Clickers: Engagement, Attitudes, and Affordances

HOW TO USE CLICKERS AND INCREASE STUDENT ENGAGEMENT

SPRING 2015 INSTRUCTIONAL TECHNOLOGY WORKSHOP SERIES

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Reasons for Student Disengagement:

1. Fear of looking foolish because they don't understand the subject matter, even after studying it.
2. Fear of looking foolish because they don't understand the subject matter, because they didn't prepare for class.
3. Natural shyness. Some people just don't like to speak out in a group session where they may not know everyone.
4. Peer pressure. Some students may think it isn't "cool" to be interactive in class.

http://physics.wku.edu/teaching_seminar/Interactivity_jtt.html
Students will be inhibited when they believe:

- (They’re) the only one with that question and will appear stupid;
- (The) instructor will not provide a sufficient answer;
- (Peers) will label them as a brown-noser;
- (It) won't matter whether they respond or not; etc.

http://physics.wku.edu/teaching_seminar/Interactivity_jitt.html
Additional reasons:

- The classroom environment may not be (conducive) to interaction
- Students may be shy and afraid to give an incorrect (response)

http://physics.wku.edu/teaching_seminar/Interactivity_jitt.html
What Do Students Appreciate Most About Clickers

- From “Teaching With Clickers”
- Published by the University of Michigan Center for Research on Teaching and Learning
- Written by Erping Zhu

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
What Do Students Appreciate Most About Clickers

In a class of several hundred students, it is virtually impossible for each student to participate and interact with the professor. I like the Quizdom system because it allows each student to actively participate and thus gauge their comprehension.

http://www.crlt.umich.edu/sites/default/files/resource_files/CRLT_no22.pdf
I definitely pay more attention to the lecture when the interactive questions are being asked. There isn't pressure to raise your hand, because there is a confident anonymity about answering the questions. It's a good system.
They allow me to interact with the material and make sure that I understand the lecture. They force me to apply what I've learned, also ensuring that I will be better able to remember it in the future.
Using the clicker gives me a chance to think about what I'm actually writing down in my notes, rather than just having a collection of incomprehensible formulas scattered through my notes.
Using clickers encourages me go to class, encourages me to discuss concepts with students around me.
During the course of a clicker question, we would discuss the problem, which was sometimes how I learned the most about a topic.
I like answering questions with them. They really help because you can see that not everyone understands the material, so the professor will then go over the material again.
UCR Faculty Testimonials

On “Use of statistical polling:”

“doing this verbal polling can be done verbally but the most common response is apathy- [audience response] might cause the student to actually take a physical action. - Force them to take an opinion on the issue and if they got it right they could feel good, if they got it wrong, they could worry.”

Robert Hanneman, Professor of Sociology

http://cnc.ucr.edu/clickers/factest.html
On “Use during lecture:”

“Resounding yes! They [students] are going to have to be able to work with it. One of the caveats is that you cannot teach them a concept and test them immediately -- that doesn't work with any system let alone clickers. They need time to digest it, you have to resist the urge to test immediately, unless there is some part of it that really is very straightforward, but I would definitely recommend it to all faculty to all sciences especially in these upper division courses, they are dry, dense -- they're full of material. It's a really nice way to break up the lecture.

Morris Maduro, Assistant Professor of Biology

http://cnc.ucr.edu/clickers/factest.html
On “Use during lecture:”

“It really does break up some of the lecture – it does energize the audience - the students learn better when there is some level of emotional arousal - the higher the energy, the greater the learning. These devices do seem to have that kind of positive effect on the energy of the room. The biggest problem you have is calming them down after having used the device, which is a greater problem than having to get them to pay attention.”

Robert Hanneman, Professor of Sociology

http://cnc.ucr.edu/clickers/factest.html
UCR Faculty Testimonials

On “Use during lecture:"

“My advice would be to seriously consider using it. It definitely engages the students. By definition, when you ask a class to give a show of hands for some particular reason, if you want to find out how much of a class understands something, has heard something before, you don't get an accurate estimate for that, a lot of people don't want to raise their hands. A lot of people are embarrassed to say or state their answers in front of other people. Everyone needs to respond because you are getting at least some minimal credit for doing so. And it's anonymous, so my experience is that students love doing it.”

Curt Burgess, Professor of Psychology

http://cnc.ucr.edu/clickers/factest.html
Perception Study

- From “Clickers in the Classroom: An Active Learning Approach”
- Published in Educause Quarterly, 2007, Number 2
- Written by Margie Martyn
- Conducted at a “small, liberal arts college in the Midwestern United States”

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Used Clicker (n = 45) Mean</th>
<th>Used Class Discussion (n = 47) Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation with clickers (or class discussion) improved my grade in the course.</td>
<td>3.60</td>
<td>3.20</td>
</tr>
<tr>
<td>Participation with clickers (or class discussion) improved my understanding of the subject content.</td>
<td>4.03</td>
<td>3.61</td>
</tr>
<tr>
<td>Participation with clickers (or class discussion) increased my feeling of belonging in this course.</td>
<td>3.78</td>
<td>3.48</td>
</tr>
<tr>
<td>Participation with clickers (or class discussion) increased my interaction with the instructor.</td>
<td>4.15</td>
<td>3.62</td>
</tr>
<tr>
<td>Participation with clickers (or class discussion) increased my interaction with other students.</td>
<td>3.45</td>
<td>3.17</td>
</tr>
<tr>
<td>I enjoyed participation with clickers (or class discussion).</td>
<td>4.14</td>
<td>3.93</td>
</tr>
<tr>
<td>I would recommend using clickers (or class discussion) again in this course.</td>
<td>4.12</td>
<td>4.05</td>
</tr>
</tbody>
</table>

*Strongly Disagree = 1; Disagree = 2; Unsure = 3; Agree = 4; Strongly Agree = 5*
UCR BIO 068 Exit Survey Results on Clickers

- From correspondence with Morris Maduro, Assistant Professor, UCR, 2005
- Department of Biology

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
UCR BIO 068 Exit Survey Results on Clickers

“Overall I thought the clickers were a good addition to the course:”

- definitely: 11/38 (29%)
- yes: 13/38 (34%)
- sort of: 13/38 (34%)
- no: 1/38 (3%)

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
UCR BIO 068 Exit Survey Results on Clickers

“I thought the clickers helped me learn the material:”

- definitely: 8/38 (21%)
- yes: 15/38 (39%)
- sort of: 11/38 (29%)
- no: 4/38 (11%)

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
UCR BIO 068 Exit Survey Results on Clickers

“The clicker questions helped me assess my understanding:”

- definitely: 15/38 (39%)
- yes: 18/38 (47%)
- sort of: 4/38 (11%)
- no: 1/38 (3%)

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
UCR BIO 068 Exit Survey Results on Clickers

“I attended more lectures because clicker responses counted toward my grade:”

- yes: 28/38 (74%)
- no: 10/38 (26%)

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
As you can see, the results are overall very positive. A majority of students thought the clickers were a good addition, helped them learn the material, and assess their understanding. And they report that it provides an extra incentive to attend more lectures (I gave 10% of the overall grade to 60 questions across the quarter -- an average of 3 questions given per 80-minute lecture.)

-Morris Maduro

http://www.educause.edu/ero/article/clickers-classroom-active-learning-approach
Faculty Experience an Increase in:

- Interactions with Students
- Awareness of What Students Grasp or Not
- Emphasis on Student Reasoning over Recall
- Dialogue with Colleagues around Teaching and Learning
- Analysis of Own Teaching in Relation to Student Learning
- Awareness of Larger Trends in Their Students’ Learning
- Opportunities for Professional Publication around Teaching
- Ability to Motivate Students to Attend Class & Learn
Students Experience an Increase in:

- Conceptual Knowledge of Course Content
- Interactions with Instructor
- Interactions with Peers around course content
- Interactions with Peers around learning strategies
- Willingness to provide Instructor with Feedback
- Awareness of Own Positioning in Class
- Articulation of own reasoning & knowledge
- Confidence in own Personal Privacy and Dignity
- Enthusiasm to Attend and Participate in Class
- Reported Satisfaction and Motivation
Best Practices for Implementing Clickers in the Classroom

- From “Clickers in the Classroom: An Active Learning Approach”
- Published in Educause Quarterly, 2007, Number 2
- Written by Margie Martyn
- Conducted at a “small, liberal arts college in the Midwestern United States”
1. Keep slides short to optimize legibility.
2. Keep the number of answer options to five.
3. Do not make the questions overly complex.
4. Keep voting straightforward—systems allow complex branching, but keep it simple.
5. Allow sufficient time for students to answer questions. Some general guidelines:
   - Classes of fewer than 30 students: 15–20 seconds per question
   - Classes of 30 to 100 students: 30 seconds per question
   - Classes of more than 100 students: 1 minute per question
6. Allow time for discussion between questions.
7. Encourage active discussion with the audience.
8. Do not ask too many questions; use them for the key points.
9. Position the questions at periodic intervals throughout the presentation.
10. Include an “answer now” prompt to differentiate between lecture slides and interactive polling slides.

11. Use a “correct answer” indicator to visually identify the appropriate answer.

12. Include a “response grid” so that students know their responses have registered.

13. Increase responsiveness by using a “countdown timer” that will close polling after a set amount of time.

14. Test the system in the proposed location to identify technical issues (lighting, signal interference, etc.)

15. On the actual day of the session, allow time to set out clickers and start system.

16. Rehearse actual presentation to make sure it will run smoothly.

17. Provide clear instructions on how to use the clickers to the audience.

18. Do not overuse the system or it will lose its “engagement” potential.

*Tips 1–5, 14–16, and 18 came from Robertson; tips 6–9 and 17 from Duncan; and tips 10–13 from Turning Point Technologies.