



Carl Wieman Science Education Initiative
at the University of British Columbia



WORKSHOP: Using Clickers Effectively

CWSEI End-of-Year Event

29 April 2009

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Credits: Clicker Resource Guide from CU-SEI and CWSEI

WORKSHOP: Using Clickers Effectively

Workshop GOALS

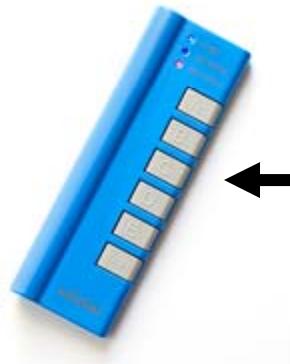
1. Articulate your own reasons for (or against) using clickers in YOUR class
2. Write a thought-provoking clicker question about something you consider important
3. Respond to class answers (histograms) in real time

What are clickers?



The Decision is Simple

[HOME](#) [TE](#)



The Instructor's clicker

How do you think using clickers will
HELP in your class?

- A.
- B.
- C.
- D.
- E.

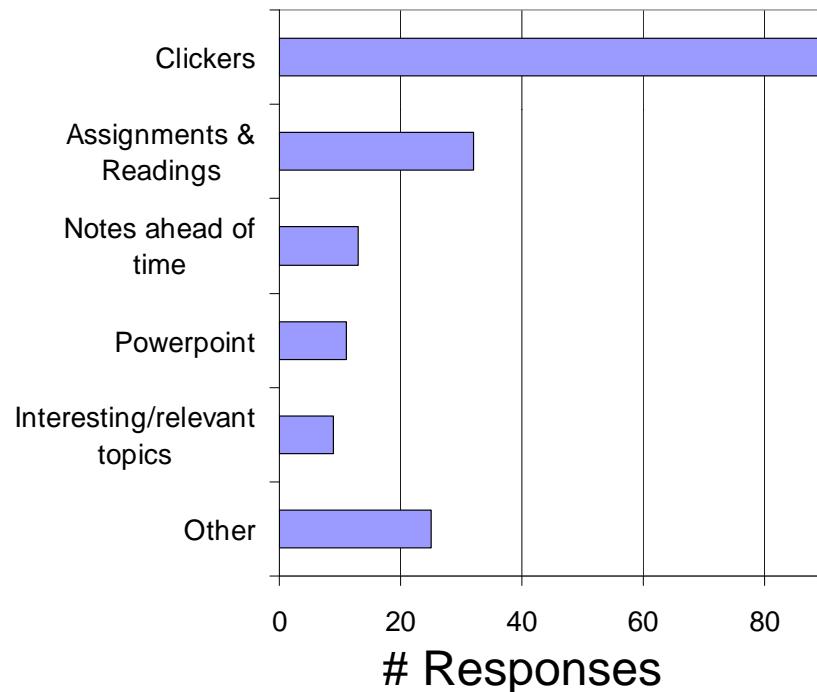
What are your CONCERNS
about using clickers?

- A.
- B.
- C.
- D.
- E.

What do students think?

End-of-Term survey, upper-level science course (200 students)

What do you think worked well in this course, and why?



"clicker questions helped me understand major concepts and how to apply the material"

"it gave me a sense of what I understood and what I didn't."

"clicker questions were really helpful because they made me to think about the material during class."

"I liked the clicker questions because they made me think deeper into particular concepts, but I did find them very challenging."

Stages of clicker use

1. Stage 1 – asking simple, primarily factual questions.
2. Stage 2 – asking more challenging conceptual questions, or questions where the answer is not obvious and critical points could be argued.
3. Stage 3 – Lecture is structured around a set of challenging clicker questions that largely embody the material students are to learn.

Bloom's taxonomy VERBS for Stage 1 (knowledge)

Know
Define
Memorize
Repeat
Record
List
Recall
Name
Relate

Level 1 example

Who is/was the 12th president of UBC?



- A. Martha Piper
- B. David Strangway
- C. Leonard S. Klinck
- D. Frank F. Wesbrook
- E. Stephen Toope



Bloom's taxonomy VERBS for Stage 2 (Comprehension, Application)

Discuss
Describe
Recognize
Explain
Express
Identify
Locate
Report
Review
Tell
Restate

Translate
Interpret
Apply
Employ
Use
Demonstrate
Dramatize
Practice
Illustrate
Operate
Sketch

Level 2 example

Two black cats are crossed.

Which of the following outcomes is **not** possible?

- A. Only black kittens.
- B. Black and brown kittens.
- C. Black and cinnamon kittens.
- D. Black, brown and cinnamon kittens.
- E. All are possible.

$$B > b > b'$$

B – black
 bb or bb' brown
 $b'b'$ cinnamon



Bloom's taxonomy VERBS for Stage 3 (Analysis, Synthesis, Evaluation)

Distinguish

Analyze

Differentiate

Appraise

Calculate

Compare

Contrast

Diagram

Debate

Relate

Examine

Compose

Plan

Propose

Design

Formulate

Assemble

Construct

Collect

Create

Design

Organize

Judge

Appraise

Evaluate

Rate

Value

Revise

Score

Select

Choose

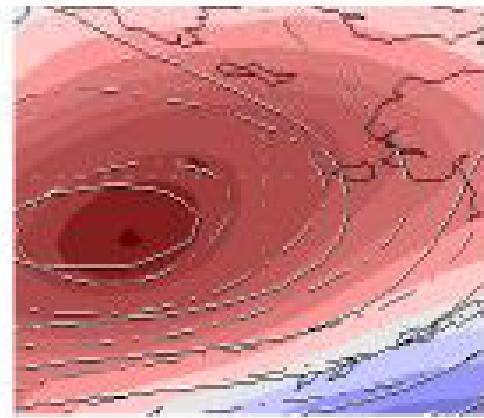
Estimate

Measure

Level 3 example



Q: This arrangement of pressures from sea level, 4 km, and tropopause, would



- A) support cyclogenesis.
- B) have little effect on cyclone evolution.
- C) support cyclolysis.
- D) support anticyclogenesis
- E) (not enough info to answer)

How to write a clicker question:

1. Pick a concept or skill you think is important and/or difficult for students.
2. If you know them, identify any common misconceptions to use as distractors.
3. Write the question as simply and clearly as possible.

There's lots of literature about writing effective MC questions. It's not easy.

Here's a link to get started with the issues around MCQs:

http://teambasedlearning.apsc.ubc.ca/?page_id=163

ACTIVITY 1:

Write a clicker question

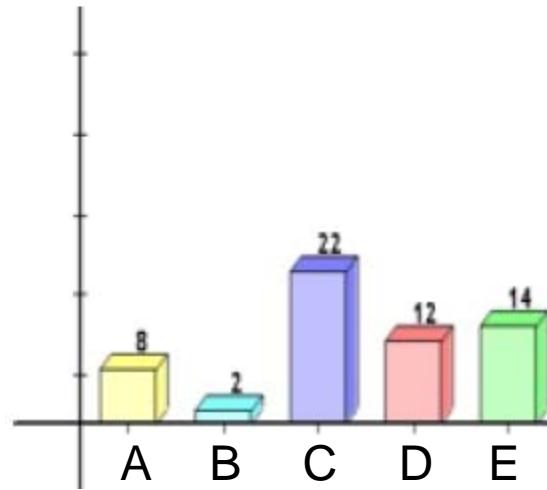
1. Pick a concept or skill you think is important and/or difficult for students.
2. If you know them, identify any common misconceptions to use as distractors.
3. Write the question as simply and clearly as possible.

(Participant example questions)

How to respond to histograms:

What would you do if you got
this histogram?

- A.
- B.
- C.
- D.
- E.



How to respond to histograms:

Example: Why do we have seasons on Earth?

- A. Because the Earth is spinning
- B. Because the Earth is tilted
- C. Because the Earth is spherical
- D. Because the Earth is sometimes closer, sometimes farther from the Sun
- E. Because the Earth's equator is closer to the Sun than the poles



ACTIVITY 2: Respond to histograms

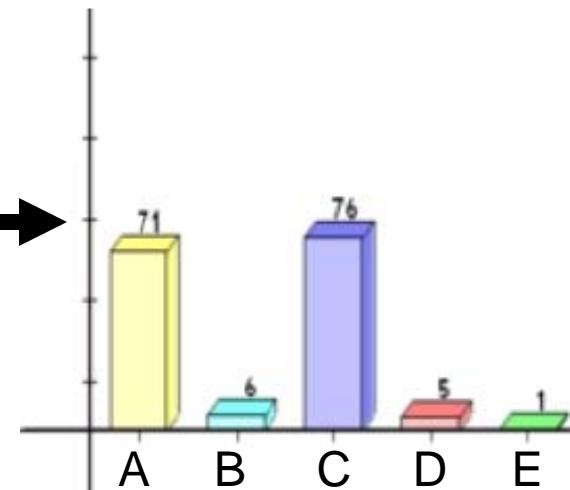
ROLES: Person with the longest commute is the “INSTRUCTOR”. Others in group are the students.

THE QUESTION: Use the question written by the “Instructor”. Alter as needed to make “A” be the correct answer.

FIRST: Give everyone in the group a chance to read the question.

NEXT: Respond to this histogram →

*What are you going to say?
What are you going to do?*



ACTIVITY 2 (cont): Respond to histograms

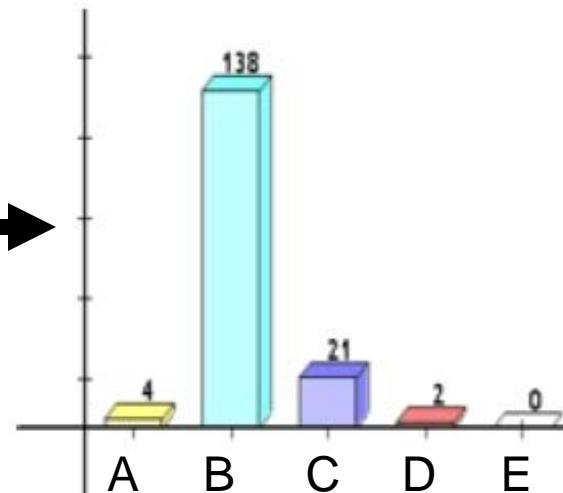
ROLES: Rotate the INSTRUCTOR one person to the left

THE QUESTION: Use the question written by the “Instructor”.
Alter as needed to make “B” be the correct answer.

FIRST: Give everyone in the group a chance to read the question.

NEXT: Respond to this histogram →

*What are you going to say?
What are you going to do?*



ACTIVITY 2 (cont): Respond to histograms

ROLES: Rotate the INSTRUCTOR one person to the left again.

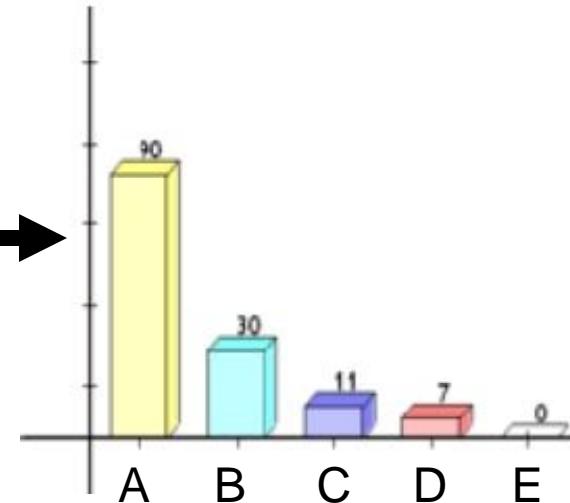
THE QUESTION: Use the question written by the “Instructor”. Alter as needed to make “D” be the correct answer.

FIRST: Give everyone in the group a chance to read the question.

NEXT: Respond to this histogram

What are you going to say?

What are you going to do?



ACTIVITY 2 (cont): Respond to histograms

ROLES: Rotate the INSTRUCTOR one person to the left again.

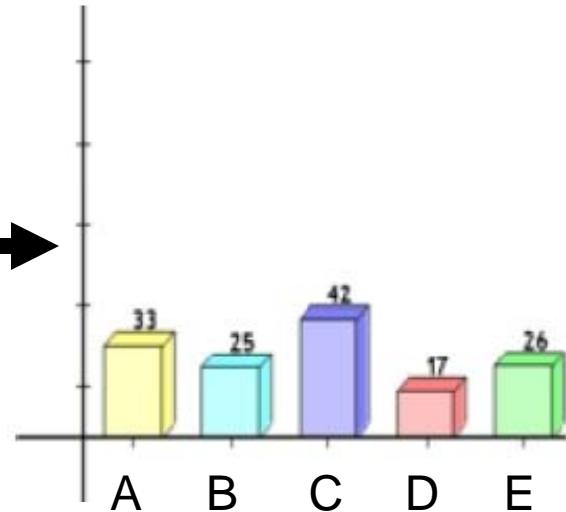
THE QUESTION: Use the question written by the “Instructor”. Alter as needed to make “E” be the correct answer.

FIRST: Give everyone in the group a chance to read the question.

NEXT: Respond to this histogram →

What are you going to say?

What are you going to do?



Tips for Effective Planning

1. Use clickers regularly (every day)
2. Carefully consider your marking scheme
3. Clearly communicate your expectations to students (verbally, in writing, often)
4. Recognize that using clickers takes class time. Consider ways for students to learn some content outside of class.

Revisit Workshop Goals

1. Articulate your own reasons for (or against) using clickers in YOUR class
2. Write a thought-provoking clicker question about something you consider important
3. Respond to class answers (histograms) in real time

Resources & Logistical Support

Lots of concise, useful resources about using clickers effectively:

<http://www.cwsei.ubc.ca/resources/clickers.htm>

You'll need a VISTA site for your course so that students can register their clicker IDs:

<http://www.elearning.ubc.ca>

Tips for writing good multiple choice questions:

http://teambasedlearning.apsc.ubc.ca/?page_id=163

(thanks to Jim Sibley)

You can email Clicker Support on campus:

clicker.support@ubc.ca

Feedback about this workshop

Please fill out the feedback forms so we can improve this workshop.

THANKS!