

Clickers in the Classroom

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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?

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.

**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.

- 0 1. True
- 0 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	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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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.

NOTE: Cheaper Infrared (IR) clickers exist. They are inferior to RF for many reasons, and not much cheaper anymore. See next slide in notes for more info.

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

- Integrates EASILY with PowerPoint.
- TurningPoint's RF clicker:
 - Comes in Braille also
 - Uses 2 coin cell CR2032 (3.0V) Lithium Batteries
 - Simple to use for student
- TurningPoint's XR clicker:
 - Has a display screen for direct feedback to student; allows for clicker-tests!
 - Uses 2 AAA batteries.
 - More features, slightly more complicated for student



Clicker Manufacturers & Reviews

ECC standardized with TurningPoint. Standardizing lowers costs.

Other affordable companies include, in no particular order:

- E-instruction
- Qwizdom
- iClicker (very simple clicker model, but also few features)
- Interwrite
- H-ITT
- Brands I've only read a little about:
 - SMART Technology's Senteo
 - Promethean Activote
 - Probably others by now...

See these two articles for more info about above systems:

1. Written in January 2008 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
- Results are easily exported to Excel

Some examples of how clickers can be used in classes

PRE-TEST: A light year is a measure of

- 0 1. Time
- 0 2. Distance

Timed question!

15

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

- 0 1. Time
- 0 2. Distance

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

Purple = previous. Blue = current.

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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.
 - Sometimes students ask a question. DON'T ANSWER! 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) system 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.
- My school's research team found:
 - Success (# earning C or better) increased 9-13%.
 - 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, partly 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?

- 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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Quizzes & Tests

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

Hardware issues

- 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 probably can't sell them back to the bookstore
- Batteries die
- Clickers fail/break – who repairs post-warranty?
- Questions/comments you have?

Technology Issues

- **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?**
- **Other questions/issues?**

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?

How could YOU use clickers?

- Work with neighbor
- Write specific examples where clickers would help you
- Try to write one difficult think-pair-share question.
- Time permitting: we'll try your questions.