Active lectures and interactive teaching (confessions of a converted lecturer)





My message

shift focus from "teaching" to helping students learn



• Education

Outline

• Education

Peer Instruction

Outline

• Education

Peer Instruction



lectures focus on delivery of information

education is not just information transfer



education is not just information transfer



education is not just information transfer











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

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



conventional problems misleading

Calculate:

(a) current in 2-W resistor

(b) potential difference

between *P* and *Q*





are the basic principles understood?



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?













Give students more responsibility for gathering information...

Give students more responsibility for gathering information... so we can better help them assimilate it.

1. Recognize the inefficacy of the lecture method



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2. Move first exposure to material out of classroom



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...assign reading!

3. Use class period to deepen and broaden understanding

... by painting the big picture...



...and giving your students time to think and discuss



Better yet: Learn from your students...



Better yet: Learn from your students...



Better yet: Learn from your students...



...bring in your Teaching Assistants too!



Includes Class-Tested, Ready-to-Use Resources

FRIC MALUA

A User's Manual

Main features:

- pre-class reading
- in-class: depth, not 'coverage'
- ConcepTests

ConcepTest:

- 1. Question
- 2. Thinking
- 3. Individual answer
- 4. Peer discussion
- 5. Revised/Group answer
- 6. Explanation



is it any good?

first year of implementing PI



first year of implementing PI



first year of implementing PI









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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!)

Why does it work?

Students:

- promotes thinking
- helps uncover and address misunderstanding
- boosts confidence

Why does it work?

Students:

- promotes thinking
- helps uncover and address misunderstanding
- boosts confidence

Faculty:

- change of format, not content
- with existing questions, little effort
- adaptable



A little reorganization goes a long way!

Funding:

National Science Foundation

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