

Confessions of a converted lecturer



Physics Education Research Lecture
University of Tennessee
Knoxville, TN, 3 April 2008



My message

shift focus from "teaching" to helping students learn



Outline

- Education



Outline

- Education
- Peer Instruction



Outline

- Education
- Peer Instruction
- Results



Education



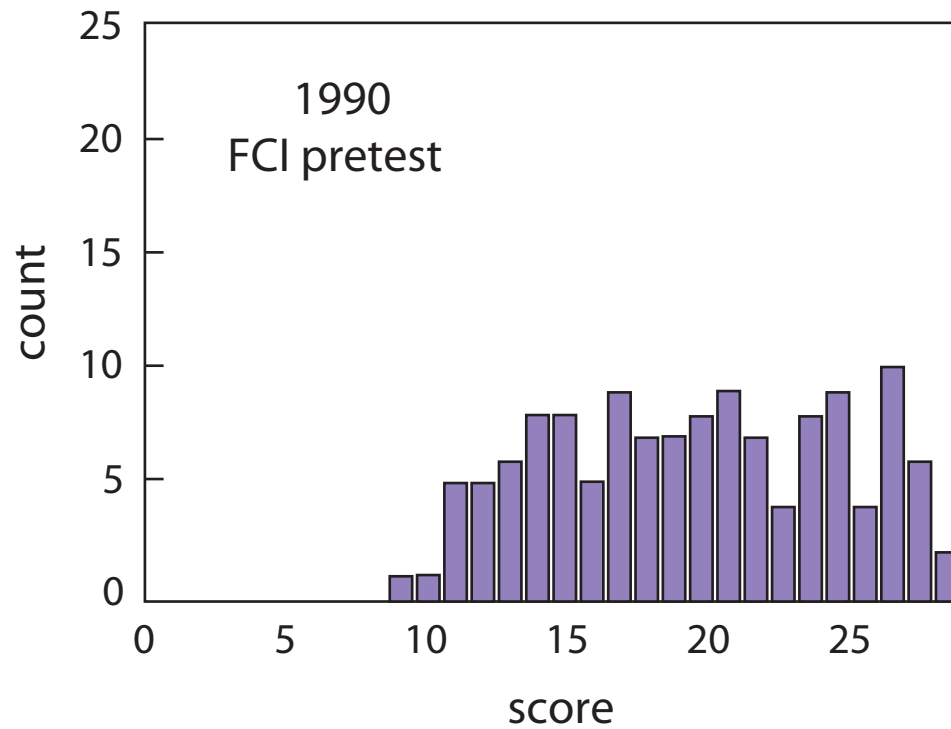
Education

lectures focus on delivery of information

A large lecture hall with students seated at desks, facing a stage where a lecturer is speaking. The room has blue walls and a large screen at the front. The text "Education" is overlaid at the top, and "lectures focus on delivery of information" is overlaid in the center.

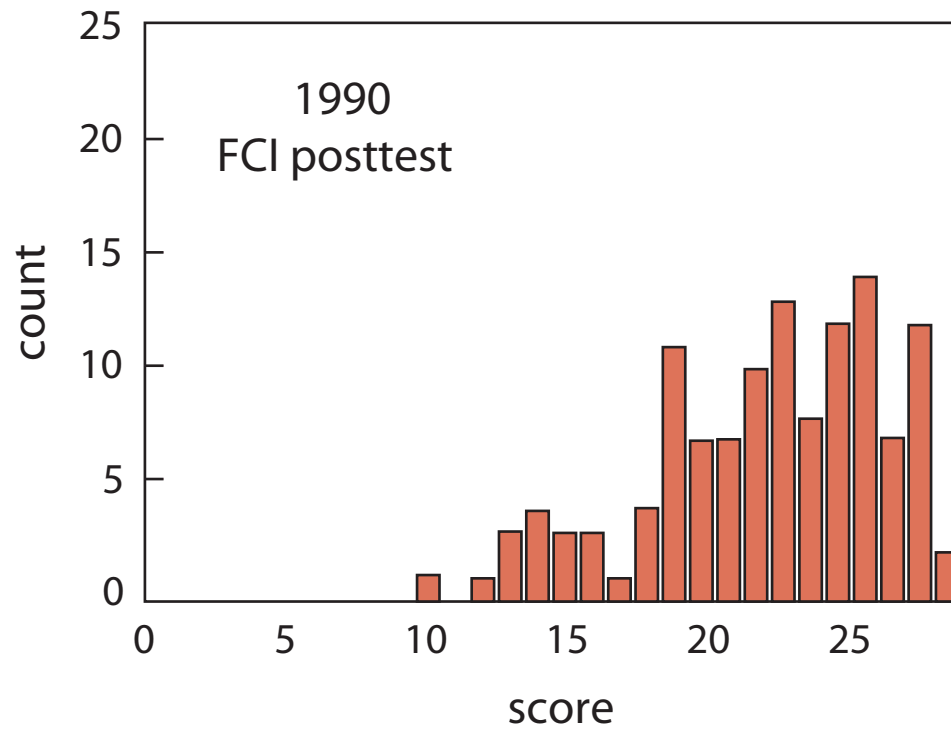
Education

education is not just information transfer



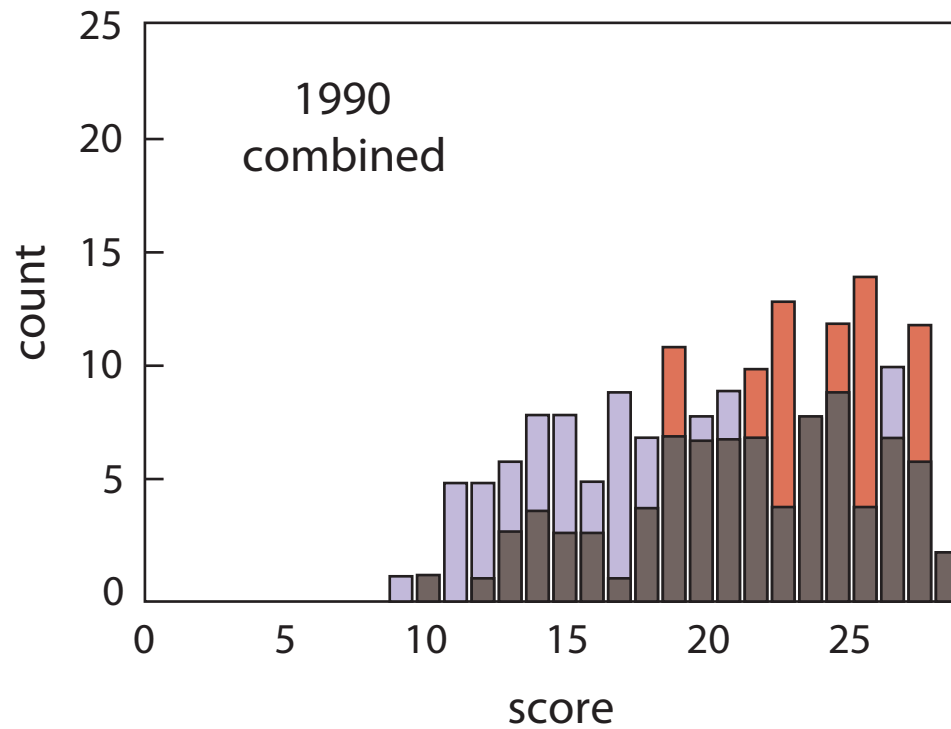
Education

education is not just information transfer

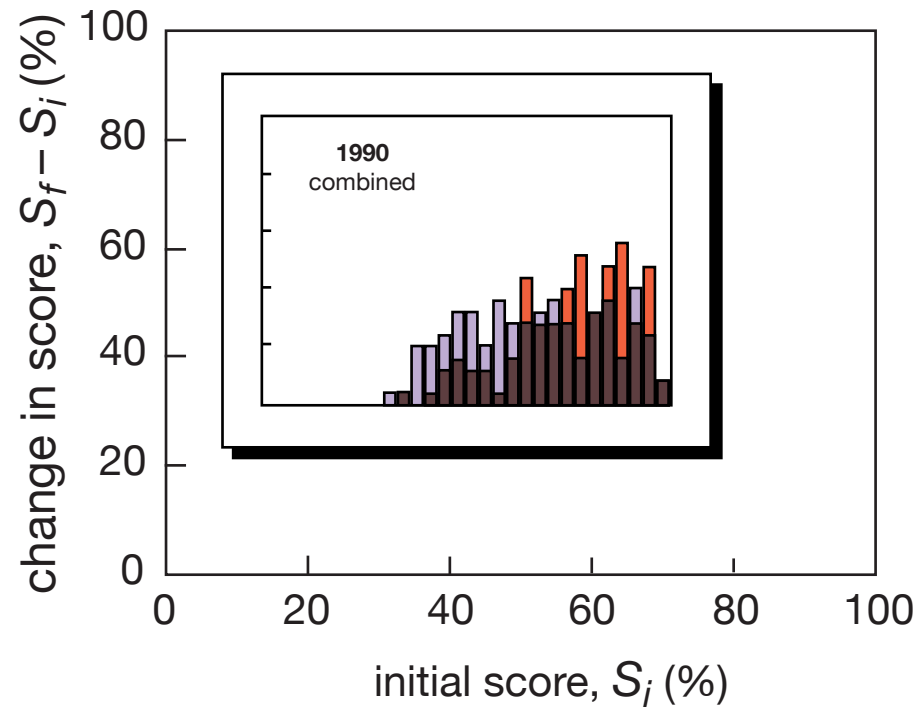


Education

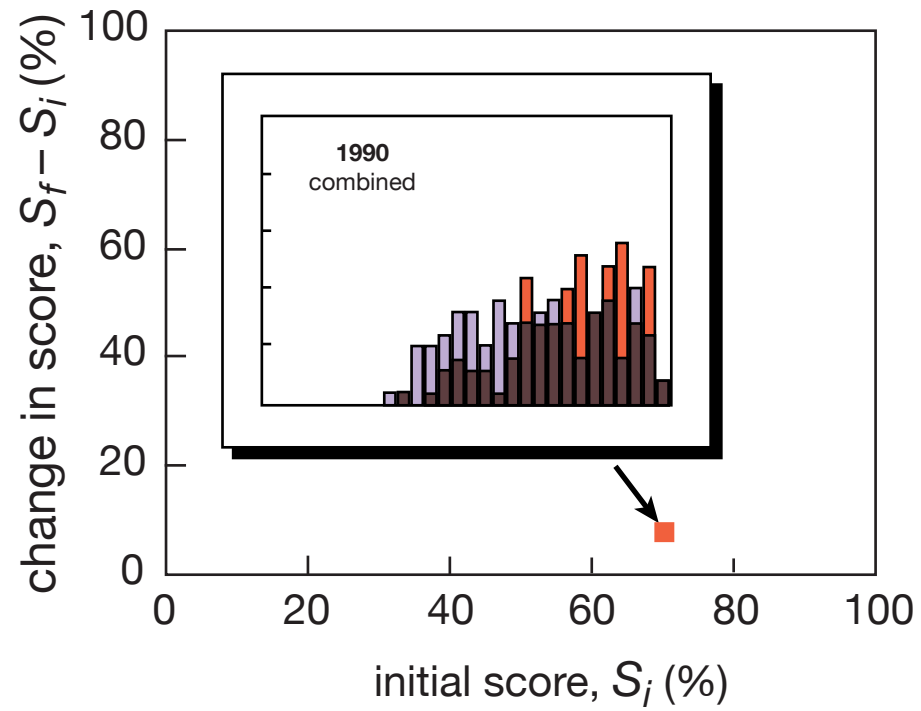
education is not just information transfer



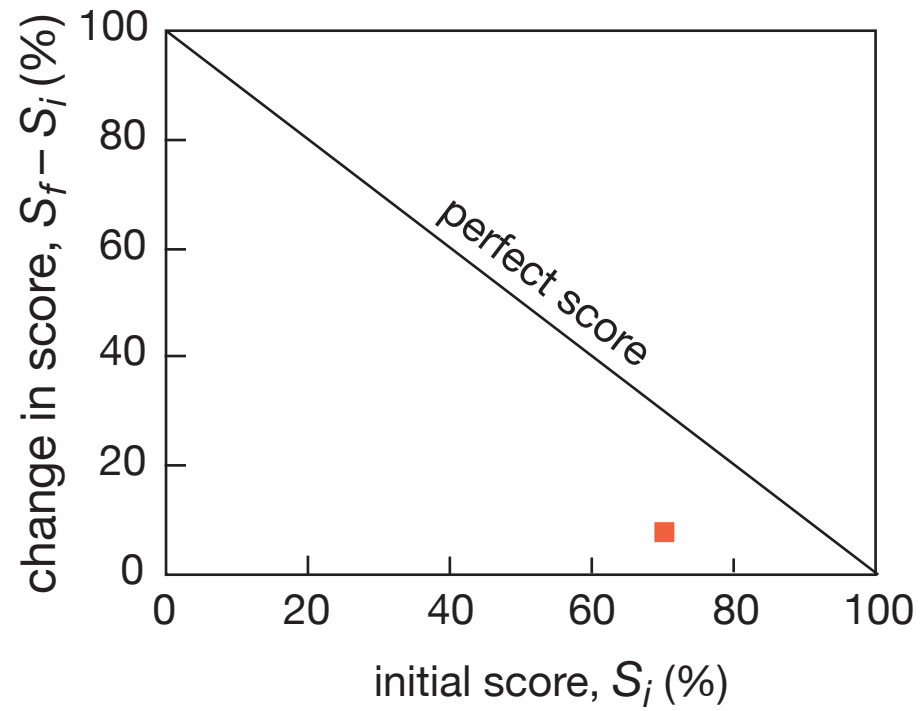
Education



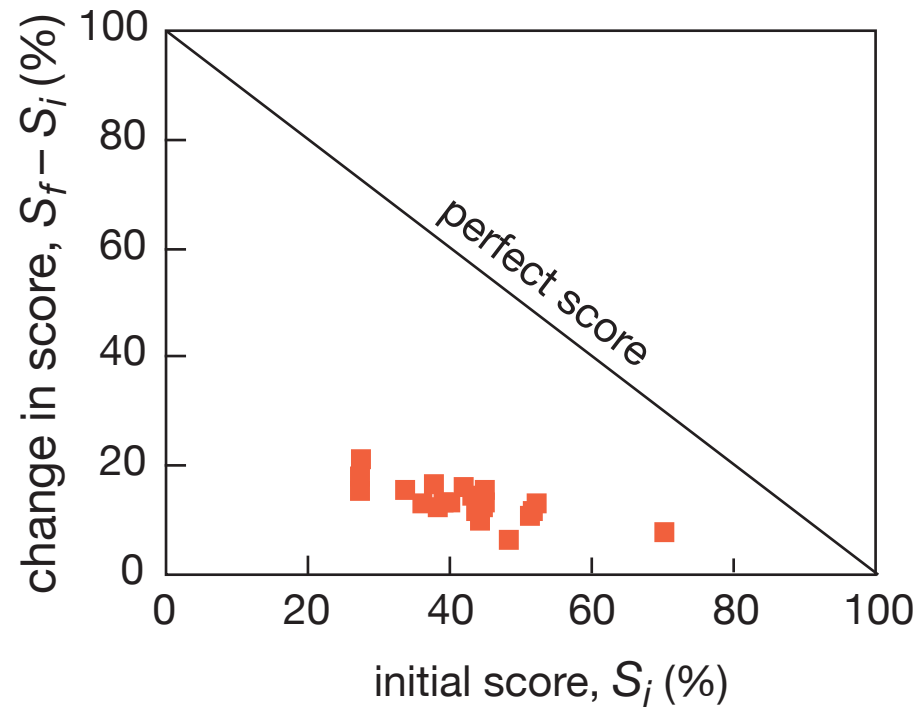
Education



Education

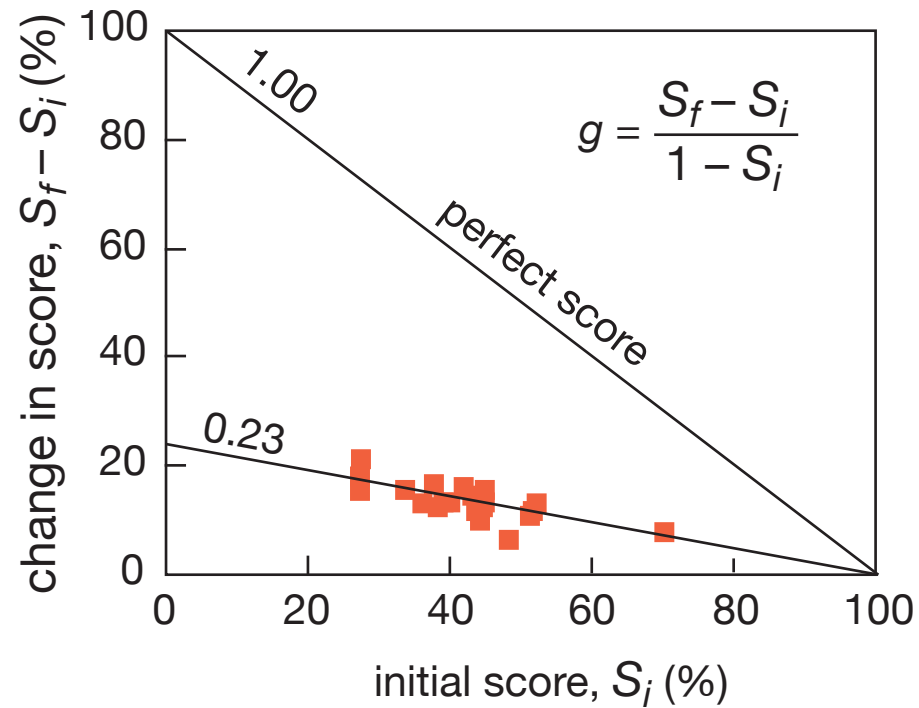


Education



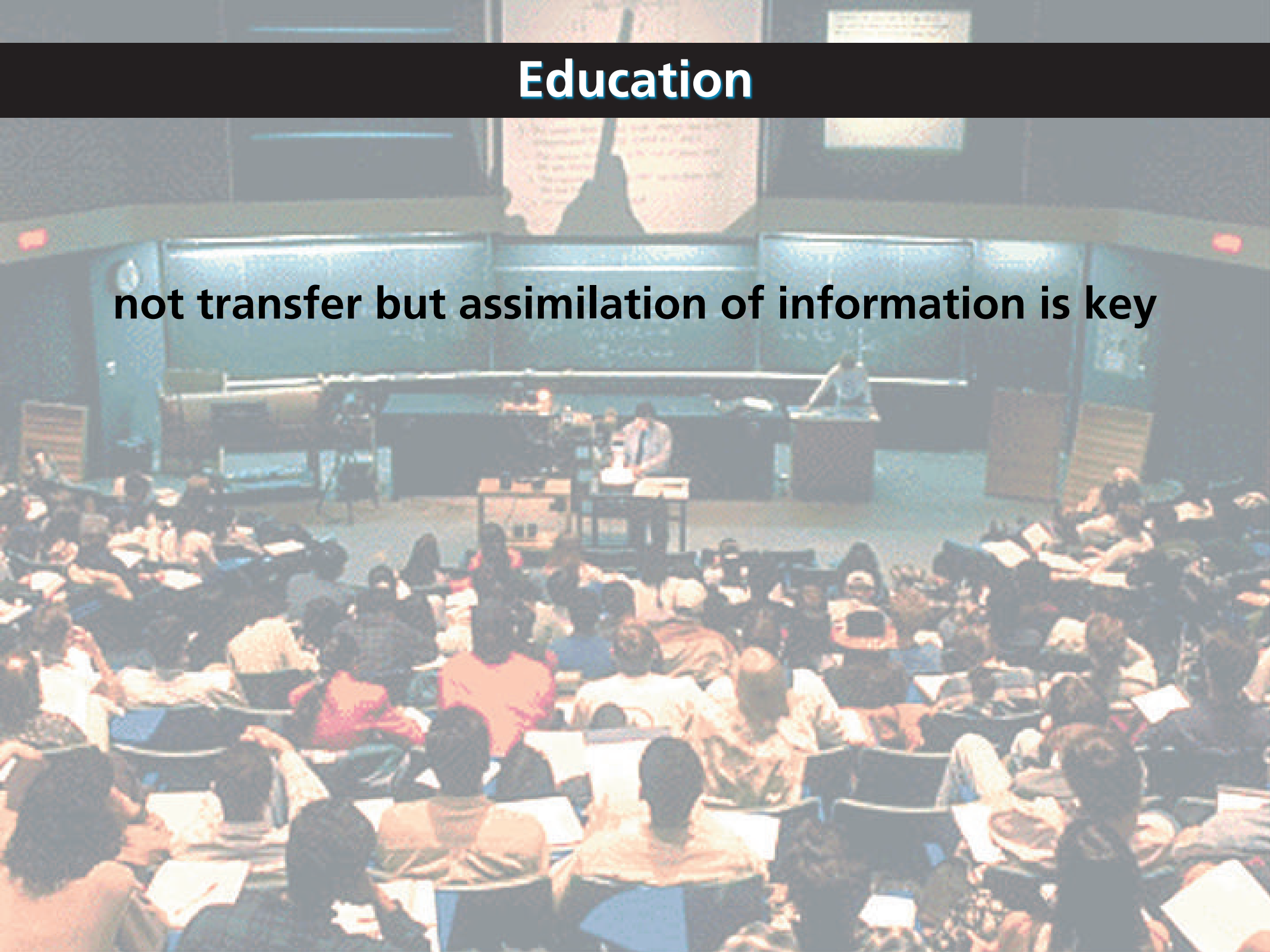
Education

only one quarter of maximum gain realized



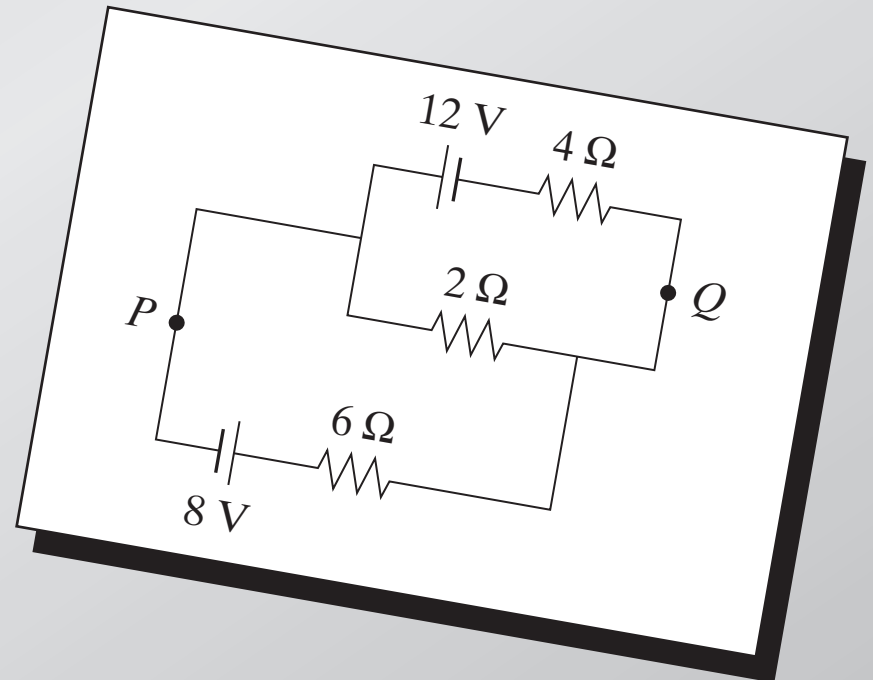
Education

not transfer but assimilation of information is key



Education

conventional problems misleading



Education

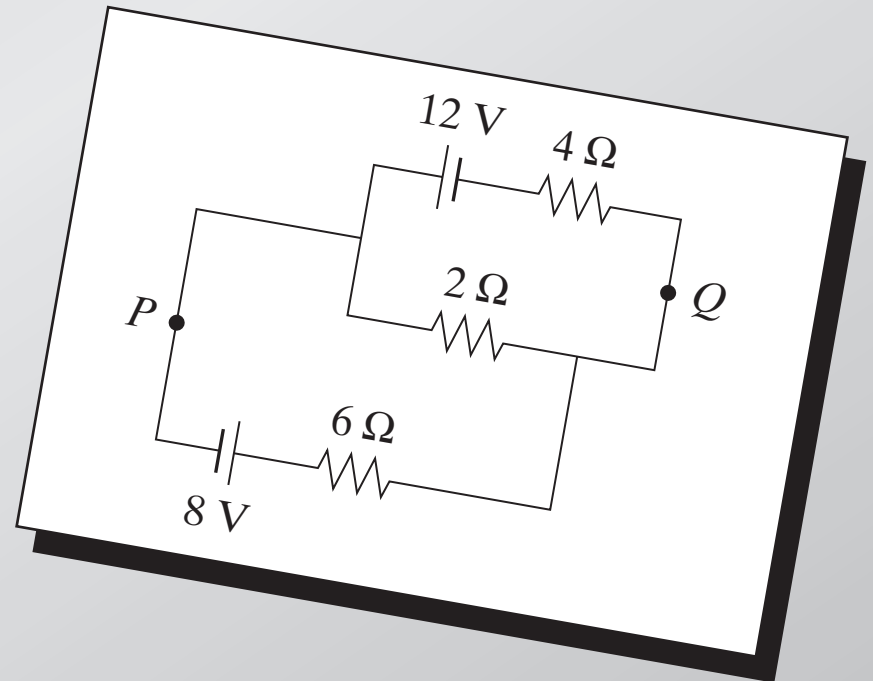
conventional problems misleading

Calculate:

(a) current in 2- Ω resistor

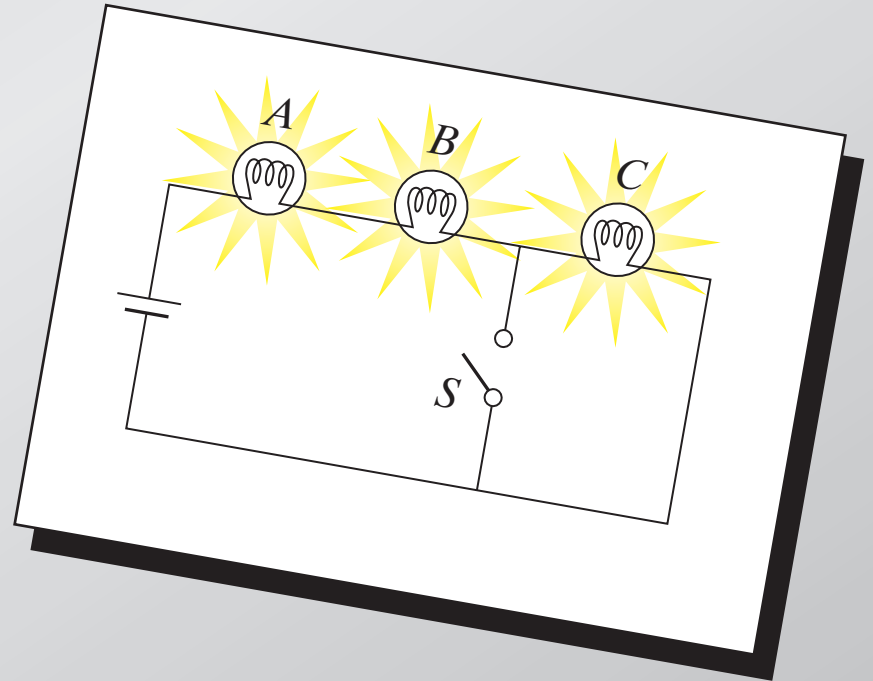
(b) potential difference

between P and Q



Education

are the basic principles understood?

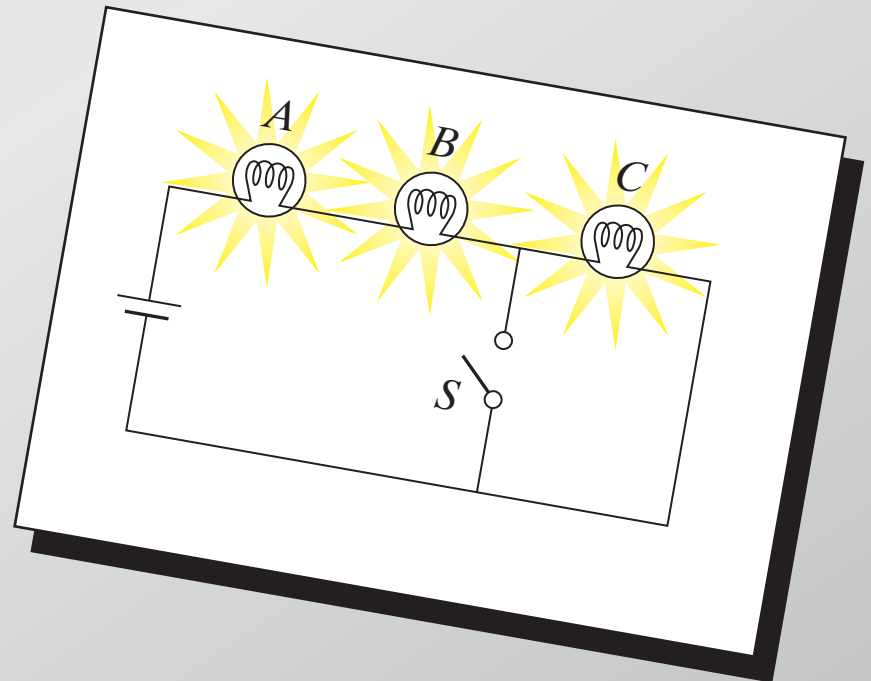


Education

are the basic principles understood?

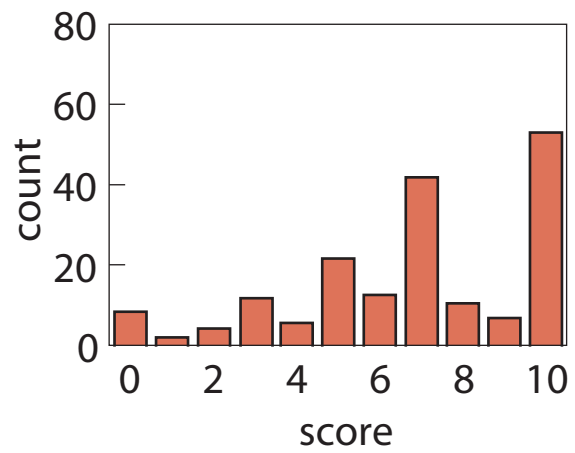
When S is closed, what happens to:

- (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?

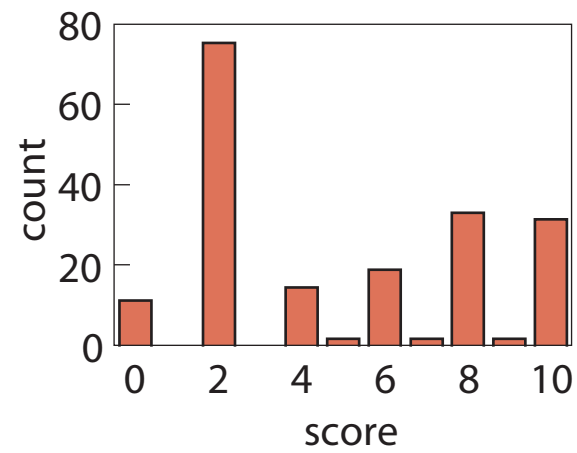


Education

conventional

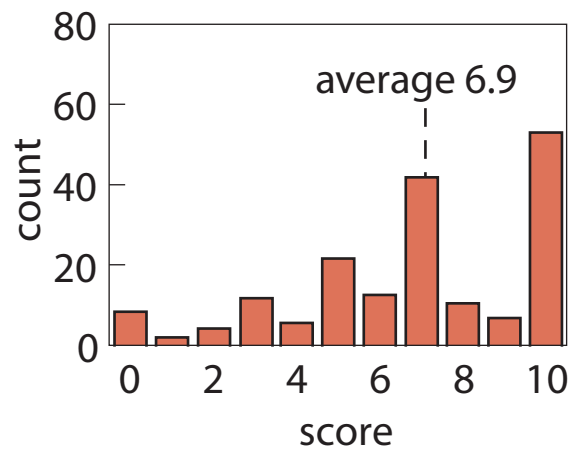


conceptual

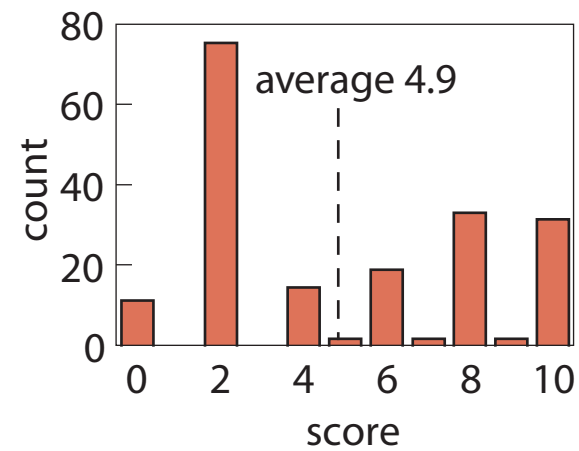


Education

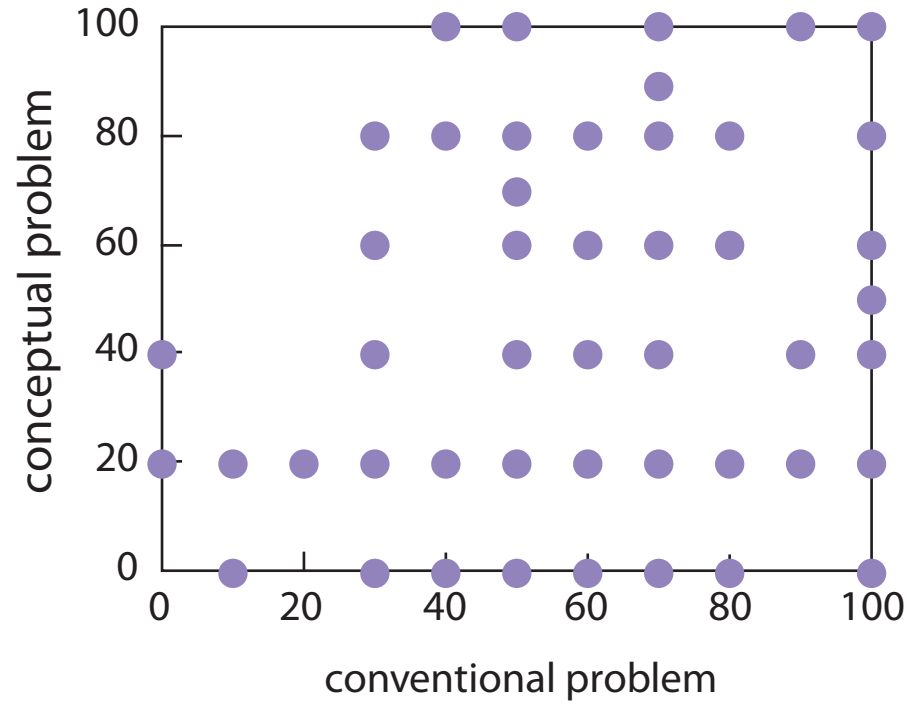
conventional



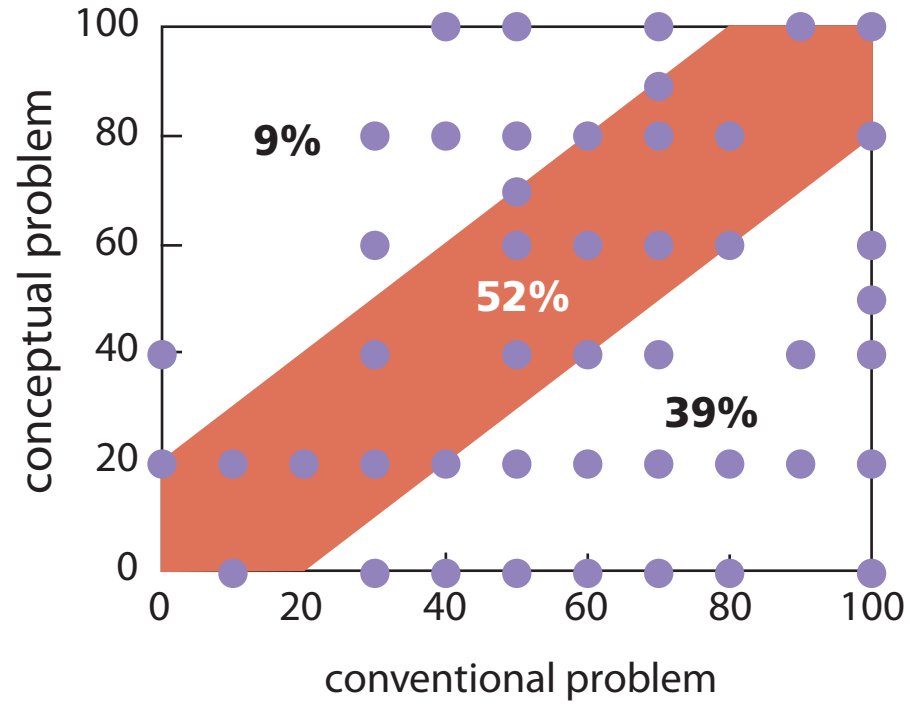
conceptual



Education



Education



A large lecture hall with a professor at a podium and students seated at desks. A large screen at the front displays text and a diagram. The text on the screen is partially legible and includes the words "The world is full of..." and "The world is full of...". The professor is standing at a podium on the right side of the stage, facing the audience. The students are seated at desks, many with papers open. The room is dimly lit, with the main light source being the screen and the podium area.

So what should we do?

Peer Instruction

Give students more responsibility for gathering information...

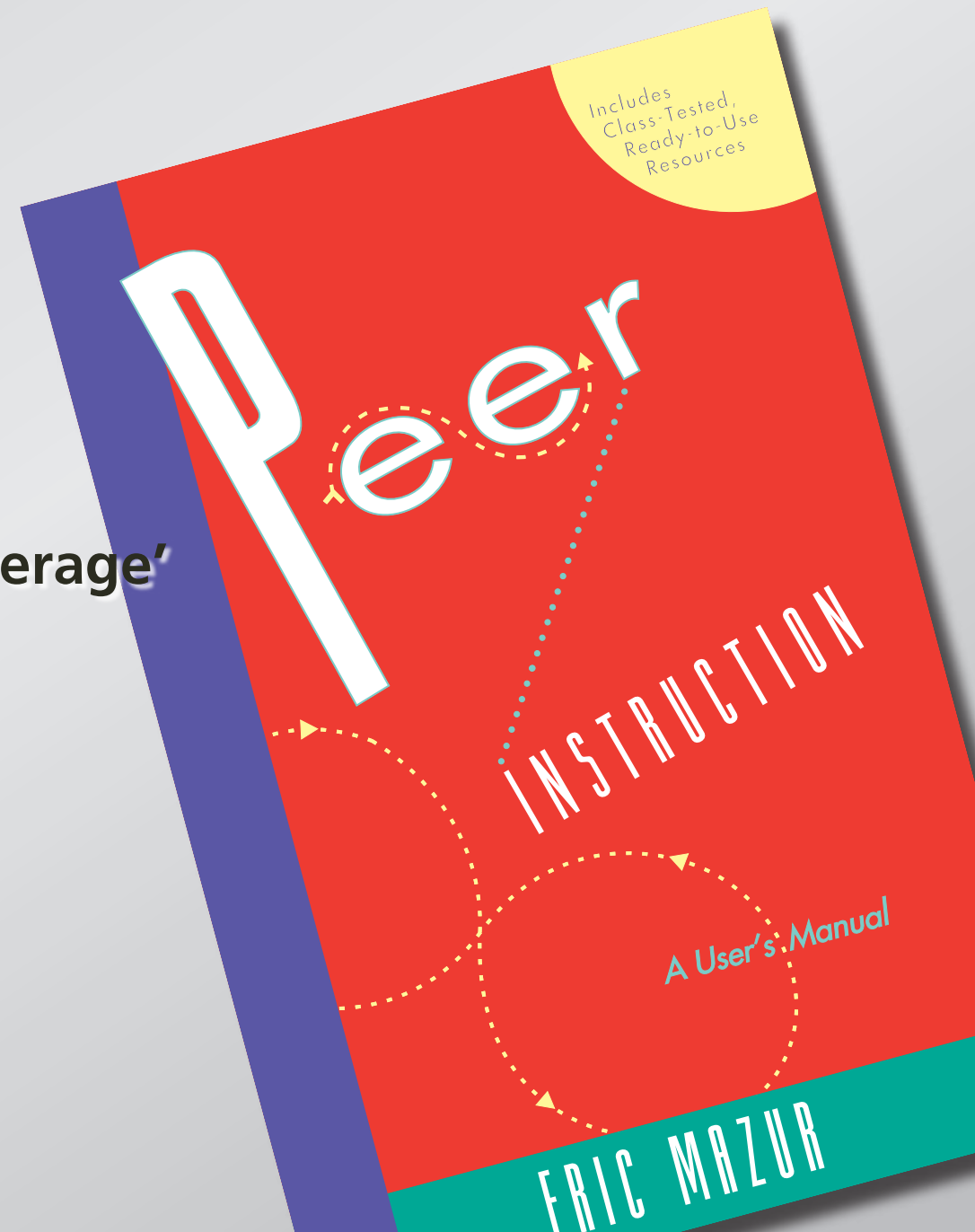
Peer Instruction

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

Peer Instruction

Main features:

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



Peer Instruction

ConcepTest:

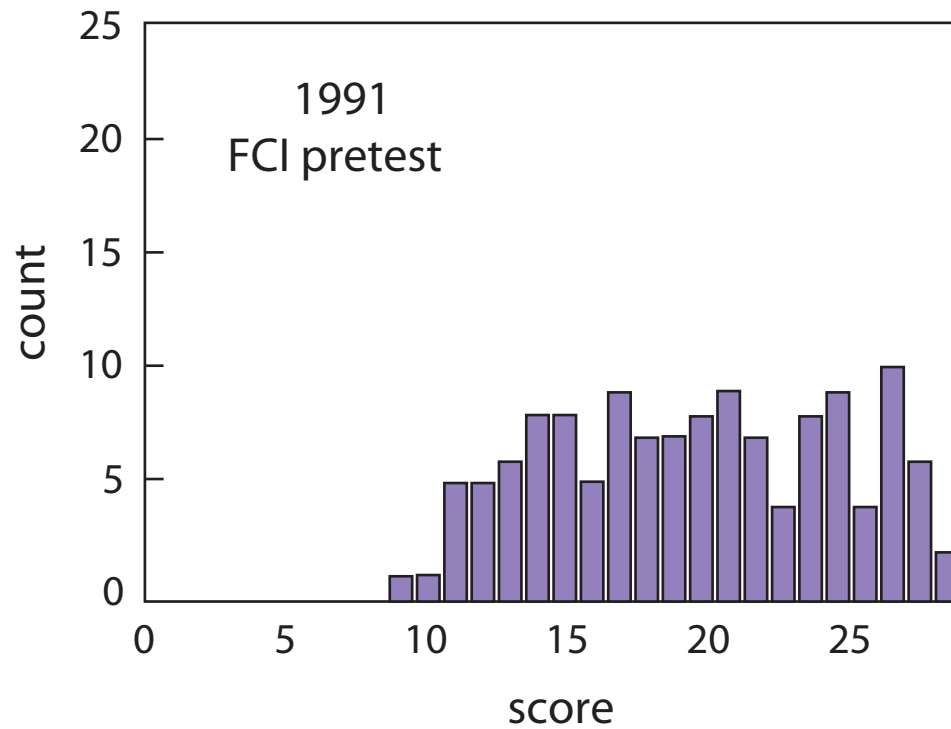
- 1. Question**
- 2. Thinking**
- 3. Individual answer**
- 4. Peer discussion**
- 5. Revised/Group answer**
- 6. Explanation**

Results

is it any good?

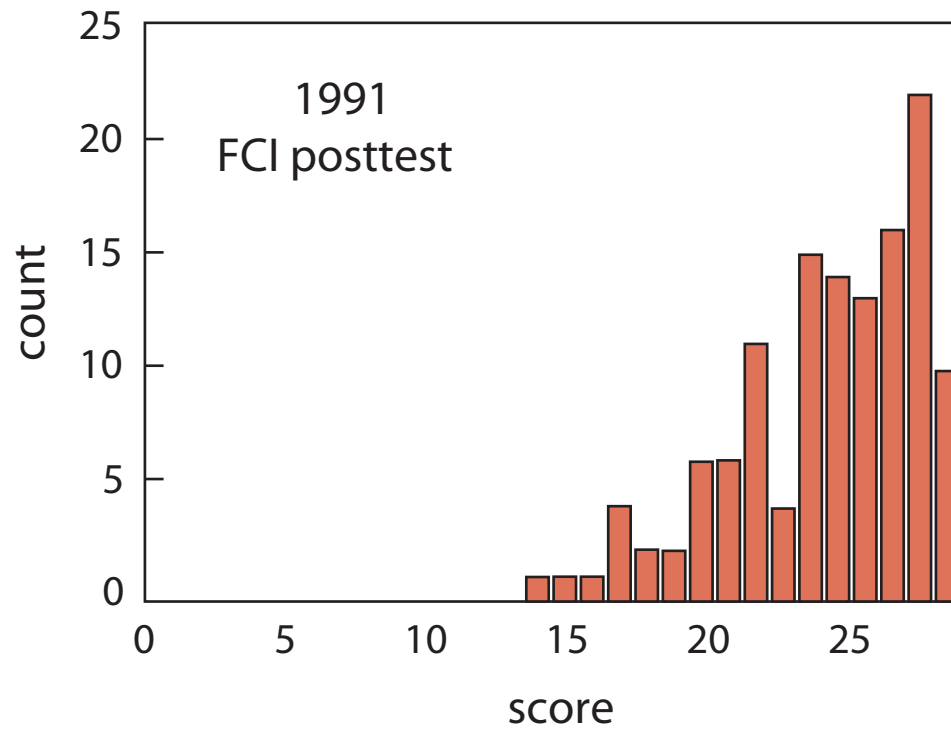
Results

first year of implementing PI



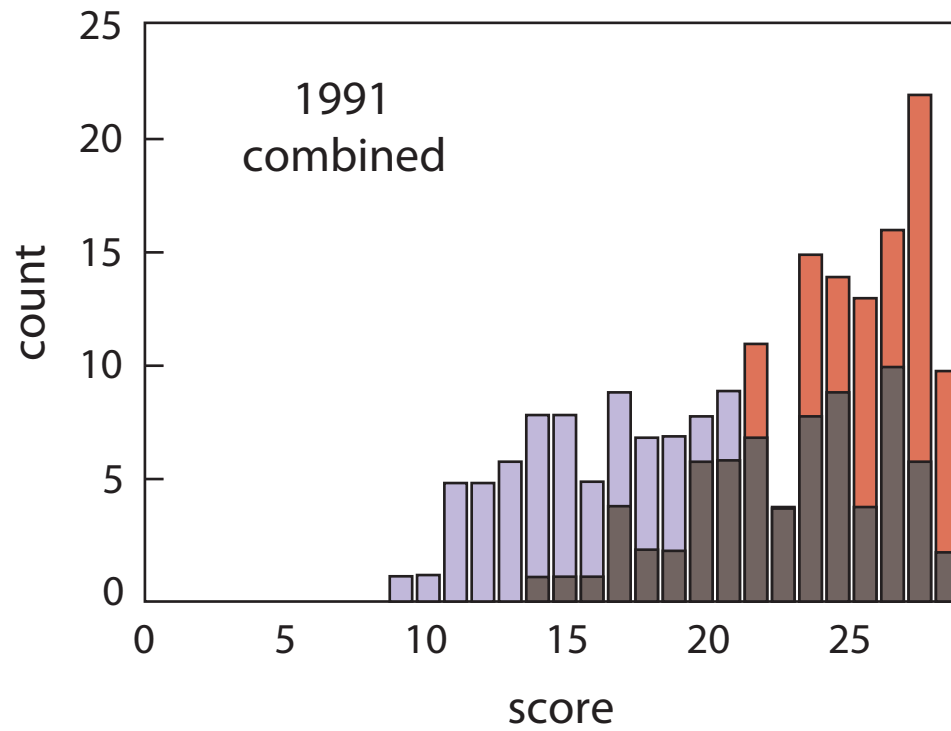
Results

first year of implementing PI

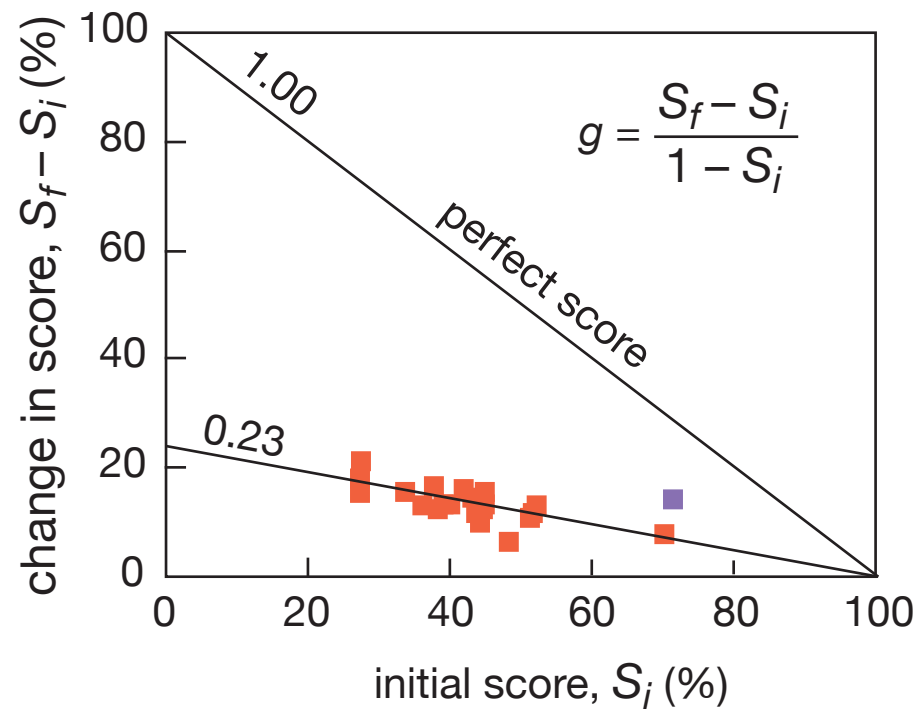


Results

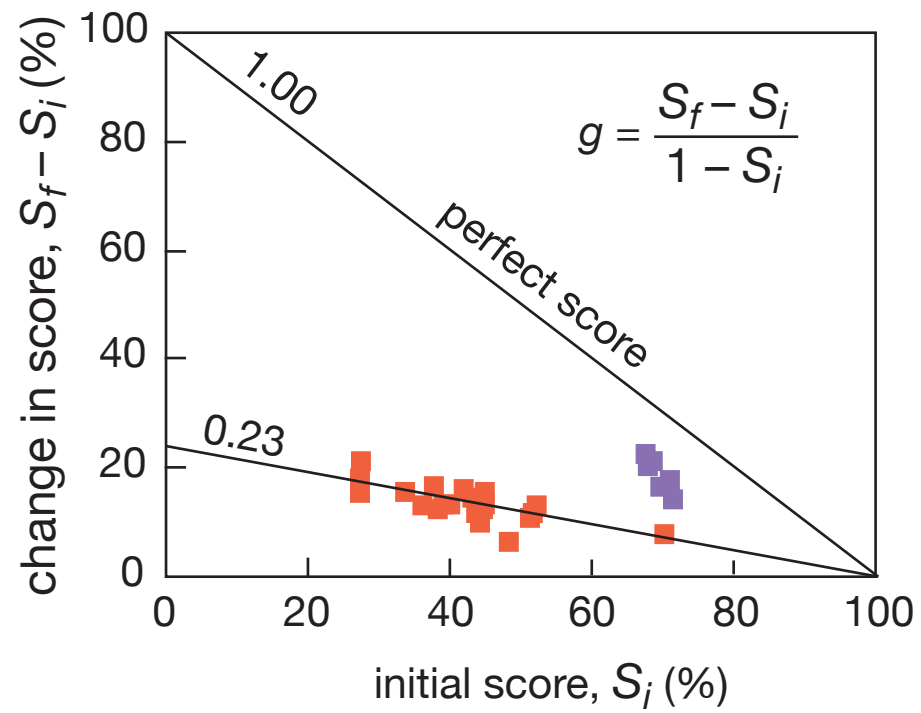
first year of implementing PI



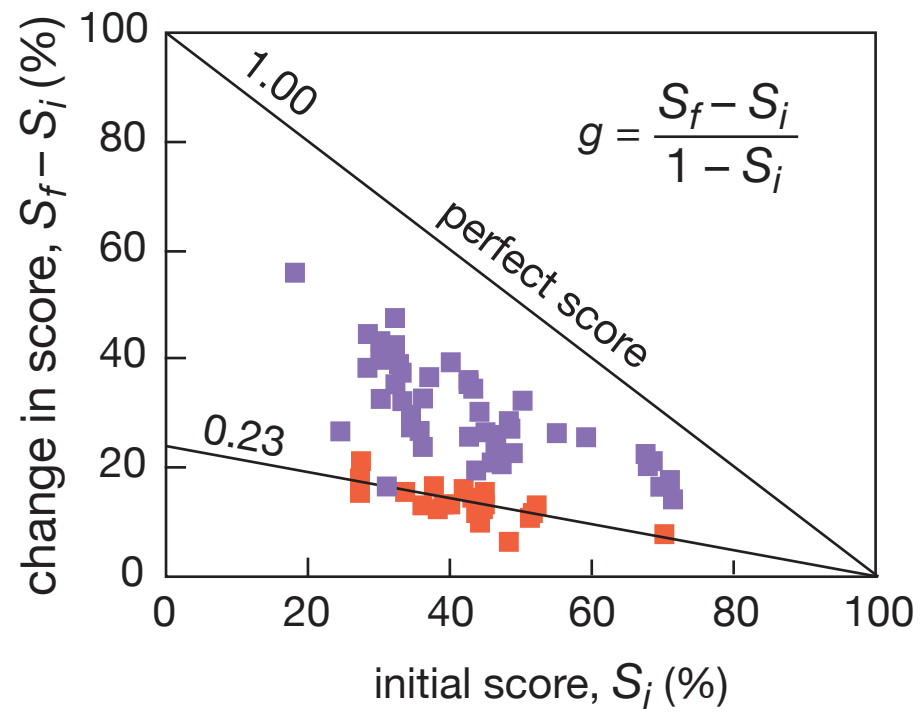
Results



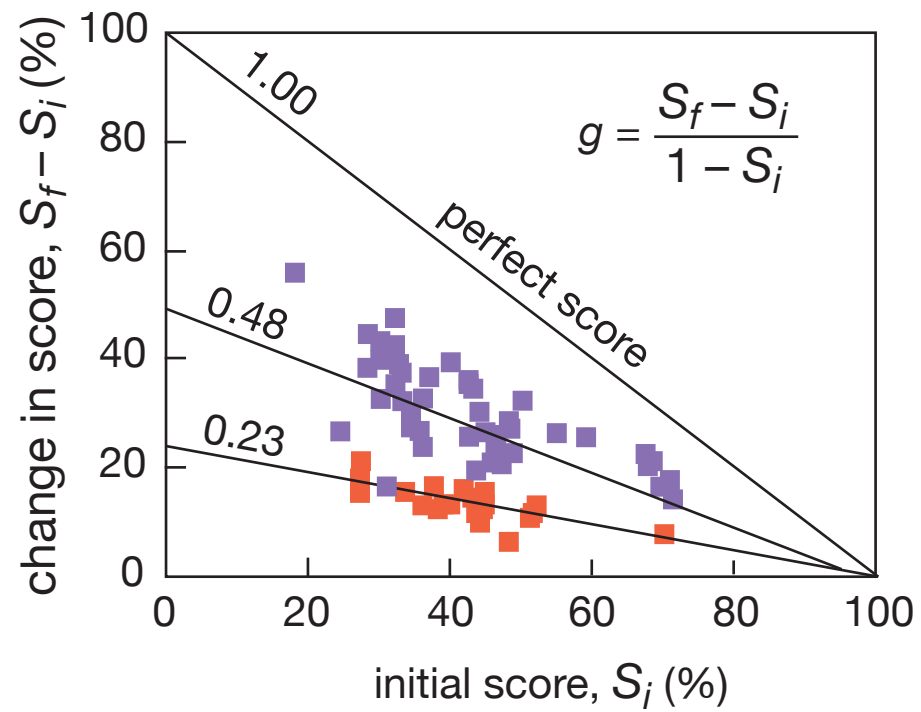
Results



Results



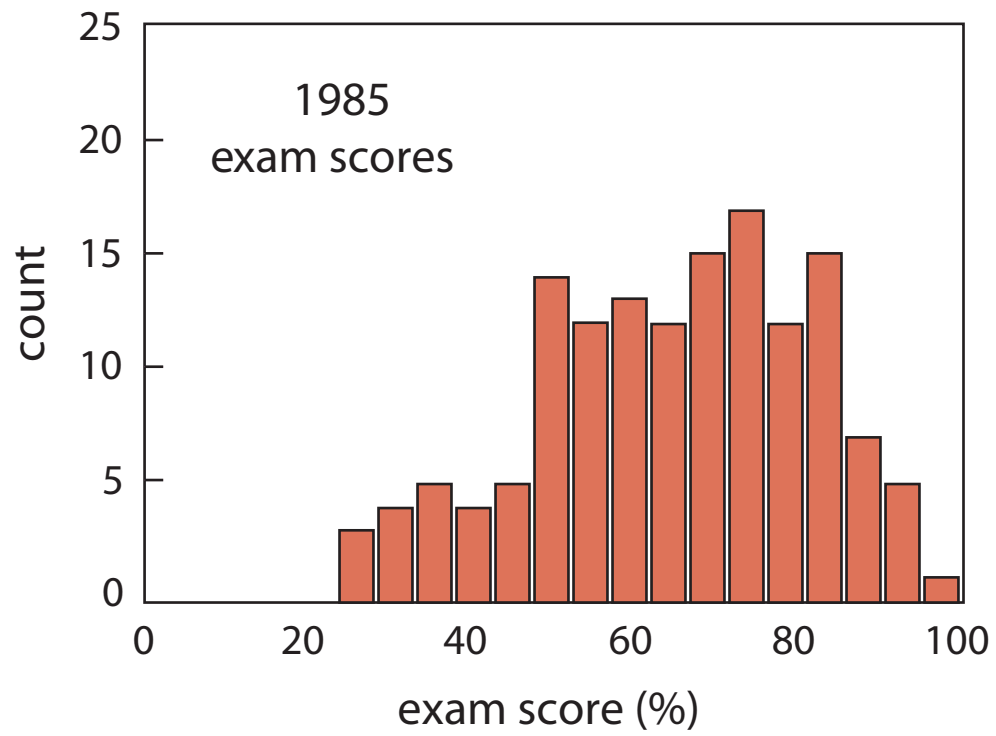
Results



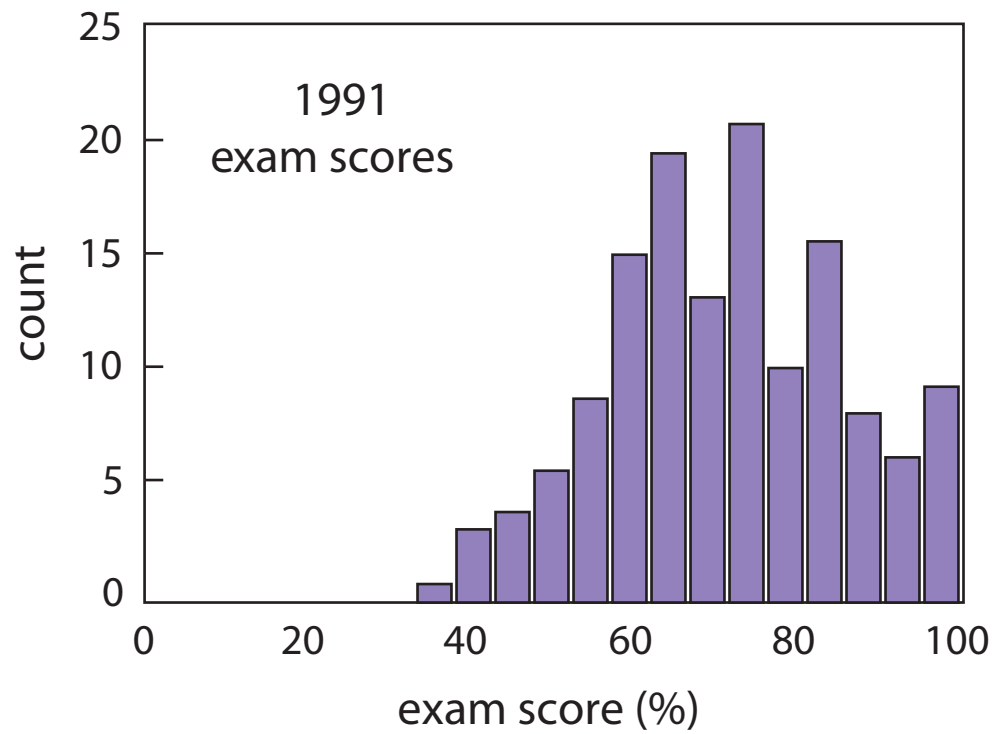
Results

what about problem solving?

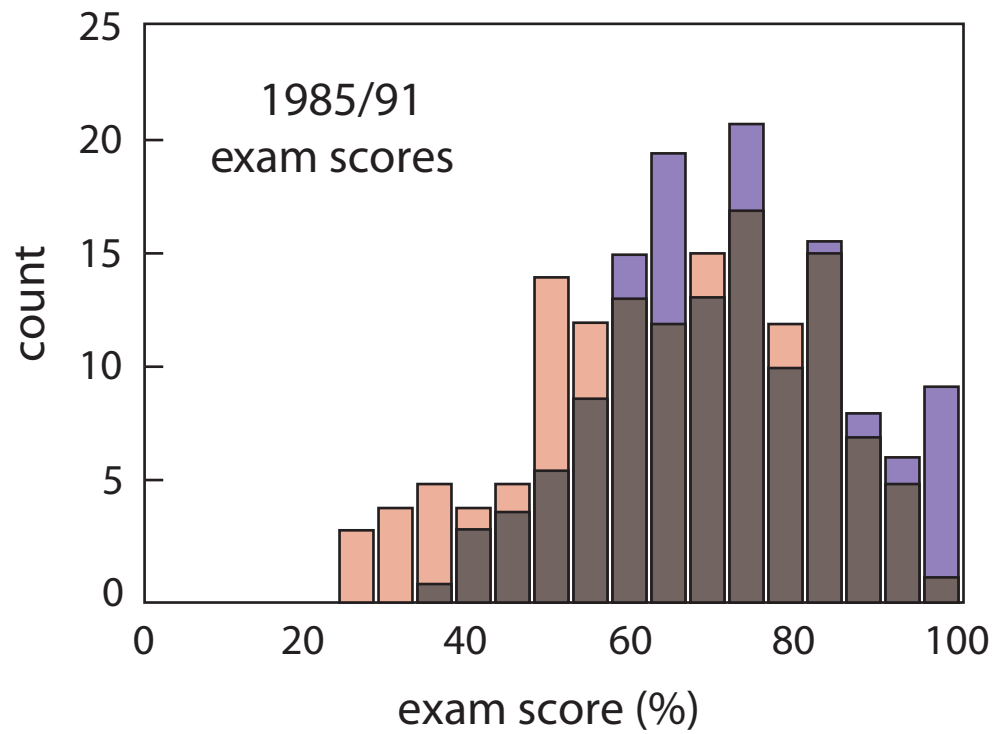
Results



Results



Results



Summary

**So better understanding leads to better
problem solving!**

Summary

So better understanding leads to better problem solving!

(but “good” problem solving doesn’t always indicate understanding!)

Funding:

National Science Foundation

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