

## Encouraging Active Learning with Clickers

More engaged students are just a click away. For the past six years, MU instructors have used clickers (Student Response Systems) in classes of different sizes (from 8 students to 390) and content (from Anatomy through Theatre). Join us for a hands-on demonstration; discussion of techniques, use cases (such as think-pair-share and discussion starters), and outcomes; and an exploration of where this technology is leading us as it begins to migrate to phones and other mobile devices.

### **Reasons to Click**

#### **Improve Comprehension**

Clicker questions reinforce course materials and allow students to quickly identify what they do and do not understand while still in the classroom.

#### **Heighten Interaction**

In large lectures it is common for students to enter "couch-potato" mode and become passive learners. Clickers force students to be more active. (In some classes, a certain level of competitiveness is involved.)

#### **Focus Attention**

Attention spans in class are about 15 to 20 minutes. By adding a different activity at appropriate points, the attention span can be "reset." Also, well worded clicker questions alert students to important points in lectures and discussions.

#### **Measure Engagement**

By paying attention to how fast and well students answer, it is possible to get some feeling for how engaged students are in the class.

### **Classroom Use**

#### **Think, Pair, Share**

This is one of the best techniques with clickers. Here is how it works with clickers:

- a. Ask a question, but do not show the correct answer unless the majority of students answered correctly.
- b. Have the students talk over the answer with a neighbor for about a minute.
- c. Ask the question again, but this time show the correct answer.
- d. Discuss the reason for the answer.

Typically, students will spot the logical or factual flaw in an answer once they begin discussing it.

#### **Introduce/Review Material**

Use clickers at the beginning of the class to ask one or two questions on either readings for the day or on the last topic covered in the previous session. This helps to focus on

the material and pick up the thread.

During class, when changing topics, try asking a question reviewing what was just said or one that will help them transition to the next topic.

### **Check Comprehension**

Some professors have found that they can move through material more quickly if they know whether the students are "getting" the material. As you move through a topic, ask a question or two to see if the material is understood. This works particularly well with objective data and solving problems. Use the results to decide if more examples or explanation is needed, or if it is possible to go on to the next topic.

### **Attendance/Participation**

Being able to take attendance easily is one of the side benefits of using clickers. It is just as easy to use clickers for participation grades. (Tip: make sure the students know their participation scores are based on answering questions, not just clicking in at the start of class.)

### **Discussion Starter**

Clickers are a great way to get students to speak up.

When faced with difficult and/or subjective topics, students often dislike being the first to speak. Asking a question and showing the answer distribution allows students to see that others agree with them. Follow up the clicker question with a discussion by asking for someone who gave each answer why they chose that one.

Variation: If there is available polling data on a controversial or subjective question, ask the students the same question(s), and then compare their results with the national poll. This is a good way to help them understand how they differ in their opinions and also to understand polling biases.

## **Classroom Challenges**

### **Forgotten Clickers**

Students forget clickers; it just happens. Different instructors have developed a variety of ways of dealing with this. Normally, this is posted as part of the attendance policy for the class. If not used regularly, forgotten clickers can become more than a minor irritant.

### **Bad Batteries/ Defective**

This issue also has to be addressed. Batteries should last at least a semester, but invariably someone has an older clicker that has old batteries. Most instructors treat this in the same way they do forgotten clickers.

Defective clickers are a little different. If under a year old, they may be exchanged. If over a year old, students will need to purchase a new one.

### **Cheating**

This is one of the most frequent issues brought up by faculty who are thinking about using clickers. Essentially, the same academic honesty regulations apply to this as to any quiz, test, or assignment. A few cases have come to light but it does not seem too

common. In large lectures, cheating is caught, in most cases, by TAs or from reports by other students. In small courses, it is generally easily detected.

### Technical Issues

Because clickers rely on a combination of hardware and software, there are several things that may go wrong. In general, two or three simple fixes take care of most problems; however, ET@MO provides office and in-class support.

### Lack of time to setup in classroom

As with other classroom technologies, the short space between classes is one of the biggest challenges. Using clickers will most likely add one to two minutes, and two or three extra steps to starting the technological components of a class.

## Preparing

### Learning the Software

Probably the biggest mistake instructors make is not allowing themselves enough time to learn to work with the software. In addition to learning the mechanics of using CPS, time also needs to be allowed to learn to effectively incorporate it into lessons.

Given that clicker orders need to be given to the Bookstore along with textbooks, we recommend that new users contact ET@MO about installing the software and getting started at that time. Trying to learn CPS at the last minute can lead to bad experiences in the classroom.

### Setting Classroom Policies

It is vital to set out classroom policies on registering clickers in a timely manner, forgotten clickers, dead batteries, cheating, and other matters in the course syllabus. Failure to do so can result in undue stress for both instructors and students. Expectation setting is one of the most underrated and most valuable parts of the clicker experience.

### Developing Questions

Writing clicker questions can be as straightforward as writing a pop quiz or as complex as the instructor desires. Many, if not most faculty use multiple-choice questions written into a single PowerPoint slide, but that is only one technique.

More complex graphic questions may work best if distributed over several slides, so that students can view the images associated with the questions before giving their answers.

Some instructors use the software in conjunction with overhead projectors or document cameras to allow more flexibility. It is also possible to use CPS in conjunction with other software to ask more complex questions than may be easily accommodated by PowerPoint.

### Developing a Process

Continuing success with CPS requires developing rhythms or processes in writing questions, using it in class, and working with the results. These may be simple or complex, but are a necessary part of adopting and adapting the software to work with existing teaching routines.

## **Links**

- MU Clicker Help - <https://courses.missouri.edu/faculty/clickers/index.php>
- Article on use of clickers in small classes - [http://www.decisionsciences.org/DecisionLine/Vol39/39\\_4/dsi-dl39\\_4class.pdf](http://www.decisionsciences.org/DecisionLine/Vol39/39_4/dsi-dl39_4class.pdf)
- Clicker Resource from UBC - <http://www.cwsei.ubc.ca/resources/clickers.htm>