

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?

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80

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-pollled, 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!

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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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.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
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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.

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

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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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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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.