

Peer Instruction

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Clickers!



- Lets you vote on multiple choice questions in real time.
- Like pub trivia, except the subject is always computer science.

Lecture: Peer Instruction

- Pose carefully designed question
 - Solo vote: Think for yourself and select answer
 - Discuss: Analyze problem in teams of 3
 - Practice analyzing, talking about challenging concepts
 - Reach consensus
 - If you have questions, raise your hand and I will come over
 - Group vote: Everyone in group votes
 - You must all vote the same to get your point
 - Class wide discussion:
 - Led by YOU (students) – tell us what you talked about in discussion that everyone should know!

Example: The best dinosaur is:



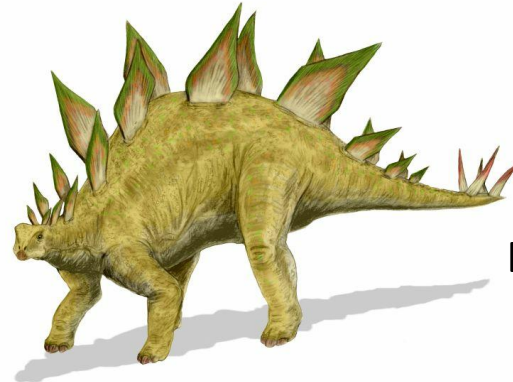
A. T-rex



B. Raptor



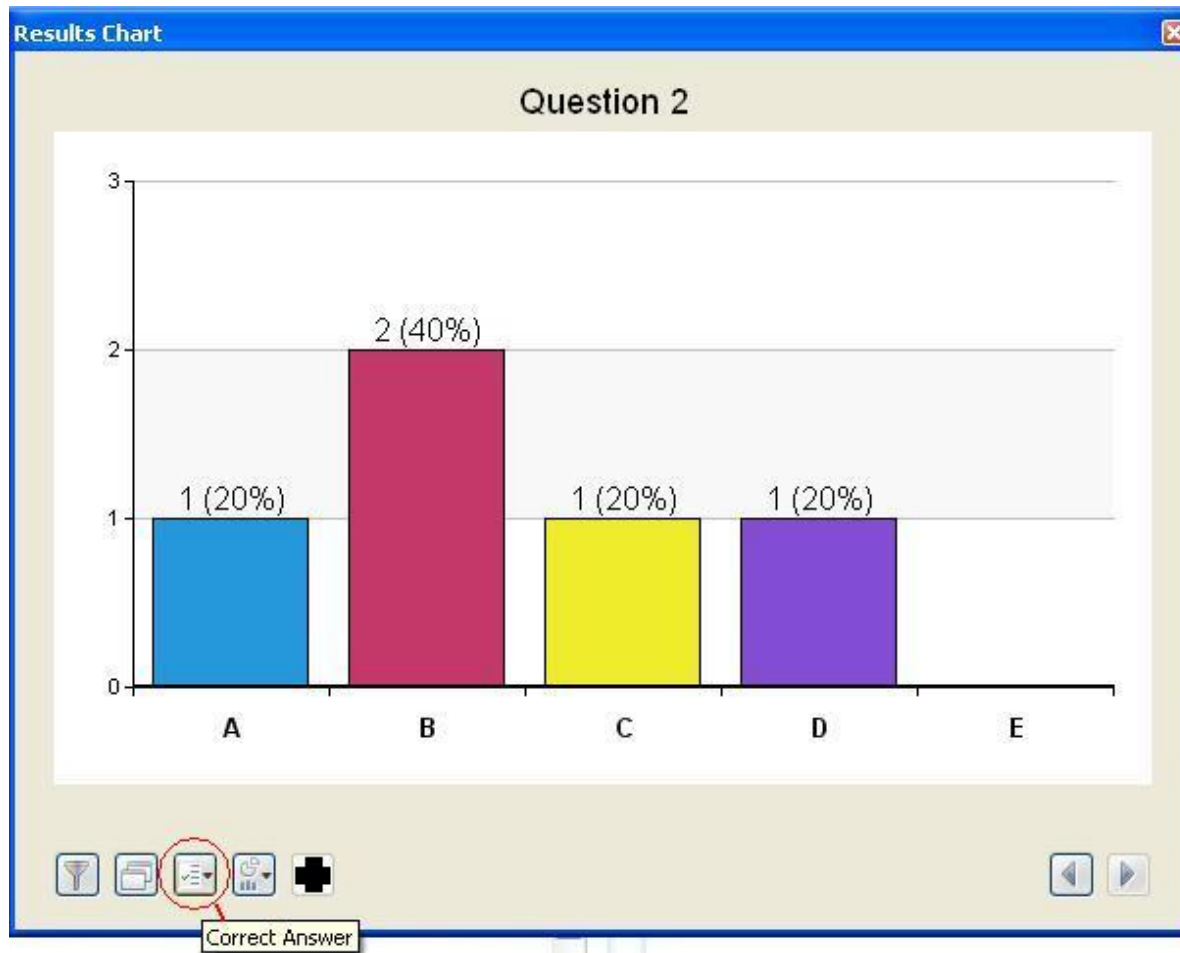
C. Triceratops



D. Stegosaurus

E. Some other dinosaur

Histogram



Why I Like Peer Instruction

- I can tell what my students do and don't understand in real time
- Students ask more questions
- Students learn from each other

Why My Students Like Peer Instruction

- “This doesn’t even seem like a lecture class” – from a student in an 80 person class
- “I cannot overstate how essential clickers are to staying awake in class.”
- “Helping to explain the material to the people around me was immensely useful in understanding the material myself”

But I'll Cover Less Material

- What does “covering material” mean, anyway?
- Make them do the easy stuff outside of class
 - Read the book, do “explorative homeworks”, etc

“In other courses, I feel like more like an ‘information sponge’. Material is thrown at me, and I have to soak up and take notes on as much as I can and hope that I’m taking notes on the right thing for the next exam. In this class, it felt like I did my initial learning with the readings, and then I took that learning into class and used class to solidify what I knew. I felt much better prepared for quizzes and exams in this class than I normally do.”

Reading

- Porter, Leo, et al. "Peer instruction in computer science at small liberal arts colleges." *Proceedings of the 18th ACM conference on Innovation and technology in computer science education*. ACM, 2013.
- Crouch, Catherine H., and Eric Mazur. "Peer instruction: Ten years of experience and results." *American Journal of Physics* 69.9 (2001): 970-977.
- R. Hake. "Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses." *American journal of Physics*, 66:64, 1998.
- Hrepic, Zdeslav, Dean A. Zollman, and N. Sanjay Rebello. "Comparing students' and experts' understanding of the content of a lecture." *Journal of Science Education and Technology* 16.3 (2007): 213-224.
- Wired article (active learning):
<http://www.wired.com/2014/05/empzeal-active-learning/>

Why My Students Like Clickers

“I come away from [PI] lectures awake, energized, and feeling awesome about knowing the material. That’s ’cause my job is to understand and pay attention, not just pay attention and hope for the best.”

How to Make Your Students Hate Clickers

- Use them to take attendance
- Give points based on correctness

Coming Up With Good Questions

- Test a single concept
- Common student mistakes as distractors
- Stress the important thing is the discussion, not the correct answer