

Confessions of a converted lecturer



EDUCACION

ACA 2012 Annual Meeting
Boston, MA, 28 July 2012



Confessions of a converted lecturer



@eric_mazur

EDUCATION

ACA 2012 Annual Meeting
Boston, MA, 28 July 2012



Think of something you are good at

EDUCACION

Think of something you are good at

How did you become good at this?

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1 education

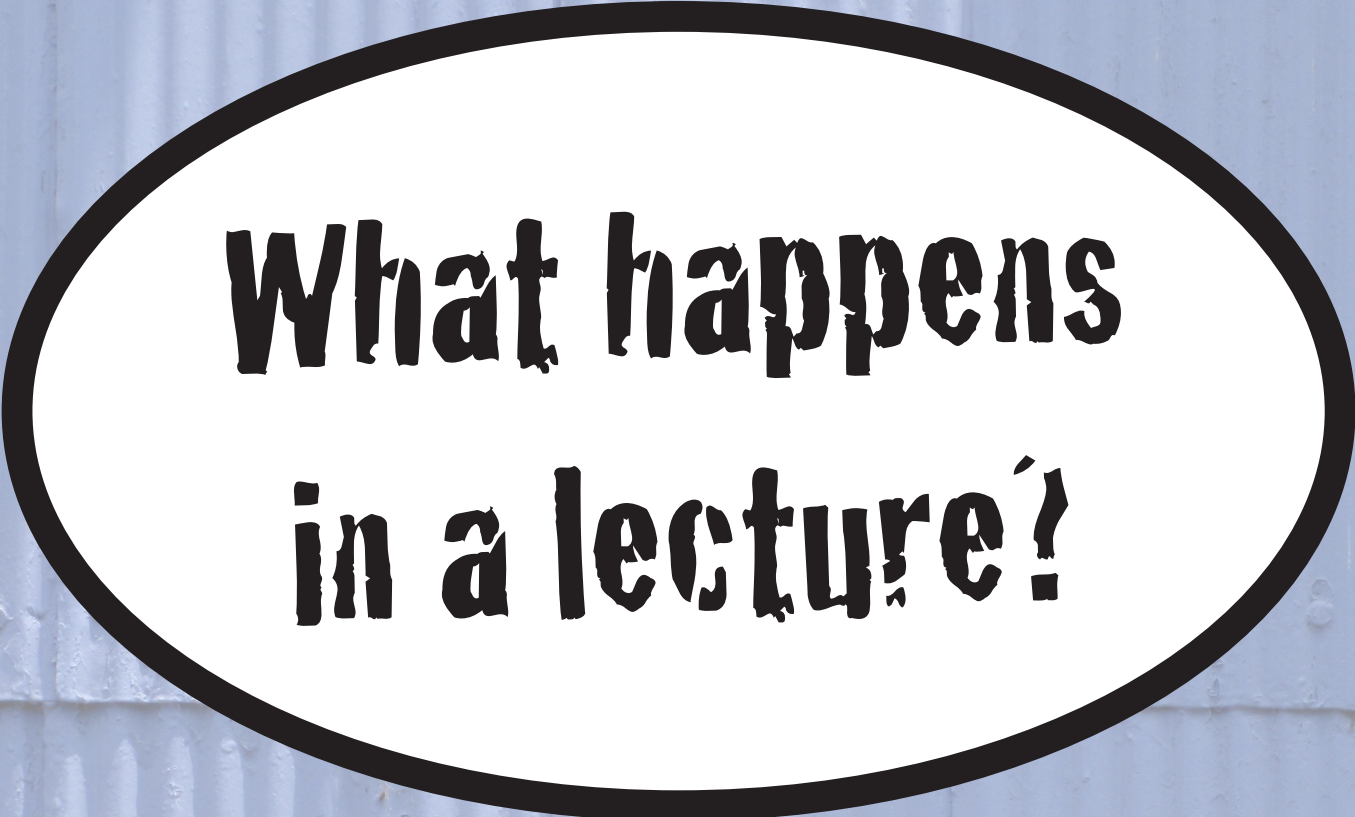
2 PI



1 education

2 PI

3 results

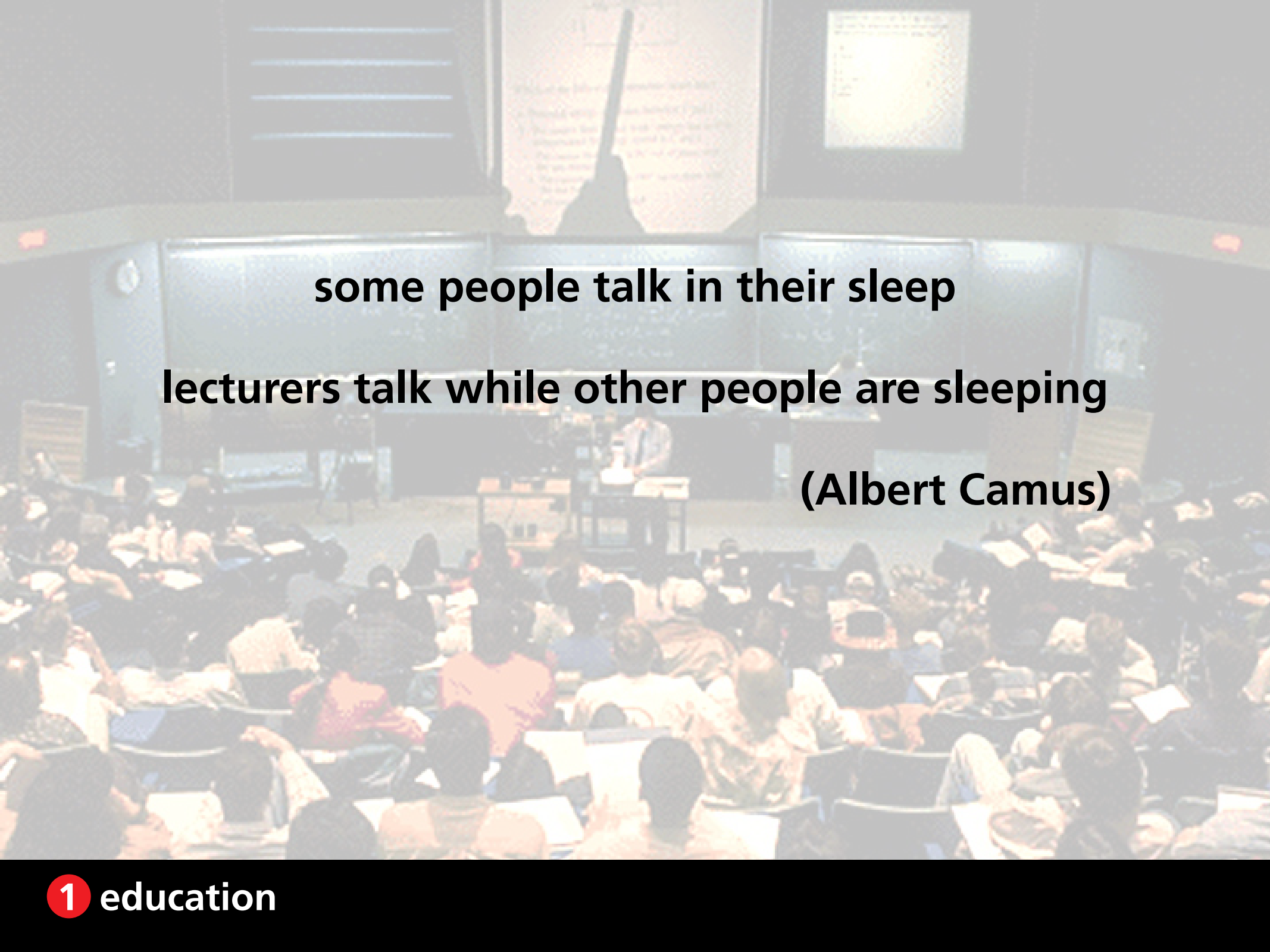
A large white thought bubble with a thick black border is centered in the upper half of the image. It contains the text 'What happens in a lecture?'. Below the main bubble are three smaller white circles with black borders, arranged in a diagonal line from bottom-left to top-right, leading up to the main bubble.

**What happens
in a lecture?**



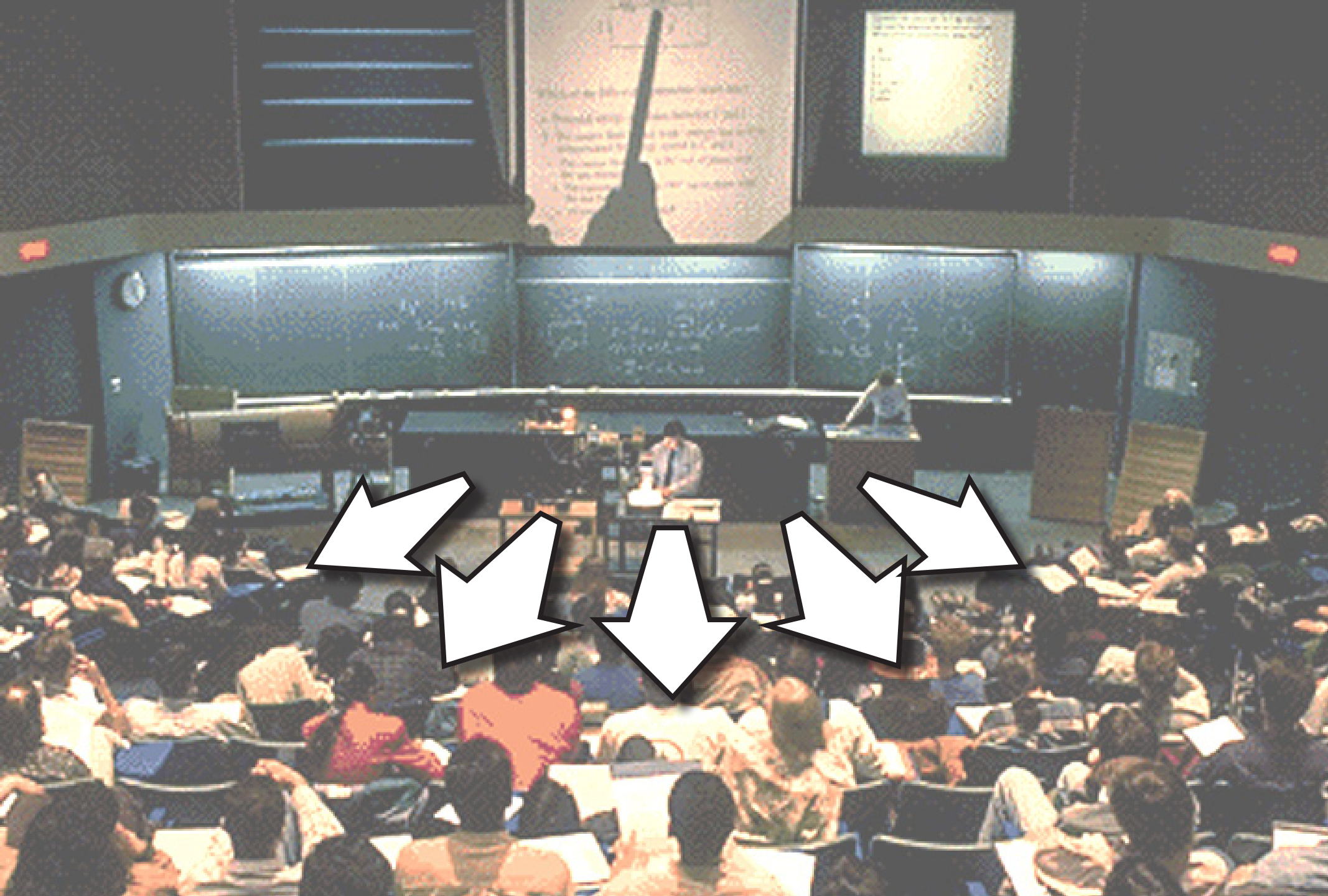
A large lecture hall with a professor at a podium and students in the audience. The room is filled with students sitting at desks, facing the front where a professor is standing at a podium. There are large screens and a chalkboard in the background. The text "some people talk in their sleep" is overlaid 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, many of whom appear to be sleeping or resting. The lecturer is standing at a podium in the center, facing the audience. The audience is seated in rows of chairs, and many people have their heads down or are looking away. The room has a high ceiling and large windows. The text is overlaid on the image.

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





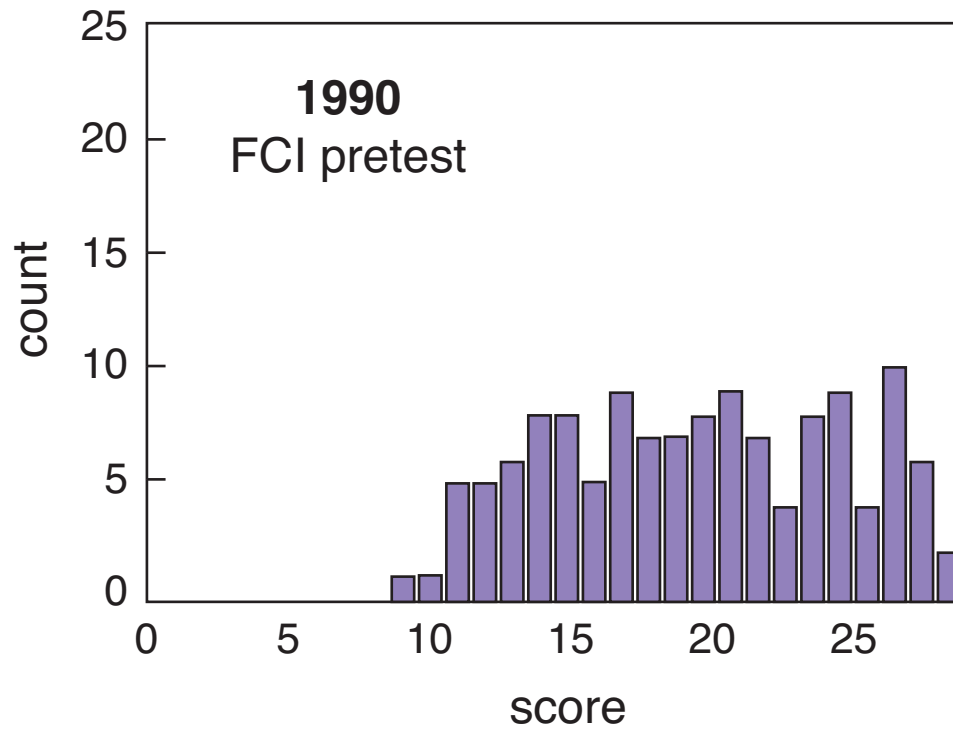
The result?

EDUCACION

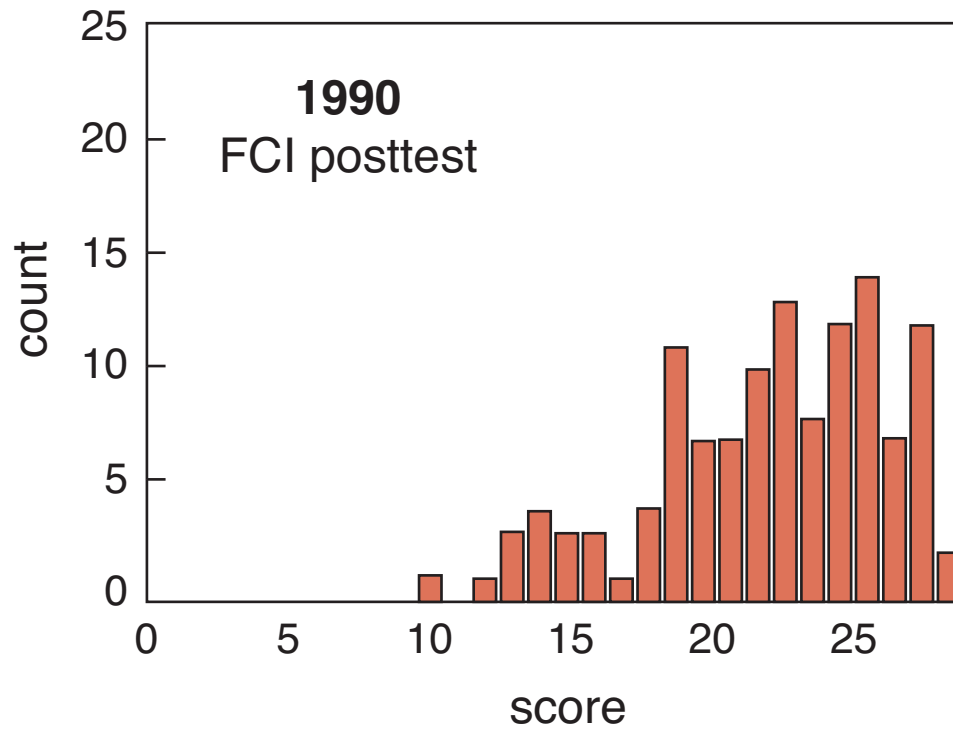
The result?

EDUCACION

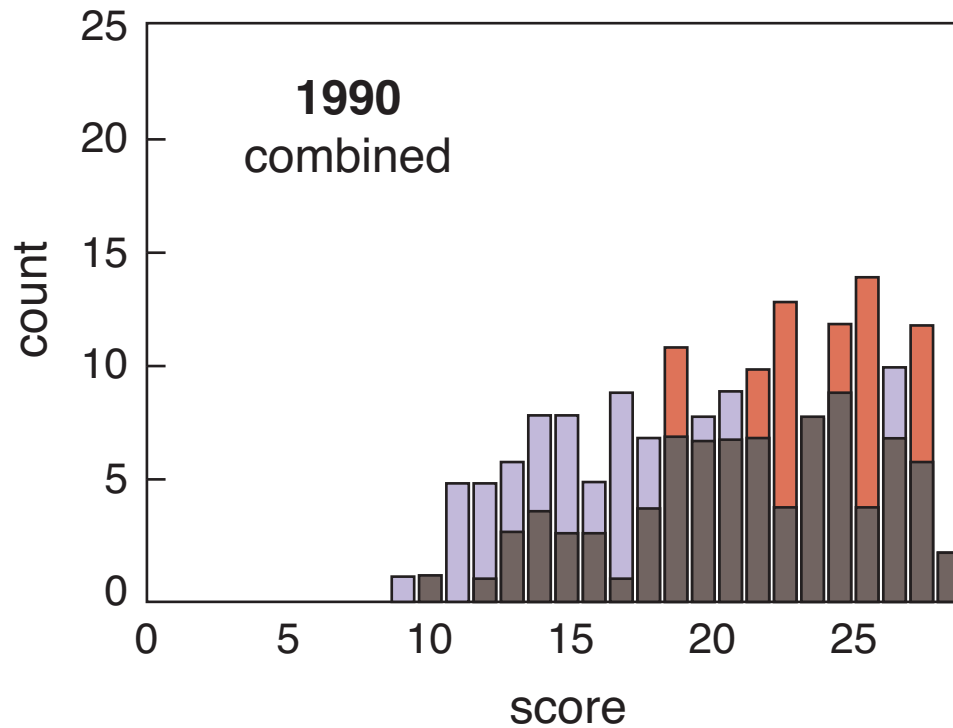
education is not just information transfer

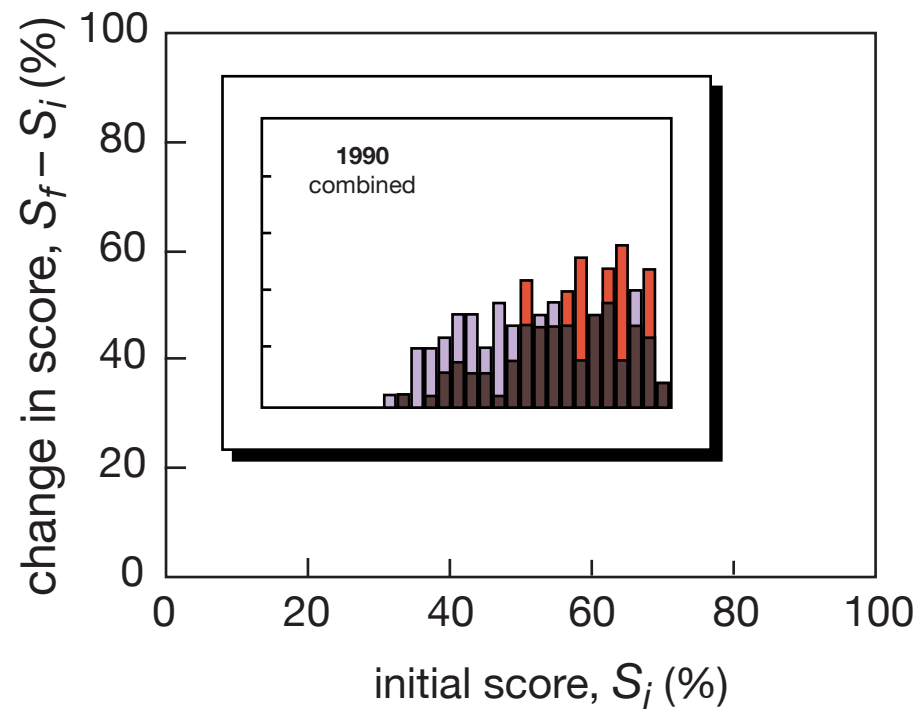


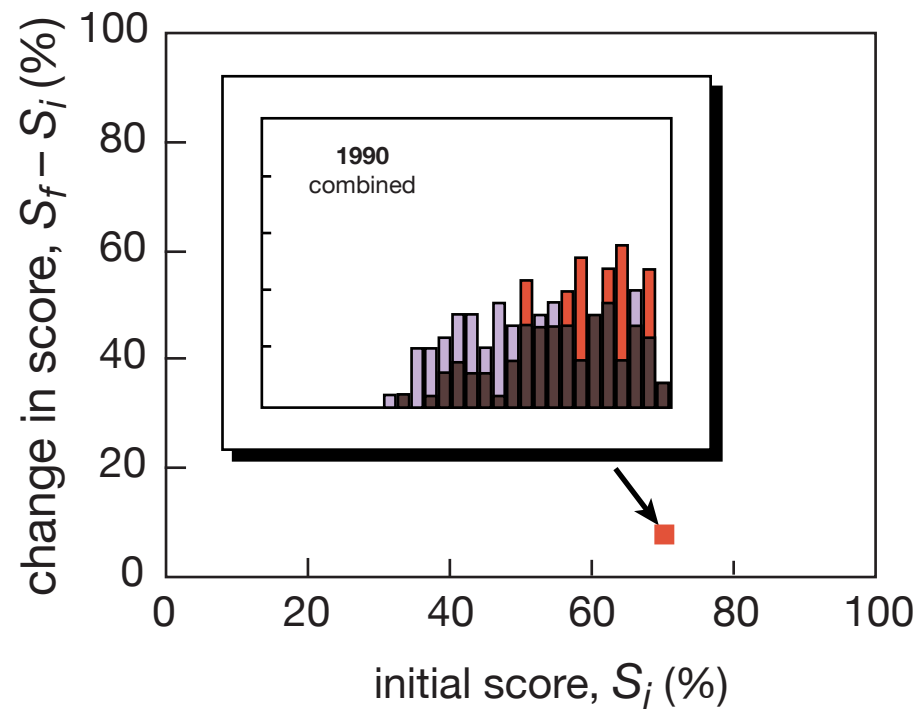
education is not just information transfer

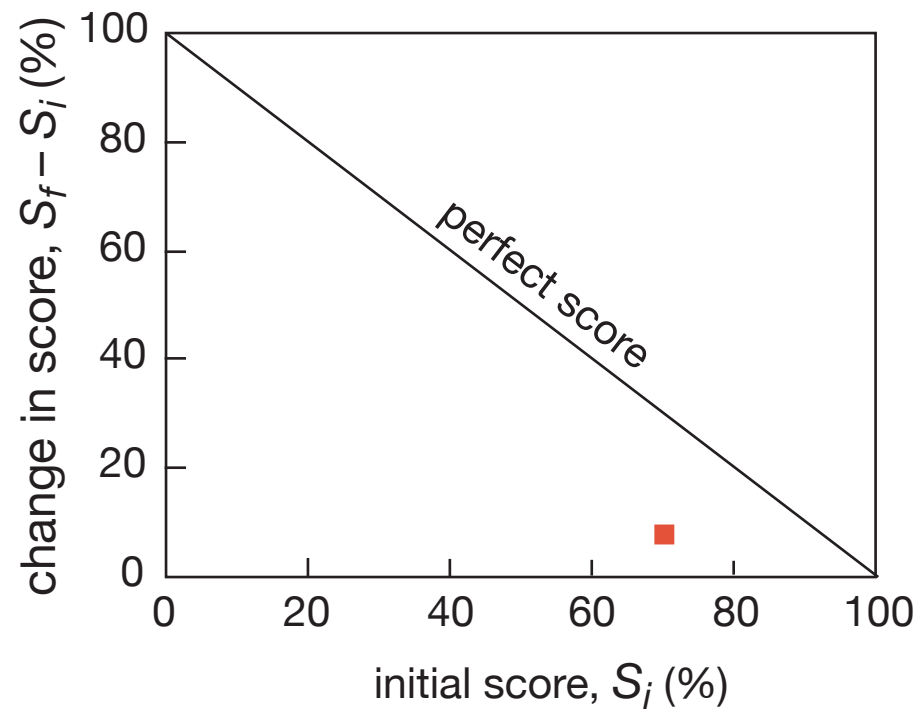


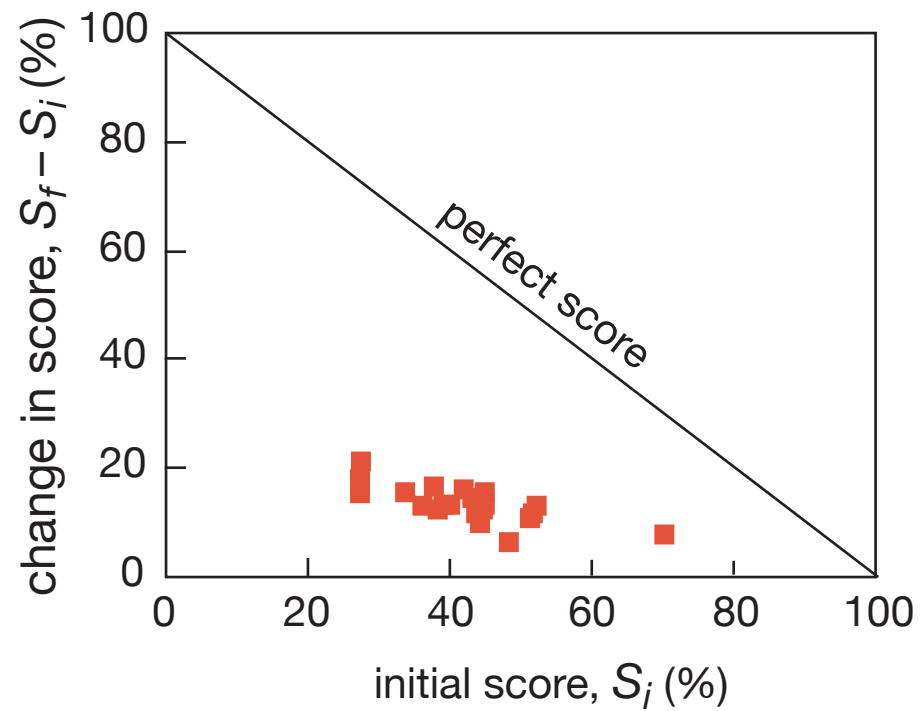
education is not just information transfer





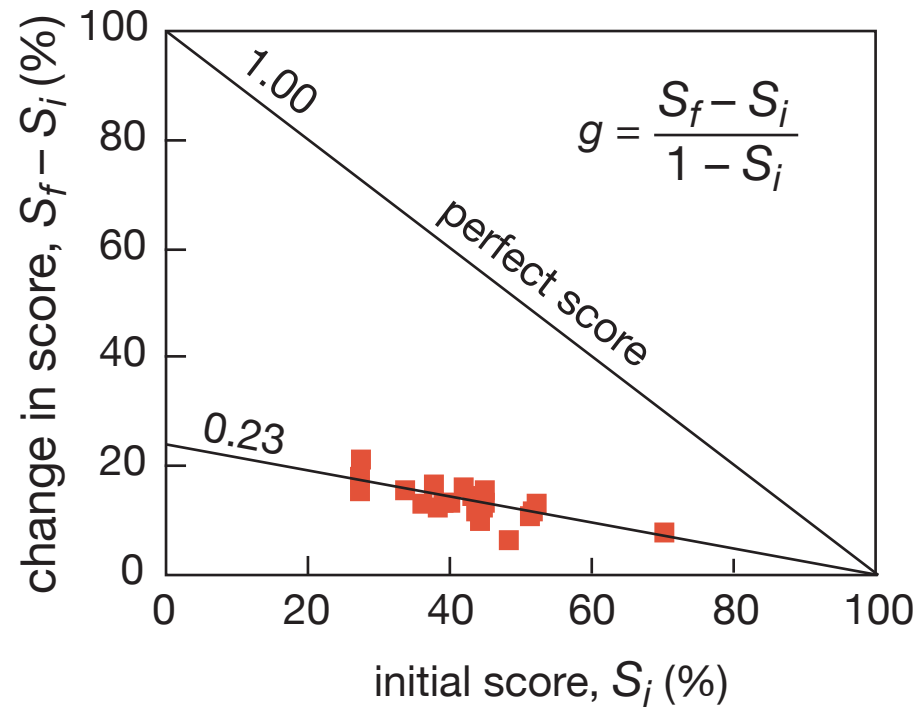






R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

only one quarter of maximum gain realized



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

not transfer but assimilation of information is key

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Lack of learning

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Lack of learning

Lack of retention



1 education

2 PI



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!**

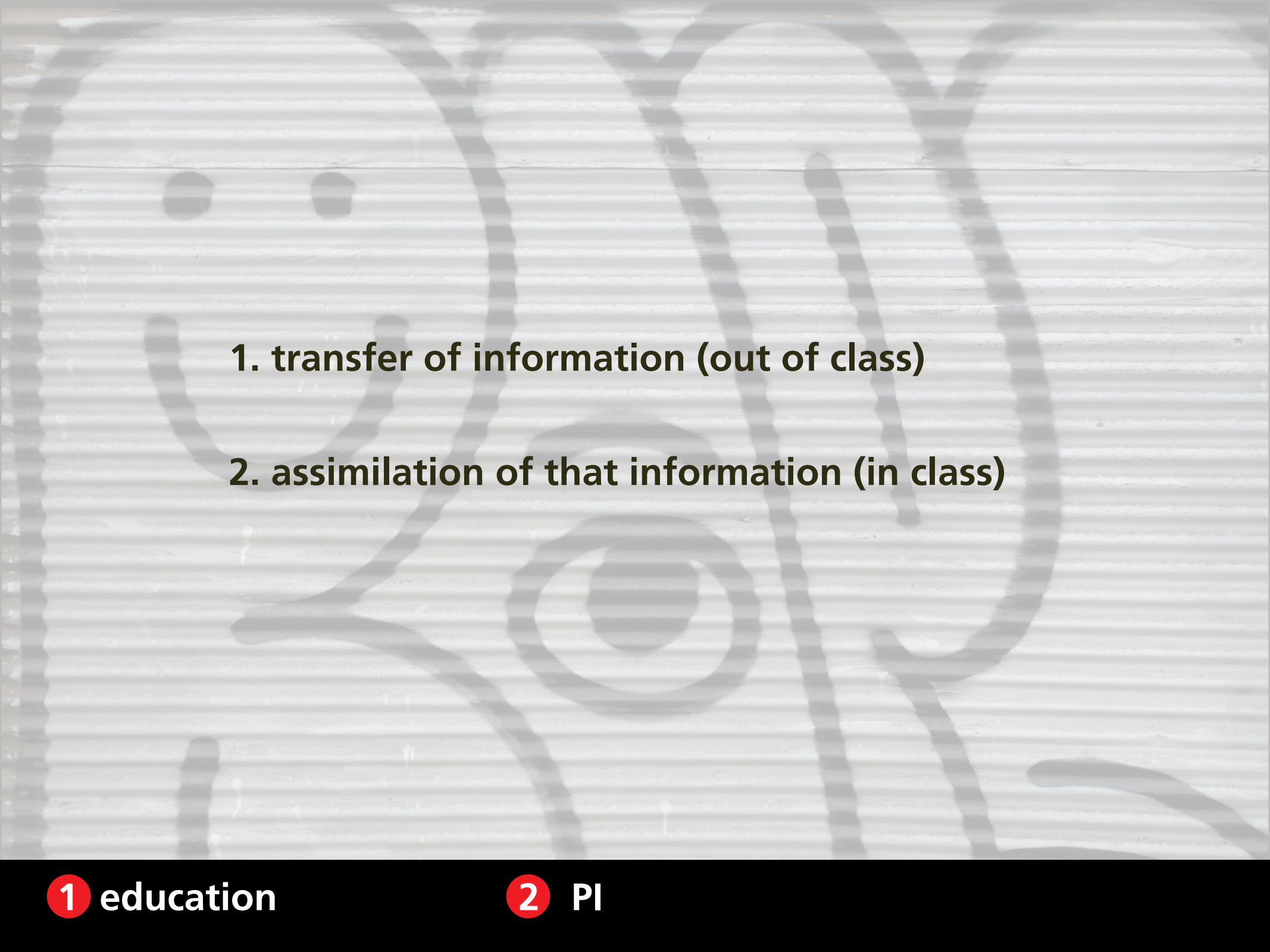
1. transfer of information (in class)

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



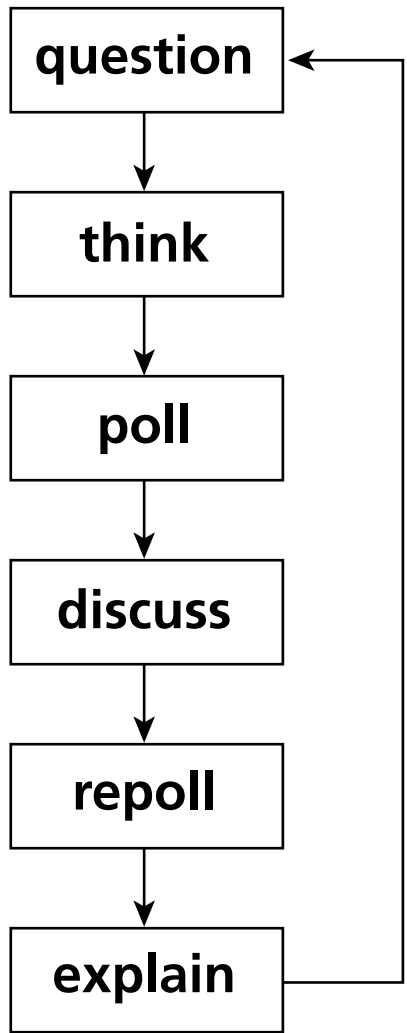
discuss

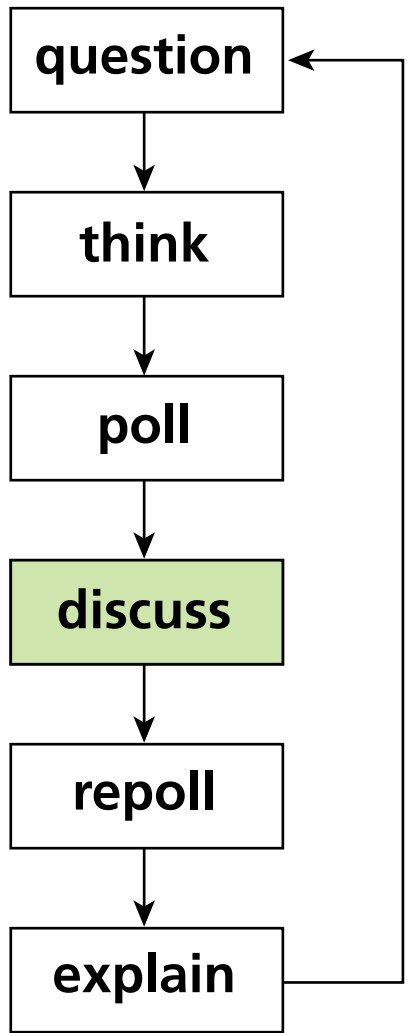


repoll



explain





1 education

2 PI

Peer

is it any good?

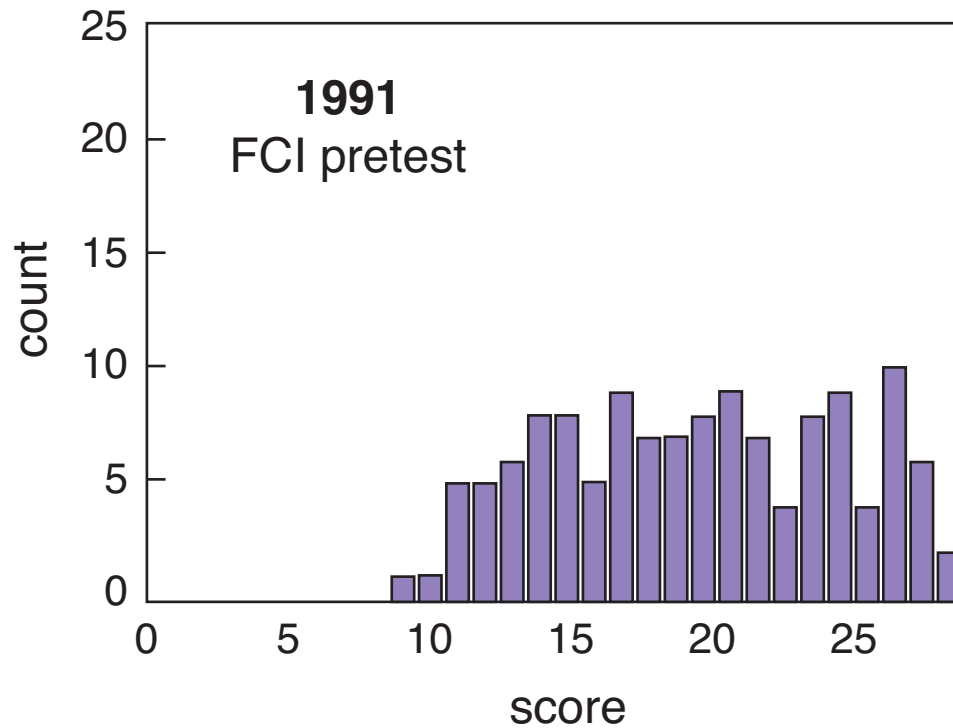
INSTRUCTION

1 education

2 PI

3 results

first year of implementing PI

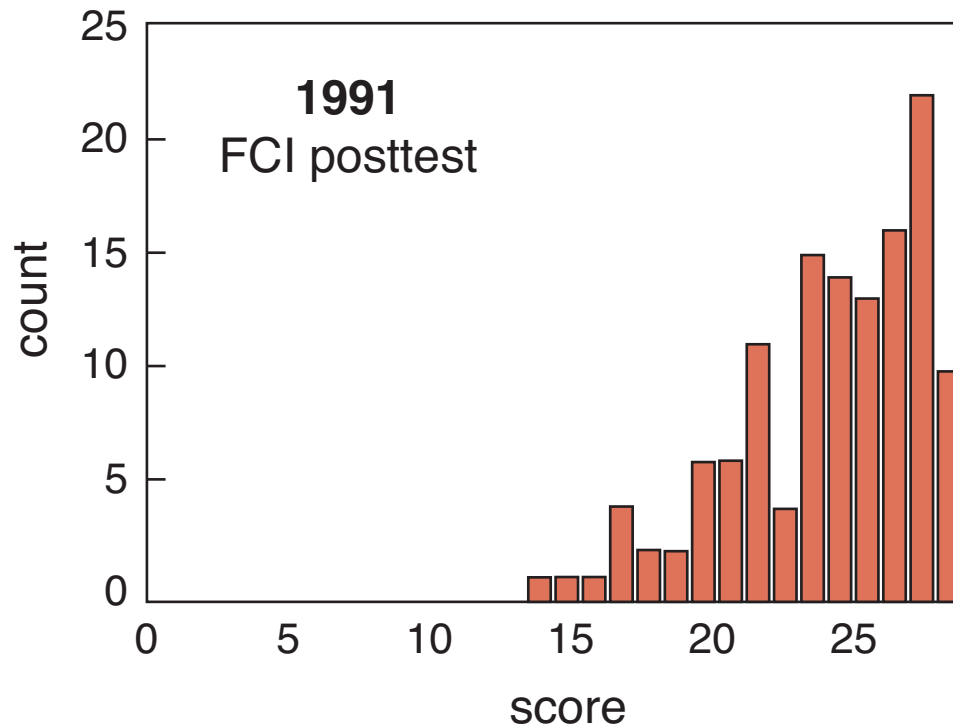


1 education

2 PI

3 results

first year of implementing PI

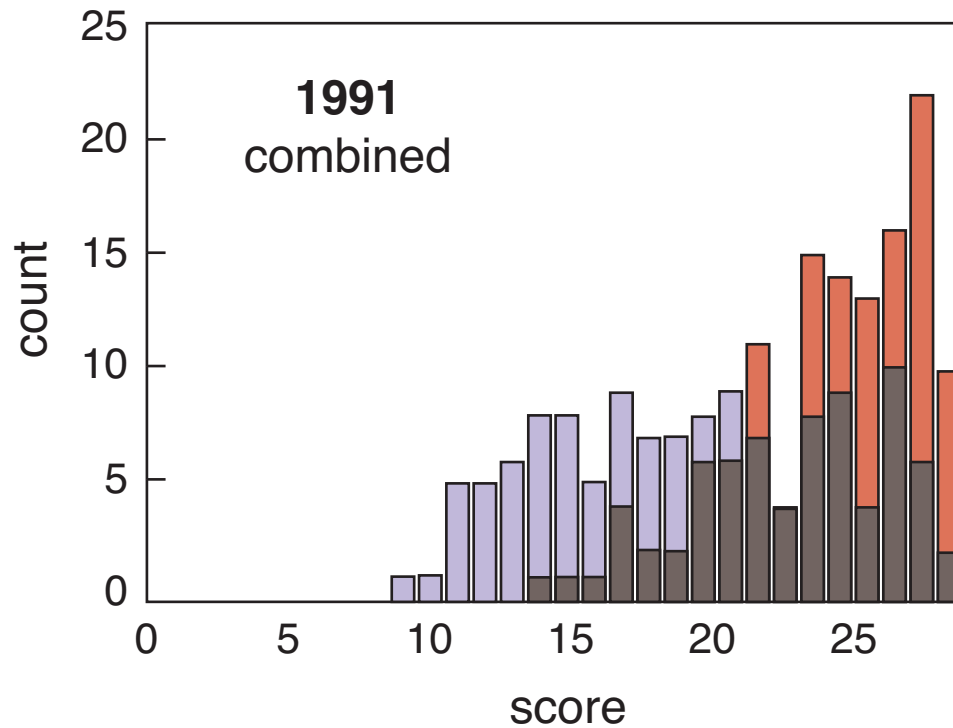


1 education

2 PI

3 results

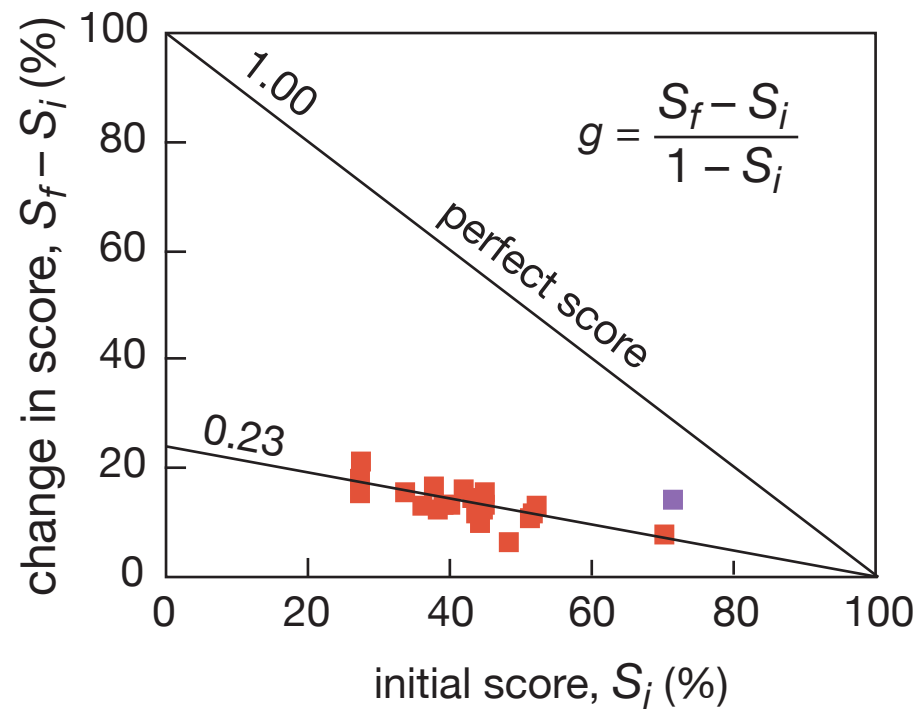
first year of implementing PI



1 education

2 PI

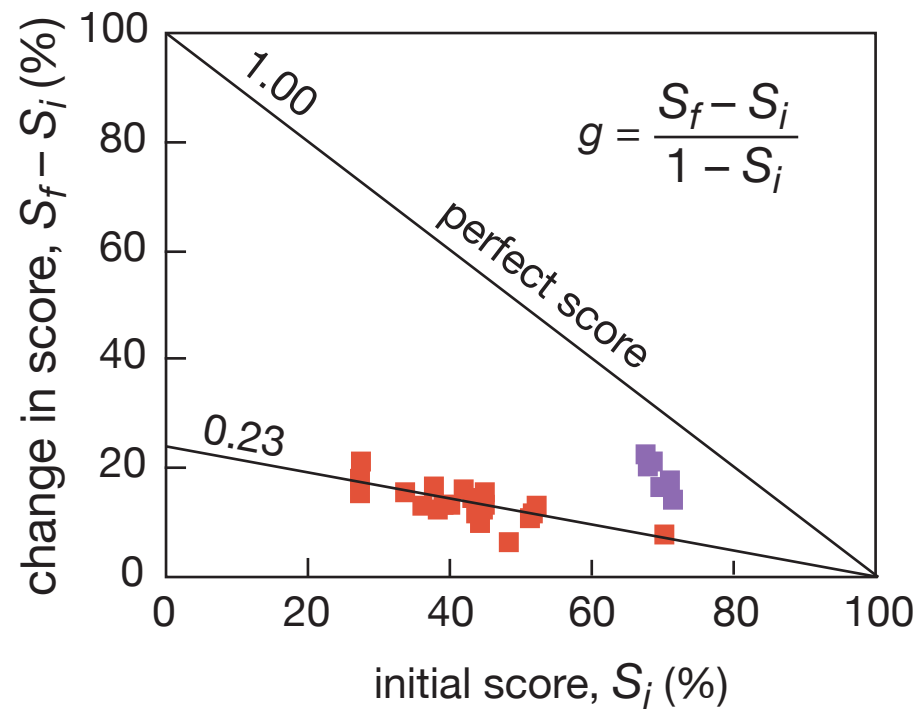
3 results



1 education

2 PI

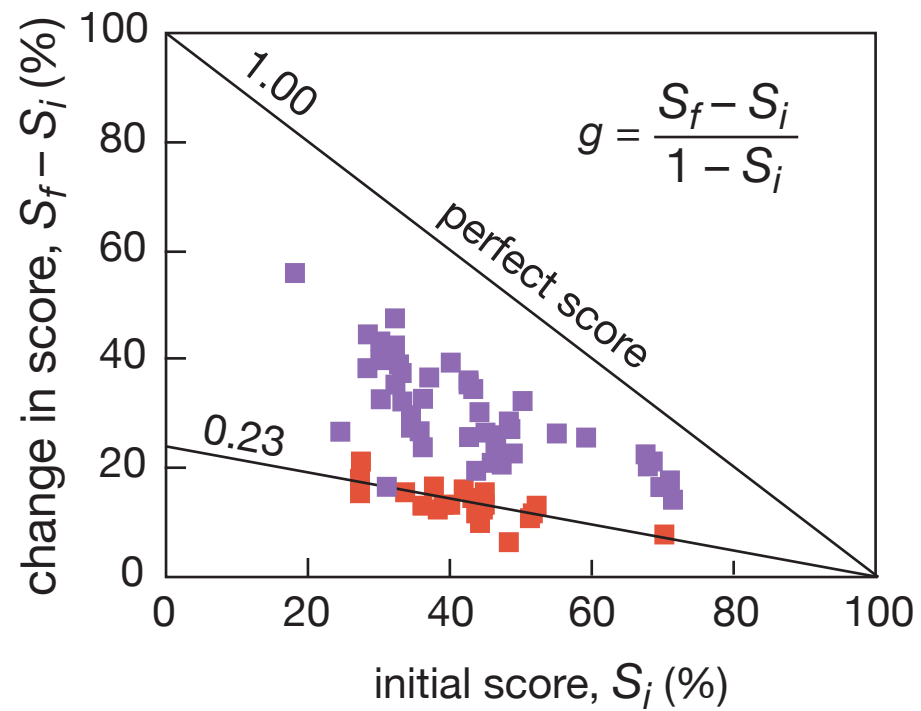
3 results



1 education

2 PI

3 results

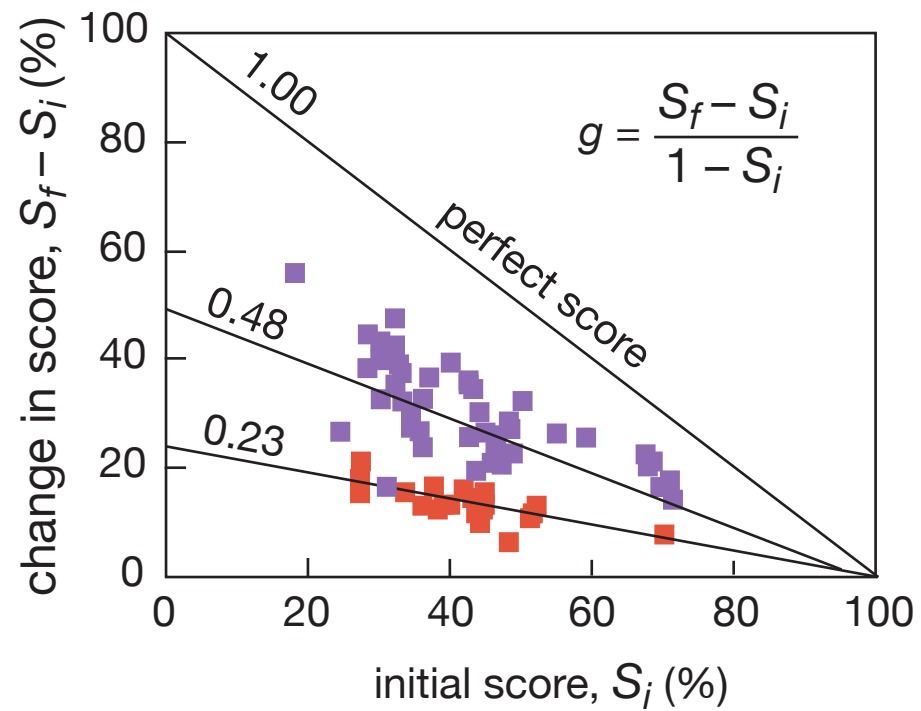


R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

1 education

2 PI

3 results



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

1 education

2 PI

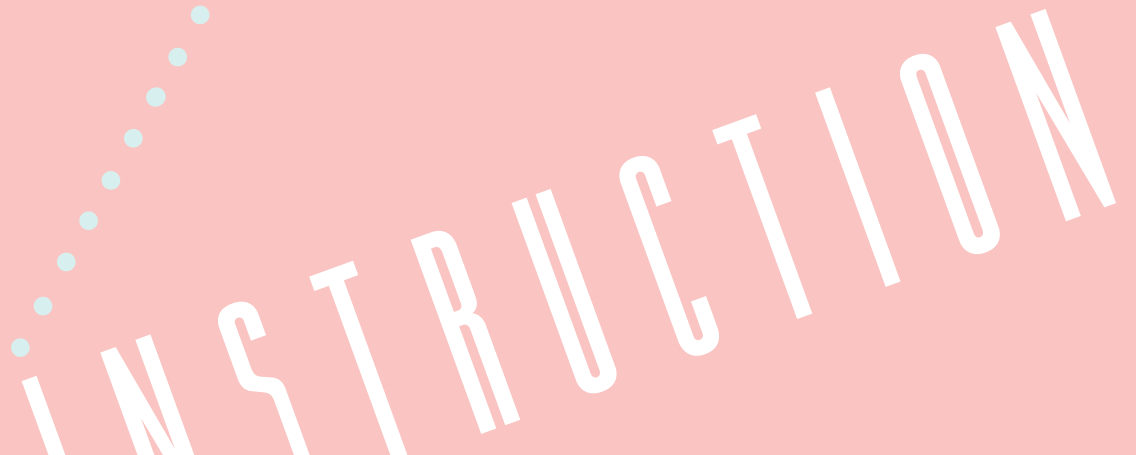
3 results



Peer

The word "Peer" is rendered in a large, white, sans-serif font with a light blue outline. The first 'e' is enclosed in a dashed yellow circle with a yellow arrow pointing clockwise. A dotted blue line starts from the top right of the second 'e' and curves downwards and to the left, ending with a yellow arrowhead pointing towards the first 'e'.

what about problem solving?



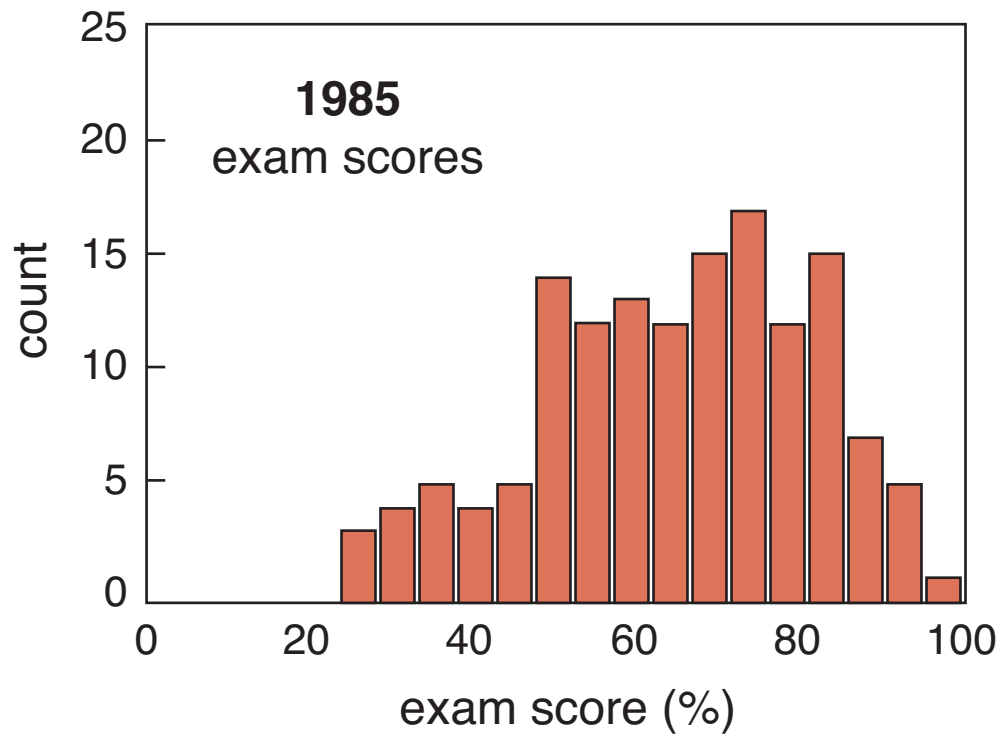
INSTRUCTION

The word "INSTRUCTION" is written in a white, sans-serif font, slanted upwards from left to right. A dotted blue line starts from the bottom left of the word and curves upwards and to the right, ending with a yellow arrowhead pointing towards the word.

1 education

2 PI

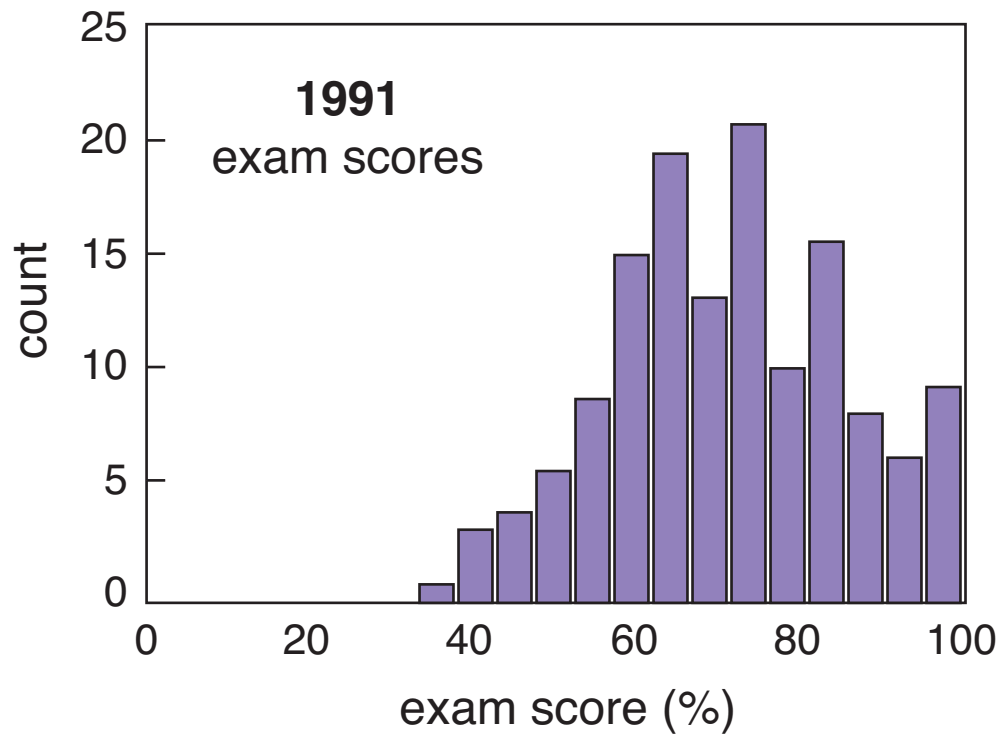
3 results



1 education

2 PI

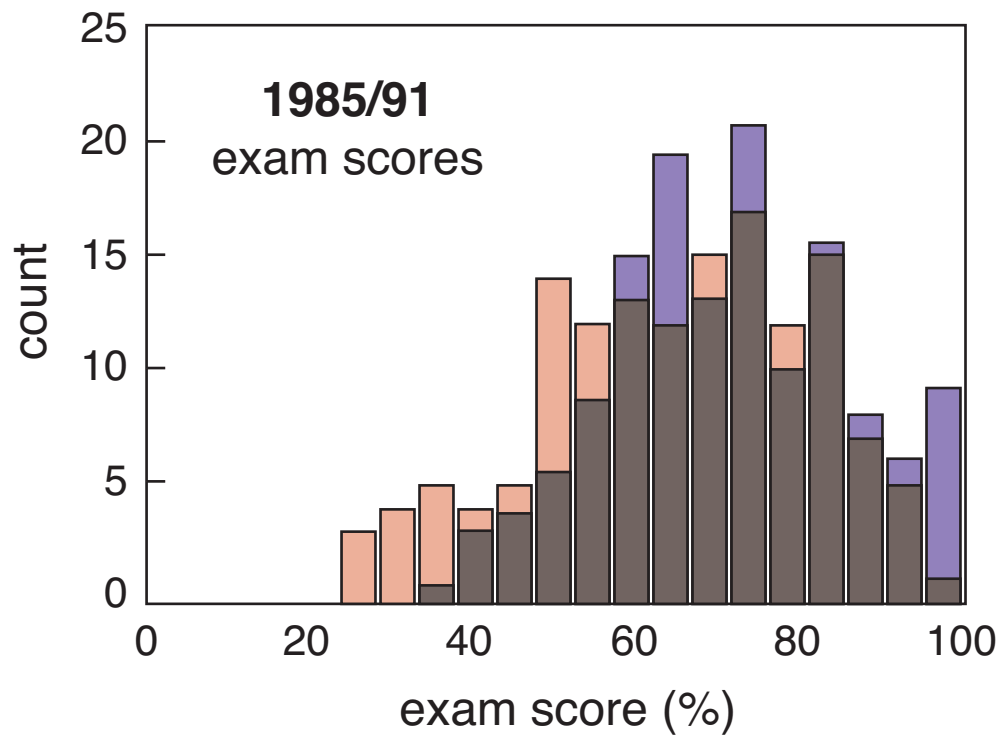
3 results



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!)

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

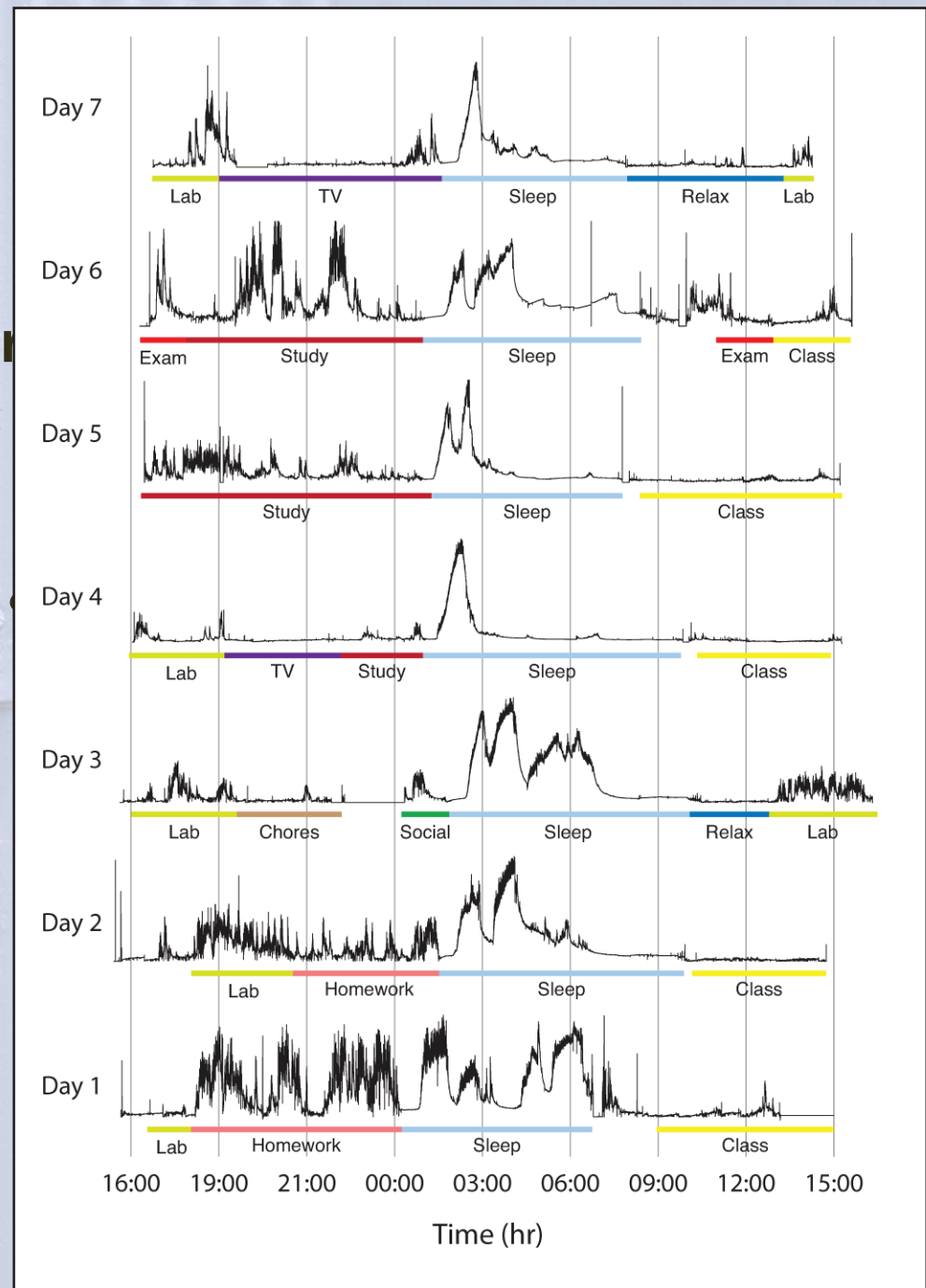
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

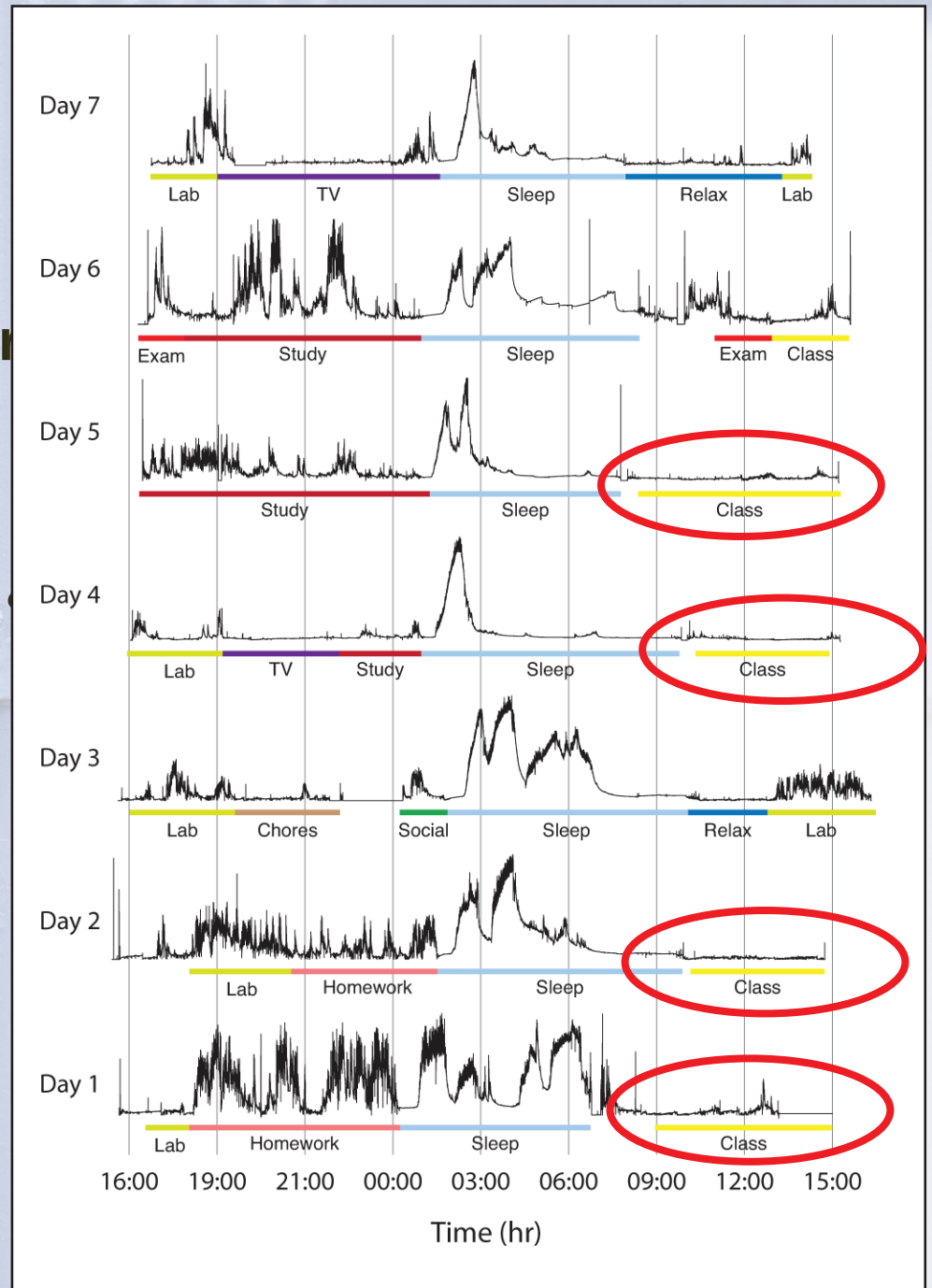
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

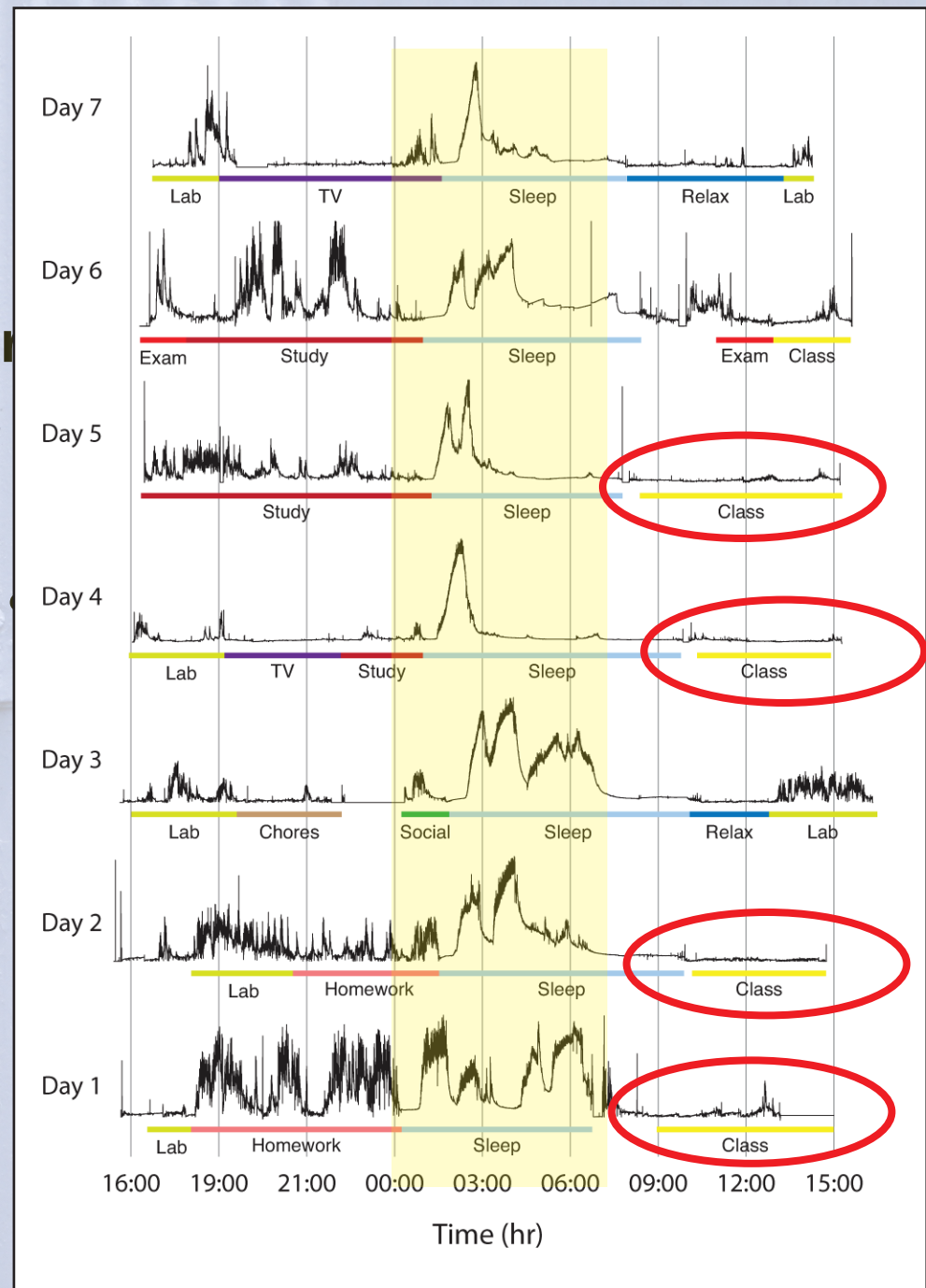
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



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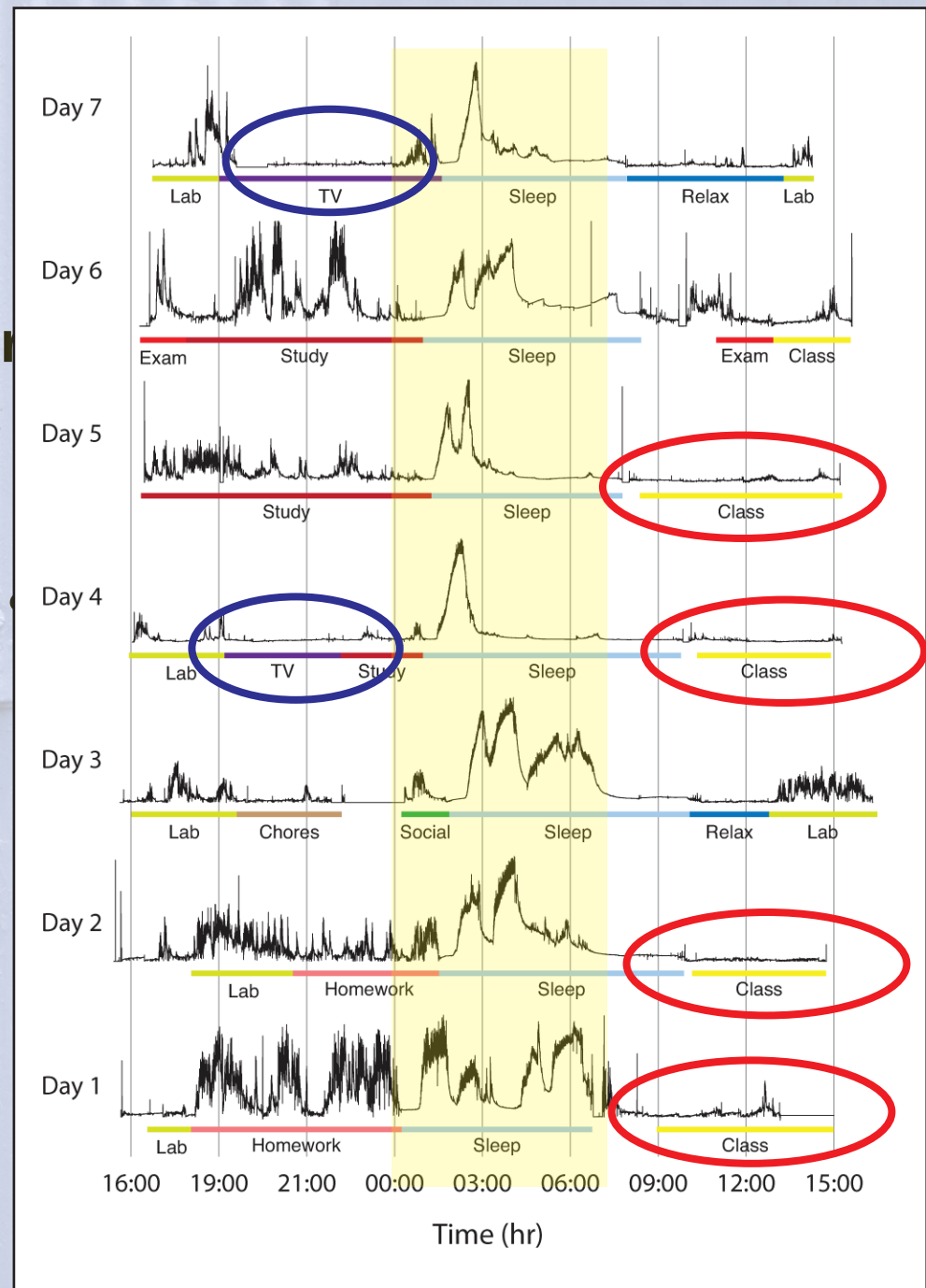
1 education

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

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