

Student/Audience Response Systems (aka “Clickers” or SRS)  
Presented by CIT at School Meetings 2/8/2008

A Student/Audience Response System is a combination of hardware and software with several purposes:

- To increase the interactivity of a classroom setting
- To allow instructors to quickly gauge the student’s understanding of a topic
- To provide an anonymous means to open a discussion on a sensitive topic

The system works in the following manner:

- 1) **An instructor posts a multiple-choice question** using an overhead or computer projector. The instructor can build these questions in to a presentation using PowerPoint or the instructor can ask questions verbal questions ‘on the fly’ with no prior preparation.
- 2) **Each student submits an answer to the question using a clicker** that beams a radio-frequency signal to a receiver attached to the computer in the classroom.
- 3) **Software on the computer collects the students’ answers and produces a graph** that can display the students’ answers on the screen.

Clickers make interaction in the classroom possible for 100% of students. The system can be used in the following ways:

- **Ask the Audience:** Allows the instructor to post a multiple-choice question and display the results in real-time. Questions can be intermixed with lecture content to allow instructors to gauge student understanding and adjust lectures accordingly.
- **Peer Instruction:** The teacher poses a question to his or her students. The students ponder the question silently and transmit their individual answers using the clickers. The teacher checks the histogram of student responses. If significant numbers of students choose the wrong answer, the teacher instructs the students to discuss the question with their neighbor. After a few minutes of discussion, the students submit their answers again. This technique often (but not always!) results in more students choosing the correct answer because of the peer instruction phase of the activity.
- **Attendance and Quizzes:** If transmitters are assigned to students for the duration of the course, then the system can be used to take attendance or to give for-credit quizzes and tests.
- **Interactive Demonstrations:** Students can be asked to predict the outcome of an experiment prior to being shown the experiment. This gives the teacher a sense of the students’ preconceptions and increases the surprise value of the experiment when students see how many of their classmates expected different outcomes.
- **Data Gathering:** SRS can be used to gather demographic, opinion, or other data from a students.

In addition to facilitating a variety of teaching activities, the system enables a teacher to ask a variety of types of questions.

- **Factual Questions:** These questions might be used to see if students did the reading, remember important points from prior classes, or have memorized key facts.
- **Conceptual Questions:** While difficult, it is possible to write multiple-choice questions that demonstrate whether students understand important concepts and principles.
- **One-Best-Answer Questions:** These questions include multiple answer choices, more than one of which could be argued as correct. Students are asked to select the one best answer from these choices.
- **Opinion Questions:** Evaluative and opinion questions may not have correct answers, but asking these questions can engage students and provoke rich discussions, particularly in response to ethical, legal, or moral issues.
- **Questions Asking for Predictions:** Students can be asked to predict the outcome of an experiment prior to being shown the experiment. This gives the teacher a sense of the students’ preconceptions and increases the surprise value of the experiment when students see just how many of their classmates expected different outcomes.
- **Games:** SRS can facilitate data gathering in such games classroom games are played to illustrate points about human behavior.

Possible benefits to students and instructors as a result of the Student Response System include:

- 1) **“Lengthen” a student’s attention span** by inserting a system-facilitated activity to reduce the amount of passive listening.
- 2) **Encourage class participation**
  - Ease fears of giving a wrong answer in front of peers
  - Ease fears of expressing unpopular opinions about sensitive ethical, legal, and moral questions
  - Engages shy & withdrawn students
- 3) **Promotes class discussion** and collaboration among students if utilized as a group activity that requires classmates to come to a consensus
- 4) **Check for student understanding during class** by asking content specific questions to determine comprehension of a topic discussed. Instructors do not need to wait to get homework turned in or exams completed to gauge student understanding.
- 5) **Lectures can adapt to the immediate needs of students** based on student responses to questions. If the report shows that a majority of students do not understand a concept, the instructor can revisit the topic.
- 6) **Take attendance and grade in-class quizzes automatically** if each clicker is assigned to a student. Each SRS provides a different level of support for anonymous and non-anonymous usage.
- 7) **Content provided for Student Response System** by some textbook publishers (and sometimes packaging the device with the book)
- 8) **Immediate recording of in class grades** into certain grade book software (usually able to export to Excel; possibility of importing into VikingWeb in the future)
- 9) **Less formal class setting with a student centered atmosphere**
- 10) **Add a little drama to class** as there is often a sense of expectation as wait for the histogram to appear showing how their classmates answered a given question.

Features of eInstruction Clickers:



- 3 line LCD screen
- Allows multiple choice, numeric (up to 12 digits, symbol button for fraction, decimal, square root and 10 other symbols, negative numbers)
- Shows battery life; powered by 2AA batteries; multiple semester life with normal use
- Software compatible with PC and Mac
- Radio Frequency signal up to 200 ft; can set receiver to different frequency to avoid interference
- Cost to School/Faculty: with standardization free instructor kit includes 1 clicker, 1 receiver, and software
- Cost to Students: with standardization \$35 - \$39; without standardization \$50 - \$60