

Using Clickers in Today's Classroom

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Today's Learners

The following chart compares the differences between the learning preferences of the past three generations:

Baby Boomers	Generation X	Net Gen (Internet Generation)
<ul style="list-style-type: none">•TV generation•Typewriters•Telephone•Memos•Family focus	<ul style="list-style-type: none">•Video games•PC•Email•CDs•Individualist	<ul style="list-style-type: none">•Web•Cell phone•IM•MP3s•Online communities

Today an average 21-year old has spent:

- 10,000 hours playing videogames,
- 20,000 hours watching TV,
- 10,000 hours using cell phones,
- has sent 250,000 emails
- has spent only 5,000 hours reading! (Oblinger, 2005).

Many of our students are then expected to read hours upon hours of material once they get to college. For many students, this creates a sort of disconnect between the instructors and the students. Many instructors still use traditional lecture to deliver course material to students. There may be a more effective way!

Student Response Systems

a.k.a. "clickers"



The Student Response Cycle

1. Instructor presents the materials. Then presents question asking for feedback from students. Questions are typically in true or false or multiple choice format.

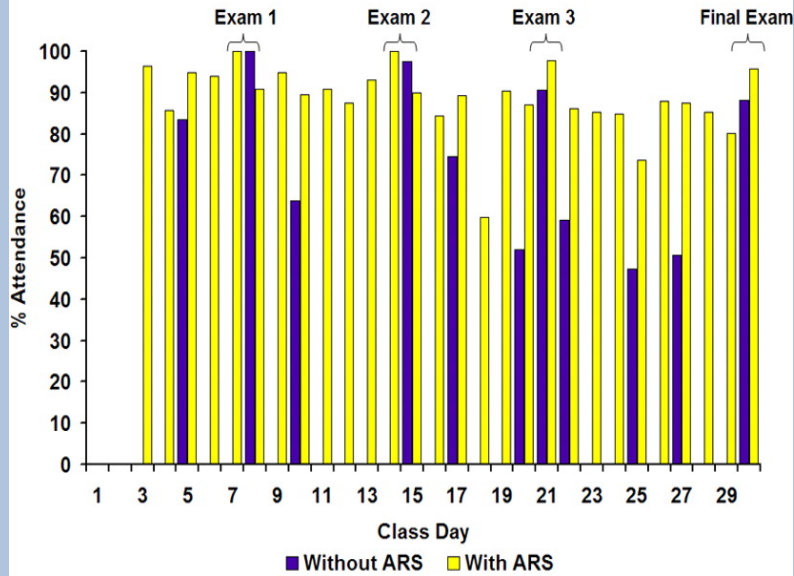
2. Students key in their responses using their handsets. These transmitters send signals to a receiver that is connected to the instructor's laptop or PC.

3. Software on the instructors machine instantly records and graphs student responses.

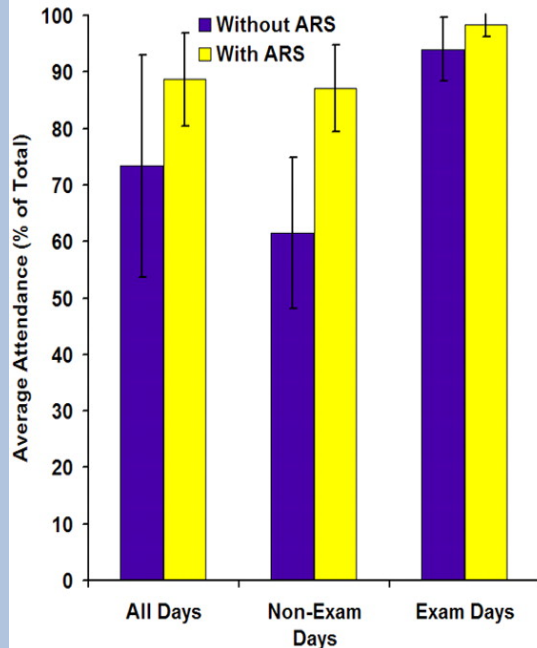
4. Many instructors then ask students to discuss the responses in groups, and to reach an agreement about the best response. This discussion can be followed with a second round of questioning, response, and display.

5. Most classroom response systems allow instructors to export and save response data for future analysis and evaluation.
(Deal, 3)

A. Daily Attendance

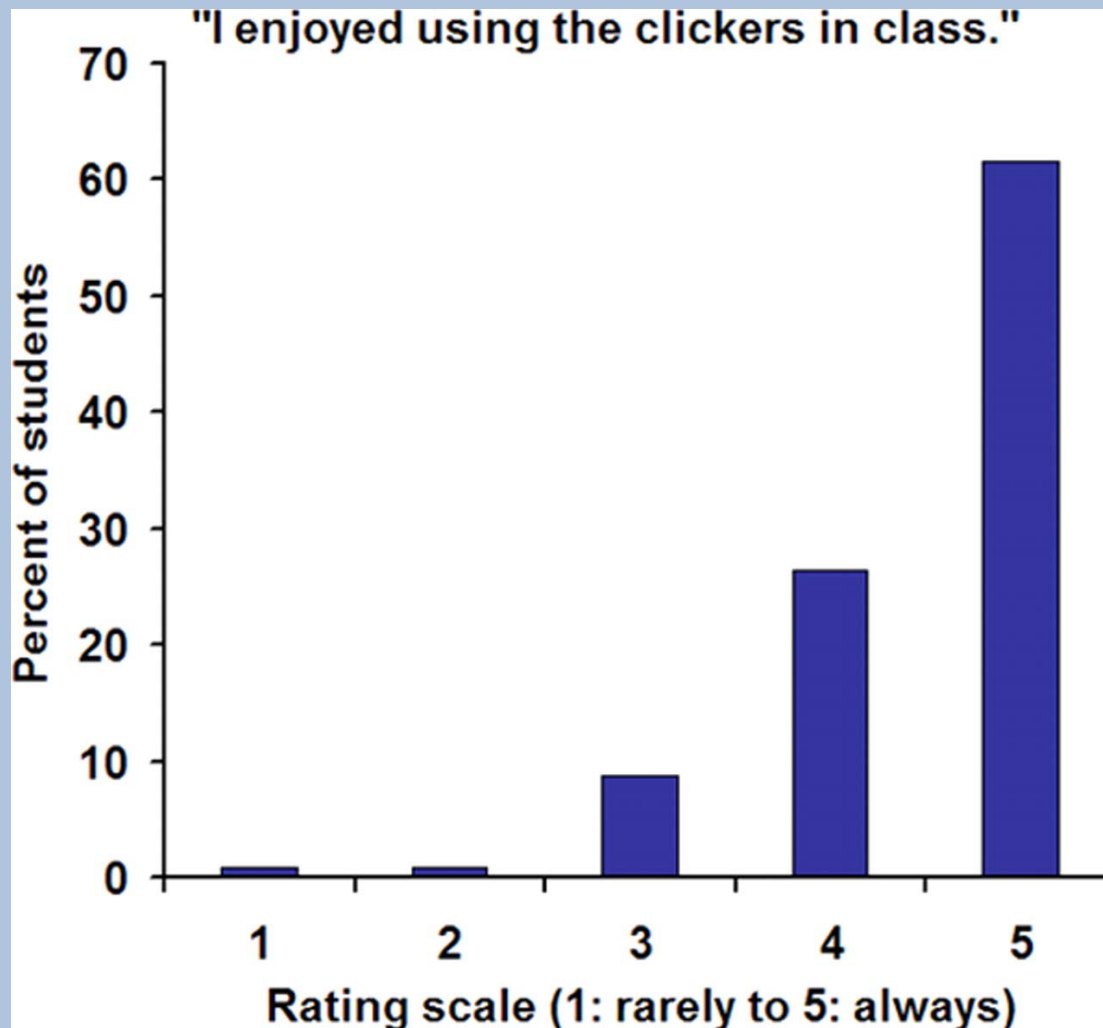


B. Average Attendance



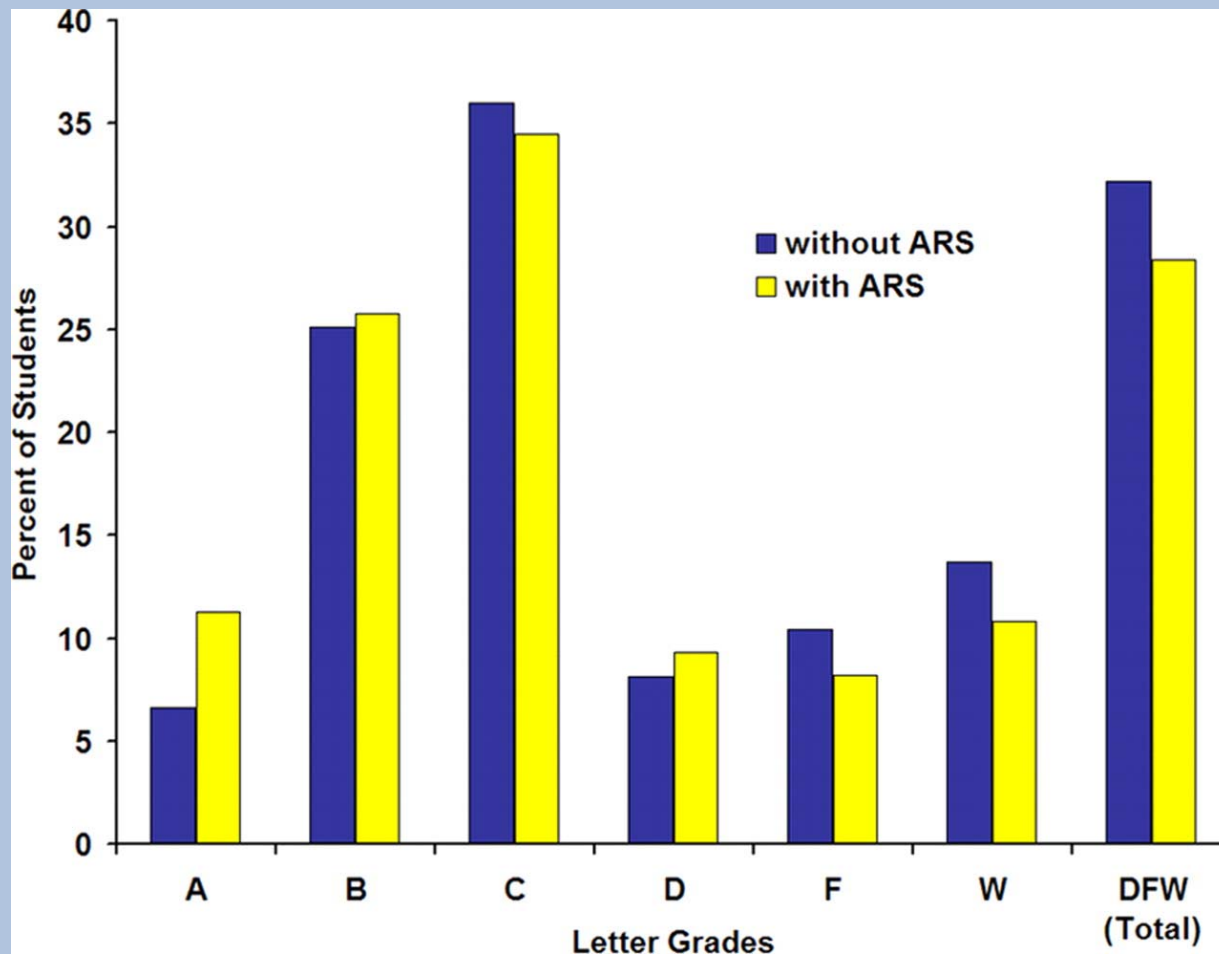
Comparison of different sections of a course taught at the same time of day, one year apart, at WVU. Blue bars indicate attendance in 2004. Yellow bars indicate attendance data collected with clickers one year later, in 2005. With clickers, the attendance figures were much more uniform and significantly higher (by 20% or more) on non-exam days (B). (Caldwell, unpublished observations).

Student Responses to Clicker Use in Class



(Caldwell)

Effect of clickers on grade distribution for two sections of college trigonometry taught at WVU. Courses were taught by the same instructor, the same semester, using the same course curricula, but in different rooms—one of which lacked an ARS. The total enrollments for the non-ARS and ARS courses were, respectively, 211 and 194. (Caldwell)



Typical Uses of Clicker Questions:

1. To increase interaction among students by focusing discussion
2. To assess student preparation and ensure personal accountability through questions about reading assignments and homework
3. To learn more about the students through surveys and polls
4. For formative assessment through questions that assess student comprehension, reveal student misunderstandings of concepts, assess students' ability to apply concepts to other contexts, allow students to assess their own understanding, and determine whether students are ready to move on to new material

5. For quizzes or tests (although summative testing is a rare use for clickers)
 6. To do practice problems/questions; exam practice
 7. To guide thinking, review, and discussion
 8. To conduct experiments or illustrate human responses
 9. For self-evaluation
 10. For peer- evaluation
- To make learning fun!

(Caldwell, Brown)

Motivations for Clicker Use

- Clickers increase student preparation by holding students individually accountable for information
- Clickers increase participation due to the anonymous nature of the assessment
- Clickers sustain attention due to the interactivity between instructor and student as well as among students

Positive Student Evaluations of Clicker Use in Class

- Using handsets is fun and breaks up the lecture
- Make lectures more interesting
- I like contributing and seeing other's thoughts too
- Gives me an idea of how I am doing in relations to others

Negative Student Evaluations of Clicker Use in Class

- Set up takes too much time
- Can distract from main point of lecture
- Sometimes questions are not clear
- Sometimes questions seem to benefit lecturer not students
- Annoying students who continuously press buttons and disrupt the process
- Not always completely anonymous
- Some students vote randomly and may mislead the instructor or affect the outcome

(Brown, p.86)

Writing Effective Clicker Questions

- Each question should have a pedagogical goal
- Use a variety of question types
- Use for purposes other than attendance and quizzing
- Avoid recall questions
- Try to "catch" student misunderstandings

- Try to illicit a broad spectrum of responses
- Use a sequence of related questions to develop a complicated concept
- Use some ambiguous questions to help students reason
- use familiar situations for new concepts to develop understanding
- consider when and how a question is presented

Taxonomy of Clicker Questions

Content Questions

- Recall Questions
- Conceptual Understanding Questions

Application Questions

- Procedural Questions
- Critical Thinking Questions
- One-Best-Answer Questions

Peer Assessment

- Discussion
- Reflective Questions

Process Questions

- Student Perspective Questions
- Confidence Level Questions
- Monitoring Questions

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