

Confessions of a converted lecturer



EDUCACION

44th European Group on Atomic Systems Conference
Göteborg, Sweden, 12 July 2012



Confessions of a converted lecturer



@eric_mazur

EDUCATION

44th European Group on Atomic Systems Conference
Göteborg, Sweden, 12 July 2012



Think of something you are good at

EDUCACION

Think of something you are good at

How did you become good at this?

EDUCACION







1 education


2 PI



1 education

2 PI

3 results

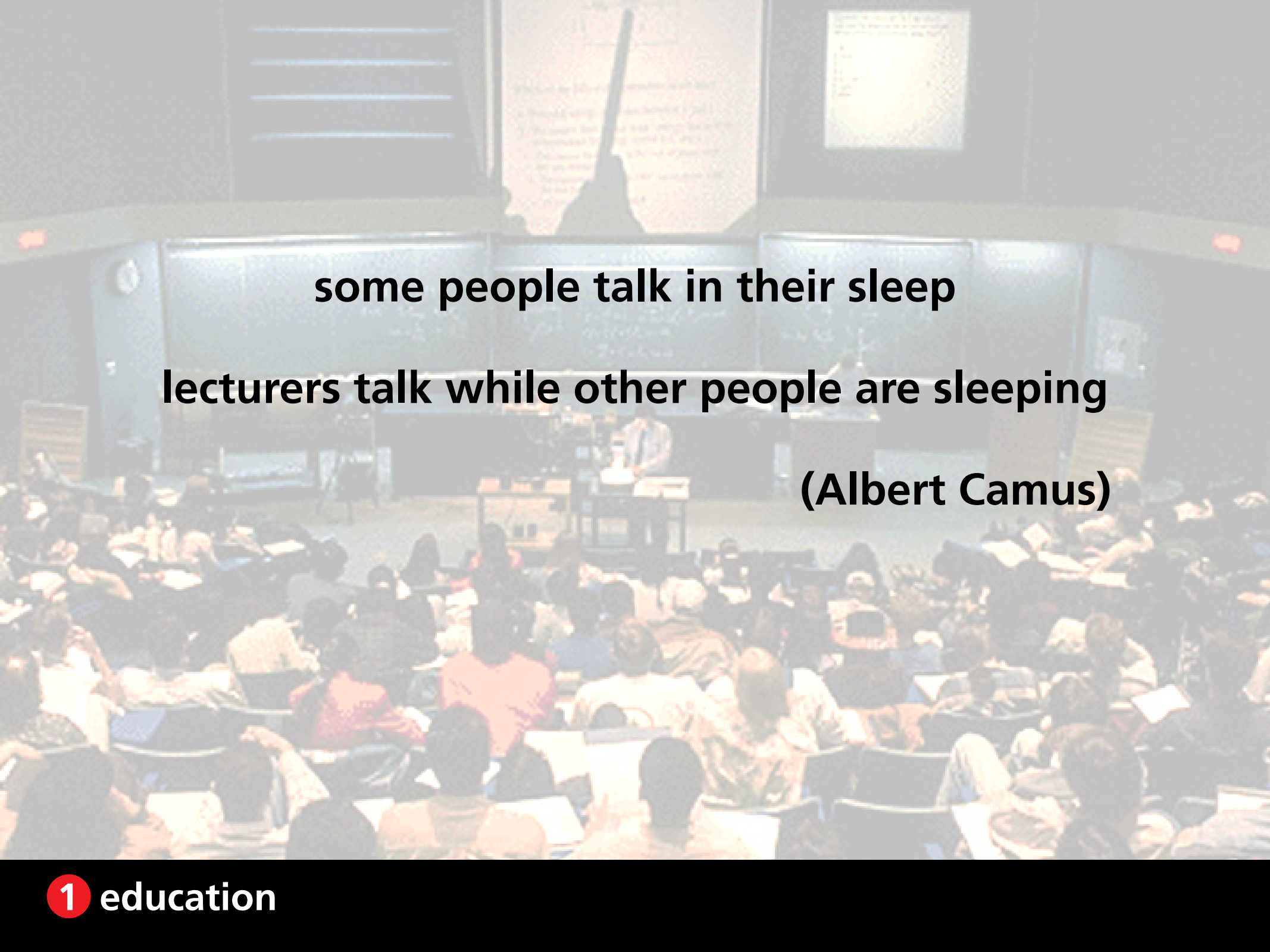
A large white thought bubble with a thick black border is centered in the upper half of the image. It contains the text 'What happens in a lecture?'. Below the main bubble are three smaller white circles with black borders, arranged in a vertical line that tapers downwards, suggesting a trail of thought.

**What happens
in a lecture?**



A large lecture hall with a professor at a podium and students in the audience. The room is filled with people, and the professor is speaking from a podium. The text "some people talk in their sleep" is overlaid on the image.

some people talk in their sleep

A large lecture hall with a lecturer at a podium and a large audience of students. The room is filled with people sitting at desks, and a large screen at the front displays text. The scene is dimly lit, suggesting a lecture in progress.

some people talk in their sleep
lecturers talk while other people are sleeping
(Albert Camus)





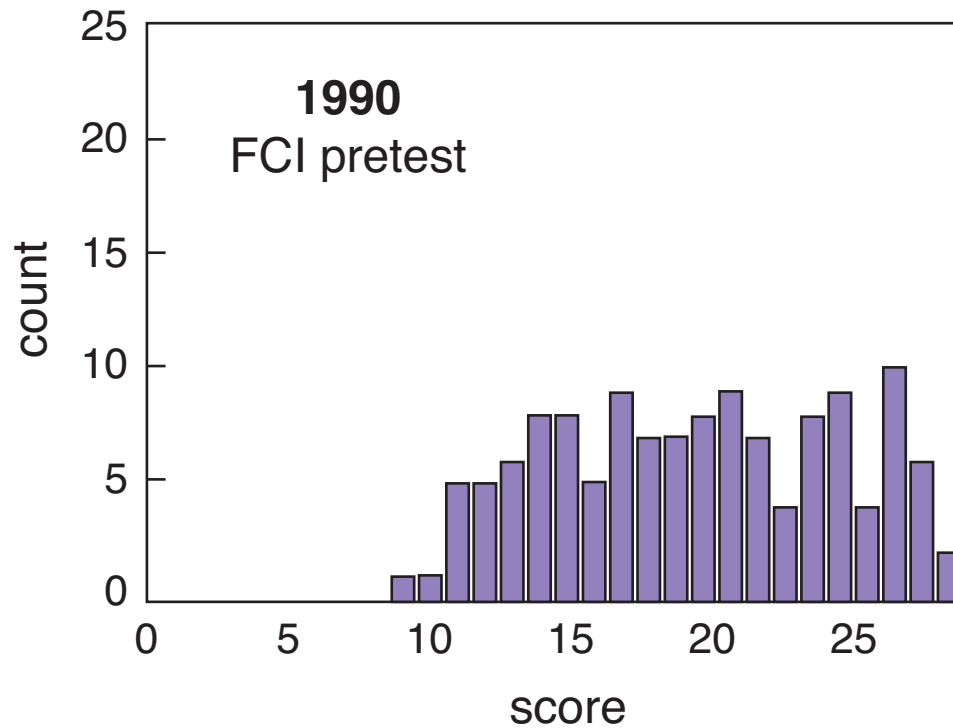
The result?

EDUCACION

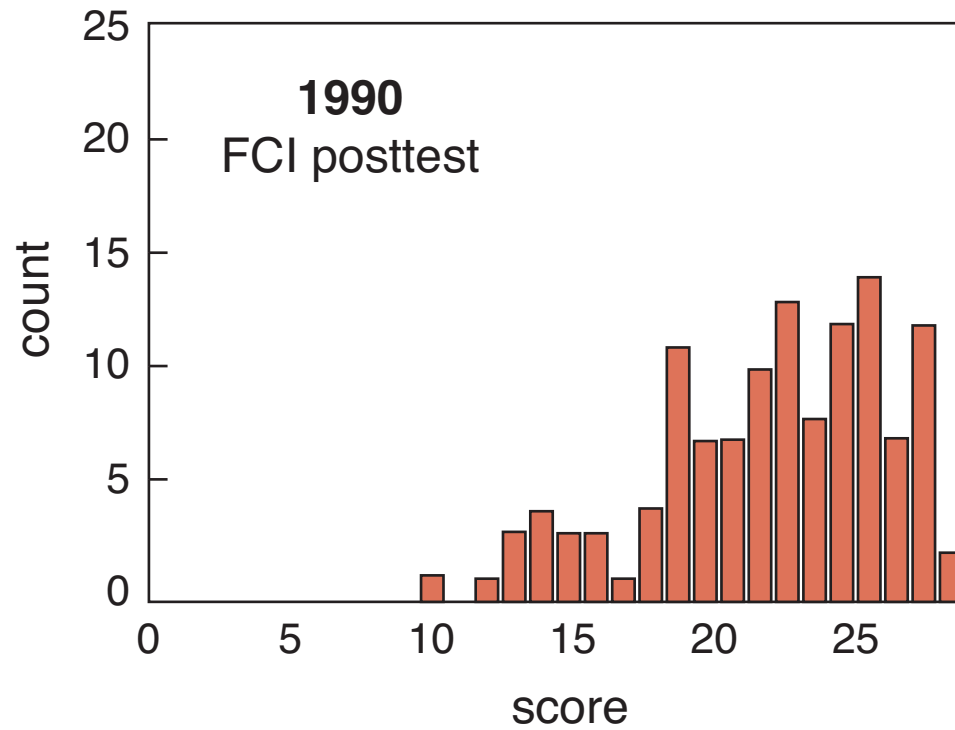
The result?

EDUCACION

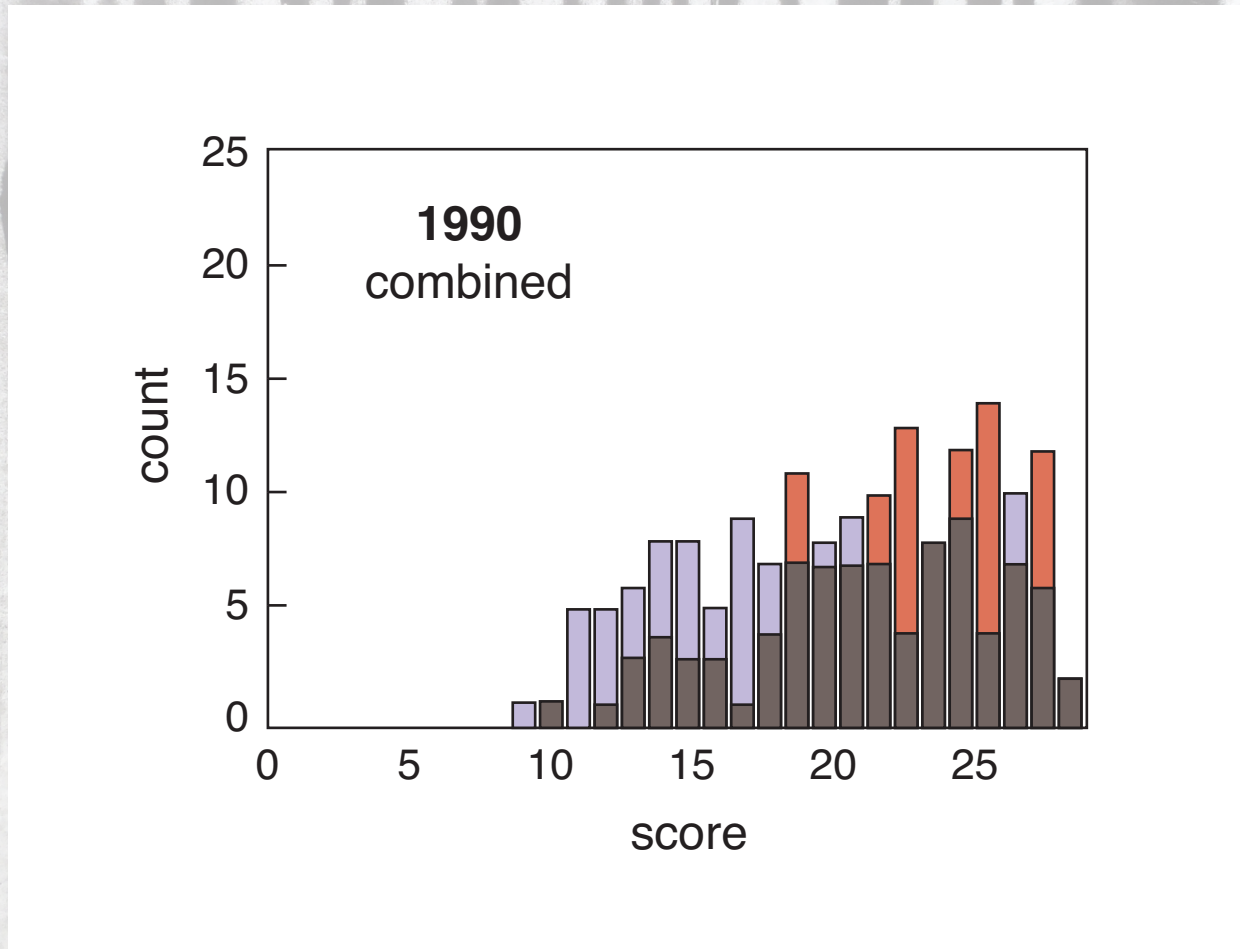
education is not just information transfer

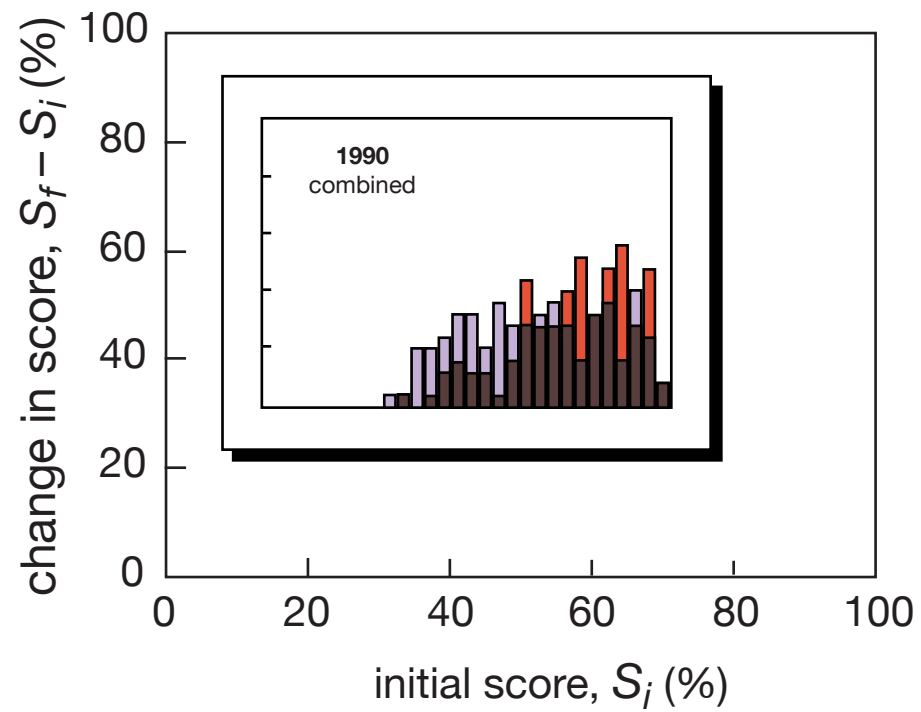


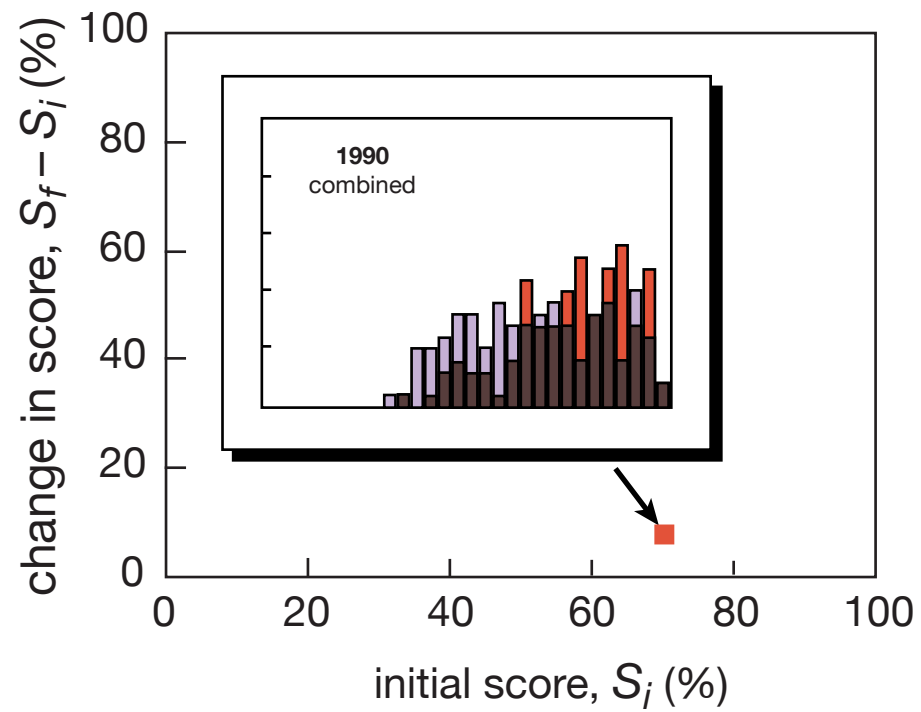
education is not just information transfer

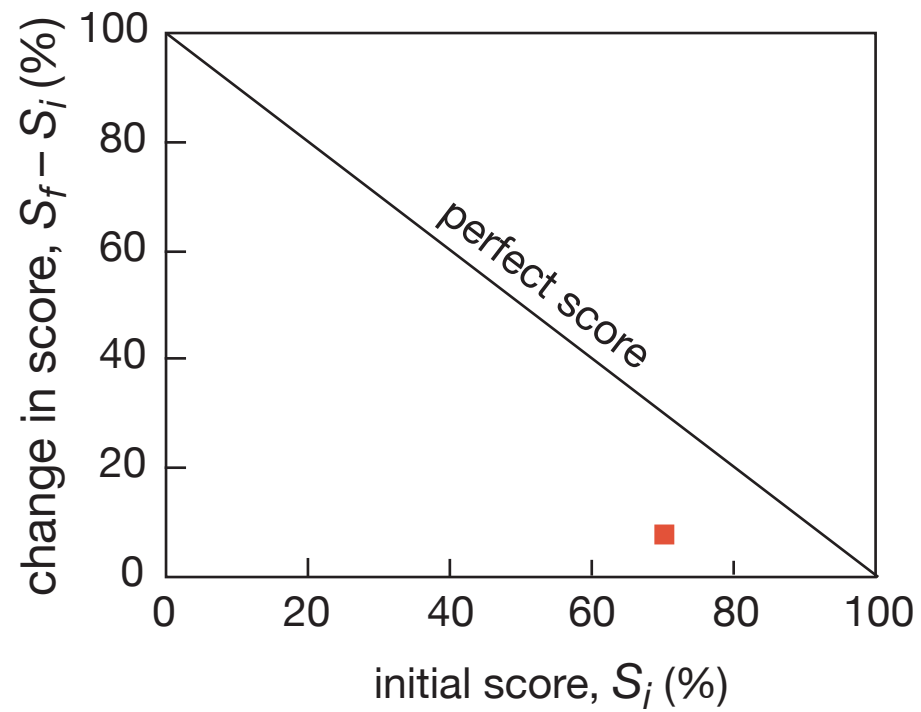


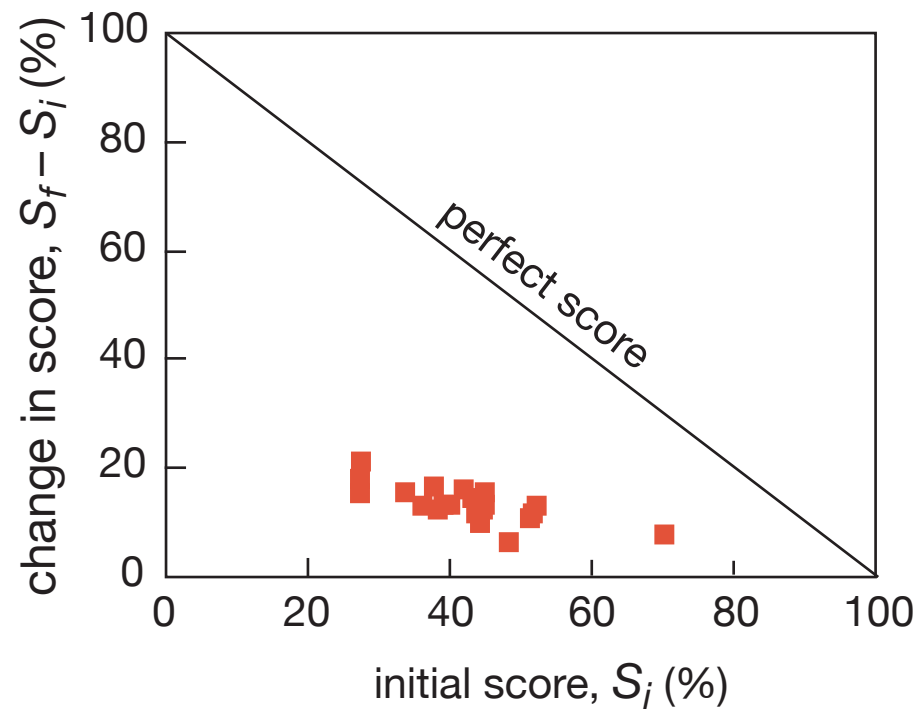
education is not just information transfer





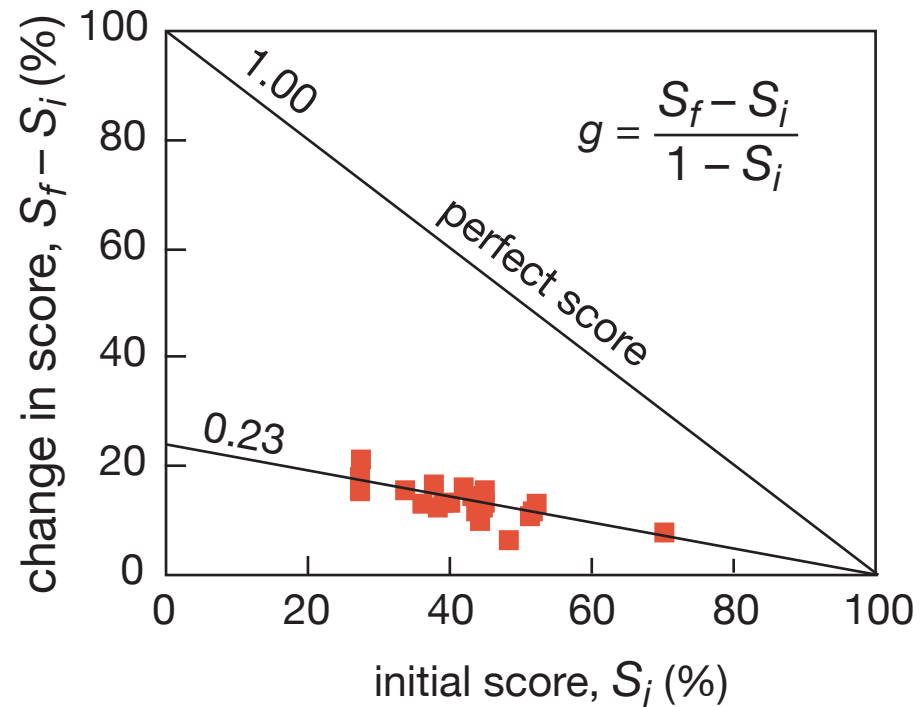






R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

only one quarter of maximum gain realized



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

not transfer but assimilation of information is key

EDUCACION

Lack of learning

EDUCACION

Lack of learning

Lack of retention





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 (in class)

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)

Peer



1. transfer of information (out of class)

2. assimilation of that information (in class)

INSTRUCTION

question

1 education

2 PI

question



think

question



think



poll

question



think



poll



discuss

question



think



poll



discuss



repoll

question



think



poll



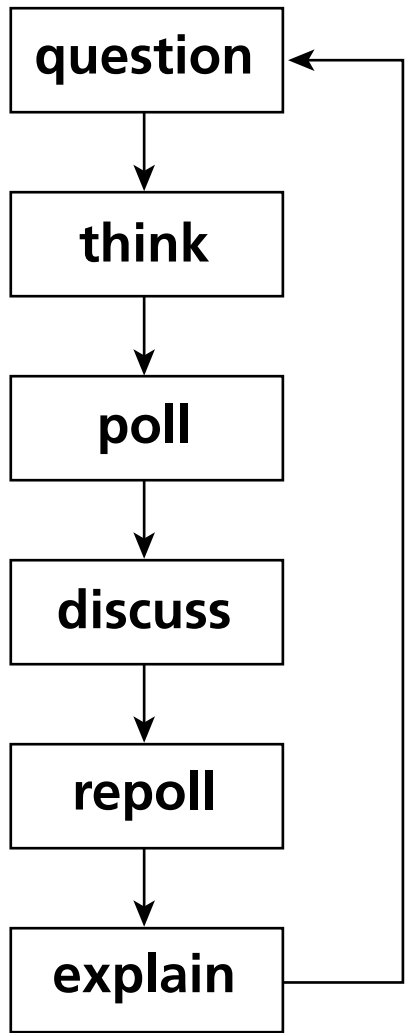
discuss

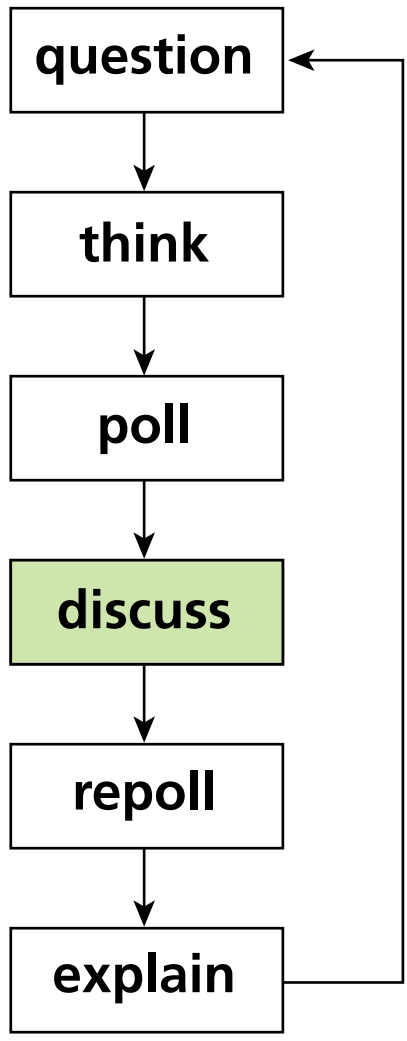


repoll



explain





1 education

2 PI

Peer

is it any good?

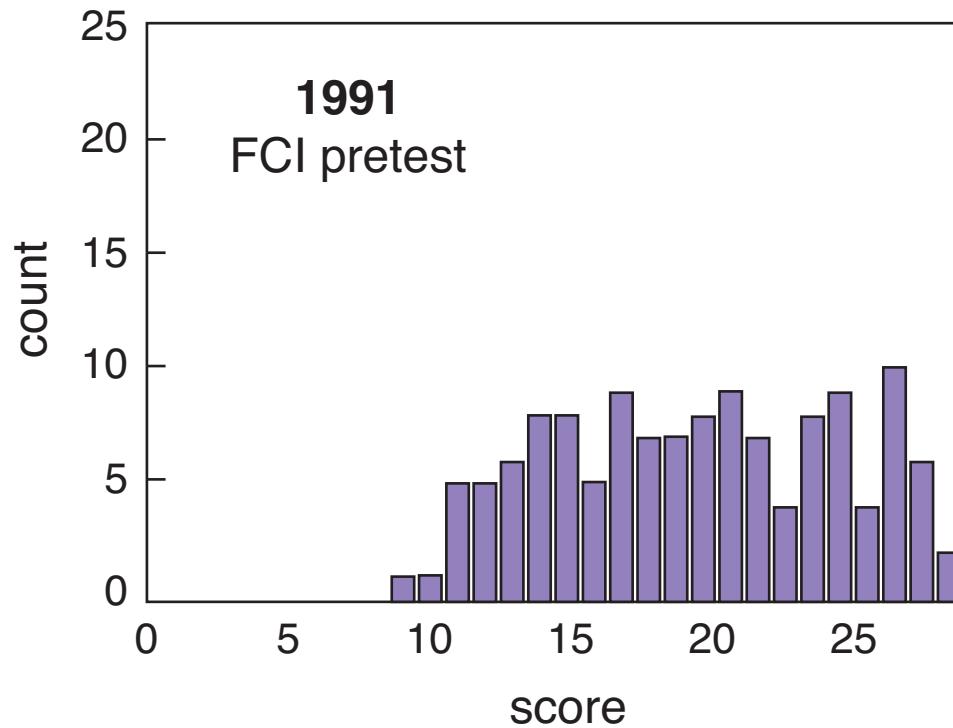
INSTRUCTION

1 education

2 PI

3 results

first year of implementing PI

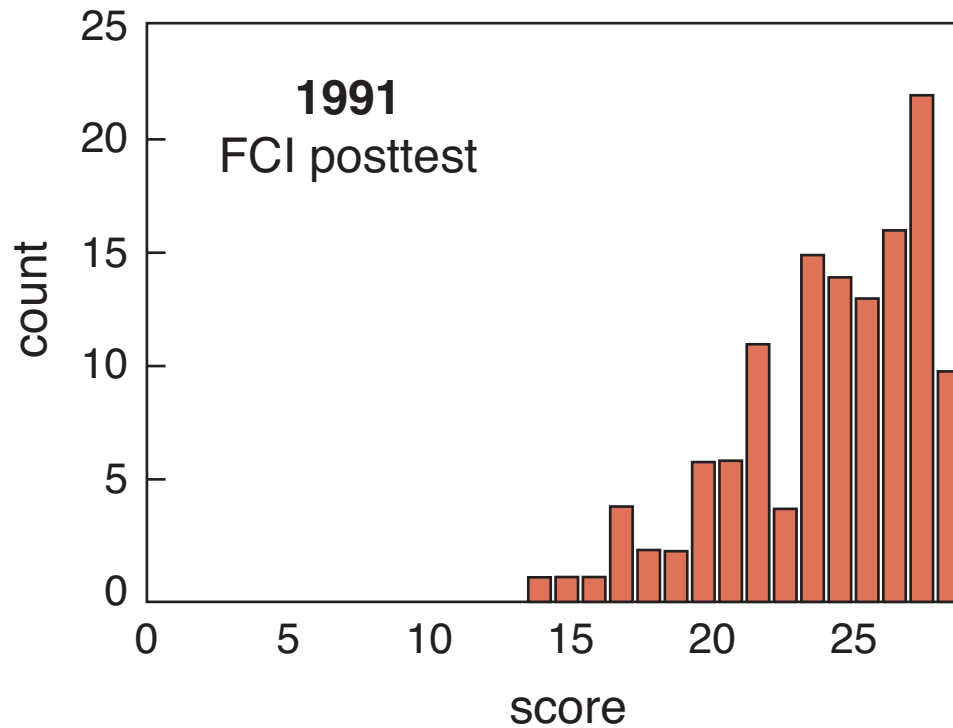


1 education

2 PI

3 results

first year of implementing PI

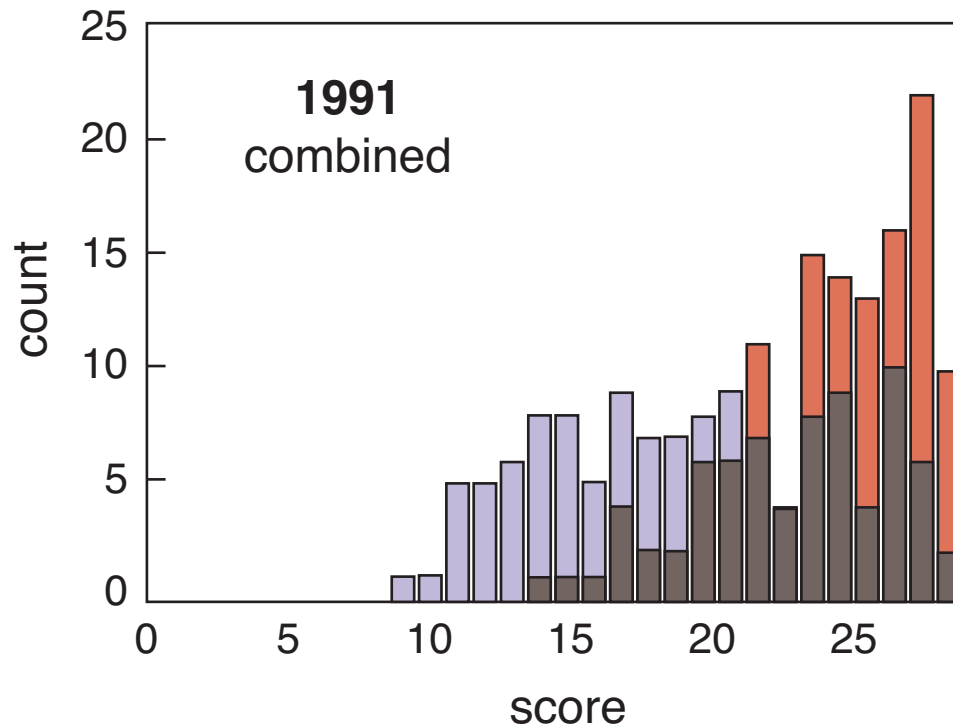


1 education

2 PI

3 results

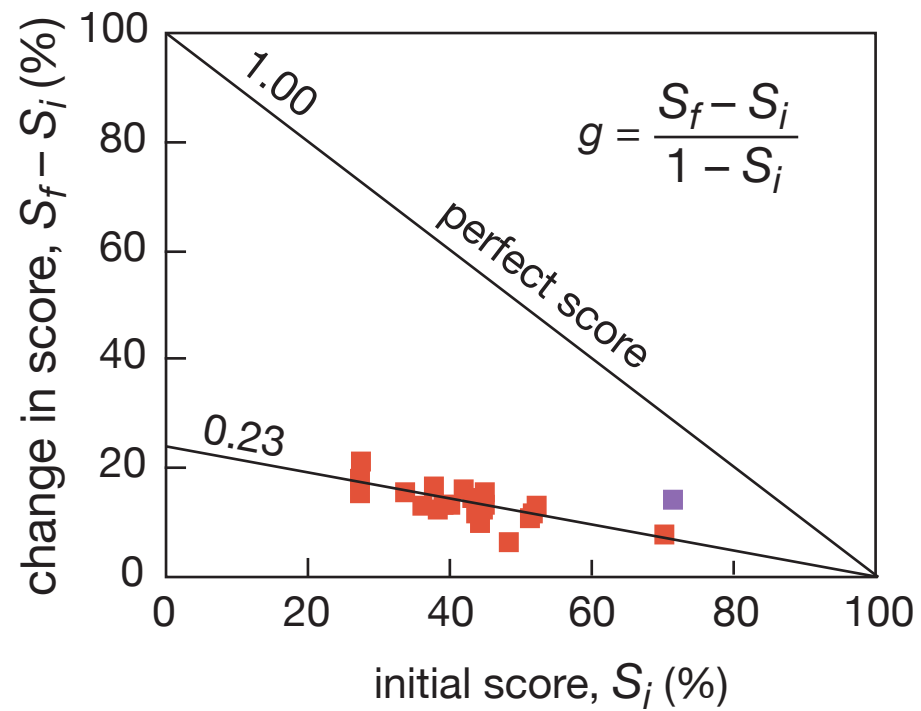
first year of implementing PI



1 education

2 PI

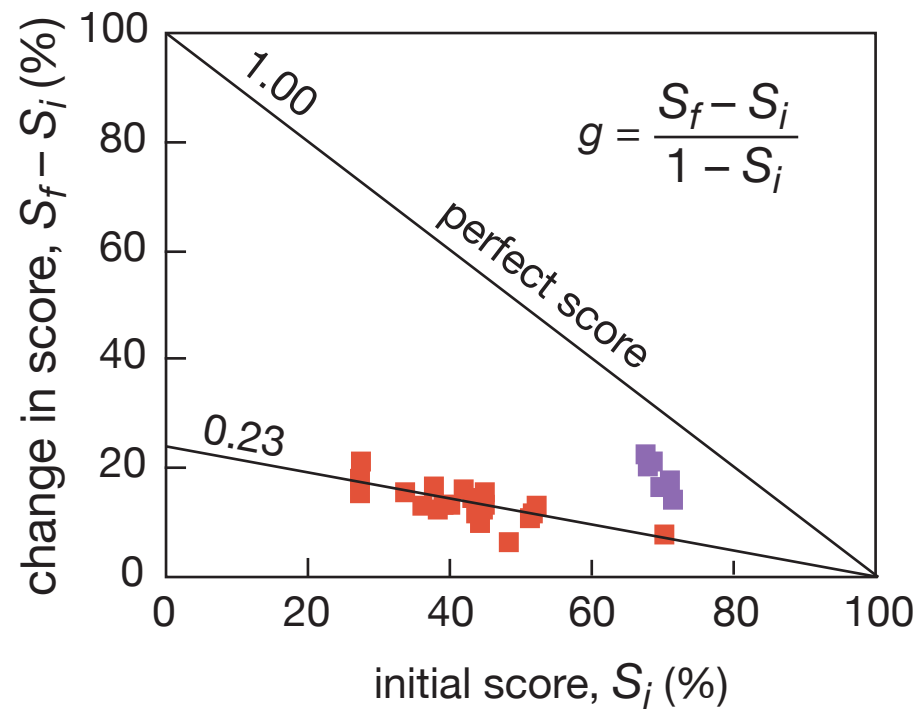
3 results



1 education

2 PI

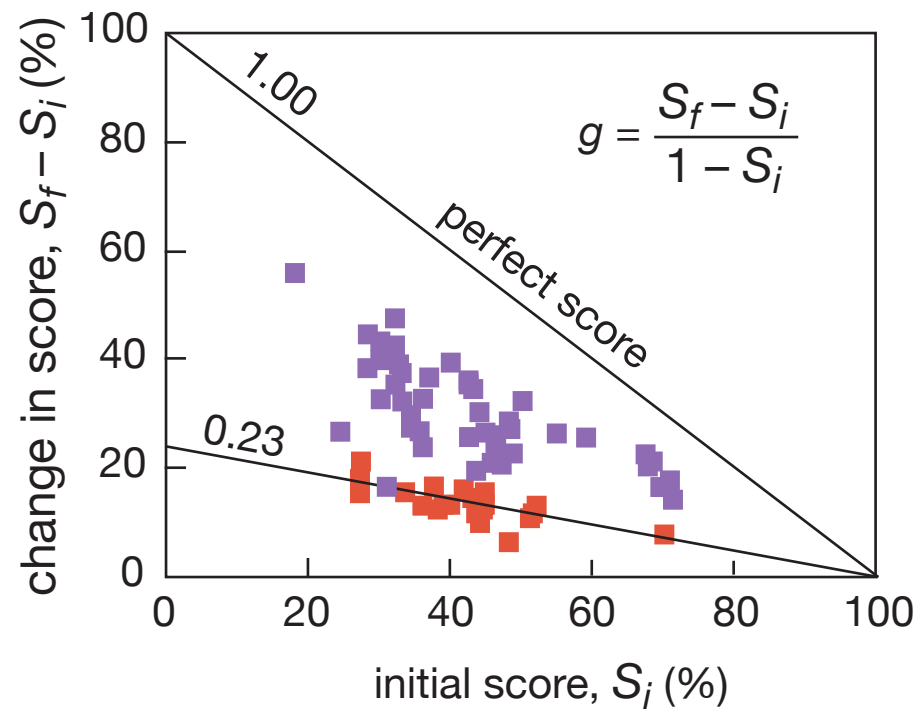
3 results



1 education

2 PI

3 results

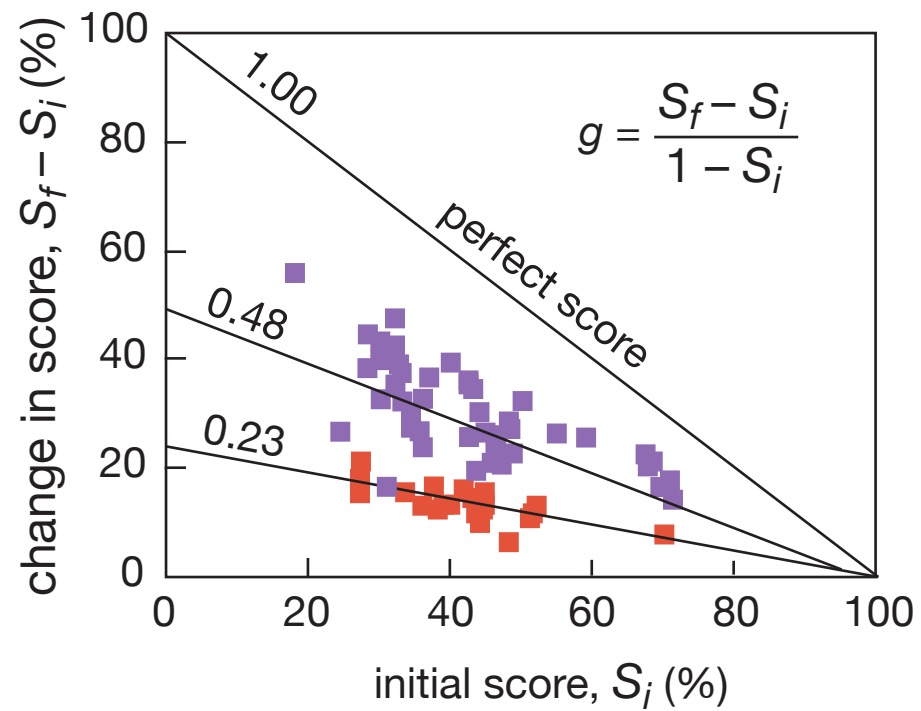


R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

1 education

2 PI

3 results



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

1 education

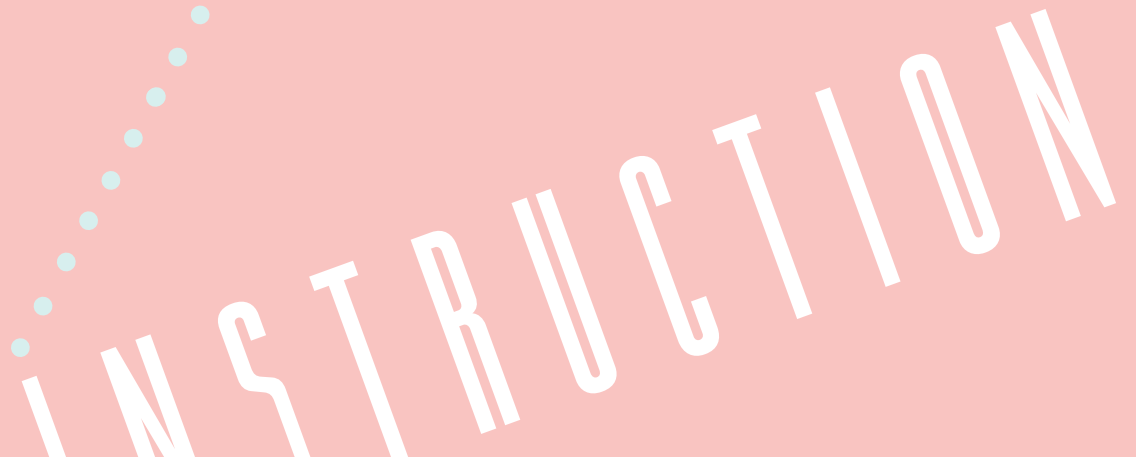
2 PI

3 results



Peer

what about problem solving?

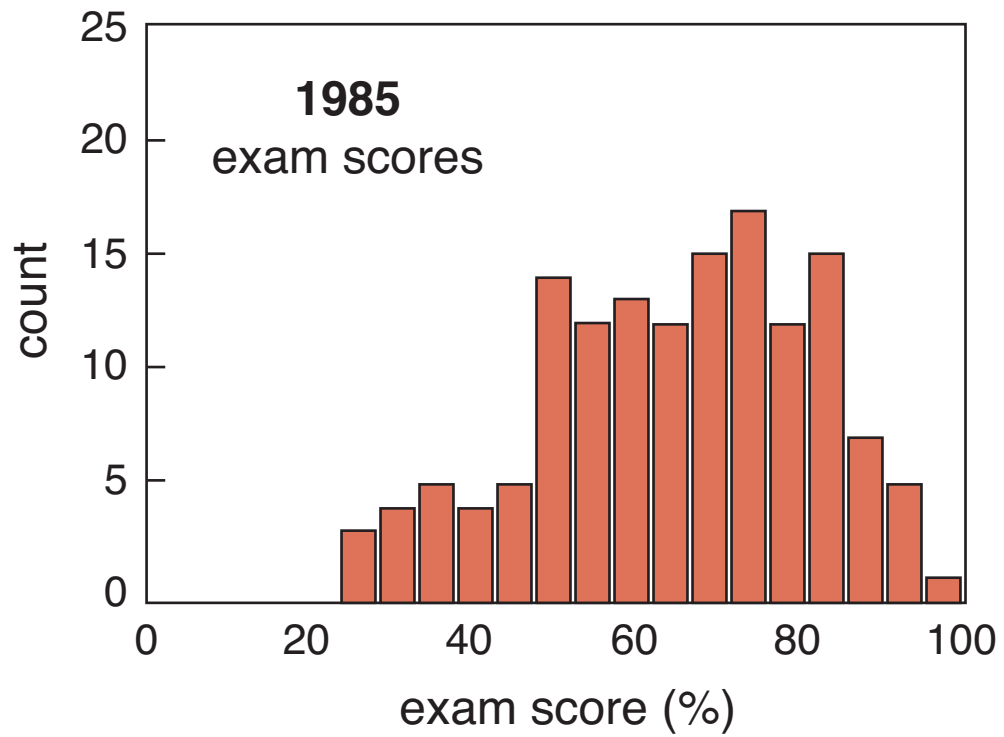


INSTRUCTION

1 education

2 PI

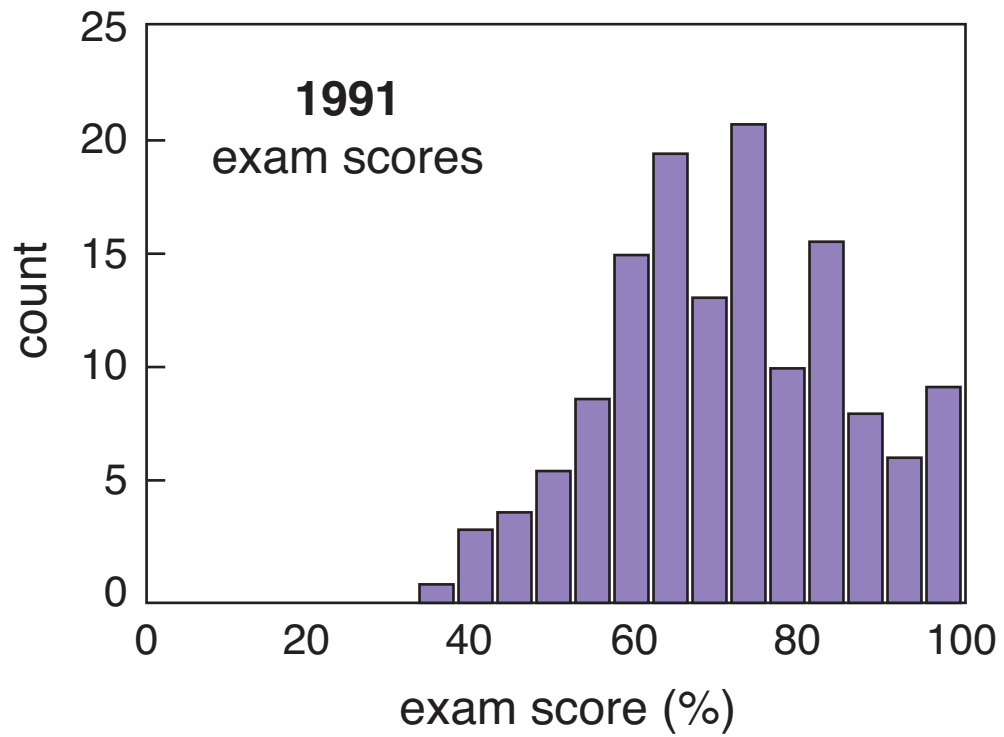
3 results



1 education

2 PI

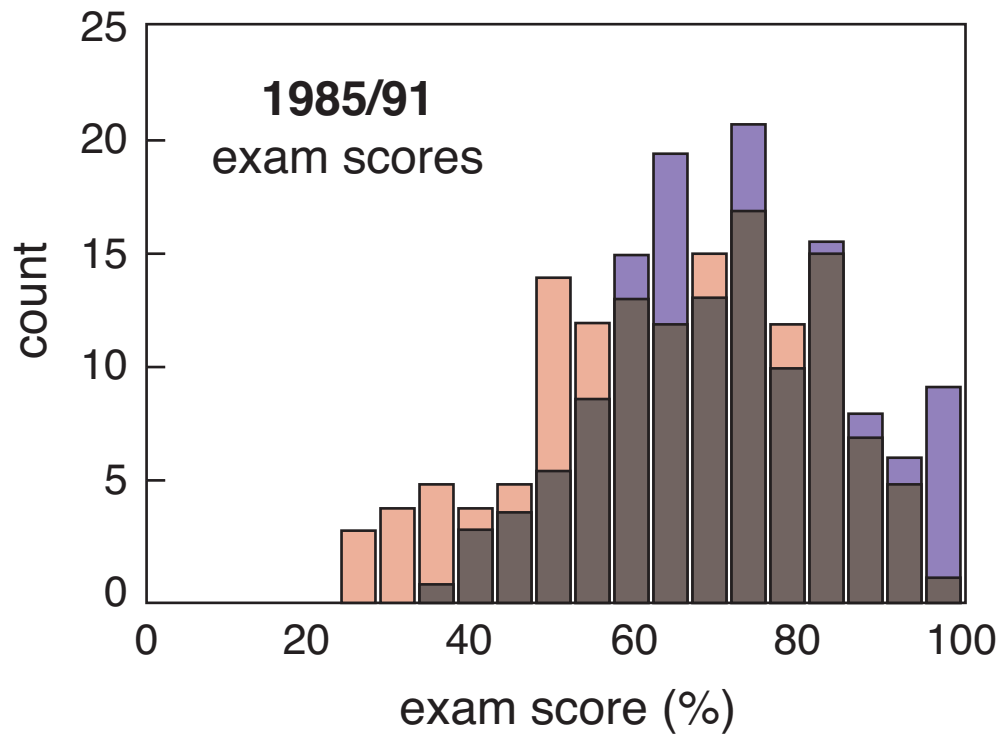
3 results



1 education

2 PI

3 results



1 education

2 PI

3 results



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

1 education

2 PI

3 results

So better understanding leads to better problem solving!

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

INSTRUCTION

1 education

2 PI

3 results



1 education

2 PI

3 results

in a lecture, students...

1 education

2 PI

3 results

in a lecture, students...

1. don't pay utmost attention

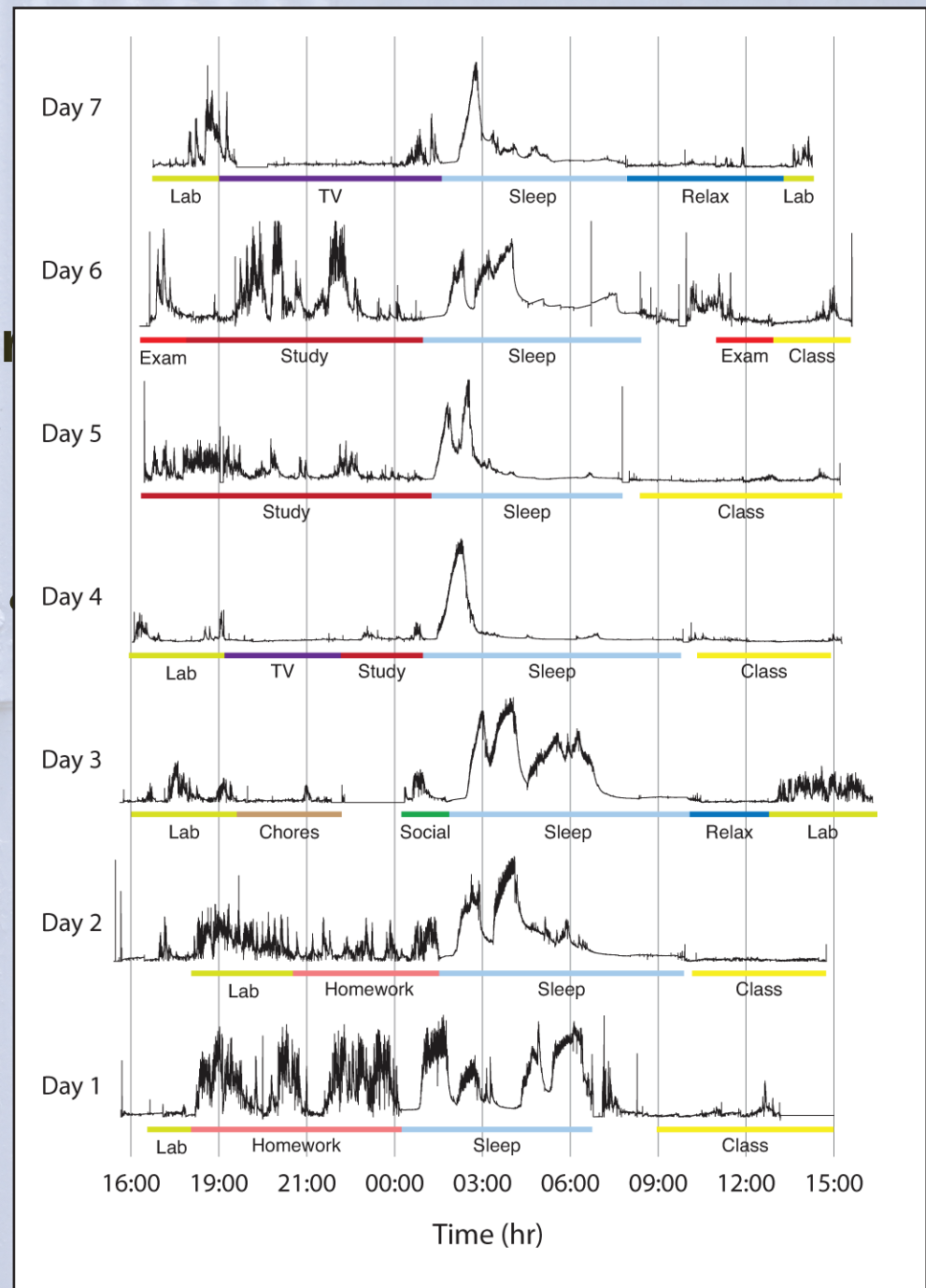
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

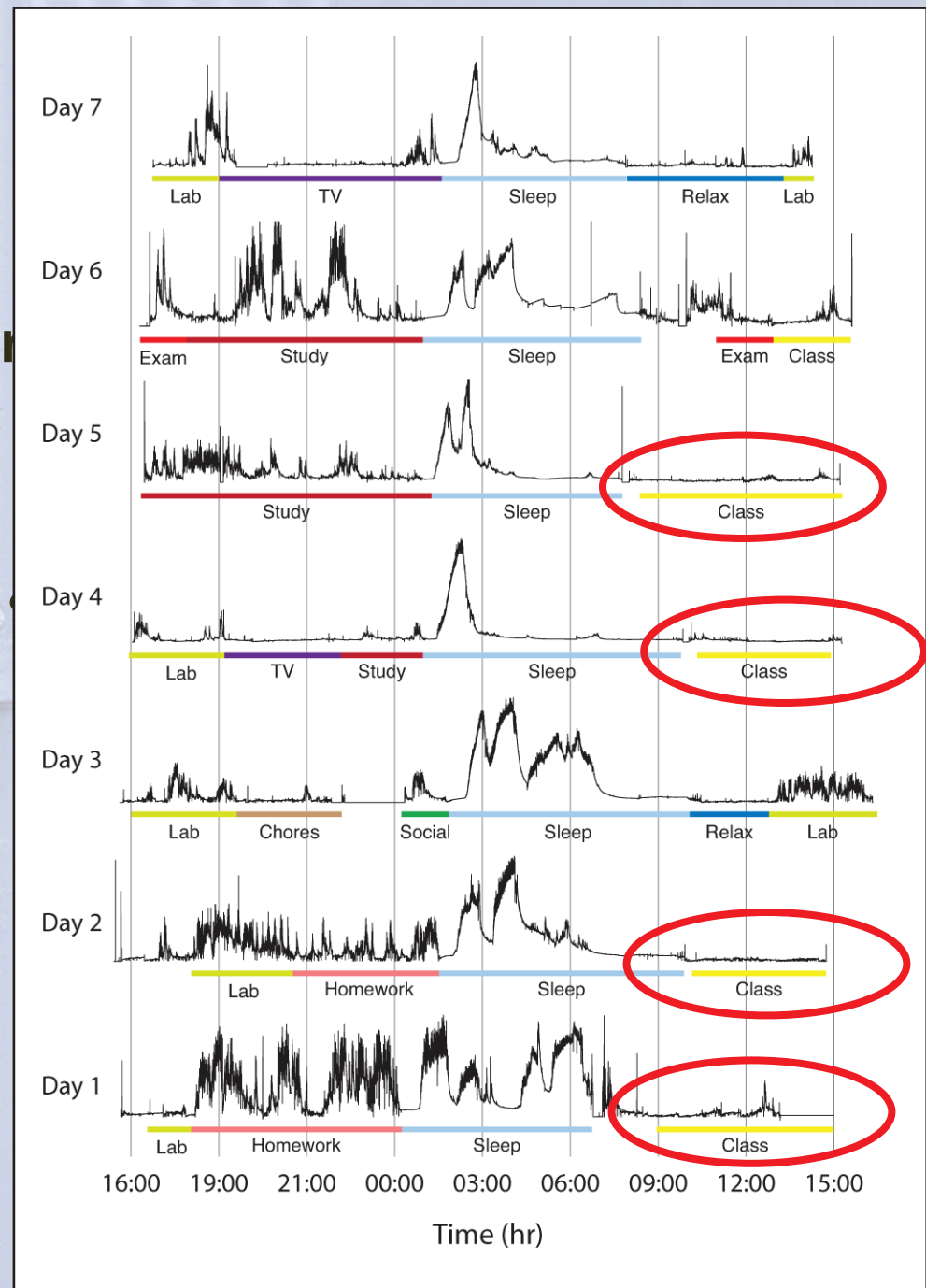
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

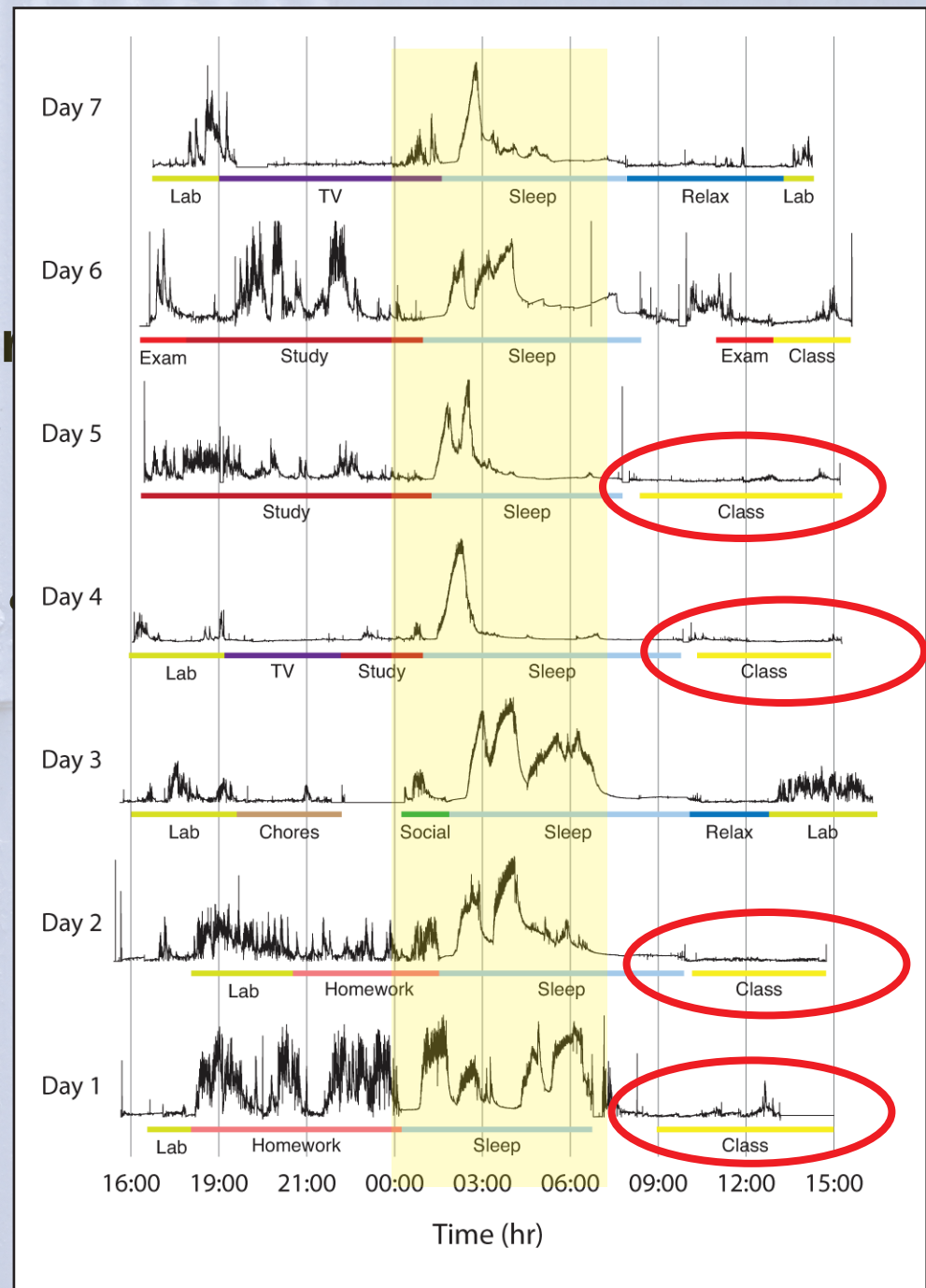
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

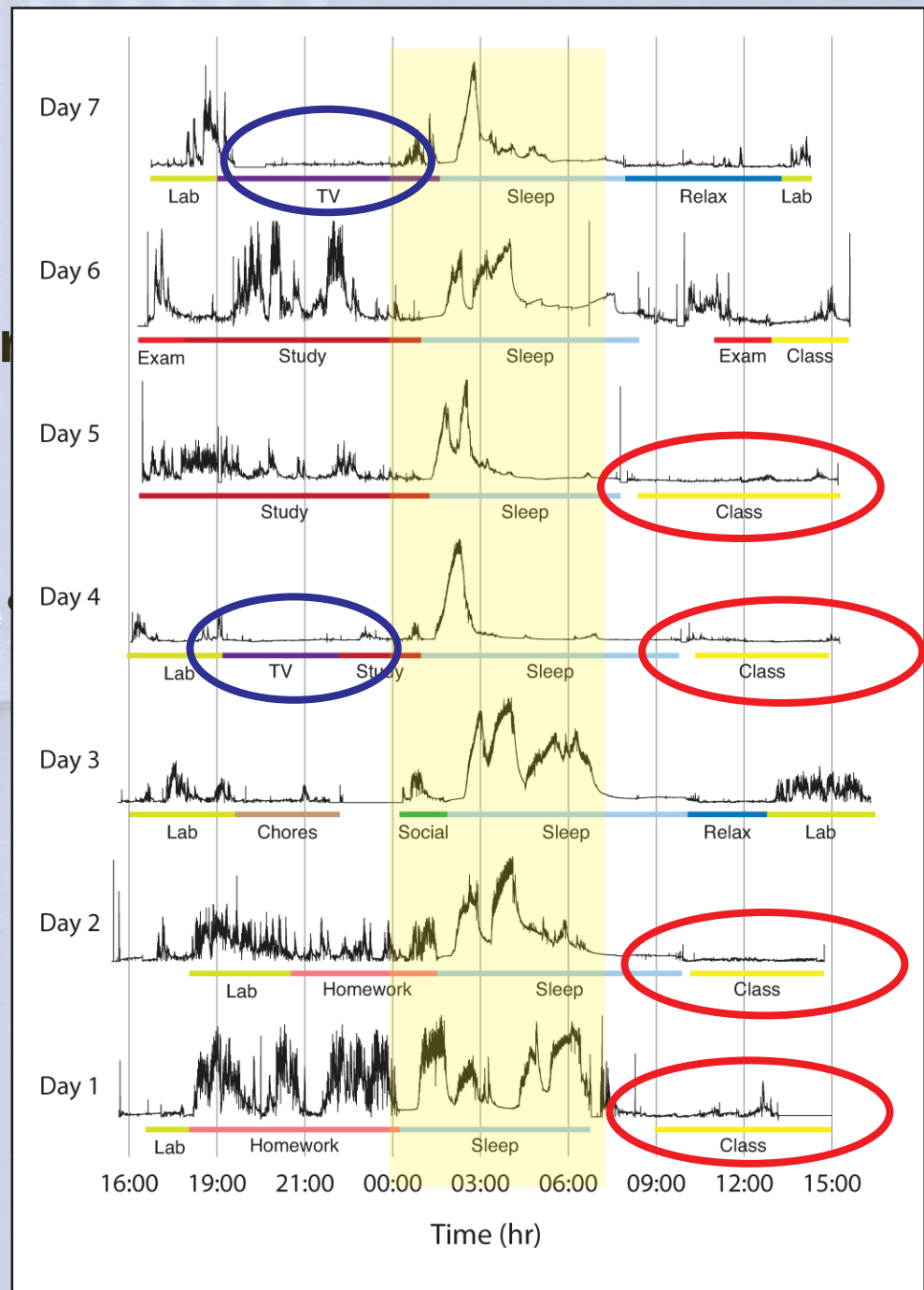
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

1 education

2 PI

3 results

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**

in a lecture, students...

1. don't pay utmost attention

2. think they know it

3. are not confronted with misconceptions

false
sense of security



1 education

2 PI

3 results



an illusion. . .

1 education

2 PI

3 results



Education is not just about:

- **transferring information**
- **getting students to do what we do**

1 education

2 PI

3 results



Education is not just about:

- **transferring information**
- **getting students to do what we do**

active participation a must!

1 education

2 PI

3 results

Funding:

National Science Foundation

for a copy of this presentation:

mazor.harvard.edu

Follow me!



[eric_mazor](https://twitter.com/eric_mazor)

Google™

Google Search

I'm Feeling Lucky

Google™

mazur

Google Search

I'm Feeling Lucky

Google™

mazur

Google Search

I'm Feeling Lucky

Google™

Google Search

I'm Feeling Lucky

Funding:

National Science Foundation

for a copy of this presentation:

mazur.harvard.edu

Follow me!



[eric_mazur](https://twitter.com/eric_mazur)