

# Clickers in the Classroom

David Vakil

April 18, 2009

On Course National Conference

Professor Vakil teaches astronomy & physics at El Camino College.

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>

## 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**



## Radio vs. Infrared

Issue	Radio	Infrared
Detector/sensor location	Any computer within few hundred feet	Line-of-sight (point at it)
Portable	Very (USB)	Limited (receiver must be high up)
Different channels if 2+ nearby classes use same model	Yes	Irrelevant – line of sight detection
Cost (more info coming)	<u>Slightly More</u>	<u>Slightly Less</u>

If cost is an issue, I still recommend radio over IR. Get more money or fewer clickers!  
Companies aren't making many more IR models.

## TurningPoint clickers

- 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
- TurningPoint's XR clicker:
  - Has screen for direct feedback to student; allows for clicker-tests and word answers!
  - Uses 2 AAA batteries.



## Clicker Manufacturers & Reviews

ECC standardized with TurningPoint. Standardizing lowers costs.

Other affordable companies include, in no particular order:

- E-instruction
- Interwrite
- Qwizdom
- iClicker = very simple(st?) clicker model, but few features
- H-ITT
- Brands I've only read a little about:
  - SMART Technology's Senteo
  - Promethean Activote
  - Others exist. Some are web-based. This slide was written in 2008.

See these two articles for more info about above systems:

1. Written in Nov. 2007 by Susan Bush & Susan McLester  
<http://www.techlearning.com/showArticle.php?articleID=196604803>
2. *CBE - Life Sciences Education*, Vol. 6, 1–20, Spring 2007

## 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)
- Decimals (not all models/manufacturers)
- Some math symbols/expressions (also not all models)
- How long it took each clicker (student) to answer
- When question is re-pollled, both answers are saved
- Turning Point results are easily exported to Excel







## 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 and iClicker systems easy for novices
- TurningPoint is also powerful and versatile for advanced users
  
- Ease of using clickers is VERY software-dependent. Shop around and try the product before buying!
  - The salespeople's demonstration make it look VERY easy.
  - TRY IT YOURSELF!

**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



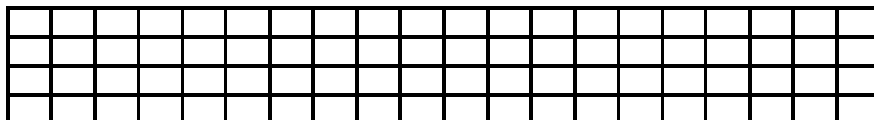
## Improve in-class demonstrations

- 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



## Quizzes & Tests

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

## Hardware issues

- Two methods of purchasing: school or student.
- If school buys clickers
  - YOU track, store, and transport clickers.
  - I STRONGLY recommend this route; I've tried both ways.
- If students buy the clicker
  - if they lose or break it, their problem.
  - Spares/class policy for when students forget clicker
  - Can be paperwork hassle for you; keeping track takes work.
  - Not everybody buys them, not simultaneously purchased
  - Students may not be able to sell back to the bookstore
- Batteries die
- Clickers fail/break – who repairs post-warranty?

## Technology Issues

- **EARLY ON: Set up schoolwide standards**
  - Allows for training of faculty & students
  - Easier on the support staff; only one system to learn
  - Lower costs
  - Else faculty adopt whatever their publisher promotes.
    - Variation
    - Students or school could purchase multiple clickers.
  - Problem: the technology evolves VERY quickly.  
Equipment will become obsolete quickly.
- How handle tech support post-warranty?
- How will upgrades be implemented?

## Getting started

- Clickers – cost \$20-50 each, depending on model
  - These cost \$30 each if campus standardizes (more if don't)
- Receiver – needed to get the signals from the clickers.  
Cost varies.
- Software to interpret the signals. (Often free)
- Train yourself for the software
  - Self-exploration
  - Company may offer on-site training and/or demonstration
  - Web-based demonstrations
  - Read the manual
- Start small in your classes

## 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*.

## **A sneak peak of the “Advanced” session: How will YOU use clickers?**

- Ask the unanswered questions
- Write clicker questions related to your class(es)
- We'll try your questions and give feedback