

## Clickers: continuing to improve for next year

EOS courses using clickers include eosc112, 114, 210, 326, 340, 355, 372, 373 and atsc201. **Over 2,200 students answered EOS clicker questions this year.**



### Why use clickers? Reasons include:

- **Facilitate discussion** and peer instruction.
- **Measure students' abilities** before AND after teaching or practicing skills or knowledge.
- **Provide timely feedback** to both students and instructors about student abilities or conceptions.
- **Provide frequent & timely practice** sessions so students can grapple with concepts.
- Help students **recognize and confront** common misconceptions;
- Obtain **honest** responses when measuring attitudes and opinions.
- Increase student's **retention**.
- Transform the way you do demonstrations.
- Help **YOU** maintain a student-centric perspective.
- And many others ....

### **BUT clickers don't work by themselves. Success (by any measure) depends on what you do in class.**

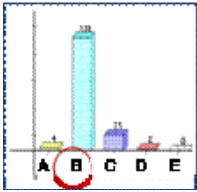

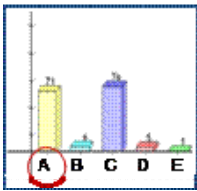
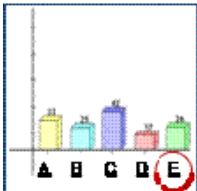
Here is advice summarized from a full 2-pg tip sheet by Dr. Douglas Duncan at University of Colorado see [http://www.cwsei.ubc.ca/resources/files/Tips\\_for\\_Successful\\_Clicker\\_Use\\_Duncan.pdf](http://www.cwsei.ubc.ca/resources/files/Tips_for_Successful_Clicker_Use_Duncan.pdf) ):

1. Plan clicker use by targeting specific learning goals.
2. It is CRUCIAL to explain why you are using clickers. If you don't, students will assume it is for attendance.
3. Practice *before* using with students. The technology is simple, but it is ONLY technology.
4. Make clicker use a regular and serious activity. If you treat clicker use as unimportant, students will too.
5. Use a combination of simple and more complex questions. Many users make their questions too simple.
6. To boost participation give a small amount of credit (5% or less in your marking scheme). Many options exist, for counting both "participation" & "correct answers". Allow students to miss 20% of clickers without penalty.
7. To increase student learning, have students discuss and debate challenging concepts. This is "*peer instruction*" and has been shown to increasing learning when used well. For example, have students answer individually first; then discuss with those sitting next to them; then answer again.
8. Explain that it is the discussion that produces learning, not just "answering". Conversations will help students find out what they don't really understand. The phrase, "No brain, no gain" is true.
9. While students are discussing circulate and listen to reasoning. *This is very valuable and often surprising.*
10. Having discussions in groups means you can ask a group to contribute without having to ask a specific student.
11. Be sure to discuss wrong answers - and why they are wrong. No one learns from getting it right.
12. Share and discuss clicker questions with colleagues. The best questions for peer discussion can be answered by 30-70% of students before discussion with peers.
13. Start small: 1 or 2 questions per class is OK for a start, but once every 10 minutes is normal. Some "experts" run the whole lesson using clicker questions. This leverages "one-on-one Socratic teaching" to a whole class.
14. Watch an experienced clicker user at work. This will help rapidly improve your clicker use.

**Practices that will likely lead to Failure:**

1. Fail to explain why you are using clickers.
2. Use them primarily for attendance.
3. Don't have students talk with each other.
4. Use only factual recall questions.
5. Don't make use of the student response information.
6. Fail to discuss what learning means or the depth of participation and learning you expect in your class.
7. Think of clickers as a testing device, rather than a device to inform learning.

**How to react to answering patterns?** Here are suggested strategies, assuming you are asking "normal" multiple choice questions with a preferred answer. Real-time response is not always easy, but well worth getting good at.

TYPE	EXAMPLE	POSSIBLE TACTICS
Mainly correct		<ul style="list-style-type: none"> <li>• Start by NOT revealing the correct answer.</li> <li>• Ask "Why do you think someone might have chosen C?"</li> <li>• Get 2-3 explanations from students or groups, then move on.</li> <li>• <b>Avoid the temptation to do all the explaining.</b></li> <li>• Students want discussion about why a choice is "wrong", even when the majority is correct.</li> </ul>
Mainly wrong		<ul style="list-style-type: none"> <li>• Do not reveal the answer right away.</li> <li>• Ask "Why do you think someone might have chosen A?" Then again for "B".</li> <li>• Use misconceptions as a positive source of inspiration for discussion or explanation.</li> <li>• OR ... do a mini lecture or demonstration &amp; then have students vote again.</li> <li>• IF these are solo results, follow up with peer discussion, then vote again.</li> </ul>
Bimodal		<ul style="list-style-type: none"> <li>• Focus on BOTH preferred answers to reveal sources of misconception without revealing the answer – yet.</li> <li>• Otherwise, consider similar tactics to "Mainly wrong" above.</li> <li>• Or ask "how did those who chose "A" eliminate "B"?"</li> </ul>
Random		<ul style="list-style-type: none"> <li>• Ask "Can we eliminate any of these choices?"</li> <li>• OR ... "Let's see how you are making decisions ...?"</li> <li>• Ask "how might you eliminate "B"?"</li> <li>• Same tactics as "Bimodal" above.</li> </ul>

**Student Feedback:**

- "The clicker questions keep me on the edge of my seat."
  - "Clicker questions are extremely useful in that they provide a means of processing the knowledge as it's learned. It also shows you guys what we understood and didn't so it provided almost an instant source of feedback."
  - "...they are really interactive. I can apply the knowledge I learned immediately and discuss my thoughts with other students. I think I learn better with clicker questions because they help me remember what was discussed in lecture."
  - "with the clicker questions, I am more able to get involved and practice the knowledge that was just learned."
- ... and so on. We rarely get negative feedback in classes that have made clicker use standard practice.

**Clicker workshop:** The CWSEI end of year event on April 29<sup>th</sup> features a workshop on designing clicker questions to foster productive discussion. Effective implementation and feedback. **You are invited!**

**To discuss options or ask advice:** Contact an STL for a 36pg instructors' guide, and **see also:** "How to" videos, peer reviewed research articles, and other resources at <http://www.cwsei.ubc.ca/resources/clickers.htm>.

**Contact EOS-SEI:** To talk about your course(s) or teaching and learning in general, visit EOS-South 361, or contact Francis Jones ([fjones@eos.ubc.ca](mailto:fjones@eos.ubc.ca)), Brett Gilley ([bgilley@eos.ubc.ca](mailto:bgilley@eos.ubc.ca)), Erin Lane ([elane@eos.ubc.ca](mailto:elane@eos.ubc.ca)), Josh Caulkins ([jcaulkins@eos.ubc.ca](mailto:jcaulkins@eos.ubc.ca)) or Sara Harris ([sharris@eos.ubc.ca](mailto:sharris@eos.ubc.ca)). See also <http://www.eos.ubc.ca/research/cwsei/>.