

Improving motivation and classroom participation with student response system technology.

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Do you ever wonder if your students:

- Are paying attention?
- Are understanding what you have just discussed?
- Feel engaged, a part of your class?

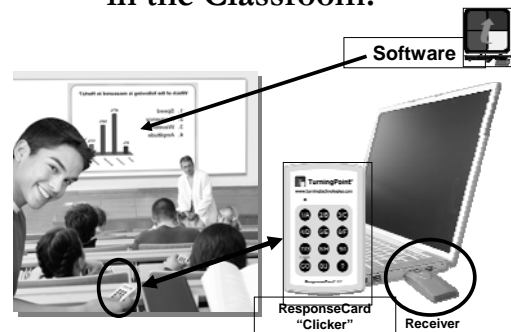


What can be done, especially in large lecture sections?

- Ask more questions.....!
- Give more quizzes.....!
- Use a student response system (SRS; aka “clickers”)

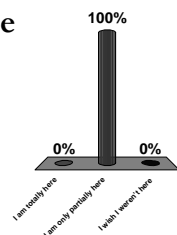


What do I need to use Clickers in the Classroom?



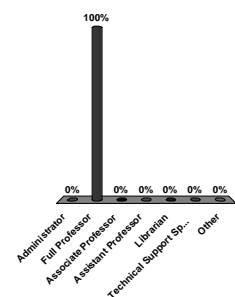
Attendance...

- 1) I am totally here
- 2) I am only partially here
- 3) I wish I weren't here



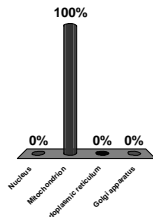
Demographics: I am a(n)...

- 1) Administrator
- 2) Full Professor
- 3) Associate Professor
- 4) Assistant Professor
- 5) Librarian
- 6) Technical Support Specialist
- 7) Other



Quiz: The “powerhouse” of the cell where ATP is made is called the ...

- 1) Nucleus
- ⇒ 2) Mitochondrion
- 3) Endoplasmic reticulum
- 4) Golgi apparatus



Student opinion.....



Student opinion.....

Congress and Bush set to clash on stem cells again

In a direct but possibly futile challenge to the only veto of George Bush's presidency, the US Congress is expected to pass a bill for a second time that would dramatically expand researchers' access to human embryonic stem-cell lines. As Senators went to press, a vote in the House of Representatives was expected on 11 January, with the Senate likely to act on an identical measure within a few weeks.

The bill would allow federal funds to be used for research on stem-cell lines derived from surplus embryos at fertility clinics and otherwise slated for destruction. The embryos would have to be donated with informed consent and without payment or other inducements.

The California-based Rand Corporation estimated in 2003 that about 11,000 of the roughly 400,000 embryos stored at US fertility clinics at that time were available for research, from which it should be possible to derive up to 275 cell lines (D. I. Hoffman *et al.* *Fertil. Steril.* 79, 2003).

“We will use every legislative means at our disposal to ensure that the bill is enacted into law. It will happen during this Congress.”

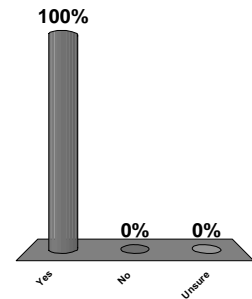


Diana DeGutis was a public campaigner in favour of federal funding of embryonic stem-cell research.

from *Nature* Vol. 445, January 11, 2007

Should stem cell research be funded?

1. Yes
2. No
3. Unsure



Exporting data to Excel

Name	Score	Date
1	77	78
2	77	78
3	77	78
4	77	78
5	77	78
6	77	78
7	77	78
8	77	78
9	77	78
10	77	78
11	77	78
12	77	78
13	77	78
14	77	78
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16	77	78
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35	77	78
36	77	78
37	77	78
38	77	78
39	77	78
40	77	78

What does it cost?

- Software is free download at www.turningtechnologies.com
- RF receiver
 - Free from Thomson
 - \$99 from Turning Technologies
- Cost to students for Clickers
 - \$25-55
 - Can be used in multiple classes; sold back

What BIO 202 students said:

- “Response pads were an asset to the class, very beneficial.”
- “I thought the response pads helped me participate in lecture in a way that allowed me to learn better about the topics.”
- “Response pads were a good tool for knowing how much we understood.”
- “I would like to see them used more.”

What do you get for the time, effort and money?

- Lots of anecdotal evidence
- Students like it
- Need for empirical evidence
- Enter Aaron Fried

What are the effects of an SRS?

- Lowery, 2005; Burnstein & Lederman, 2001.
 - Improved class preparation
 - Improved attendance
 - Better comprehension
 - More active participation/ peer collaboration
 - Better student retention
 - Greater student satisfaction
 - Ease of tracking student progress

Other effects

- Daily quizzing leads to better curricular decisions
- Mean pass rates & exam scores have been improved
- This research has been poorly designed, e.g. experiments with poor control groups, anecdotal evidence, small populations...

Problems in large lectures

- Lectures can be effective but:
 - Poor at fostering critical thinking
 - Hard to provide quality feedback
 - Poor attendance
- Attendance vs. motivation as an indicator of success

(Huxham, 2005; Maloney and Lally, 1998; Moore, 2003)

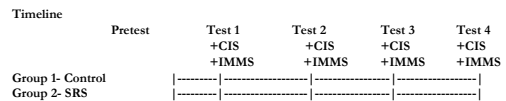
A Model For Motivation

- John Keller (1987)
 - Effective instruction should focus on providing the learner with motivation to learn.
 - 4 components of Motivation (ARCS)
 - A – Attention
 - R – Relevance
 - C – Confidence
 - S – Satisfaction

Measuring Motivation

- Motivation can change over time
 - Multiple measures at multiple times
- Measurement instruments:
 - Course Interest Survey (CIS)
 - Instructional Materials Motivational Survey (IMMS)

Two Group Study



Single Group Study

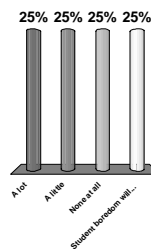
A → B → A → B → A → B

A = No SRS

B = SRS

Now that you have heard this talk,
how much do you think clickers
might improve student motivation?

1. A lot
2. A little
3. None at all
4. Student boredom
will increase



(Please leave response pads on the tables. Thanks.)