

# Clickers in the Classroom

David Vakil

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Compton Flex Day

Professor Vakil teaches astronomy & physics at El Camino College. He is also the current Academic Senate president.

Contact info:

[dvakil@elcamino.edu](mailto:dvakil@elcamino.edu) – 310-660-3593 x3134

For more clicker information or a copy of this presentation, please visit:

<http://www.elcamino.edu/faculty/dvakil/clickers.htm>

(there's also a link to the clicker page on my home page)

## Presentation outline

- What are clickers?
- How can they be used?
- Why should you use clickers?
  - What are the benefits?
- Please ASK QUESTIONS **during** this presentation.

Big Picture: Clickers enable you to do student-centered learning. Let's start with a "student"-centered activity, rather than with me lecturing. This is what clickers are about.

**Respond as though you are students in  
YOUR class.**

**By show of hands...**

**Who believes:**

**“Not enough students answer questions  
that I ask during class.”**

**Blank Slide**

## Not enough students answer questions that I ask during class.

1. True
2. False

See how much the vote participation increases with clickers?

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										

## What are clickers?

- Clickers get quick results to multiple choice questions.
- They send signals using Radio frequency (RF) light
  - Radio light doesn't require line-of-sight, unlike household remote controls
  - Receiver is small and portable.

## TurningPoint clickers – ECC's standard

- Platform uses:
  - Integrates EASILY with PowerPoint.
  - Available as stand-alone software.
  - Model available with no computer needed!
  - Macintosh model available
- TurningPoint's RF clicker:
  - Comes in Braille also
  - Uses 2 coin cell 2032 (3.0V) batteries
  - Simple to use for student
  - RF **LCD** model has display screen – BUY THIS ONE!
- TurningPoint's XR clicker:
  - Has screen for direct feedback to student; allows for clicker-tests and word answers!
  - Uses 2 AAA batteries.
  - More features, slightly more complicated for student



## Costs & getting started

- Costs:
  - Clickers – cost \$30 each. **LCD model = \$34 each.**
  - Receiver – needed to get the signals from the clickers. Cost \$99 each (one per class set).
  - Carrying case - ??\$75??
  - Software to interpret the signals. (free)
- Getting started
  - Train yourself for the software
    - Self-exploration
    - Web-based demonstrations
    - Read the manual
    - Ask me or watch my training videos
  - Start small in your classes

## 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)
  - Turning Point results are easily exported to Excel
  - How long it took each clicker (student) to answer
  - When question is re-pollled, both answers are saved
- 
- Decimals (only on XR model)
  - Some math symbols/expressions (also only on XR)

Some examples of how  
clickers can be used  
in classes

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

1. Time
2. Distance

15

Timed question!

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

1. Time
2. Distance

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

Purple = previous. Blue = current.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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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 40-50% 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 1 minute or less per question asked
  - I typically give 60 seconds per conceptual question.
- 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
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## **What can you do with clickers?**

- Pre- and post- instruction questions. (Did they learn?)
- Taking attendance (automatically calculated if any question is asked)
- Classroom demographics
  - Who are your students?
  - How does performance relate to various characteristics?
- Gathering feedback about class or getting opinions
  - like/dislike activity
  - useful/useless
- Quick assessment of recently covered material
  - Ask about facts or conceptual understanding.
  - No question is too easy to ask students. You'll be amazed.
  - Build their confidence or shake yours!
- Ice-breakers
- Discussion starters

## Uses, continued

- Data gathering – very useful for accountability reports
- 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
- On-the-fly questions to suit whatever comes to mind during class.
  - Some of my best & worst questions were done on the fly.
  - When students ask a question, **DON'T ANSWER THEM!** Click!
- Fastest responses
- Team questions/answers

## What skills are needed to use clickers?

- Knowledge of presentation software (e.g. PowerPoint) helpful, **but not required**.
- Anybody with basic knowledge of computers
- TurningPoint is easy for novices
- TurningPoint is also powerful and versatile for advanced users

## Why you should use clickers...

### Qualitative reasons to use clickers

- Interactive
- Student-centered, minds-on
- Just-in-time teaching
- 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

## Quantitative reasons to use clickers

- Attendance increases noticeably
  - Research at 4-year schools shows attendance at 85%.
- Similar research shows students read the text more, are more interested in the course, have a more positive attitude towards the course. Clickers help students enjoy school!
  - When I don't use clickers during class, I get complaints! Students like clickers and learn from using them.
- FOR MY CLASSES: my school's research team found:
  - Success (# earning C or better) increased 12%.
  - Retention (# finished) increased 2% (astro) & 25% (physics).
  - GPA didn't change much because W's → C's.
- Success gains this large are VERY difficult to achieve.
  - Gains partly from technology, mostly from new way of teaching

## Clicker capabilities

- The following slides show some other things you can do with clickers.

**MULTI-ANSWER: Which of the following are NOT 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

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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?**

1. The pen will hit the ground first.
2. They will hit the ground at the same time.
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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## Quizzes & Tests

- XR clickers can handle tests & quizzes
- Requires some student training of the clickers, so I won't demonstrate that now.

## How could YOU use clickers?

- Time permitting: we'll try your questions.
- Work with neighbor
- How to assess learning in YOUR classes:
  - Write an important question about a lesson you are teaching soon 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 answer is correct.

## CONCLUSION

- 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?
- **STRONGLY RECOMMEND READING:**
  - Derek Bruff's book *Teaching with Classroom Response Systems, Creating Active Learning Environments*.