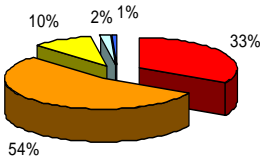


Red = SA =5
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Mean +/- SE
4.11 +/- 0.09

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

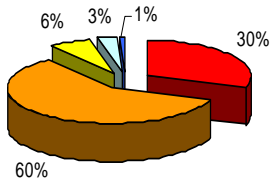


Red = SA =5
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Mean +/- SE
4.17 +/- 0.06

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

HITT Survey

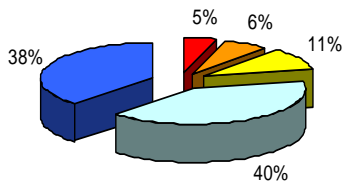


Red = SA =5
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Yellow = Neutral =3
Lt. Blue = D =2
Dark Blue = SD =1

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



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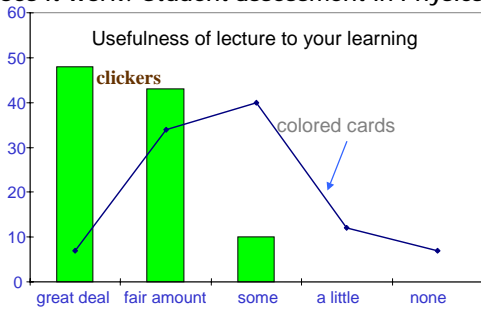
Mean +/- SE
2.00 +/- 0.10

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**
