Using Clickers to Assess Student Learning

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Assessment of Student Learning Week

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For more clicker information or a copy of this presentation, please visit: http://www.elcamino.edu/faculty/dvakil/clickers.htm

Clickers as a Tool for Assessment

- How can they be used to assess student learning?

Big Picture: Clickers enable you to assess student learning in real time in a fun, student-centered way.

Quality of the clicker-assessment depends on the quality of the questions that are written and how the data are interpreted. YOU will try a common and very effective scheme at the end so you can implement clickers.

An example, aimed at political science teachers…
Which one of these people directly affects your life most?

1. Barack Obama
2. Arnold Schwarzenegger
3. State assemblyperson or senator
4. Mayor of your town
5. Tom Fallo
6. Gloria Miranda

Information gathered by clicker

- Which clickers responded to the question
- What answer each clicker gave to each question
- If multiple answers given, order is saved, useful for:
  - multi-digit numbers
  - Ranking a list (prioritizing)
- How long it took each clicker (student) to answer
- If a question is re-polled, both answers are saved
- Results are easily exported to Excel
Some examples of how clickers can be used to immediately assess learning

**PRE-TEST:** A light year is a measure of

0 1. Time
0 2. Distance

Timed question!
Checking current understanding during class

A miniature astronomy lecture

- The universe is 13.7 billion years old.
- A light year is ____________________________, approximately 6 trillion ______________.

POST-TEST: A light year is a measure of

0 1. Time
0 2. Distance

As seen here, you can visually compare two questions, or, in this case, pre- and post-lecture answers.

Purple = pre-test. Blue = post-test. Pre- and post-tests are the gold standard for assessment! Clickers make it easy.
Think-Pair-Share

- Ask the question
- If results are between 50-75% correct, consult with your neighbor and vote again.
  - If 40% correct, coach them a little first.
  - If less than 40% correct, they need more help first.
- Usually results improve noticeably, often 80+%.
- Students understand and remember concept better
- Takes only 3 minutes or less
- Here’s an example…

It is possible for astronomers to detect an object 15 billion light years away from Earth.

1. True
2. False
What can you do with clickers to assess learning?

- **Pre- and post- instruction questions. (Did they learn?)**
- Gathering feedback about class or getting opinions
  - like/dislike activity, useful/useless – students learn better when they enjoy class!
- Quick assessment of recently covered material
  - Ask about facts or conceptual understanding.
  - No question is too easy to ask students. You’ll be amazed.
- **Cooperative learning: Think-pair-share**
- **Quizzes**
  - End of class summary, beginning of class review
  - Determine if students did reading/homework
- Full-length tests
- Ranking choices
- Fastest responses

Why you should use clickers…
Qualitative reasons to use clickers

- Interactive
- Student-centered, minds-on
- Just-in-time teaching. Go fast when they understand, go slow when they struggle.
- Immediate feedback – to you AND your students
  - Create responsible & informed learners!
- FUN (competitive?)
- Gets everyone actively (not passively) involved
  - (Semi?) anonymous, which helps shy students!
- Early and frequent assessment. Diagnose and fix bad lectures/activities
  - Catch poor students quickly, start troubleshooting early

Clicker capabilities

- The following slides show some other things you can do with clickers.
MULTI-ANSWER: Which of the following are types of electromagnetic radiation? Select all that apply.

1. Gamma rays
2. X-rays
3. Infrared
4. Ultraviolet
5. Ultrasound
6. Sound waves
7. Microwaves
8. Radio waves

Improve in-class demonstrations

- Explain the demo set-up
- Have students predict the outcome
- Do the demonstration
- Specifically ask students “Was your prediction correct?”
  - Shows students who lack confidence they aren’t alone
  - Recognize intuition can be wrong
I will drop a pen and a **crumpled** piece of paper. Which will hit the ground first?

0  1. The pen will hit the ground first.
0  2. They will hit the ground at the same time.
0  3. The paper will hit the ground first.

I will now perform the demonstration

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**CONCLUSION** – before YOU try to use clickers

- There are a LOT of things you can do with clickers in your class
- Method of student-centered learning
- They dramatically increase learning
- Particularly well-suited for lecture classes
- Questions? Comments?

- **BONUS:** Here are a few ideas to use clickers without technology…
How could YOU use clickers?

- Work with neighbor
- How to assess learning in YOUR classes:
  - Write an important question about a lesson you are teaching or taught very recently.
  - Write a SHORT one or two line correct answer
  - Write 3-4 common INCORRECT answers, approximately the same length as the correct answer.
  - Bring your question and answers to me. Don’t tell me which is correct.
- Time permitting: we’ll try your questions.