

Advanced Clickers: Practical Classroom Issues & Question Design

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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

- Uses for clickers (3 min)
- Suggested reading (2 min)
- What are your questions and concerns? (up to 15 min)
- Grading suggestions, pre-empting cheating (5 min)
- Types of questions (3 min)
- Write your own clicker questions (10+ min)
- Simulate class with your questions (20+ min)
- Final tips (2 min)

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, putting lists in order
- 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

Suggested Reading - Books

- I VERY STRONGLY RECOMMEND:
 - Derek Bruff's *Teaching with Classroom Response Systems, Creating Active Learning Environments*.
 - 200 pages of everything you need to know. Useful Table of Contents. Well organized. Has everything EXCEPT for info about clicker manufacturers and software help.
 - Written for most disciplines about generic clickers.
- QUICK READ:
 - Doug Duncan's *Clickers in the Classroom*.
 - Centered mostly on science, especially astronomy/physics.
- THE BOOK THAT STARTED IT ALL:
 - Eric Mazur's *Peer Instruction: A User's Manual*.
 - Centered mostly on physics

Suggested Reading - Journal Articles

- *Physics Teacher*, April 2008, "Clickers or Flashcards" by Nathaniel Lasry
 - Clickers & flashcards result in same amount of learning
 - Clickers are better because clickers are both a learning AND teaching tool. Flashcards are just a learning tool.
- *Life Sciences-CBE*, Spring 2007, "Clickers in the Large Classroom" by Jane E. Caldwell
- Doug Duncan's 2 page clicker tips handout:
 - <http://casa.colorado.edu/~dduncan/clickers/Tips.pdf>
- Check YOUR discipline's journals. More articles appear every day.

Your questions & concerns

- Topics:
 - What are your biggest concerns about using clickers?
 - What are your unanswered questions?
- YOUR TASK:
 - Work in small groups
 - Write 3-5 questions
 - In 5 minutes we will share them with the room

Clicker grading

- Doug Duncan's book: *Clickers in the Classroom*
 - Align grading with course goal (e.g. participate vs. correct)
 - Use clickers consistently if part of grade
 - Drop some scores – tech problem, forgot clicker, etc.
 - Make worth 10% (maybe less)
 - small effect on grade, big effect on attendance
- Patrick Len's article: *Astronomy Education Review*:
 - Offer bonus points if class gets it 80+% correct
 - Increases participation and discussion
- High stakes grading DISCOURAGES talking with neighbors.

Cheating

- Doug Duncan's book: *Clickers in the Classroom*
- Paraphrased:
 - Discuss cheating at start of the semester
 - Using another clicker = taking their exam for them
 - Little to gain, lot to lose
 - Small part of grade, big hindrance to learning
 - Most students LIKE the feedback
 - Students say feedback improves grade

Types of Questions

- Fact check
- Conceptual
 - Easy: one concept
 - Medium: assemble two concepts
 - Hard: assemble 3+ concepts
- Think-Pair-Share (next slide)
- Discussion starter / opinion gathering
- Pre & Post test (identical question)

Think-Pair-Share

- (My personal favorite, the kind I use most often)
- Ask the question, students respond individually
- 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, coach a lot or review.
- Usually results improve noticeably, often 80+%.
- Students understand and remember concept better
- Takes only 2-3 minutes, for rich conceptual questions.

Write your own clicker question

- Write question(s) on your own for YOUR class.
- Then share them with group
- Estimate your questions' difficulty level
- We'll try your questions in here
- We'll assess your difficulty level

Your questions

- Insert participant questions in the slides below

Asking the question in class

- Two thoughts:
 1. Don't read the question out loud.
 - The students reread it to themselves anyway.
 2. Don't show the vote results if you may do a Think-Pair-Share
 - Seeing the majority influences decision/discussion
 - Try not to reveal if you're happy or sad about results
 - Guide students if <50% correct on first question

CONCLUSION

- I hope you wrote the useful tips down! That was the entire point of today's session!
- Some final advice:
 - Pay attention to difficulty level & Bloom's taxonomy
 - Discussion questions are most memorable and lead to longer term learning
 - Don't write questions all by yourself or at the last minute!
 - We all write bad questions. Learn from mistakes. Try to use the "bad" question as a teachable moment. "How should this question be worded if we were trying to XXXXX?"
 - Get student input on improvements! Some of my favorite questions were drafted by students!