Peer Instruction: Engaging Students in the Classroom



MECESUP Program on Innovative Teaching and Learning RI **Harvard University** Cambridge, MA, 3 October 2012

Peer Instruction: Engaging Students in the Classroom



@eric_mazur **MECESUP Program on Innovative Teaching and Learning Harvard University** Cambridge, MA, 3 October 2012



- no ON/OFF button
- only last "click" counts
- display shows recorded answer

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Think of something you are good at

Think of something you are good at

How did you become good at this?

Became good at it by:

- 1. trial and error
- 2. lectures
- 3. practicing
- 4. apprenticeship
- 5. other













better pay attention!







What happens in a lecture?













lecturers talk while other people are sleeping

(Albert Camus)

















education is not just information transfer





education is not just information transfer





education is not just information transfer













only one quarter of maximum gain realized



R.R. Hake, Am. J. Phys. 66, 64 (1998)



not transfer but assimilation of information is key









conventional problems misleading

Calculate:

(a) current in 2- Ω resistor

(b) potential difference

between *P* and *Q*









are the basic principles understood?

When S is closed, what happens to:

(a) intensities of A and B?

(b) intensity of C?

(c) current through battery?

(d) potential difference across

A, B, and C?

(e) the total power dissipated?





conventional

conceptual







conventional



conceptual












education



1. transfer of information





1. transfer of information

2. assimilation of that information





1. transfer of information (in class)

2. assimilation of that information





1. transfer of information (in class)

2. assimilation of that information (out of class)





Should focus on THIS!

1. transfer of information (I)

2. assimilation of that information (out of class)





1. transfer of information (in class)

2. assimilation of that information (out of class)





1. transfer of information (out of class)

2. assimilation of that information (in class)





1. transfer of information (out of class)

2. assimilation of that information (in class)



































thermal expansion



























When the plate is uniformly heated, the diameter of the hole

- 1. increases.
- 2. stays the same.
- 3. decreases.









When the plate is uniformly heated, the diameter of the hole

1. increases 2. ctave the same. 3. decreases







When the plate is uniformly heated, the diameter of the hole

- 1. increases.
- 2. stays the same.
- 3. decreases.









Before I tell you the answer...



















You...

1. made a commitment







- 1. made a commitment
- 2. externalized your answer







- 1. made a commitment
- 2. externalized your answer
- 3. moved from the answer/fact to reasoning







- 1. made a commitment
- 2. externalized your answer
- 3. moved from the answer/fact to reasoning
- 4. became emotionally invested in the learning process







When the plate is uniformly heated, the diameter of the hole

- 1. increases.
- 2. stays the same.
- 3. decreases.








Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole

- 1. increases. V
- 2. stays the same.
- 3. decreases.































































first year of implementing Pl









first year of implementing Pl









first year of implementing PI











PI

3 test











2 PI









what about problem solving?































So better understanding leads to better problem solving!







So better understanding leads to better problem solving!

(but "good" problem solving doesn't always indicate understanding!)







in a lecture, students...







in a lecture, students...

1. don't pay utmost attention































in a lecture, students...

1. don't pay utmost attention

2. think they know it







in a lecture, students...

1. don't pay utmost attention

2. think they know it

3. are not confronted with misconceptions







Security 1. don't pay utmost attention

2. think they know

of fonted with misconceptions

in a lecture, students...













an illusion...







Education is not just about:

- transferring information
- getting students to do what we do







Education is not just about:

- transferring information
- getting students to do what we do

active participation a must!







not technology, but pedagogy matters







First International Asia-Pacific Conference on Peer Instruction

mazur@harvard.edu

Beijing, China 14-16 December 2012


PeerInstruction.net

Funding:

National Science Foundation

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