

Introduction to Peer Instruction



Physics and Astronomy New Faculty Workshop
College Park, MD, 17 June 2013

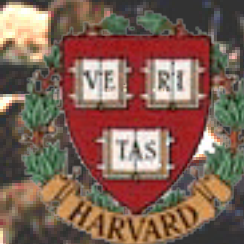


Introduction to Peer Instruction



@eric_mazur

Physics and Astronomy New Faculty Workshop
College Park, MD, 17 June 2013



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Quick survey...

Peer Instruction...

1. Never heard of it.
2. Heard of it, but don't really know what it is.
3. Quite familiar with it.
4. I heard you speak about it so often, I could give your talk!



Quick survey...

Peer Instruction...

1. Never heard of it.
2. Don't use it in my classes, but I'm open to it.
3. Considering using it in my classes.
4. I have used it in my classes a few times.
5. I use it regularly in my classes.



How do we learn?

Think of something you are good at — something that you know you do well.

How do we learn?

Think of something you are good at — something that you know you do well.

How did you become good at this?

How do we learn?

Became good at it by:

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

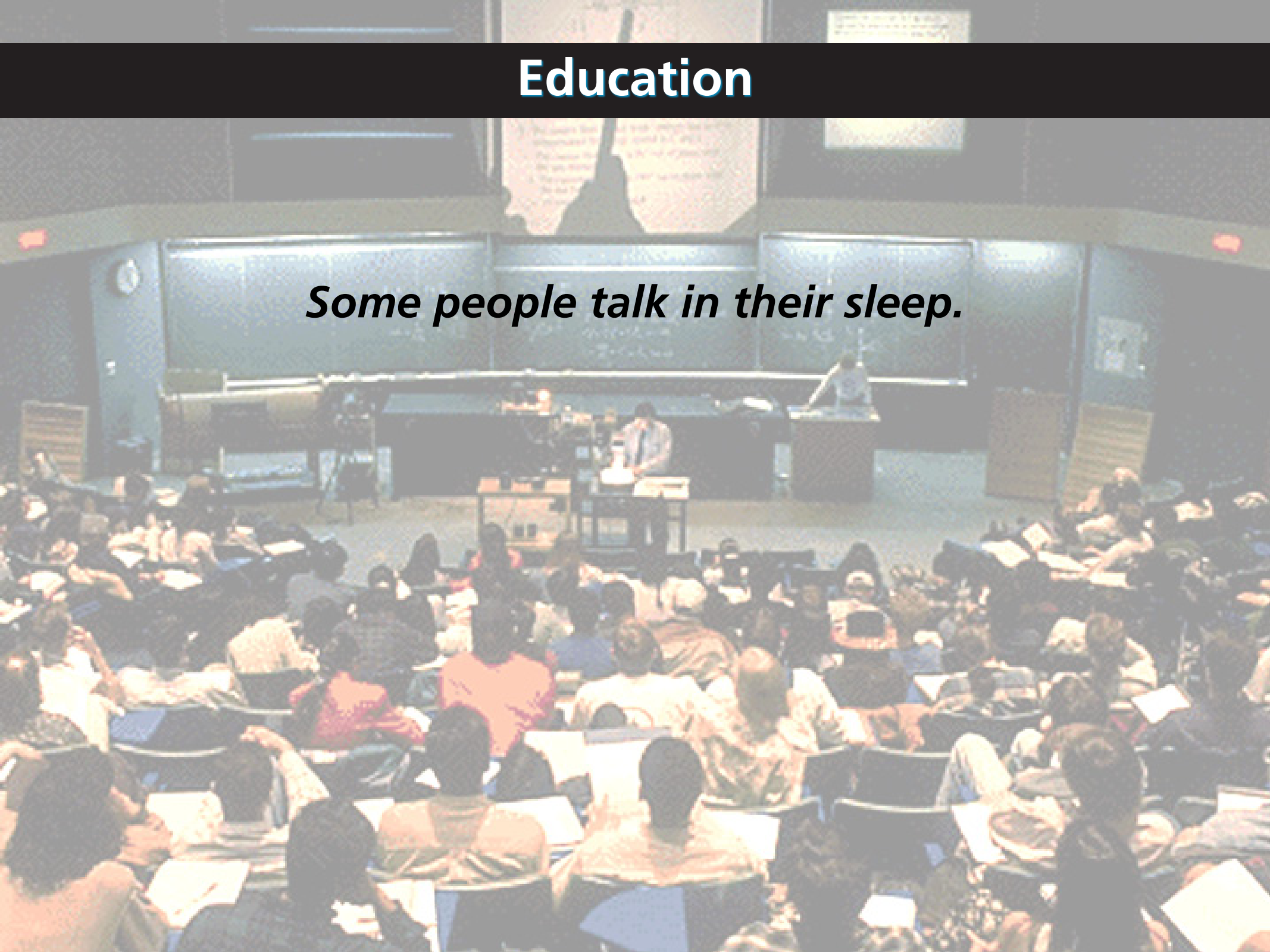


Education



Education

Some people talk in their sleep.

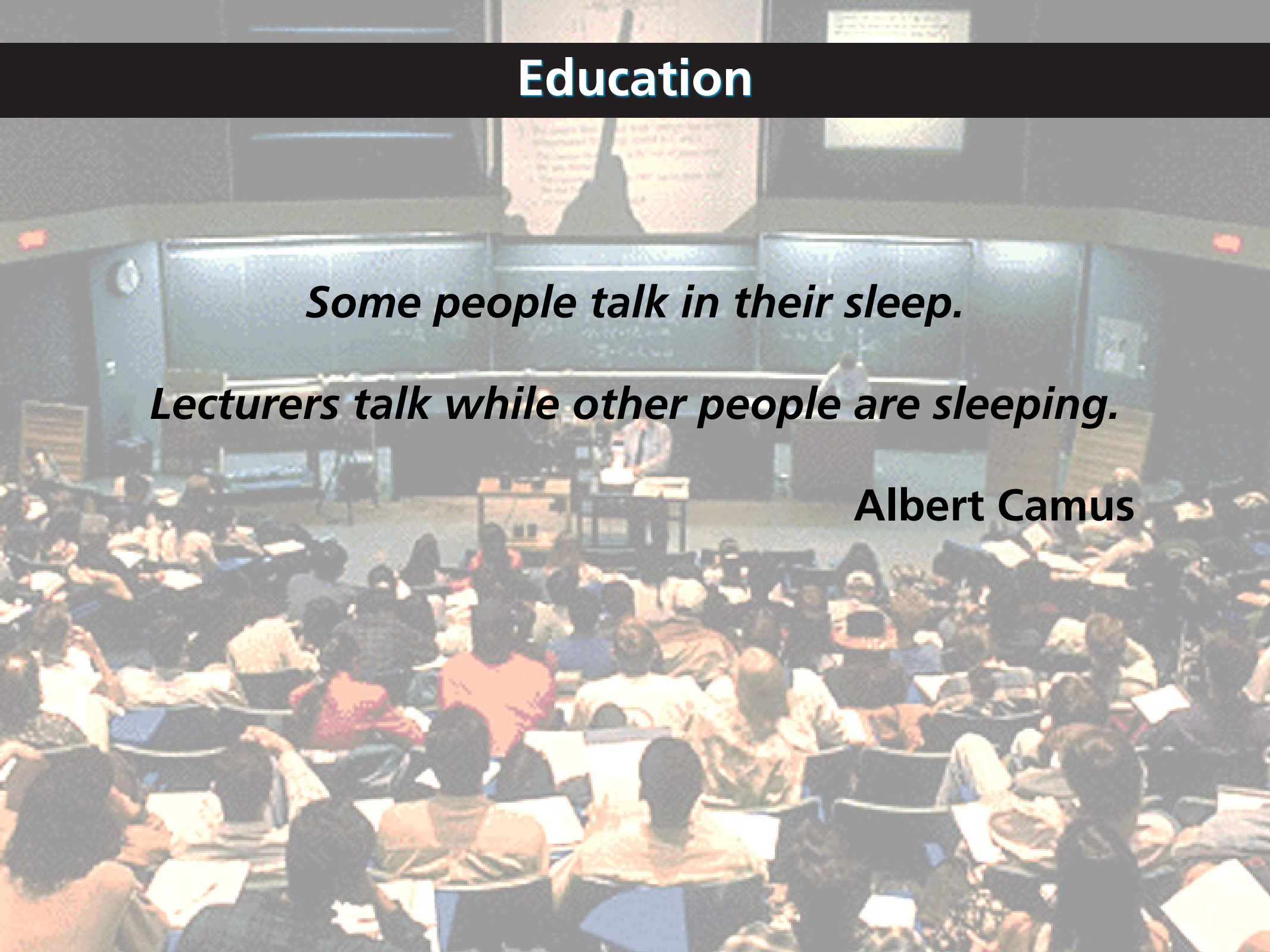


Education

Some people talk in their sleep.

Lecturers talk while other people are sleeping.

Albert Camus

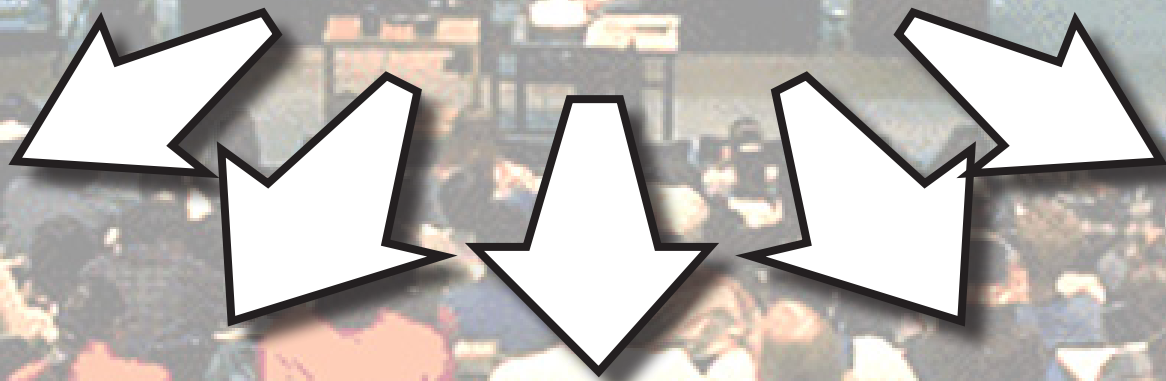


Education



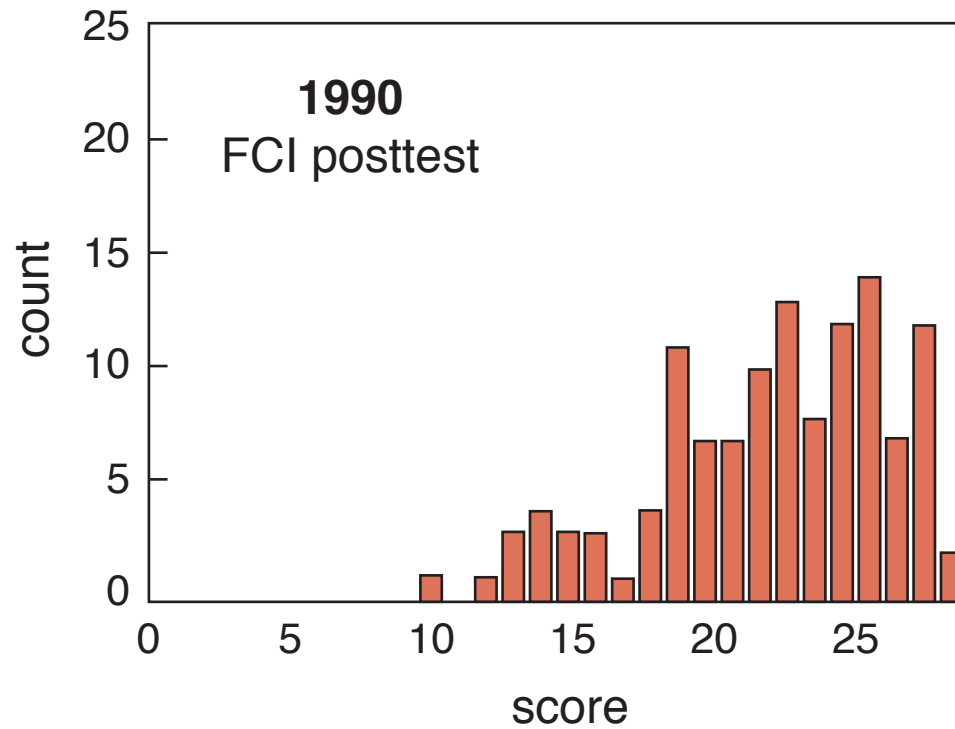
Education

lectures focus on information transfer...



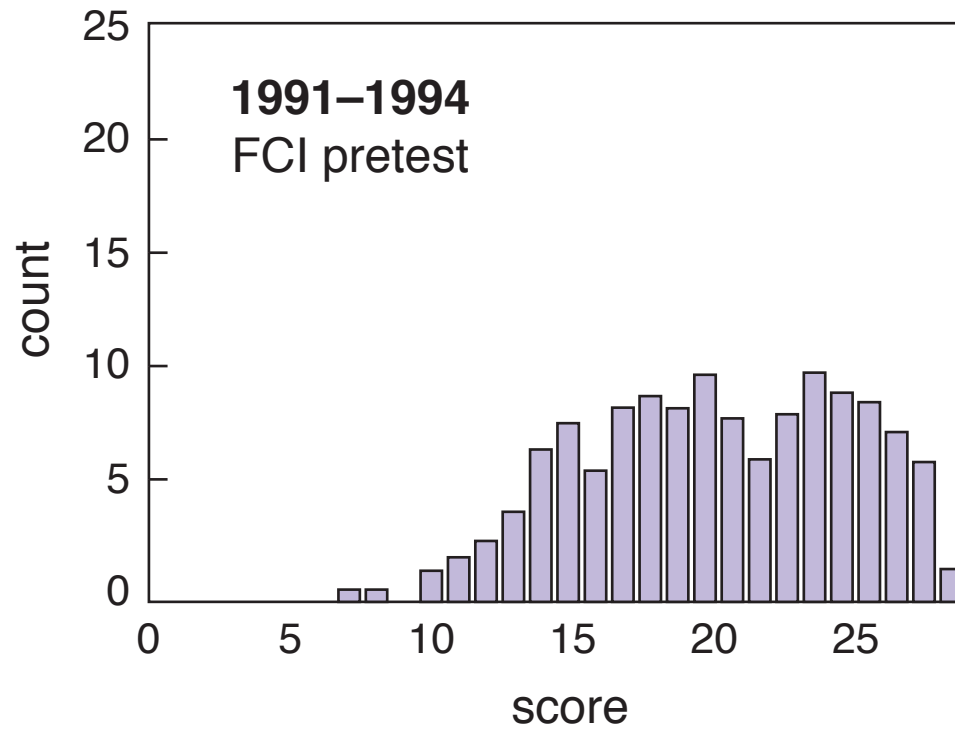
Education

education is not just information transfer



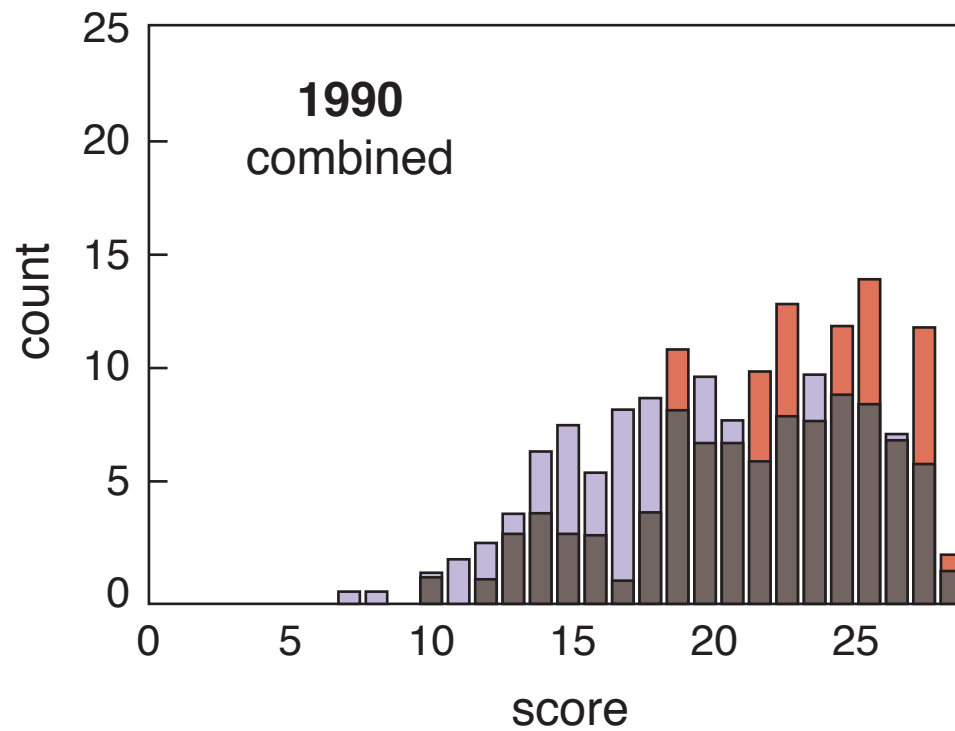
Education

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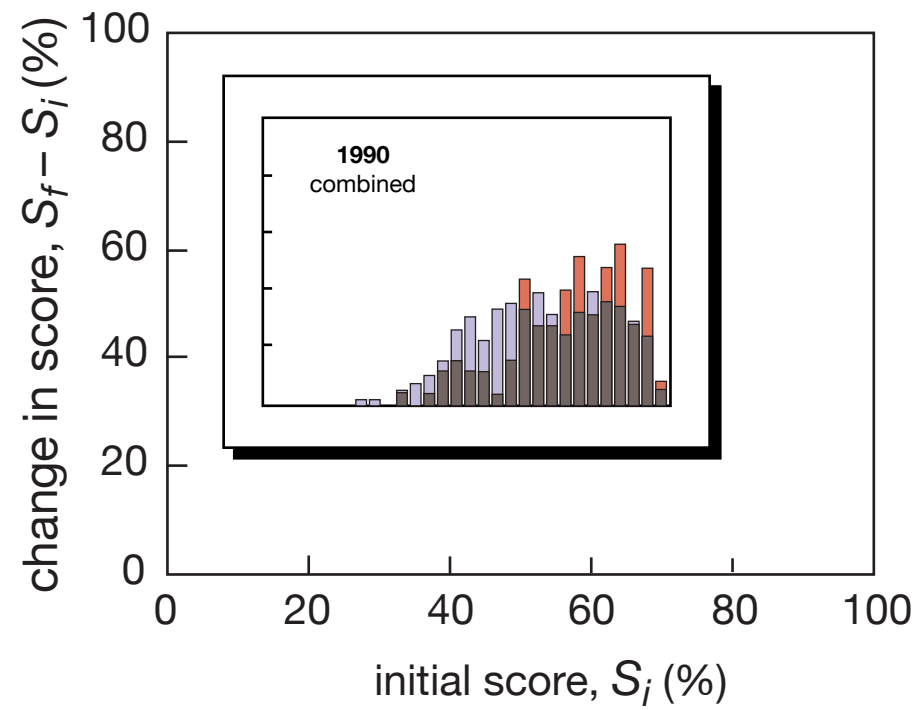


Education

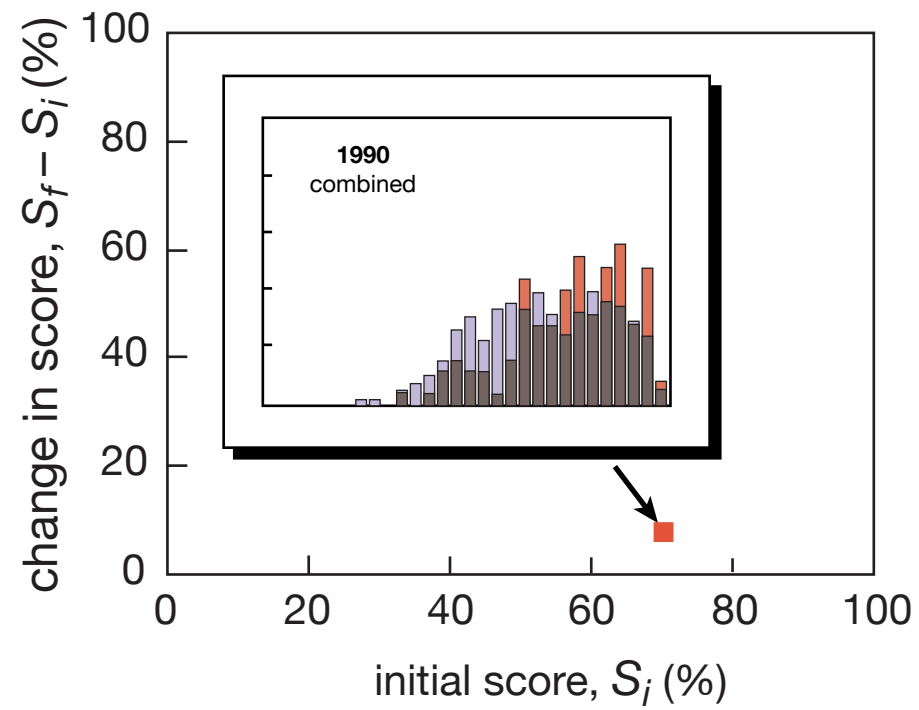
education is not just information transfer



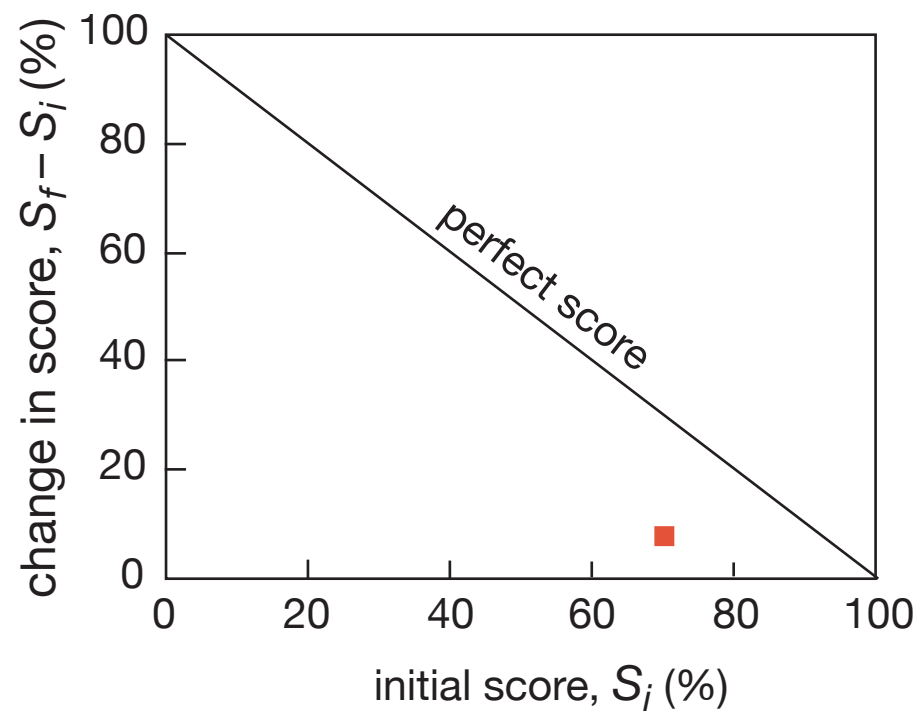
Education



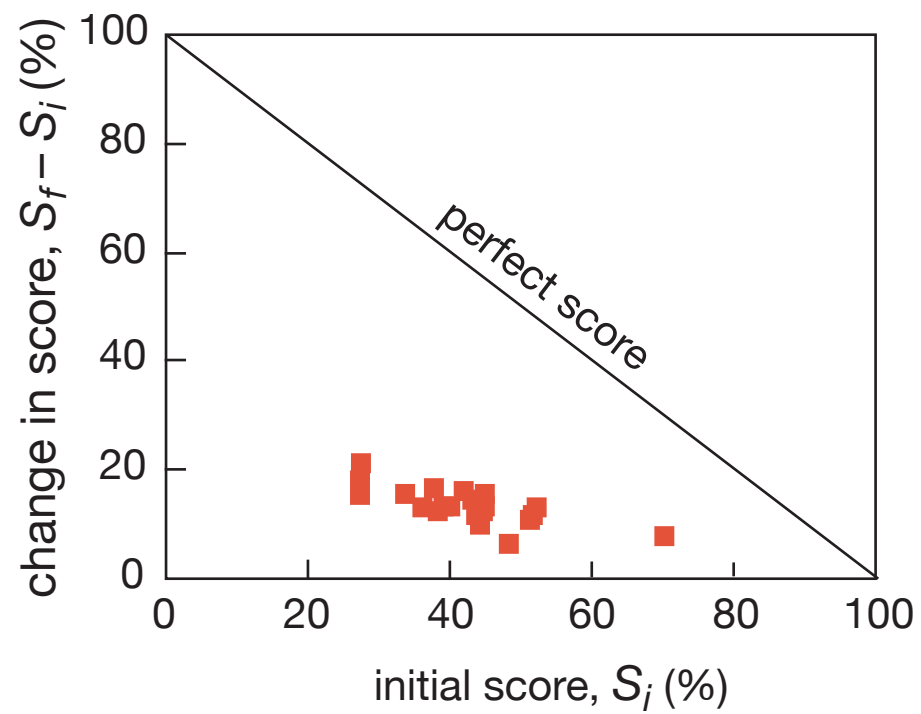
Education



Education



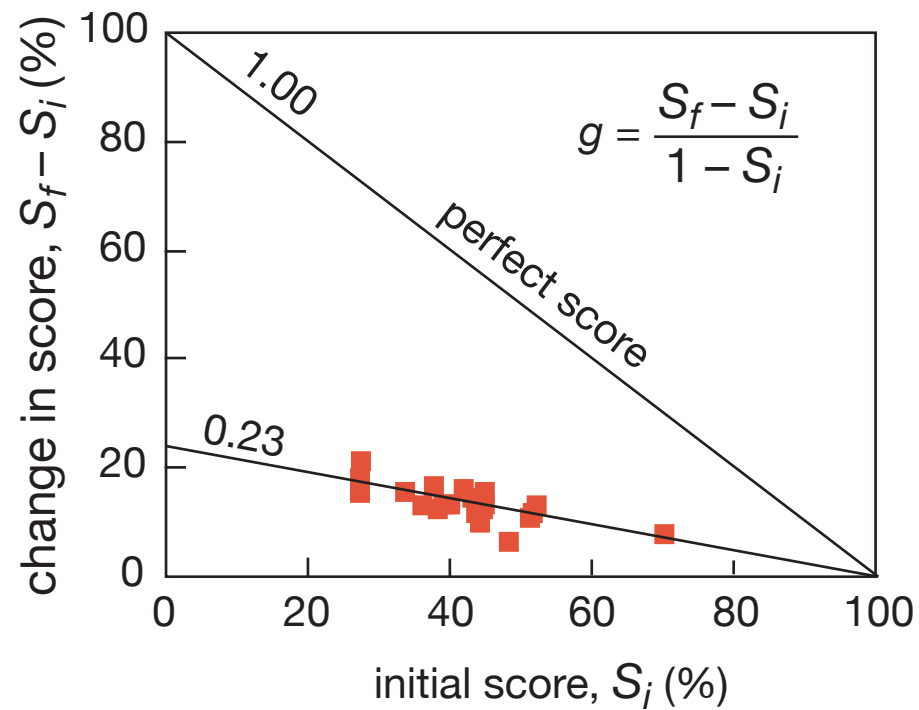
Education



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

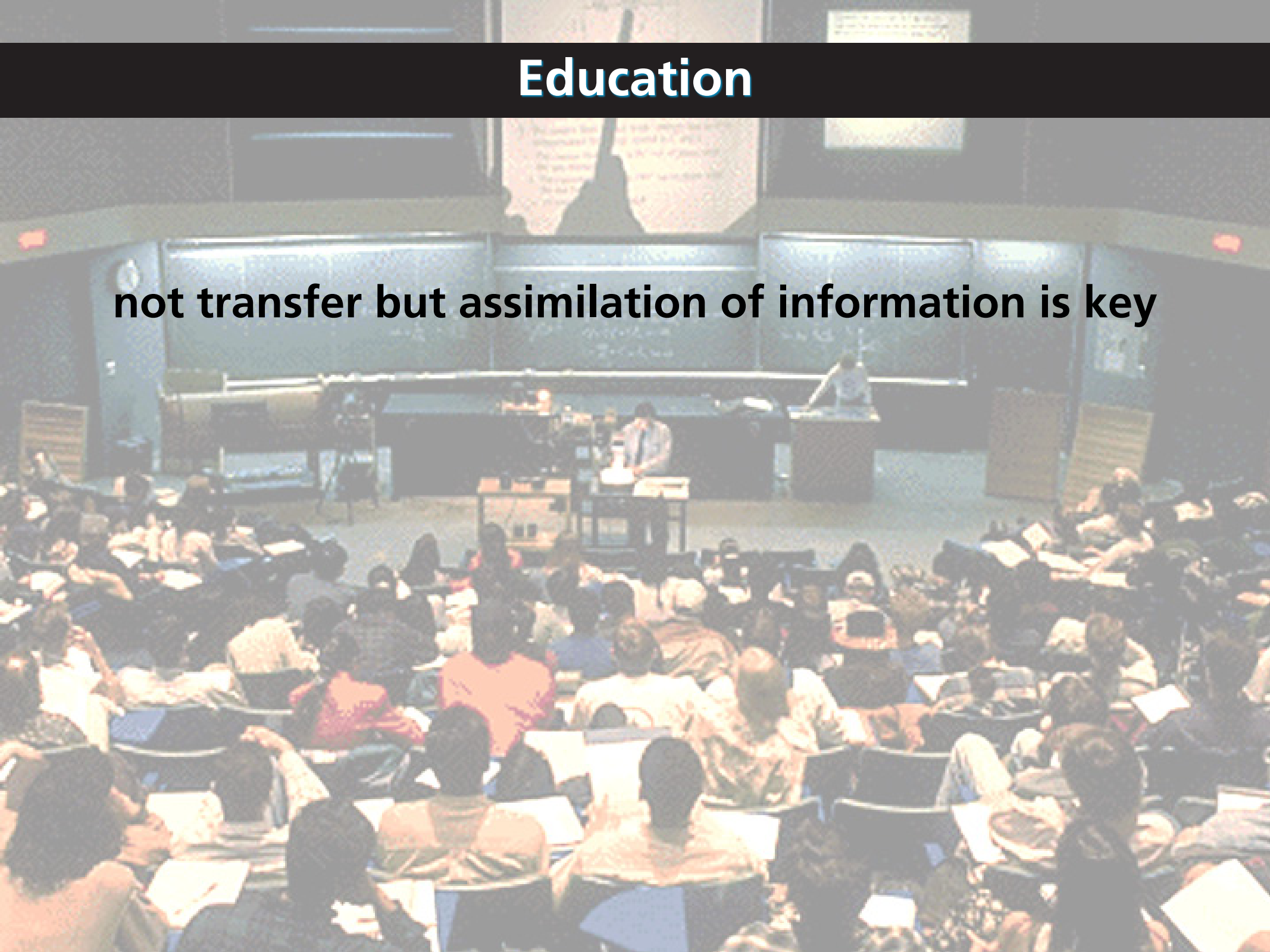
Education

only one quarter of maximum gain realized



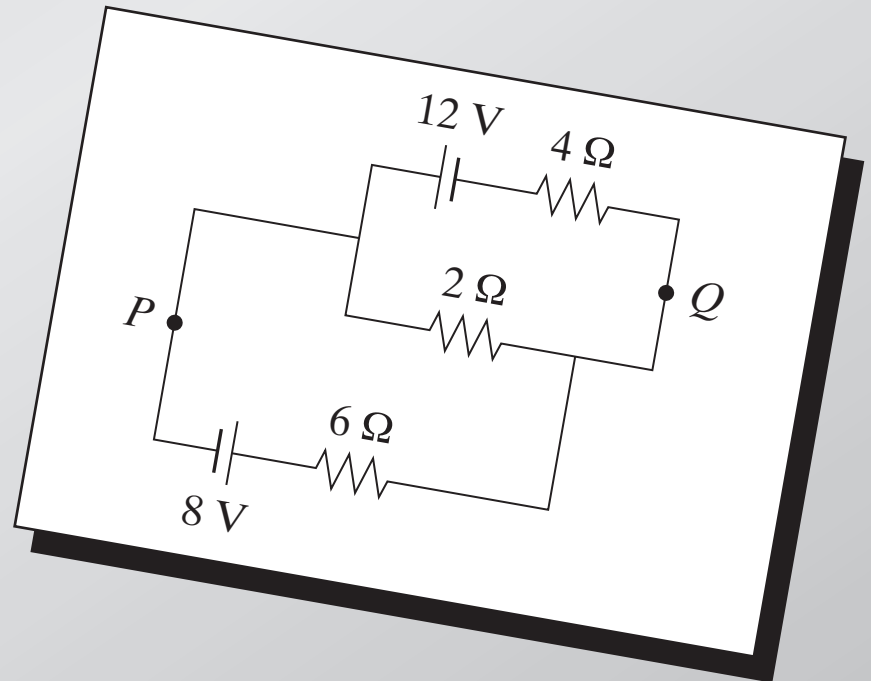
Education

not transfer but assimilation of information is key



Education

conventional problems misleading



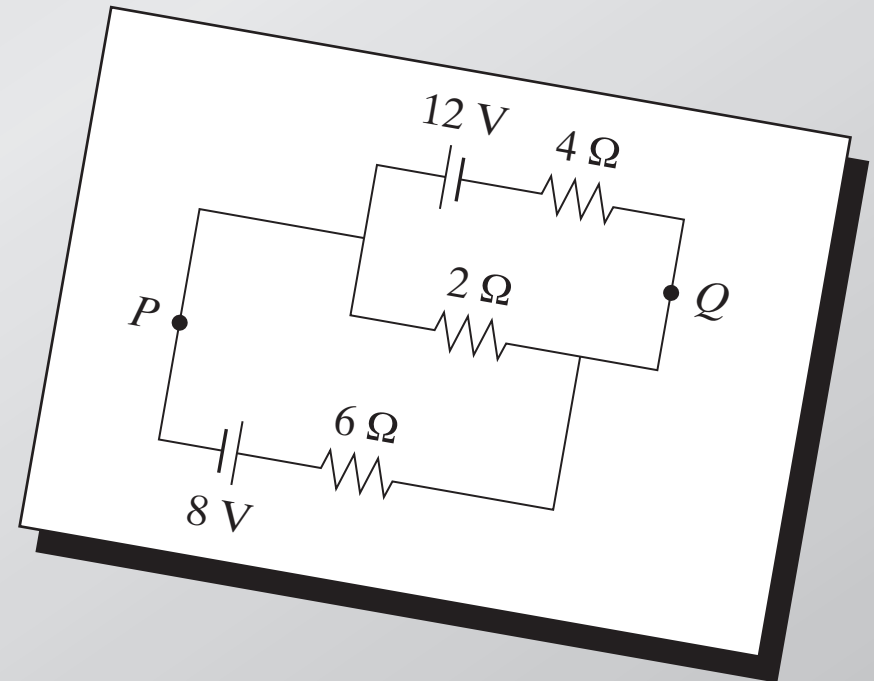
Education

conventional problems misleading

Calculate:

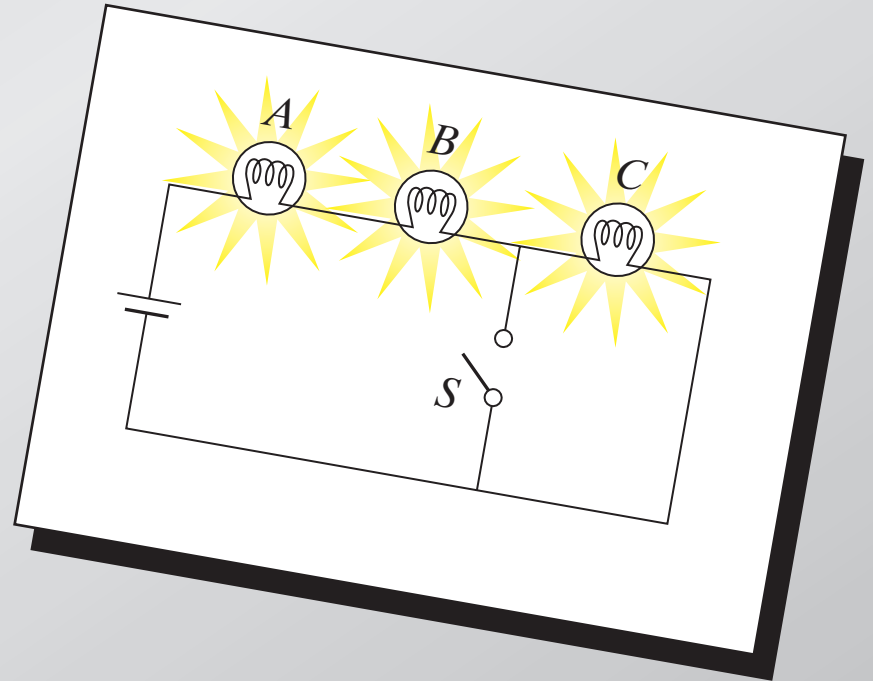
(a) current in $2\text{-}\Omega$ resistor

(b) potential difference
between P and Q



Education

are the basic principles understood?

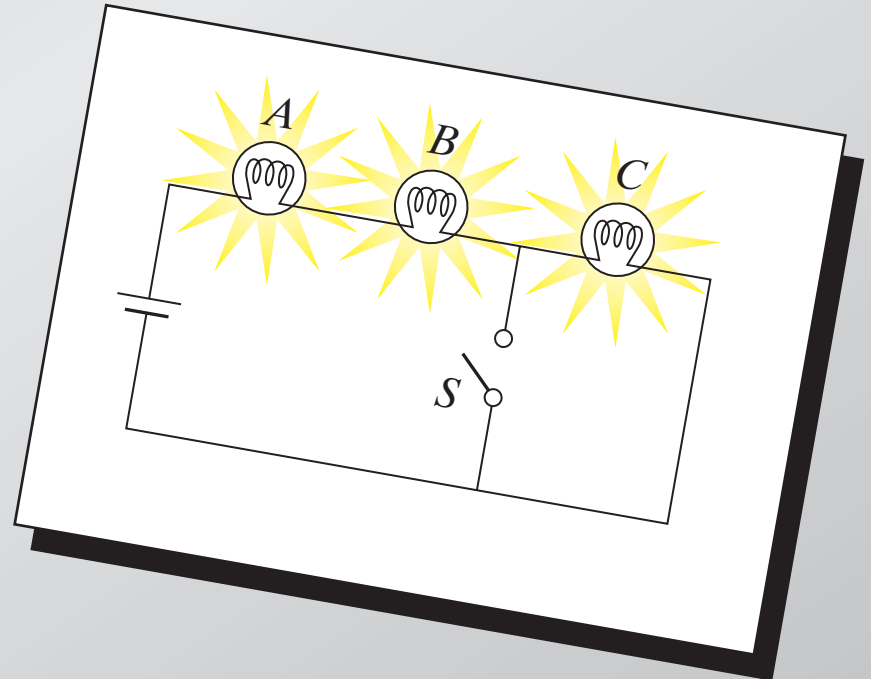


Education

are the basic principles understood?

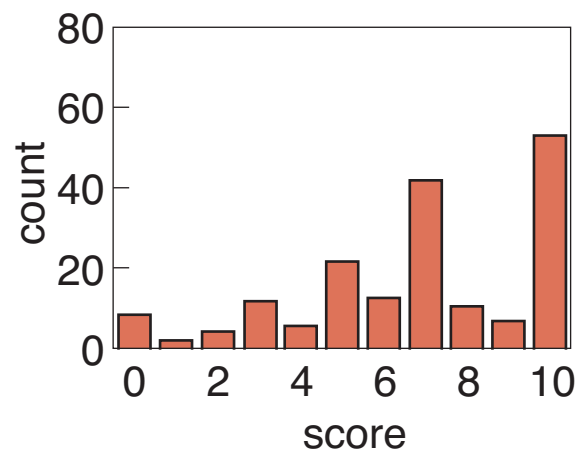
When S is closed, what happens to:

- (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?

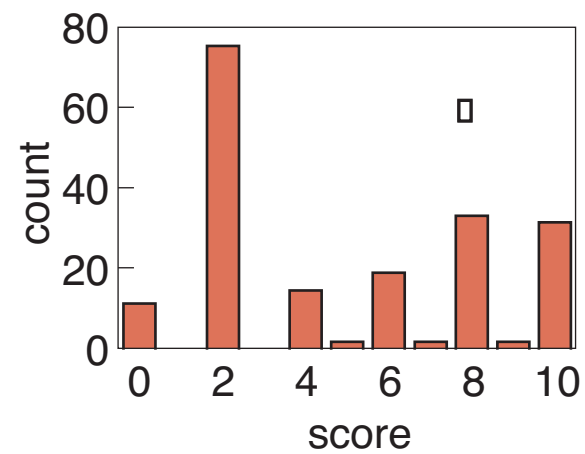


Education

conventional

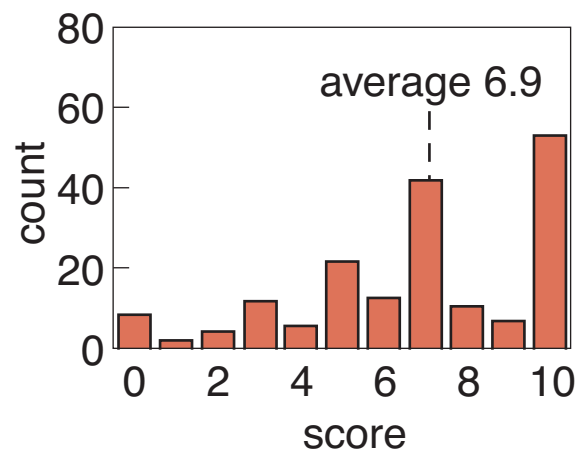


conceptual

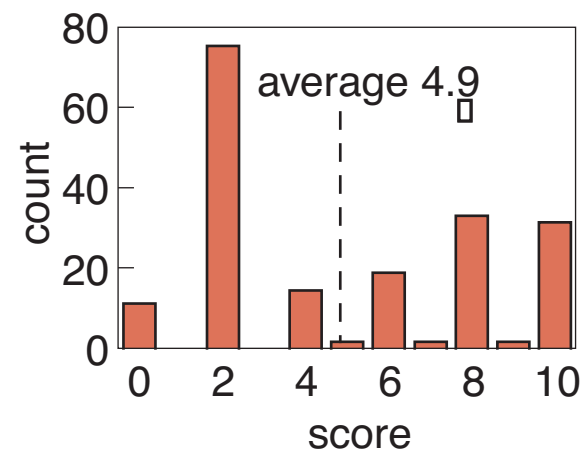


Education

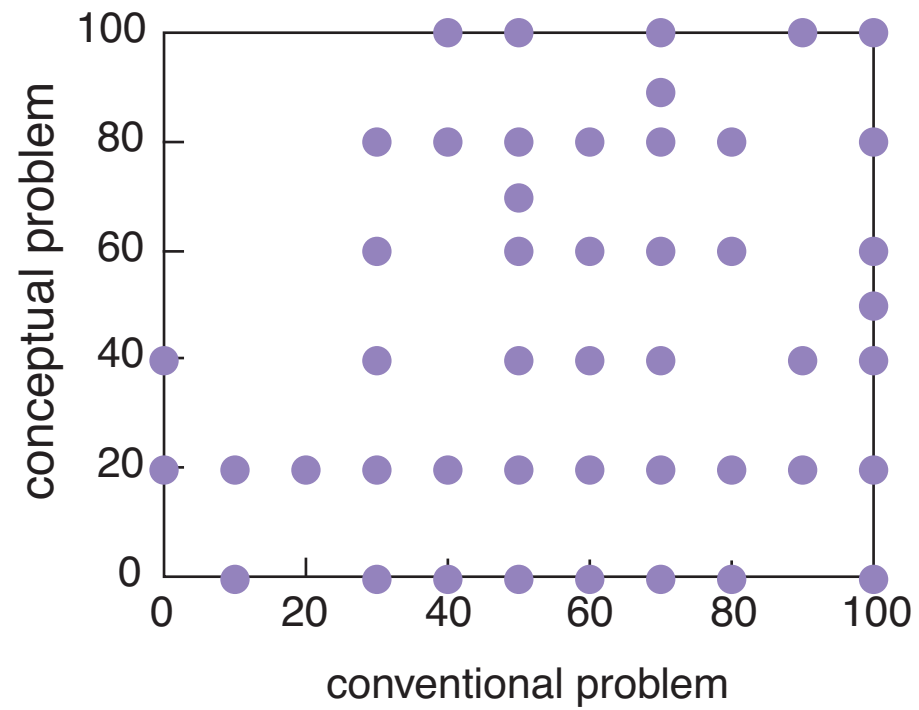
conventional



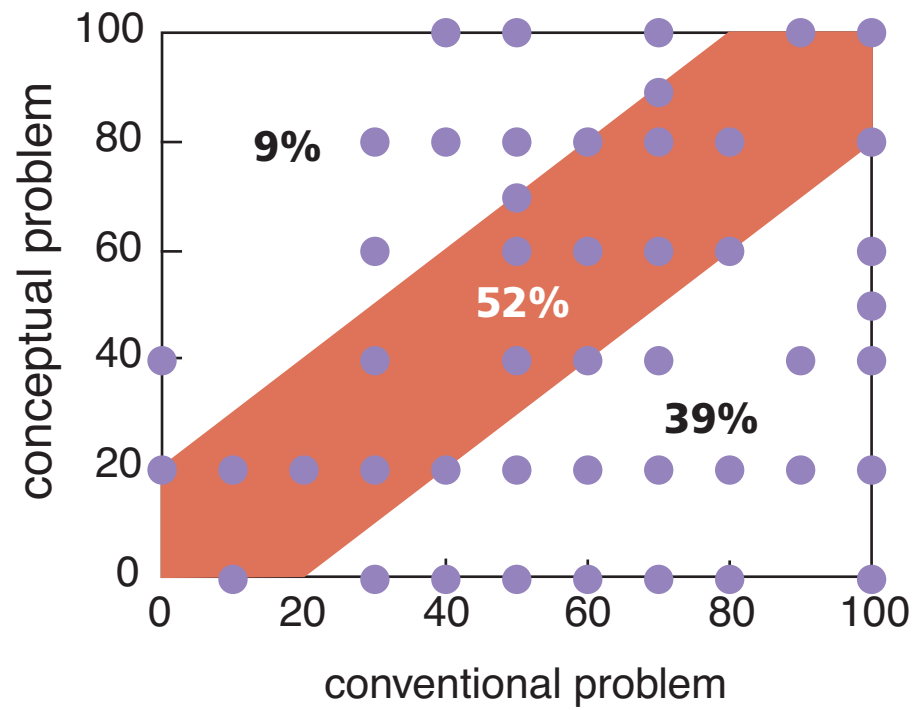
conceptual



Education



Education



So what should we do?



Peer Instruction

Give students more responsibility for gathering information...

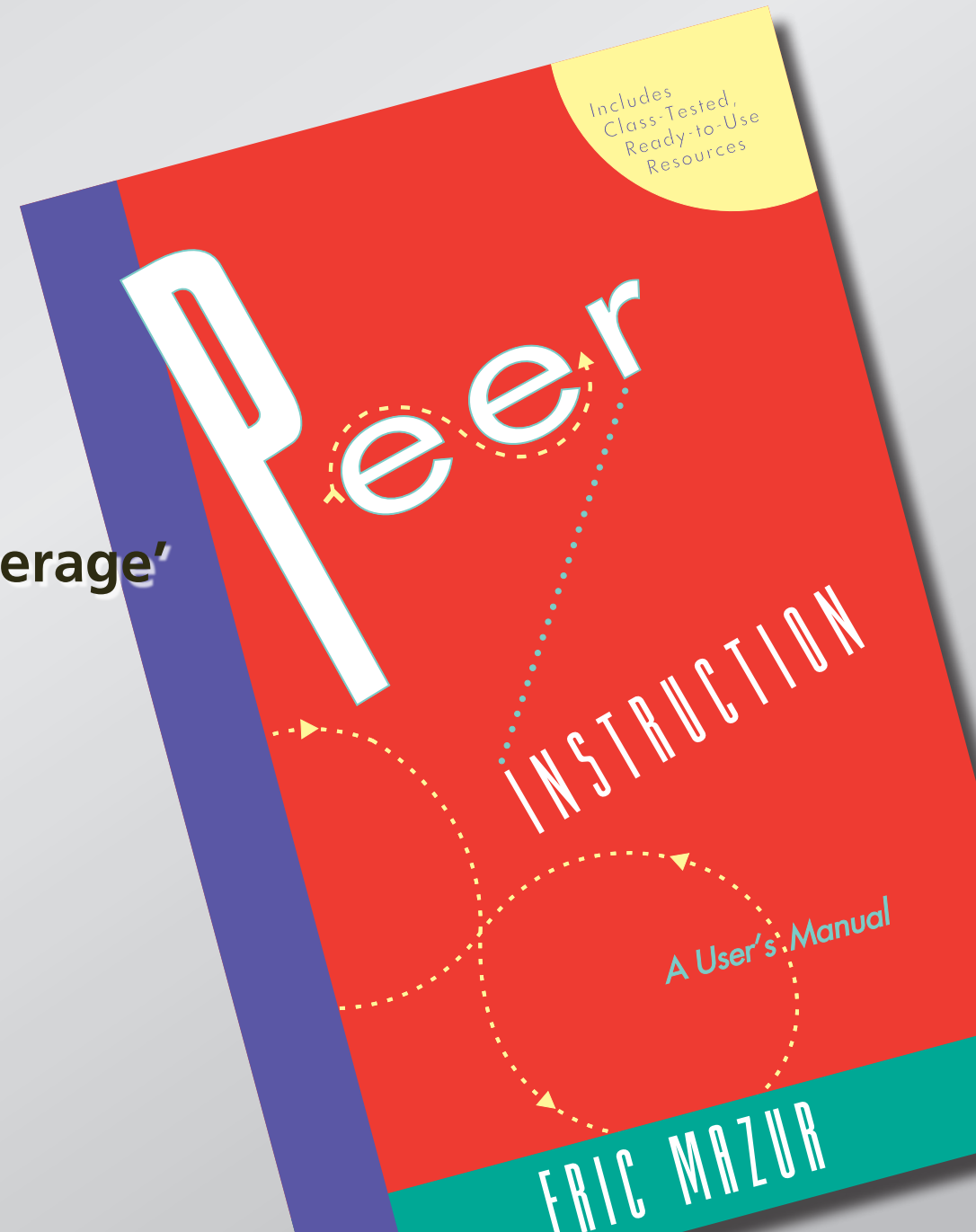
Peer Instruction

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

Peer Instruction

Main features:

- pre-class assignment
- 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**

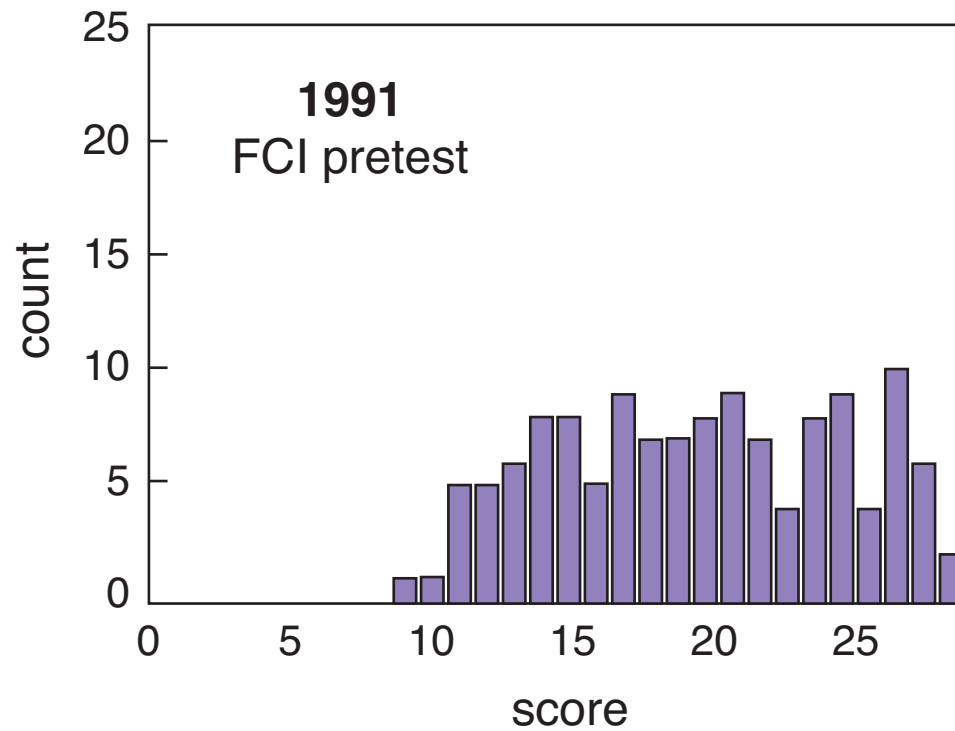


Results

is it any good?

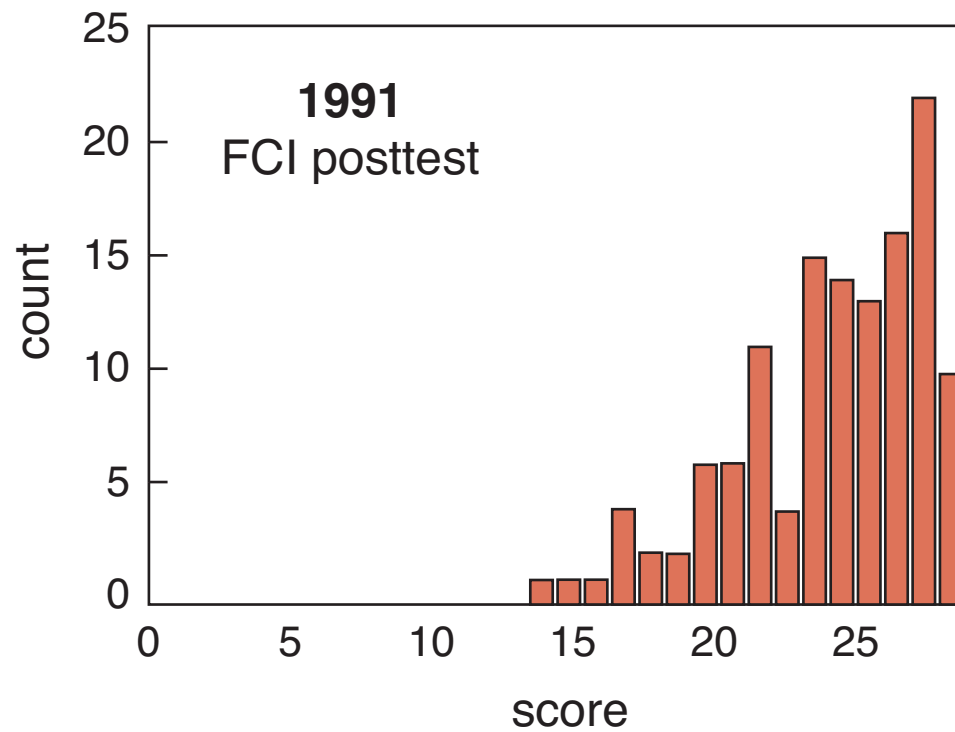
Results

first year of implementing PI



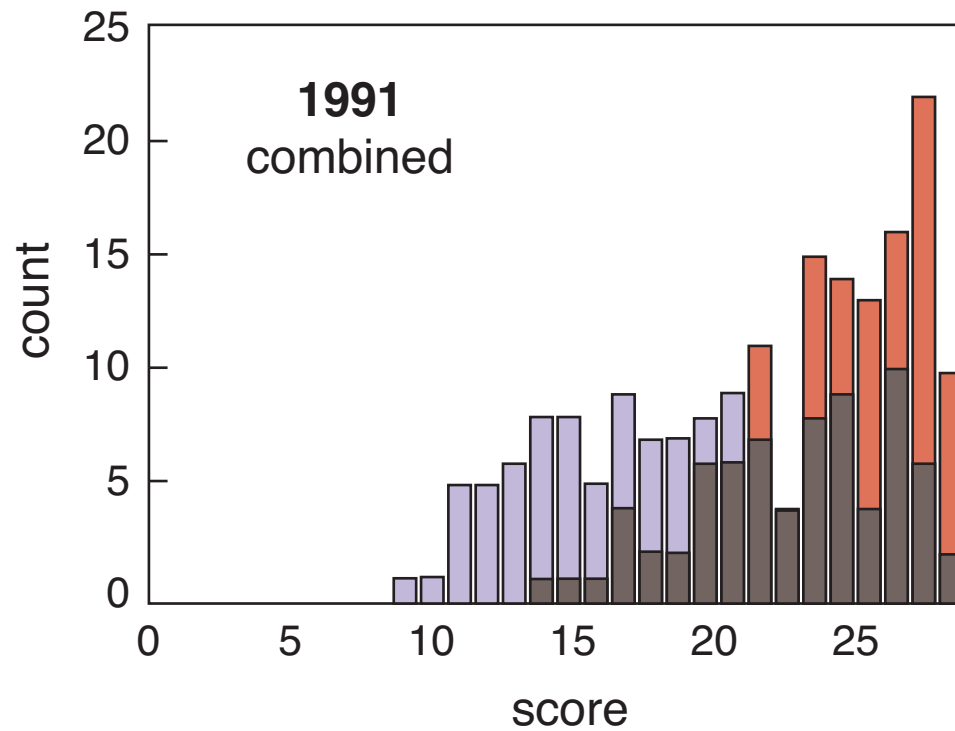
Results

first year of implementing PI

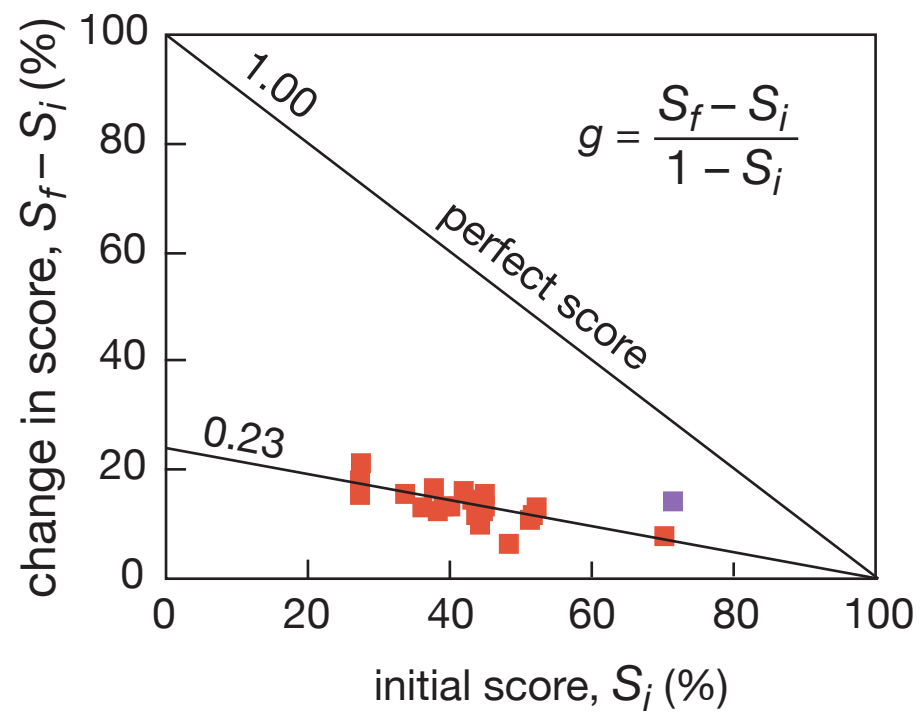


Results

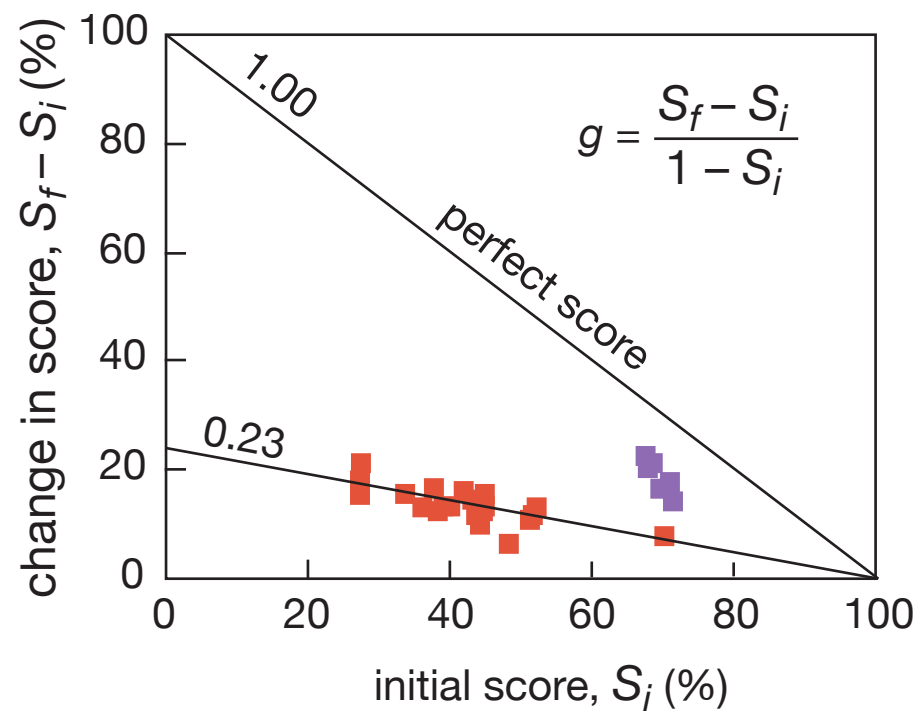
first year of implementing PI



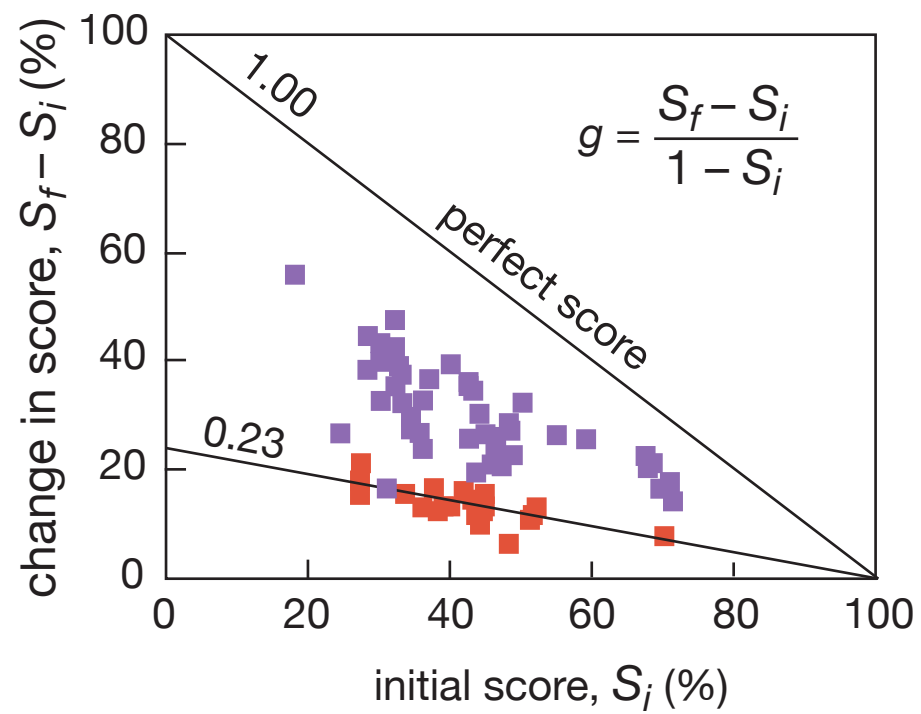
Results



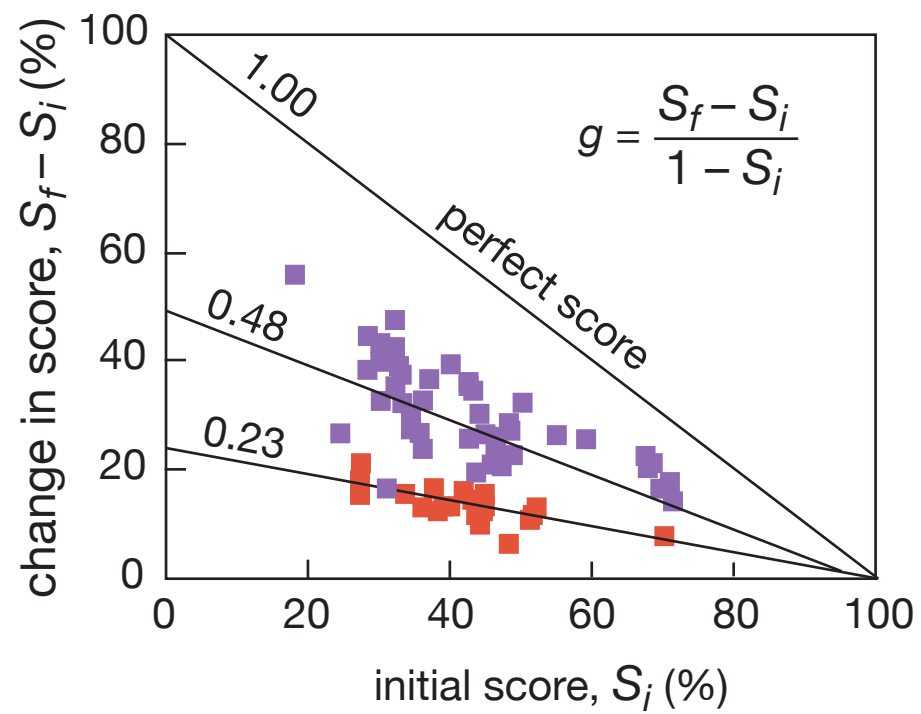
Results



Results



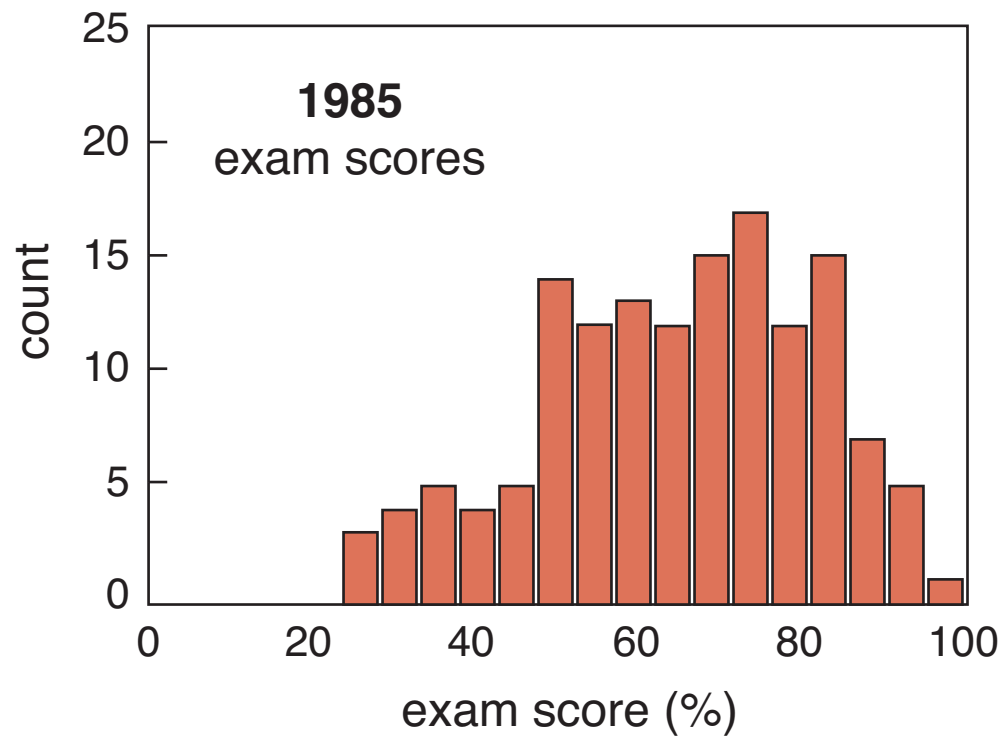
Results



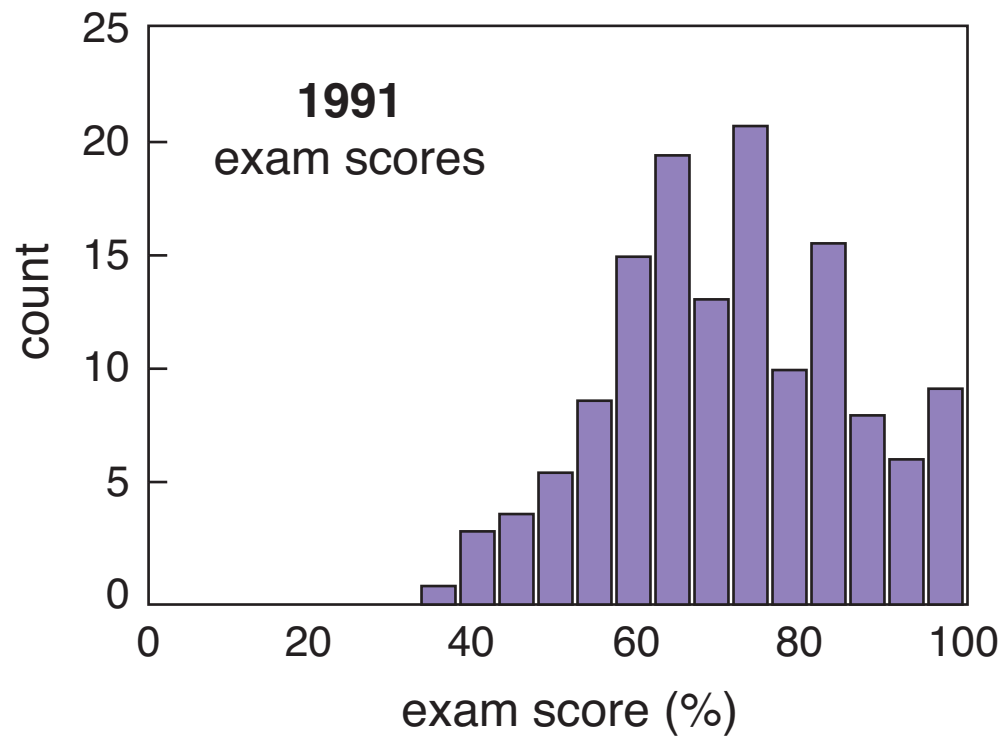
Results

what about problem solving?

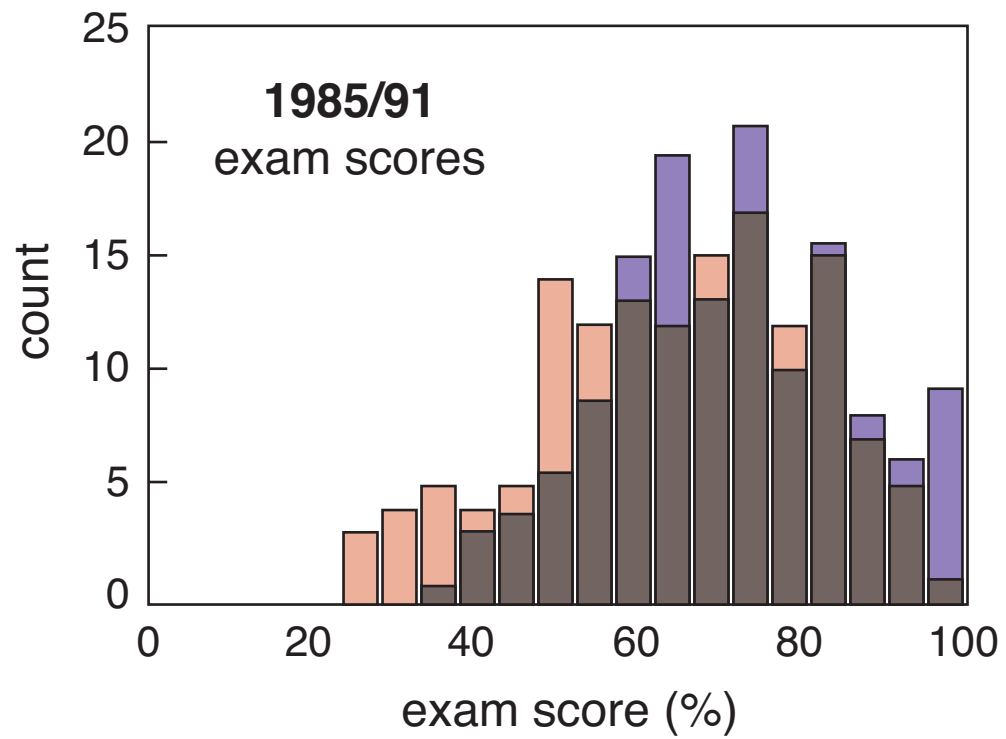
Results



Results



Results



Conclusion

So better understanding leads to better problem solving!

Conclusion

So better understanding leads to better problem solving!

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

Summary

Traditional indicators of success misleading

Summary

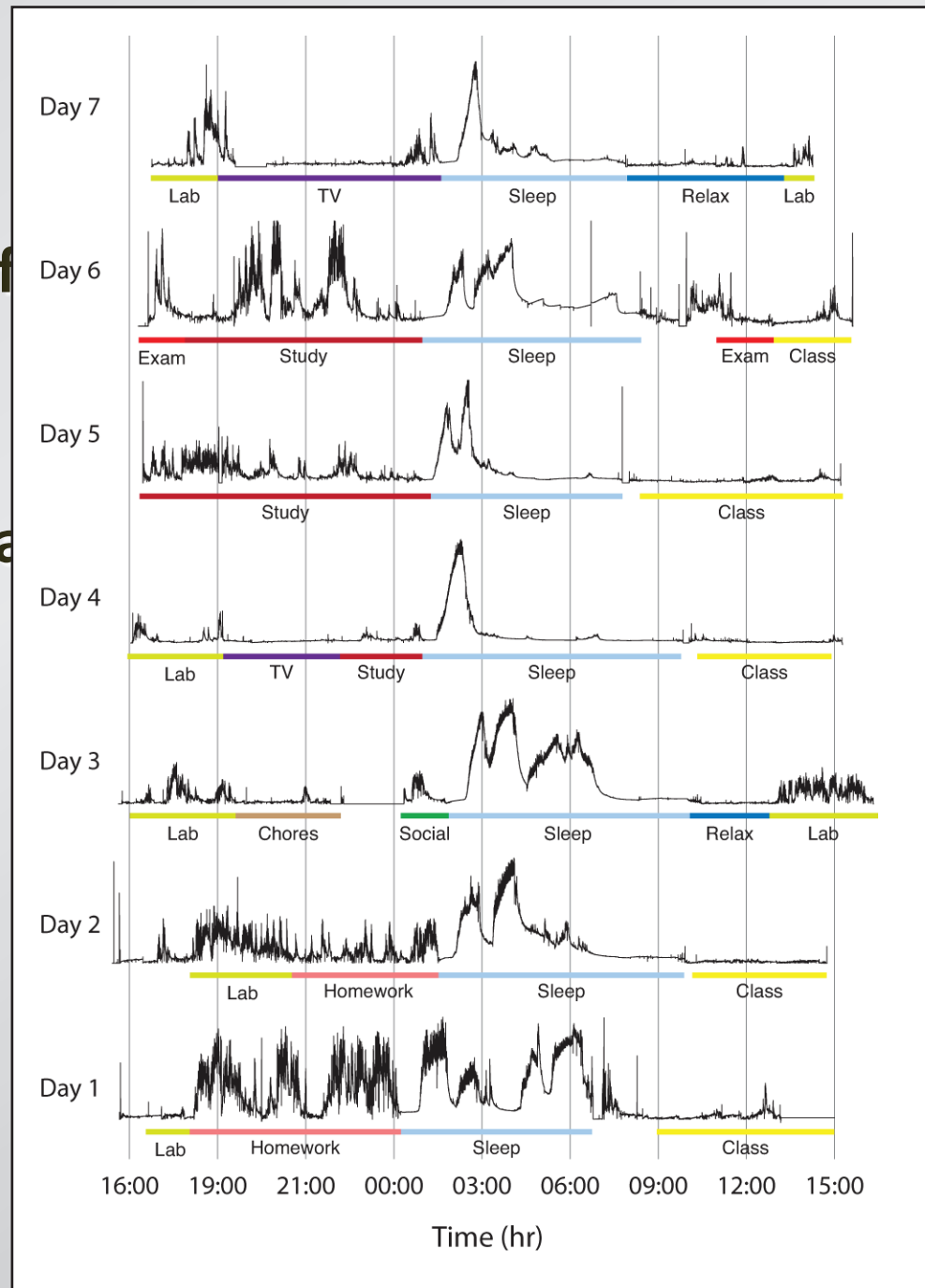
Traditional indicators of success misleading

Education is no longer about information

Summary

Traditional indicators of

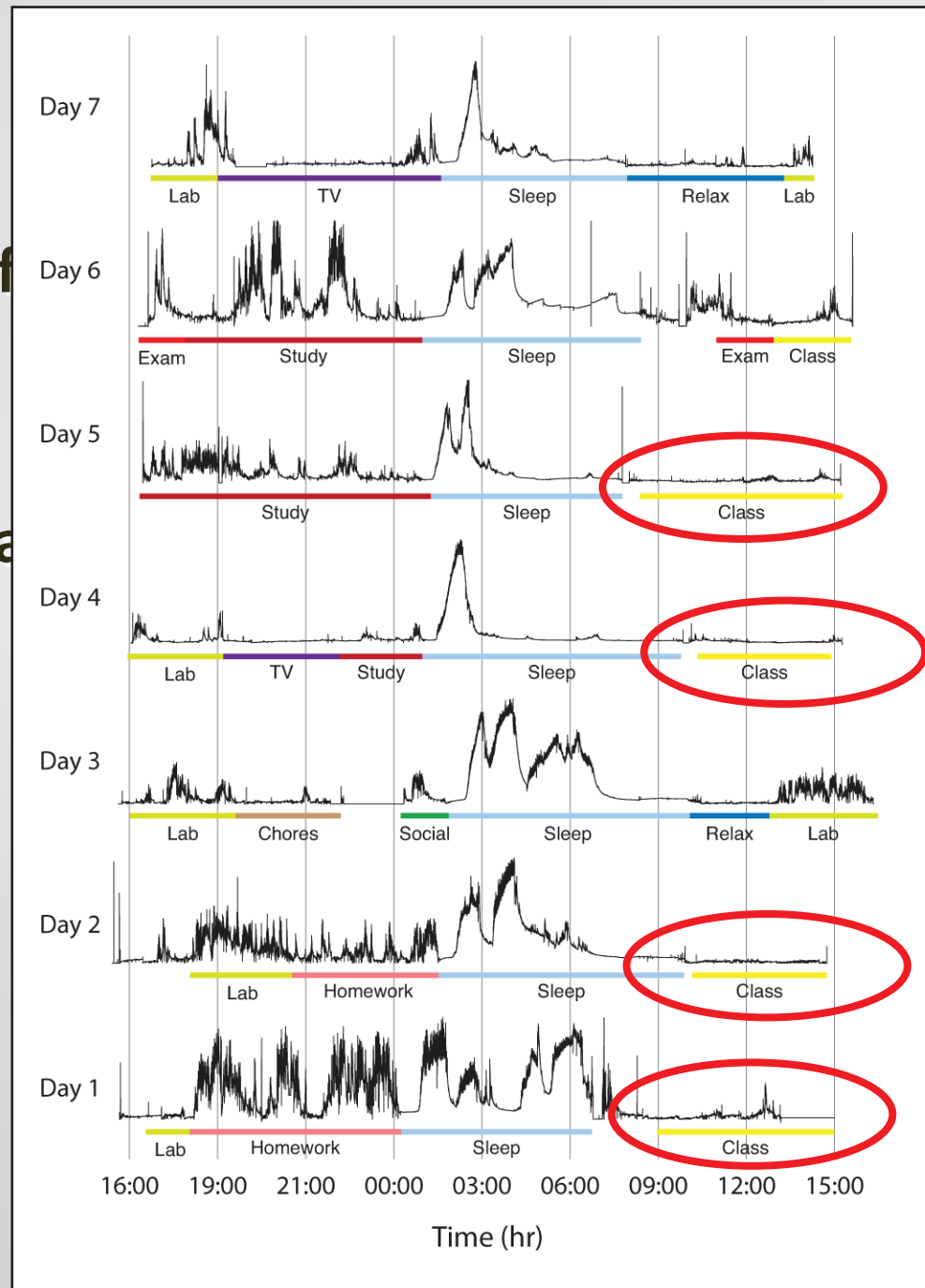
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Summary

Traditional indicators of

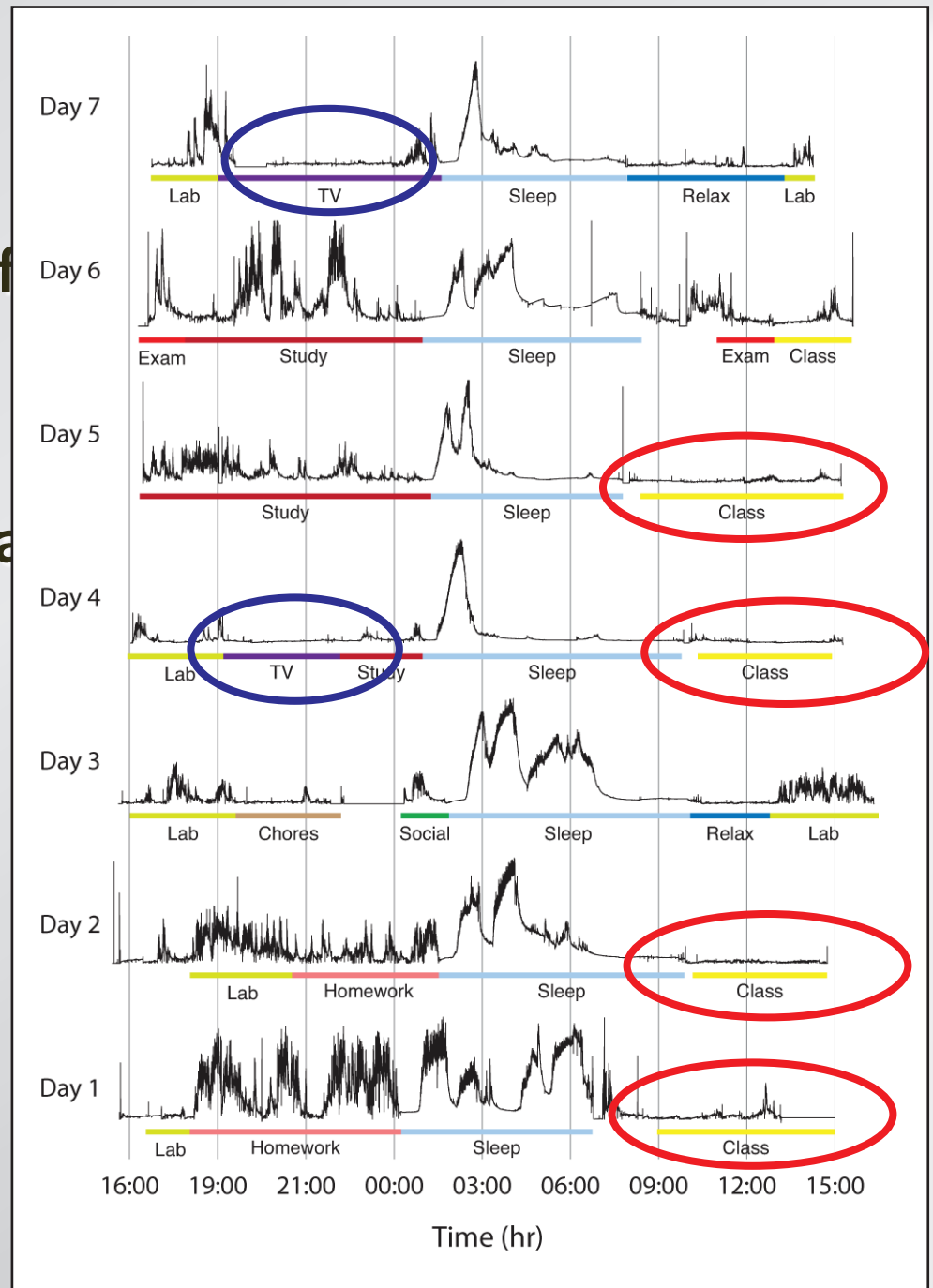
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Summary

Traditional indicators of

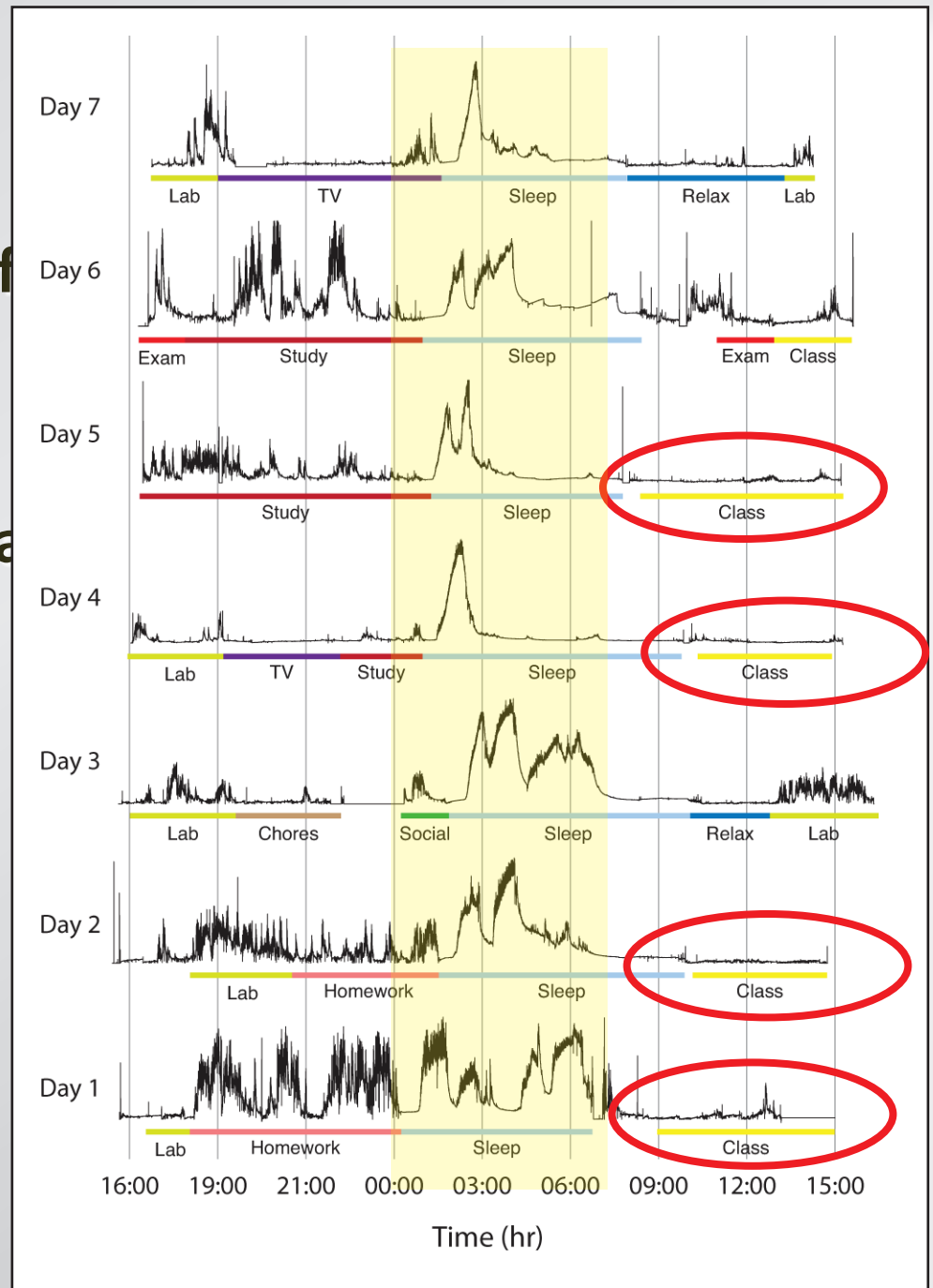
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Summary

Traditional indicators of

Education is no longer a



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