

Confessions of a converted lecturer



EDUCACION

Fysikermøtet 2013
Bergen, Norway, 9 August 2013



Confessions of a converted lecturer



@eric_mazur

EDUCATION

Fysikermøtet 2013
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Think of something you are good at

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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

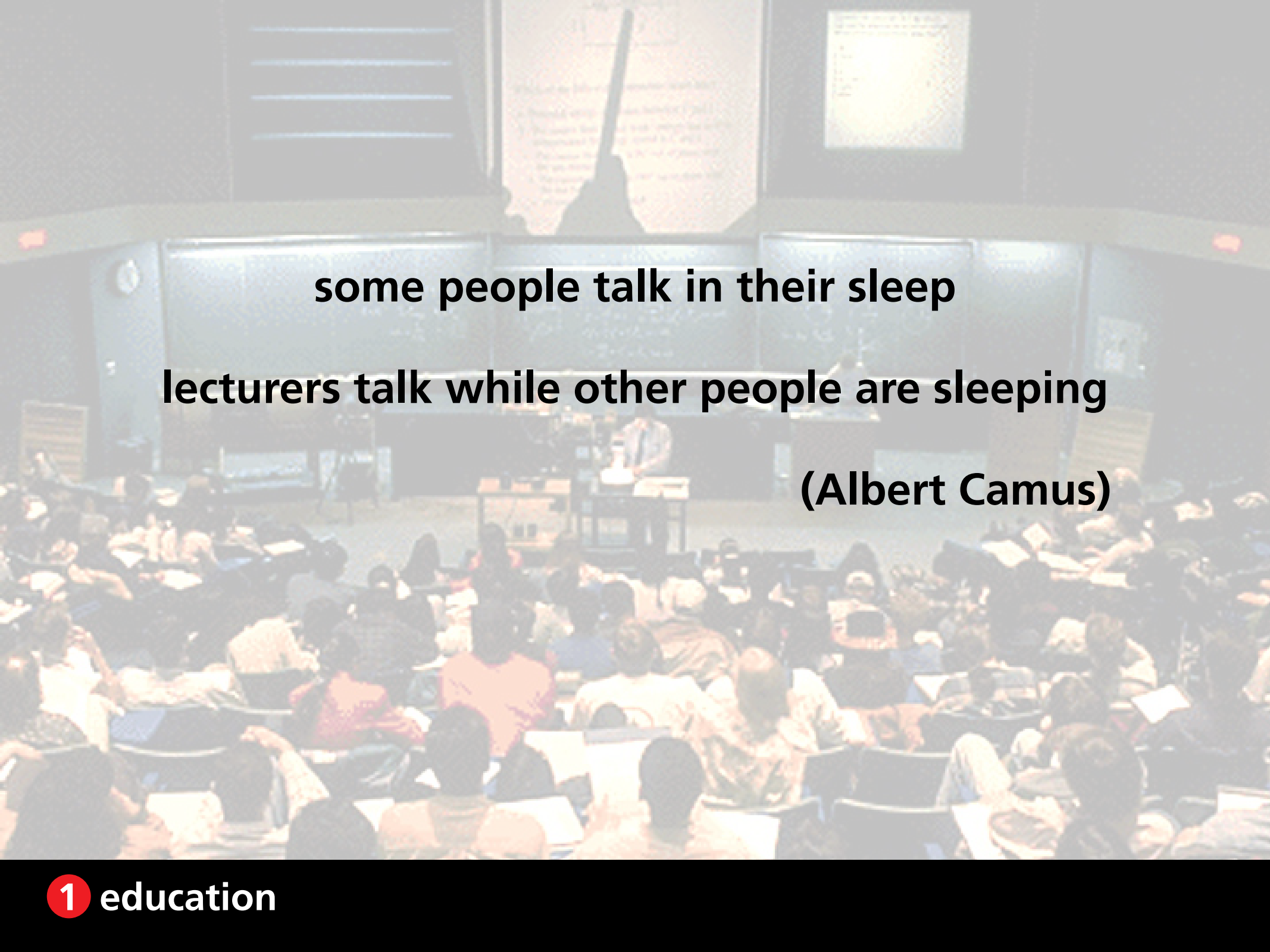
A large white thought bubble with a thick black border is centered in the upper half of the image. It contains the text 'What happens in a lecture?'. Below the main bubble are three smaller white circles with black borders, arranged in a vertical line that tapers downwards, suggesting a trail of thought.

**What happens
in a lecture?**



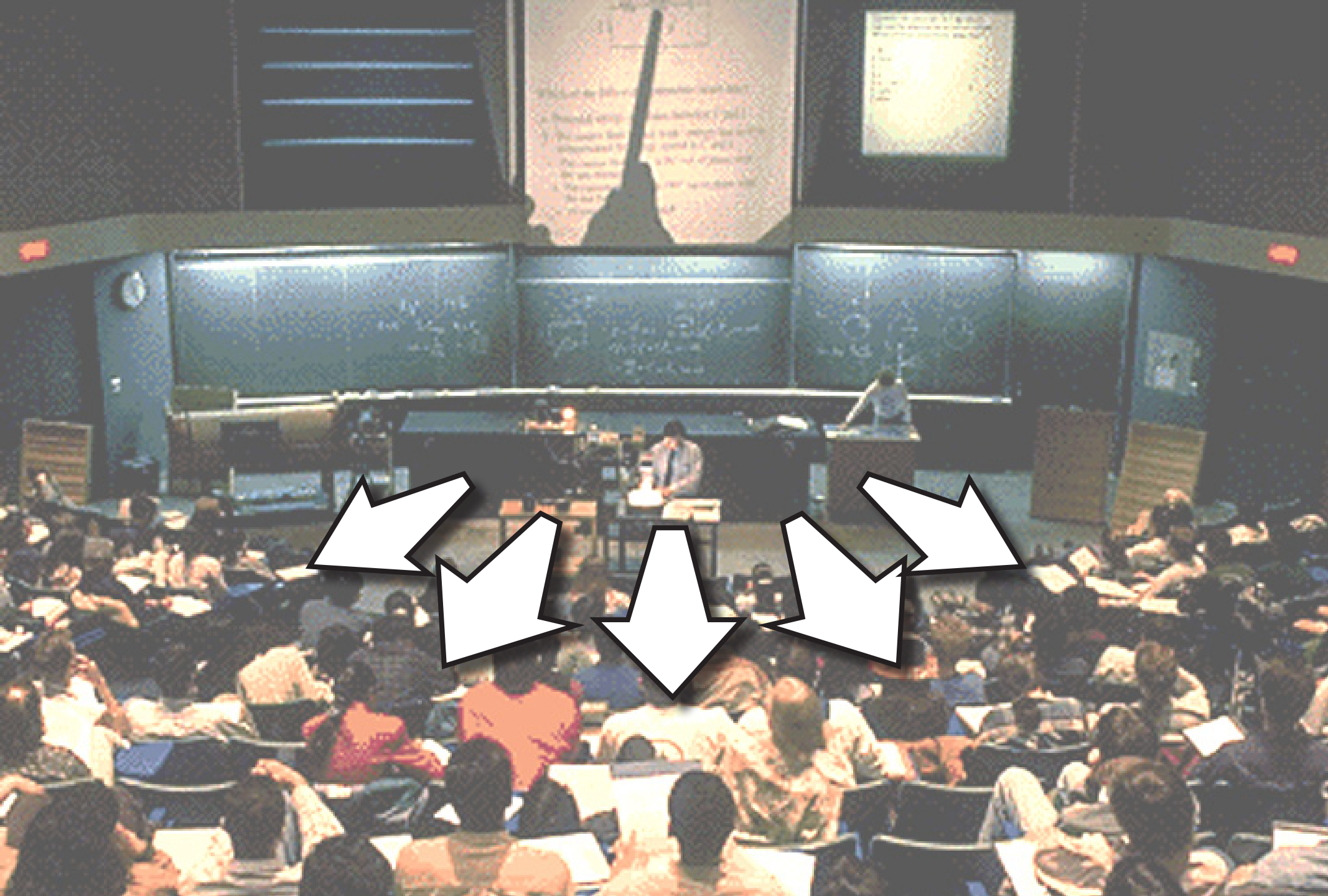
A large lecture hall with a professor at a podium and students in the audience. The professor is standing at a podium on a stage, facing the audience. The audience is seated in rows of chairs, filling the hall. The stage has a large screen behind the professor displaying text. The text on the screen is partially legible and appears to be a list of items or a document. The overall scene is a typical classroom or lecture hall setting.

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 of the stage, facing the audience. The audience is seated in rows of chairs, filling the foreground and middle ground. The room has a high ceiling and large windows or screens in the background. The overall atmosphere is one of a large-scale educational event.

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





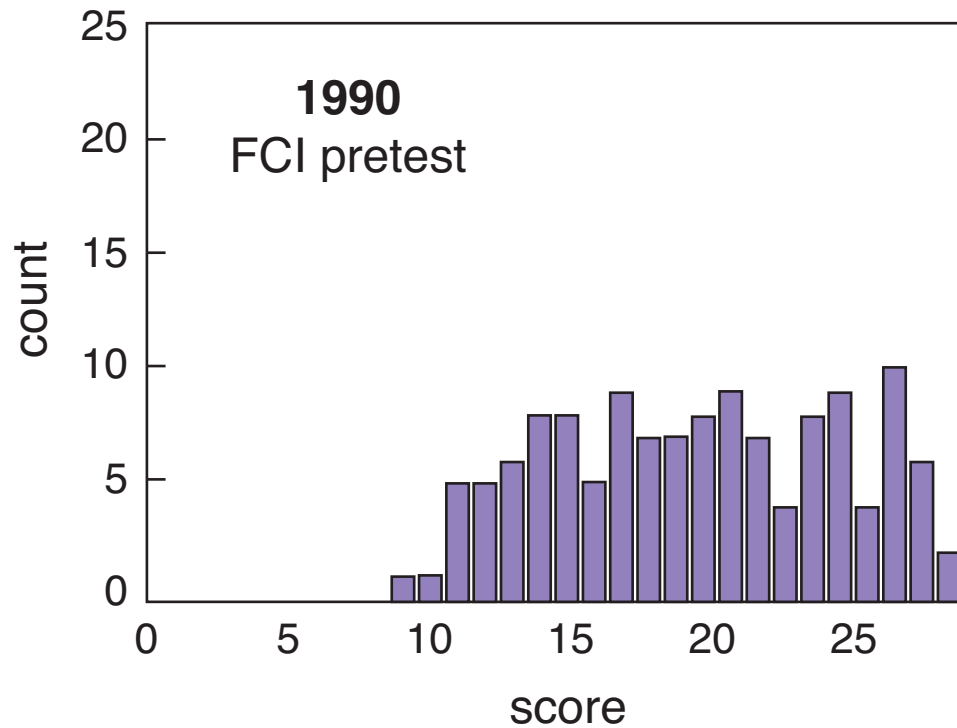
The result?

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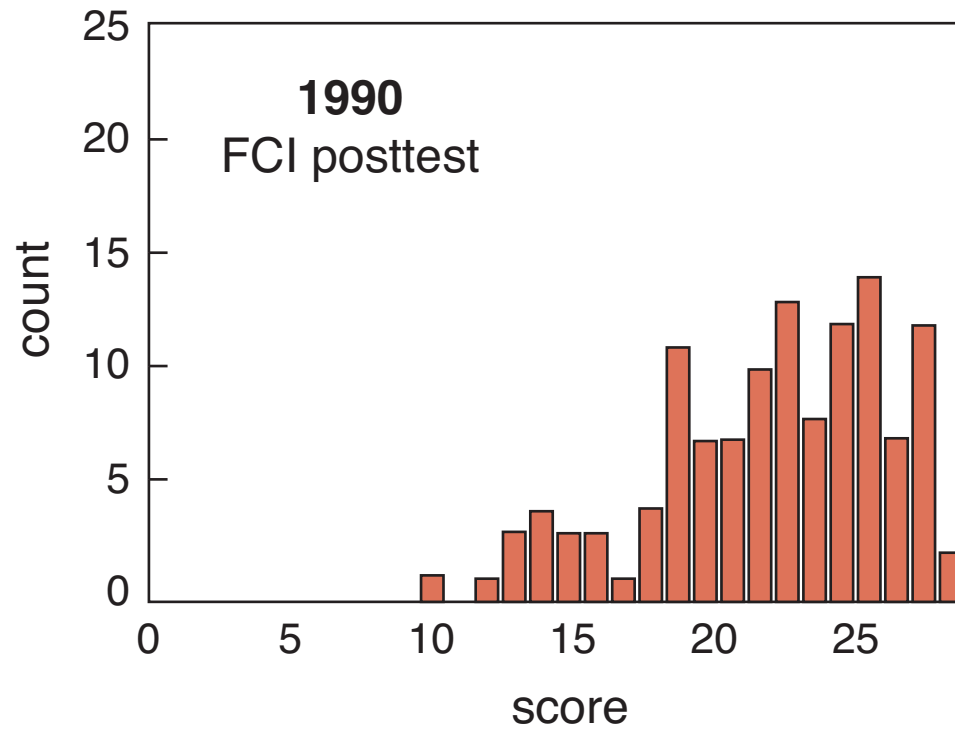
The result?

EDUCACION

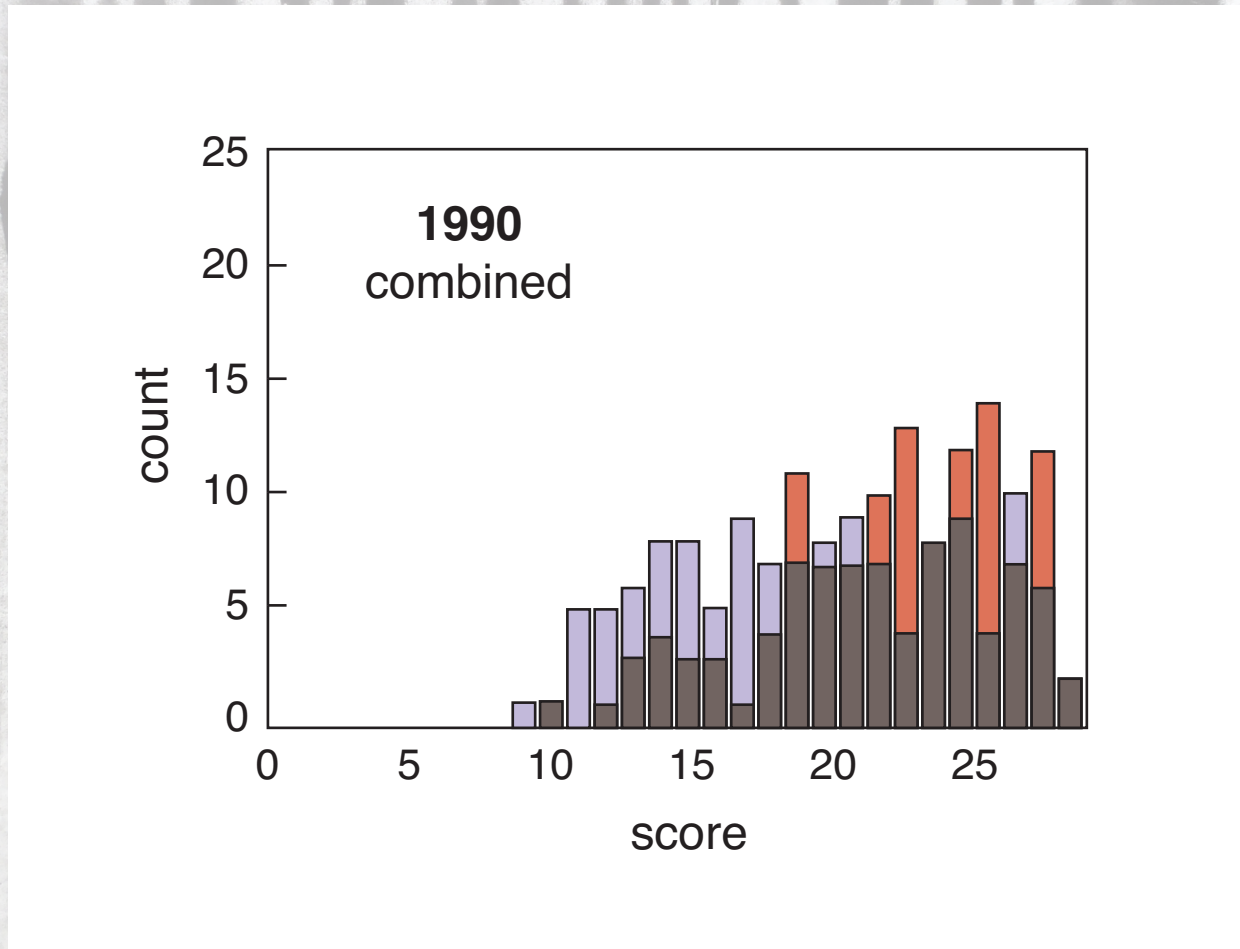
education is not just information transfer

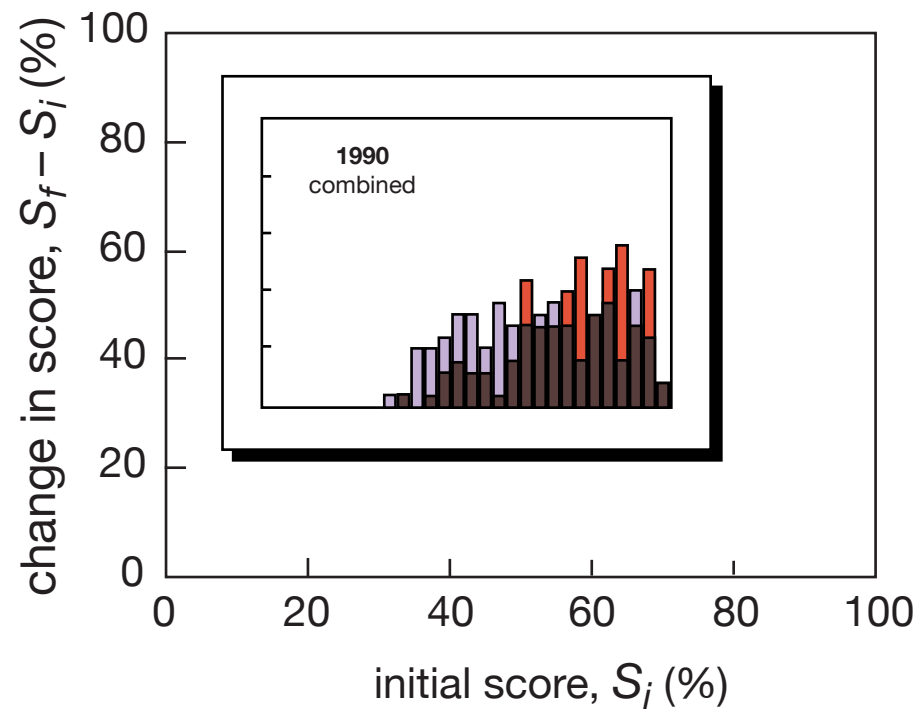


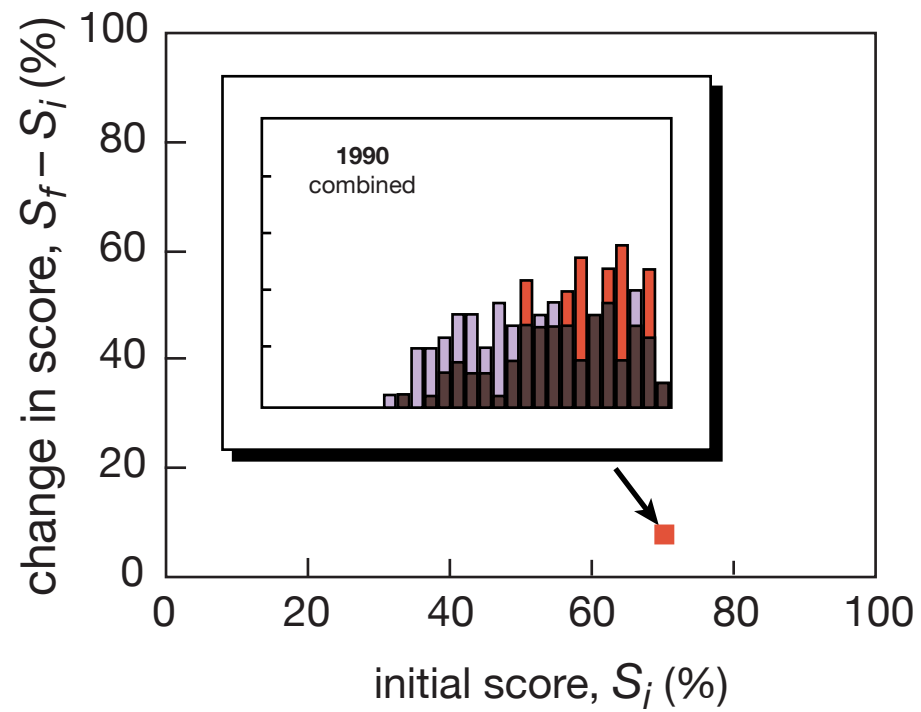
education is not just information transfer

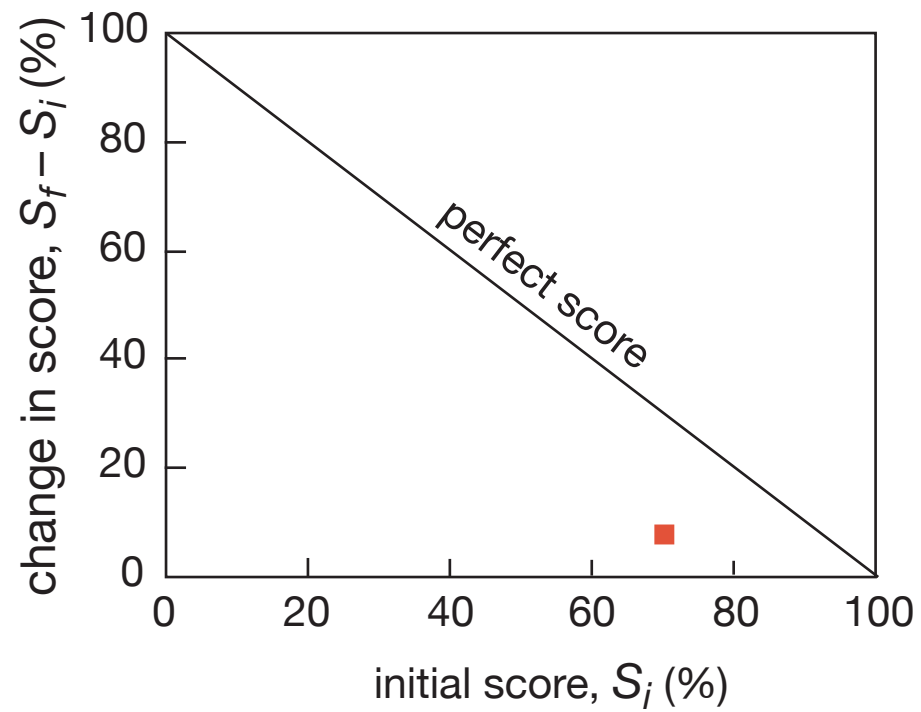


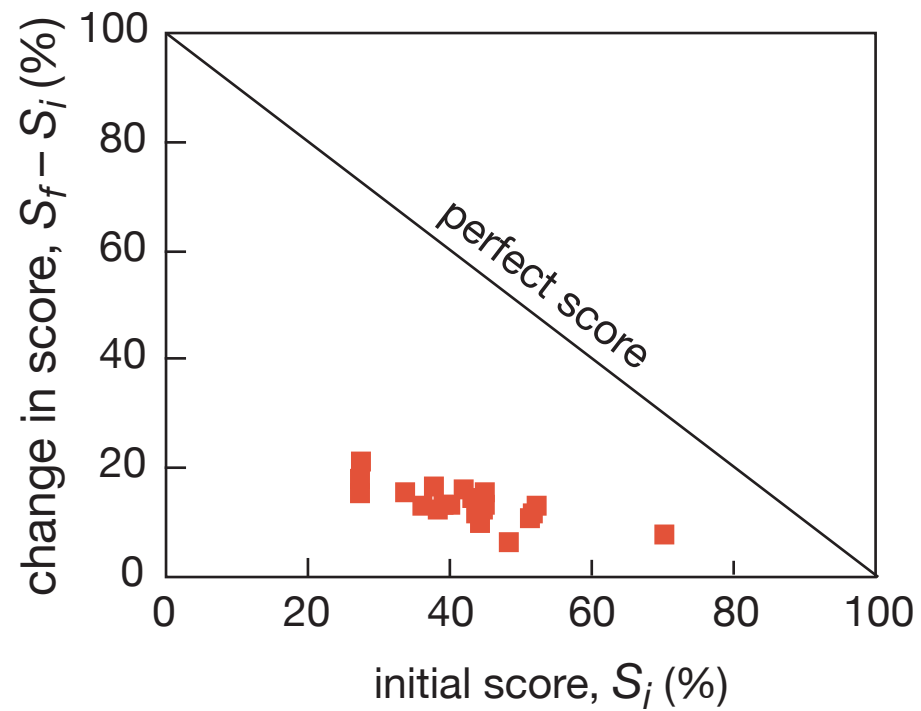
education is not just information transfer





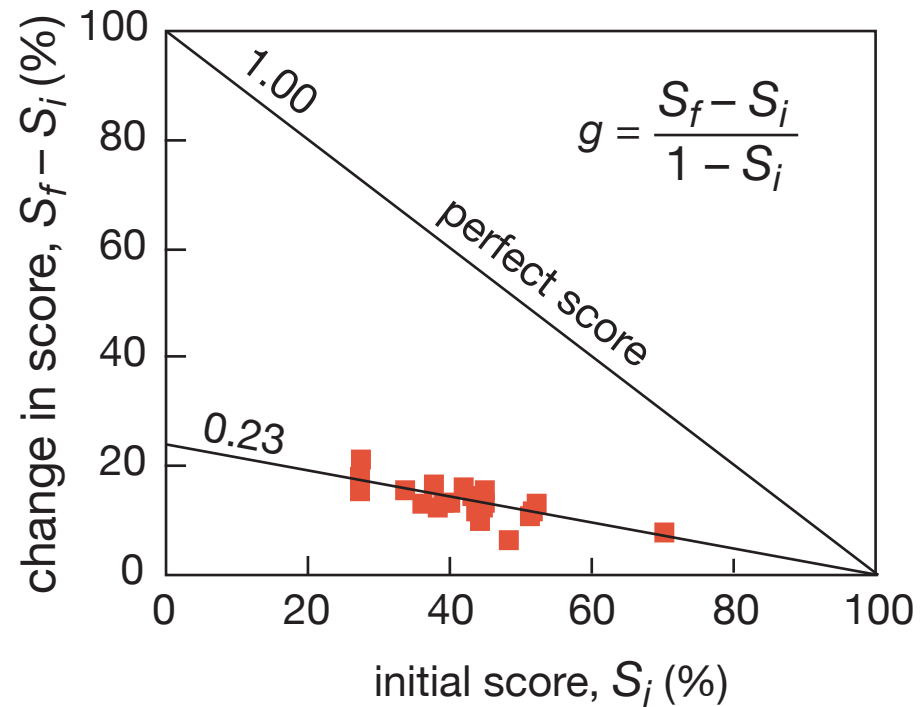






R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

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. 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



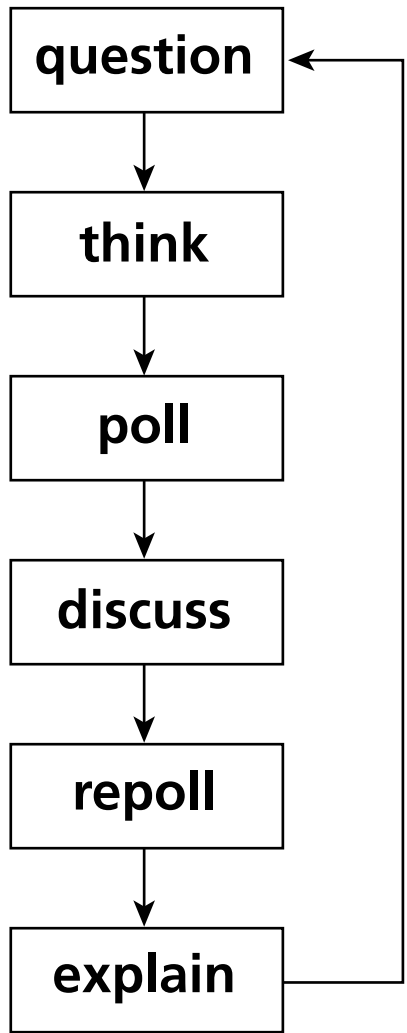
discuss

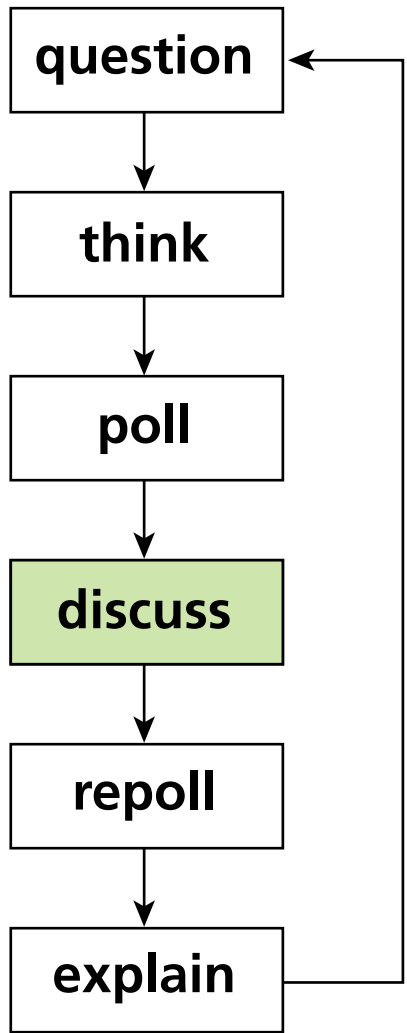


repoll



explain





1 education

2 PI

Peer

is it any good?

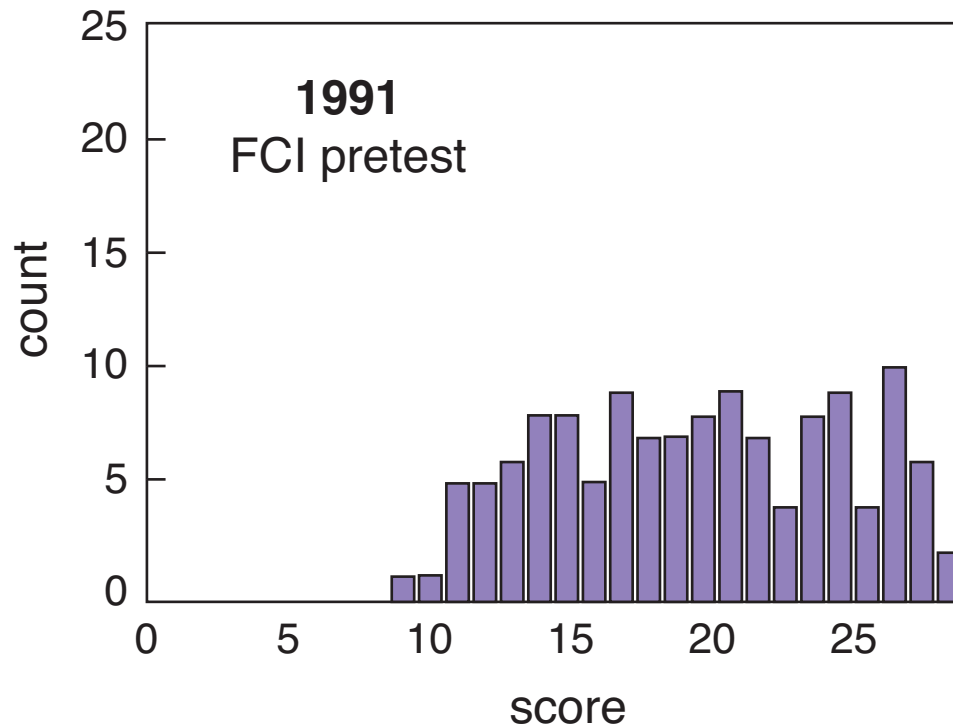
INSTRUCTION

1 education

2 PI

3 results

first year of implementing PI

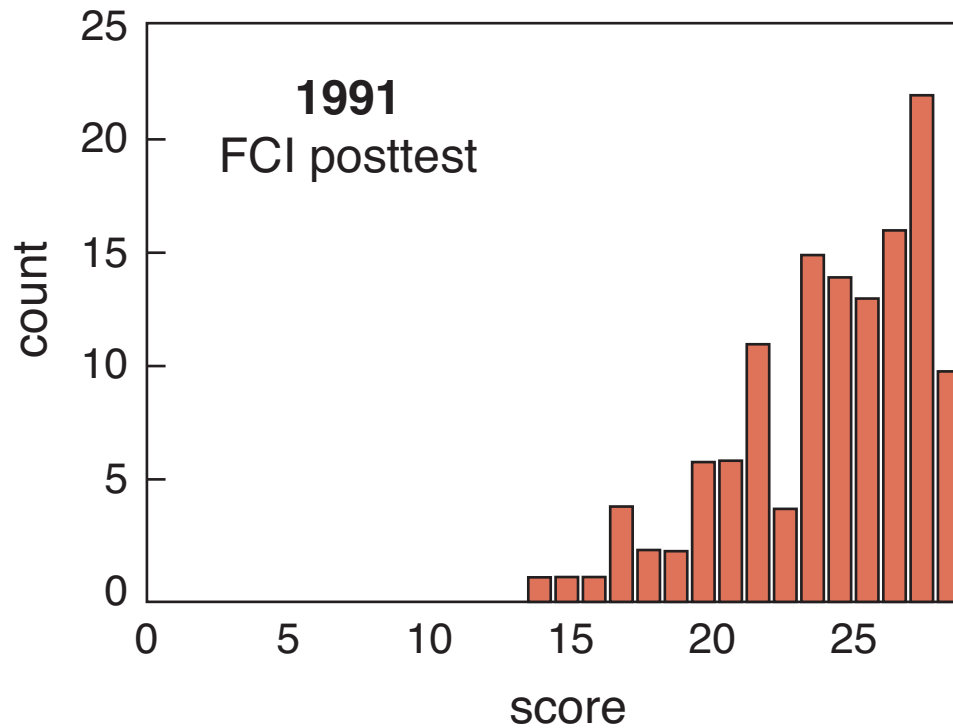


1 education

2 PI

3 results

first year of implementing PI

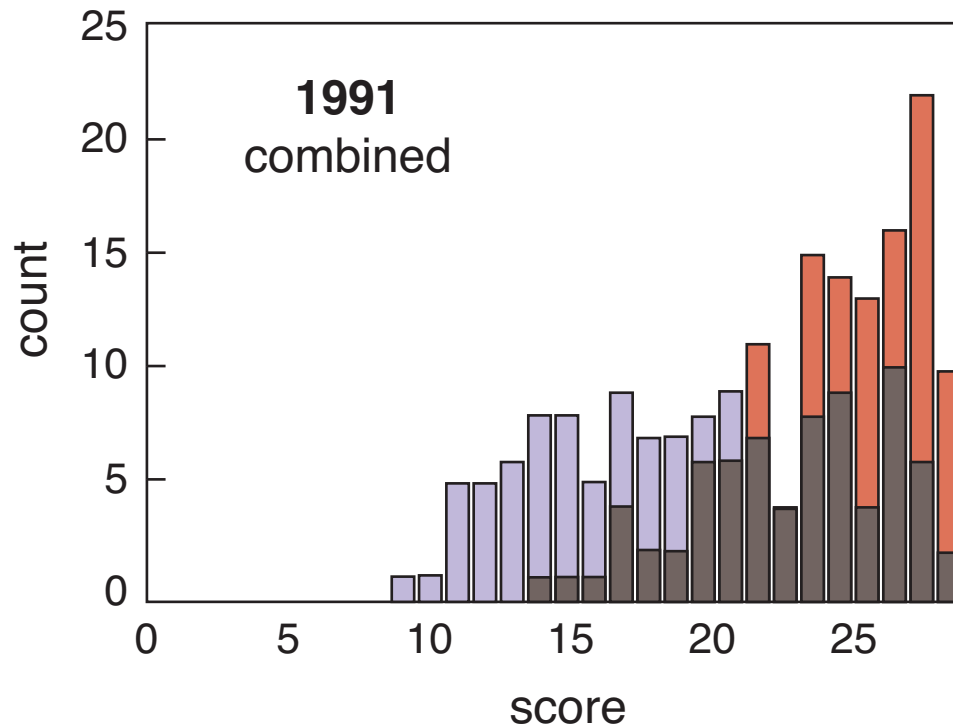


1 education

2 PI

3 results

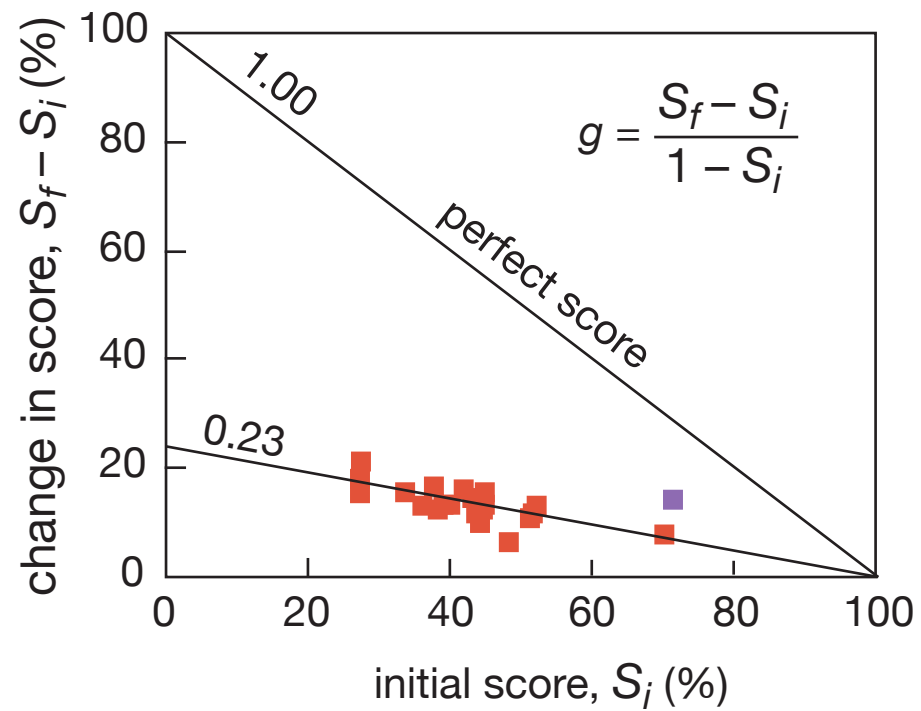
first year of implementing PI



1 education

2 PI

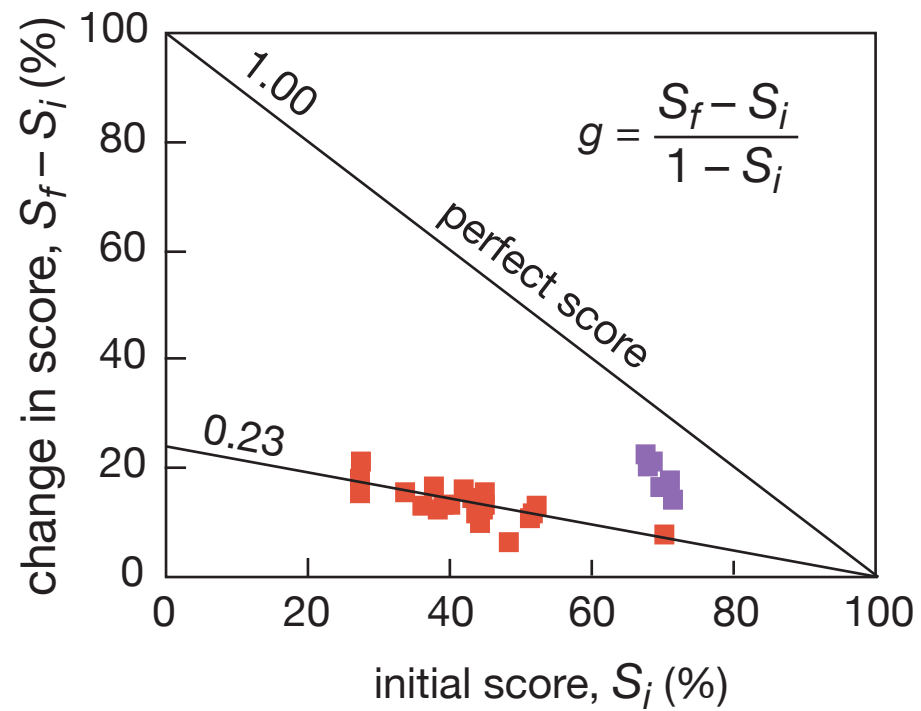
3 results



1 education

2 PI

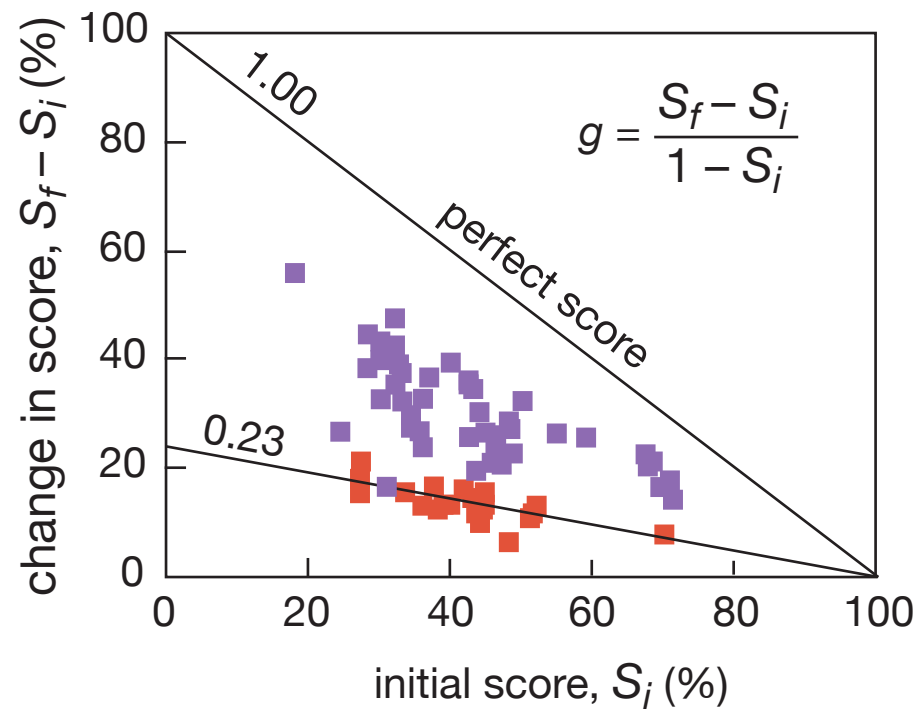
3 results



1 education

2 PI

3 results

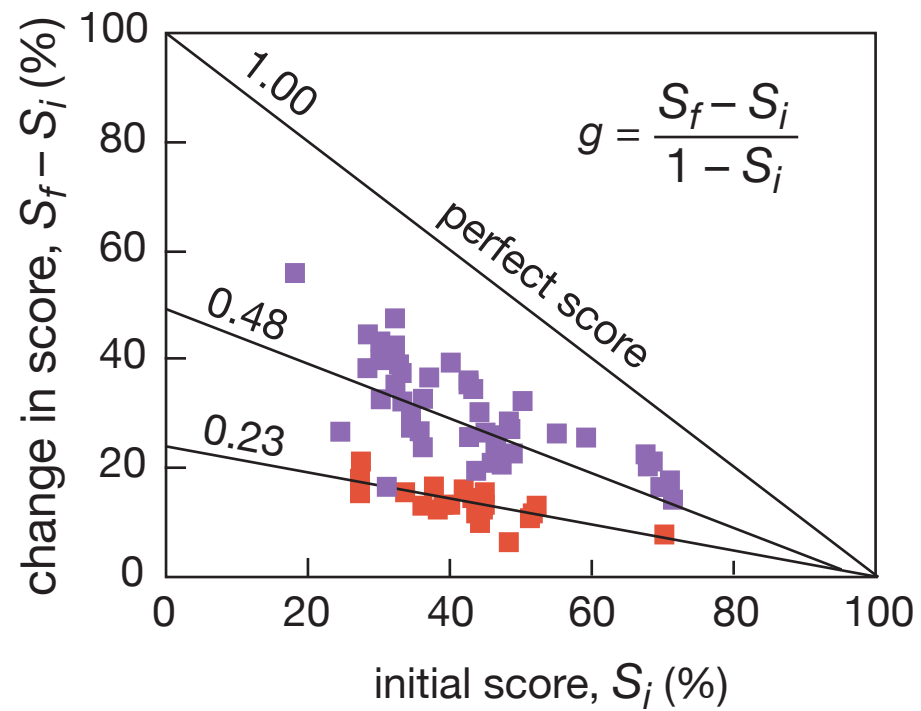


R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

1 education

2 PI

3 results



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

1 education

2 PI

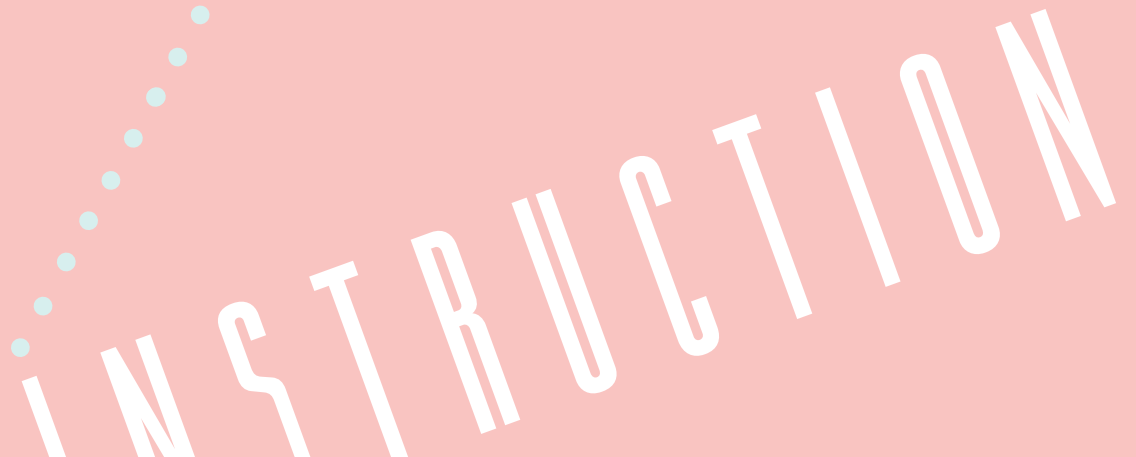
3 results



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?



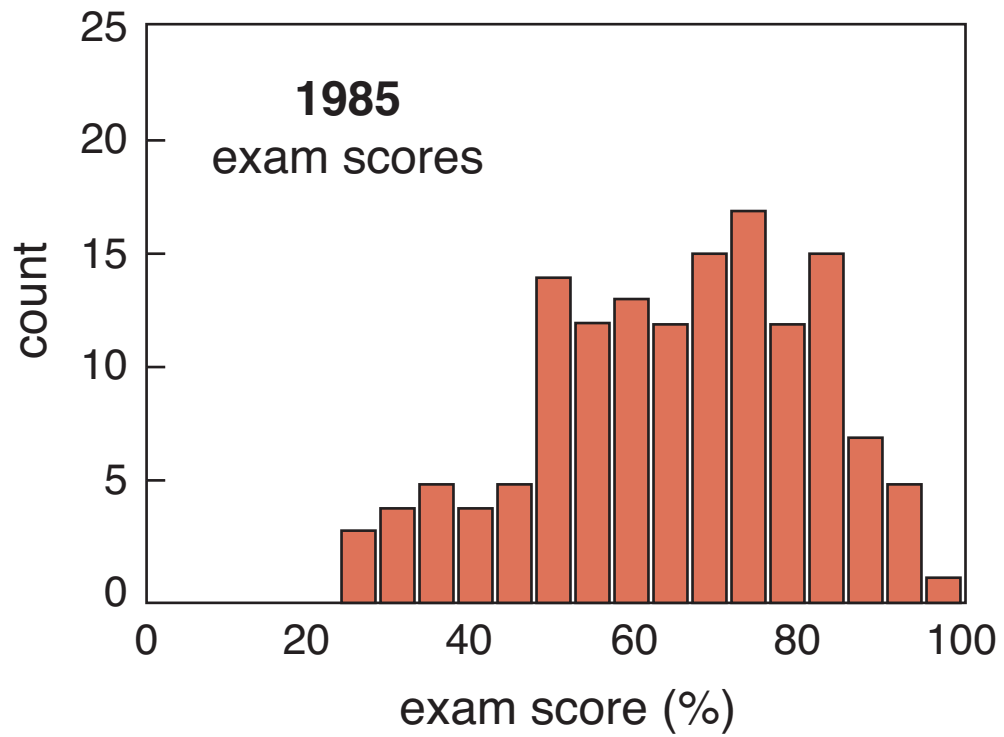
INSTRUCTION

The word "INSTRUCTION" is written in a white, sans-serif font, tilted 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

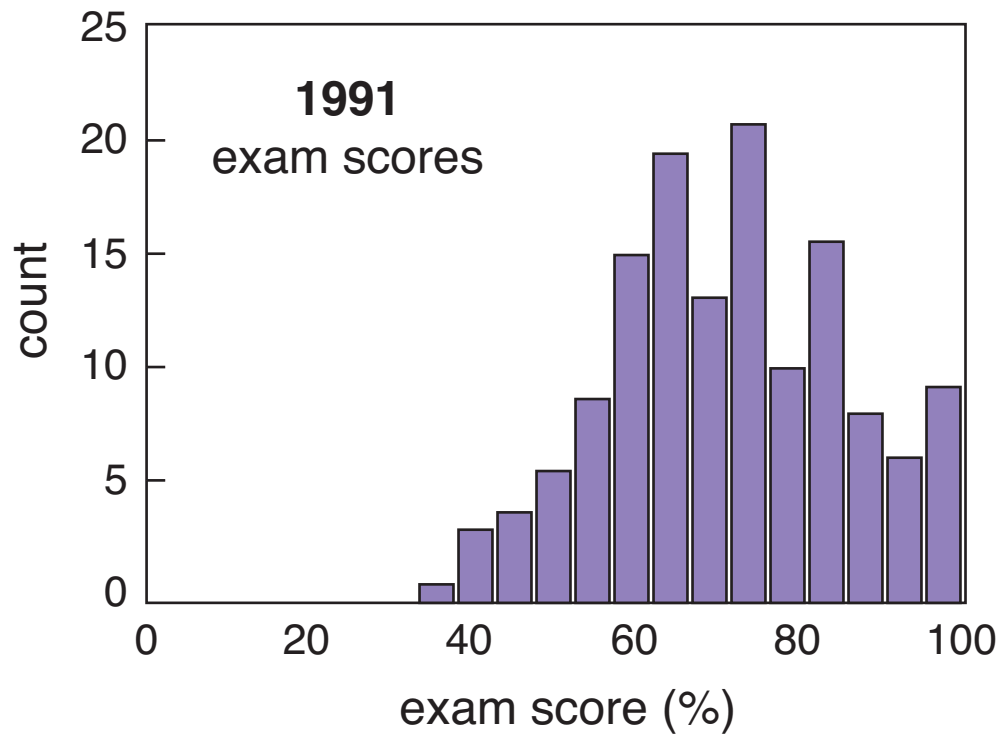
3 results



1 education

2 PI

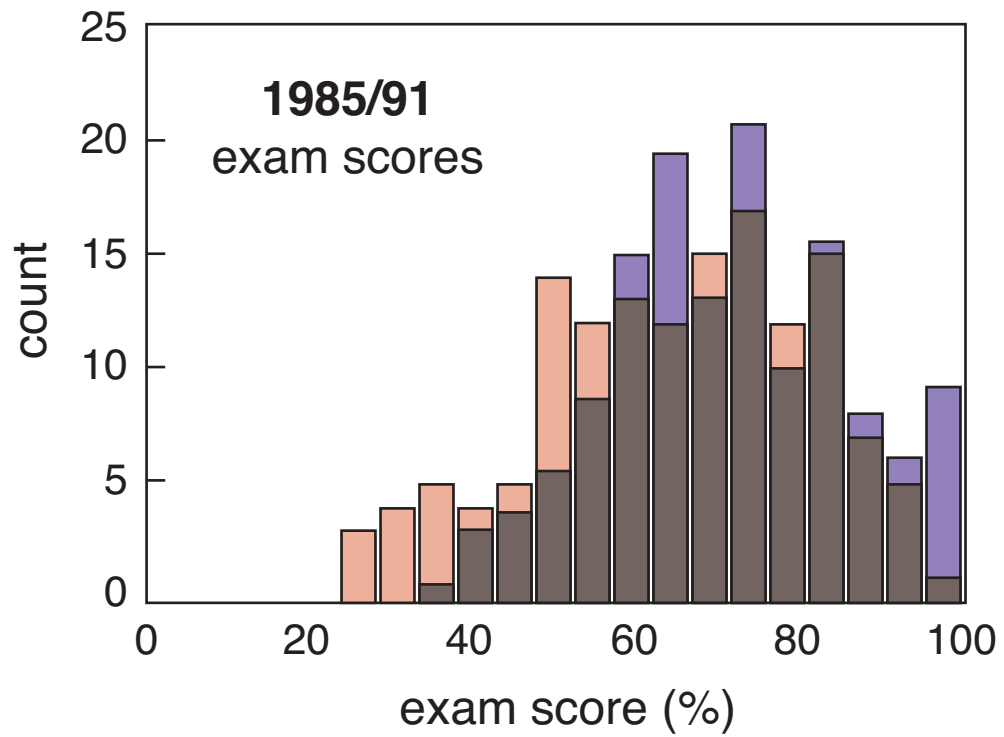
3 results



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!)

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

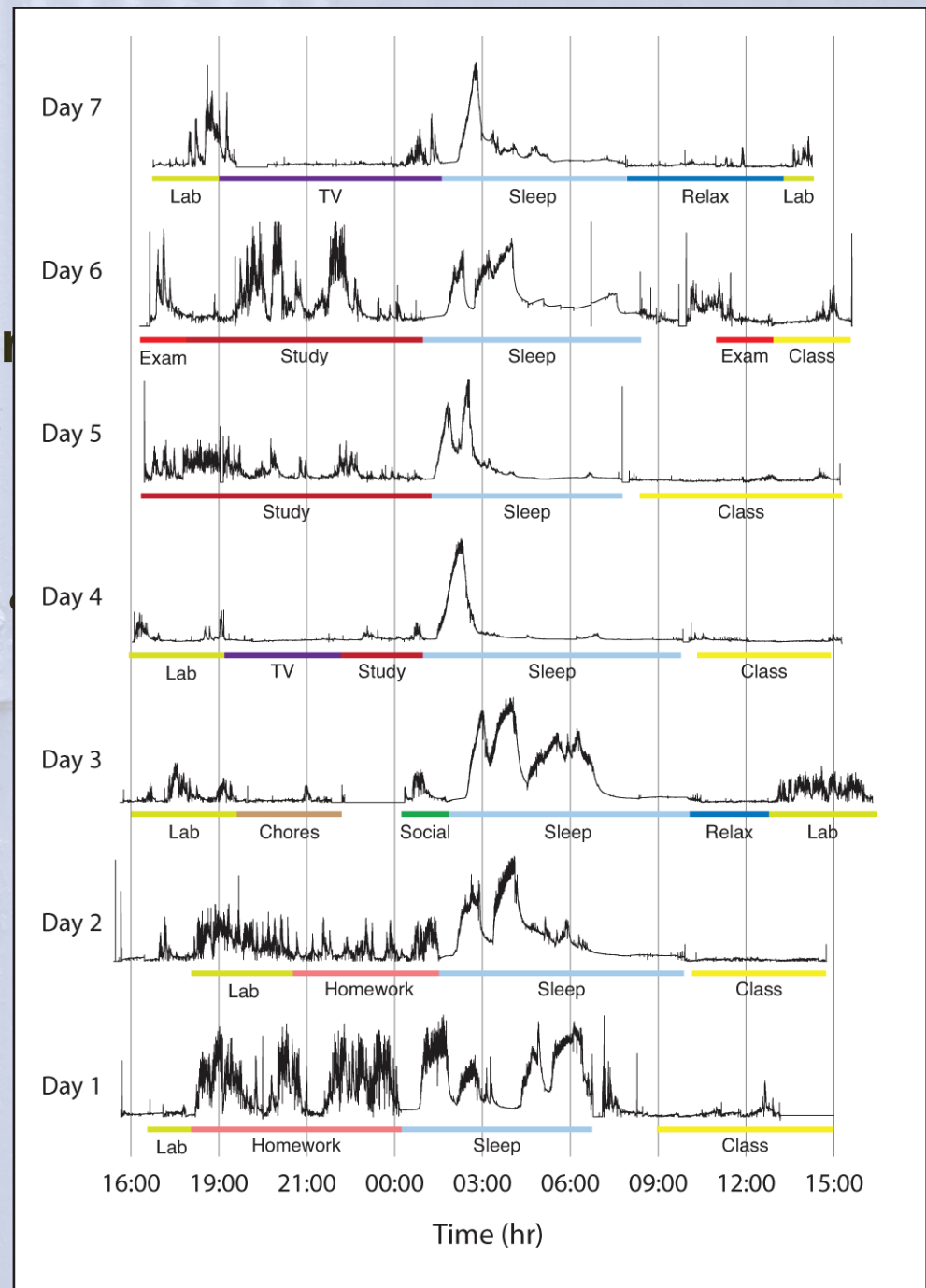
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

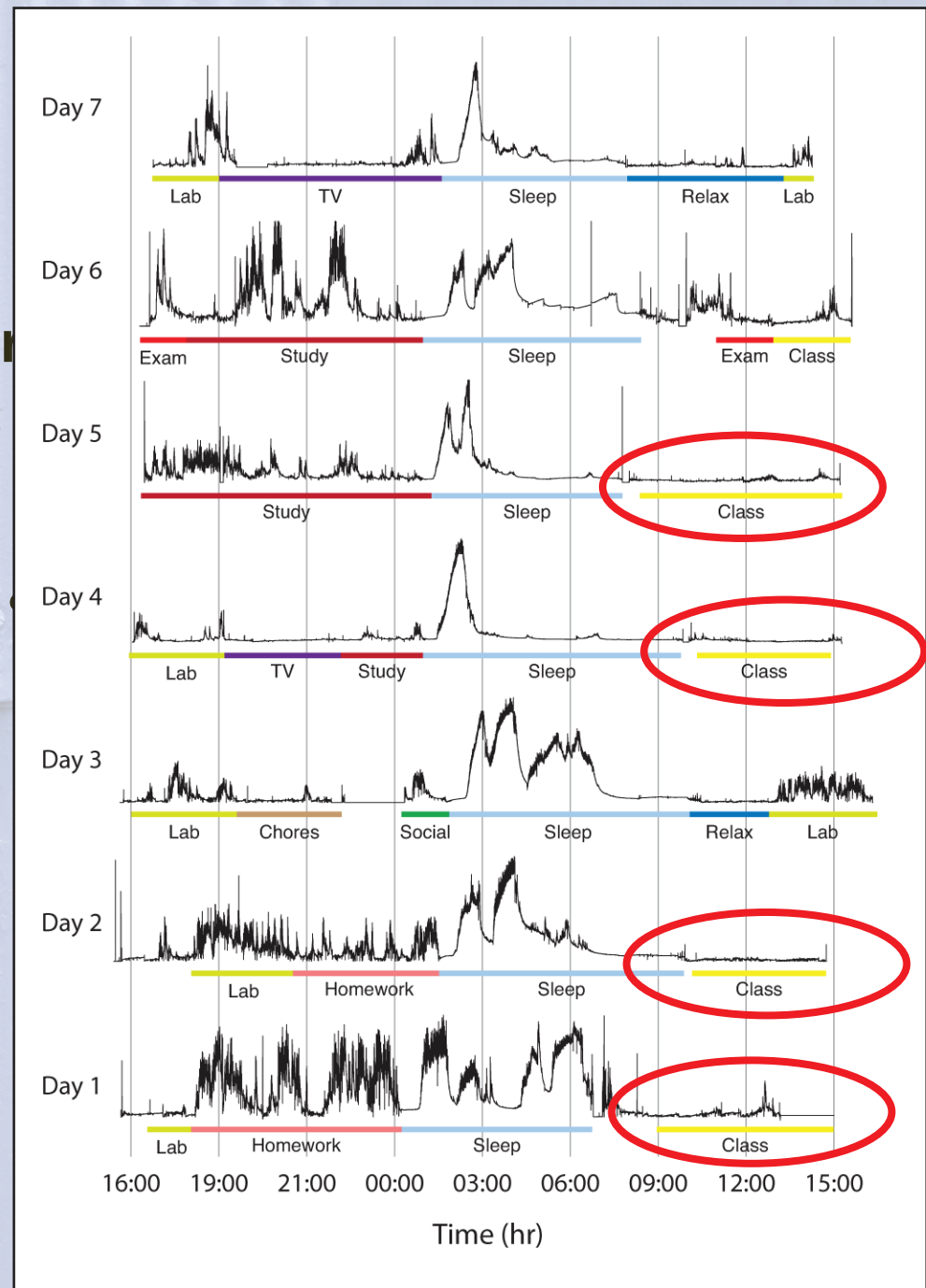
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

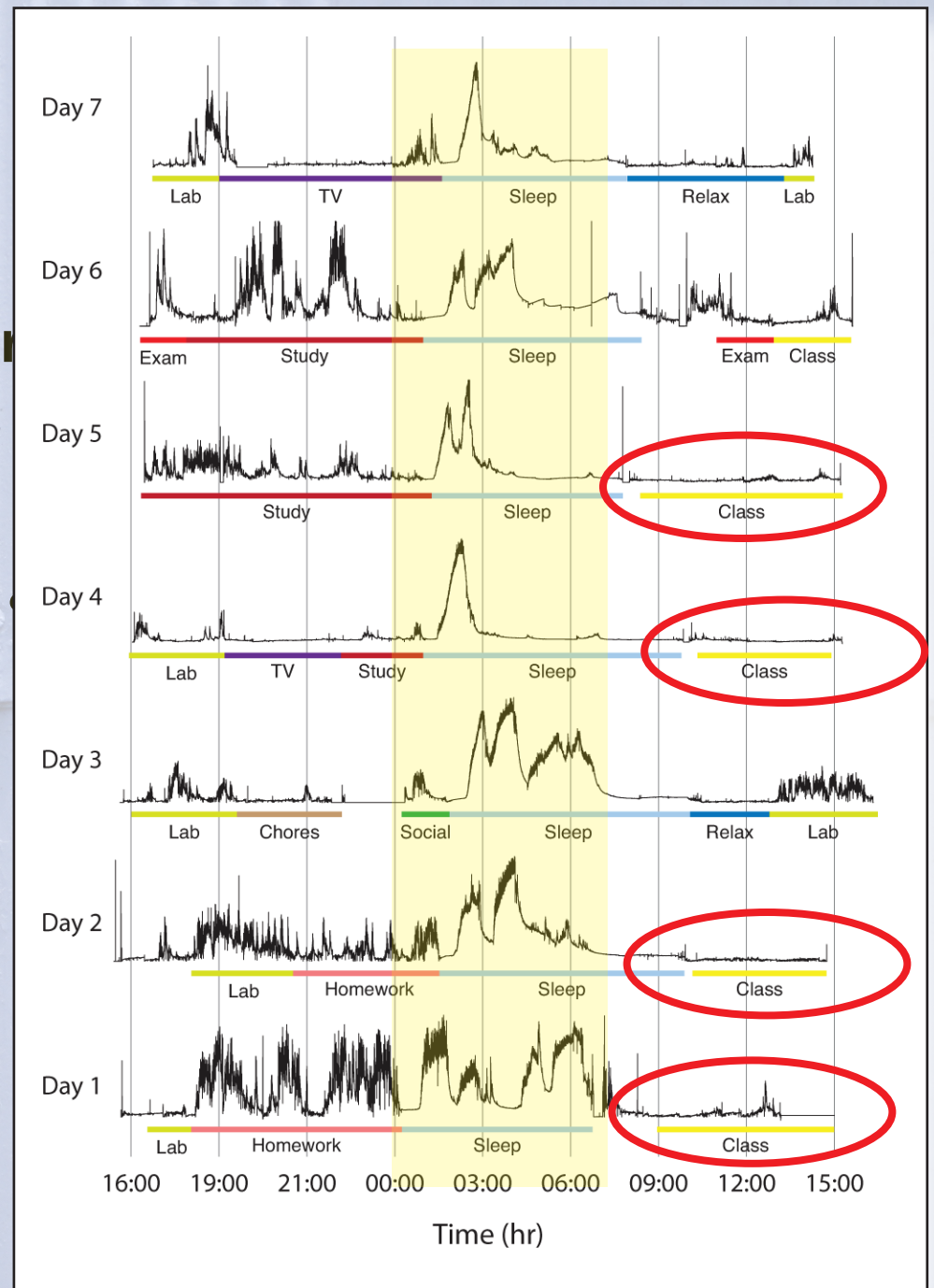
1 education

2 PI

3 results

in a lecture

1. don't pay utmost



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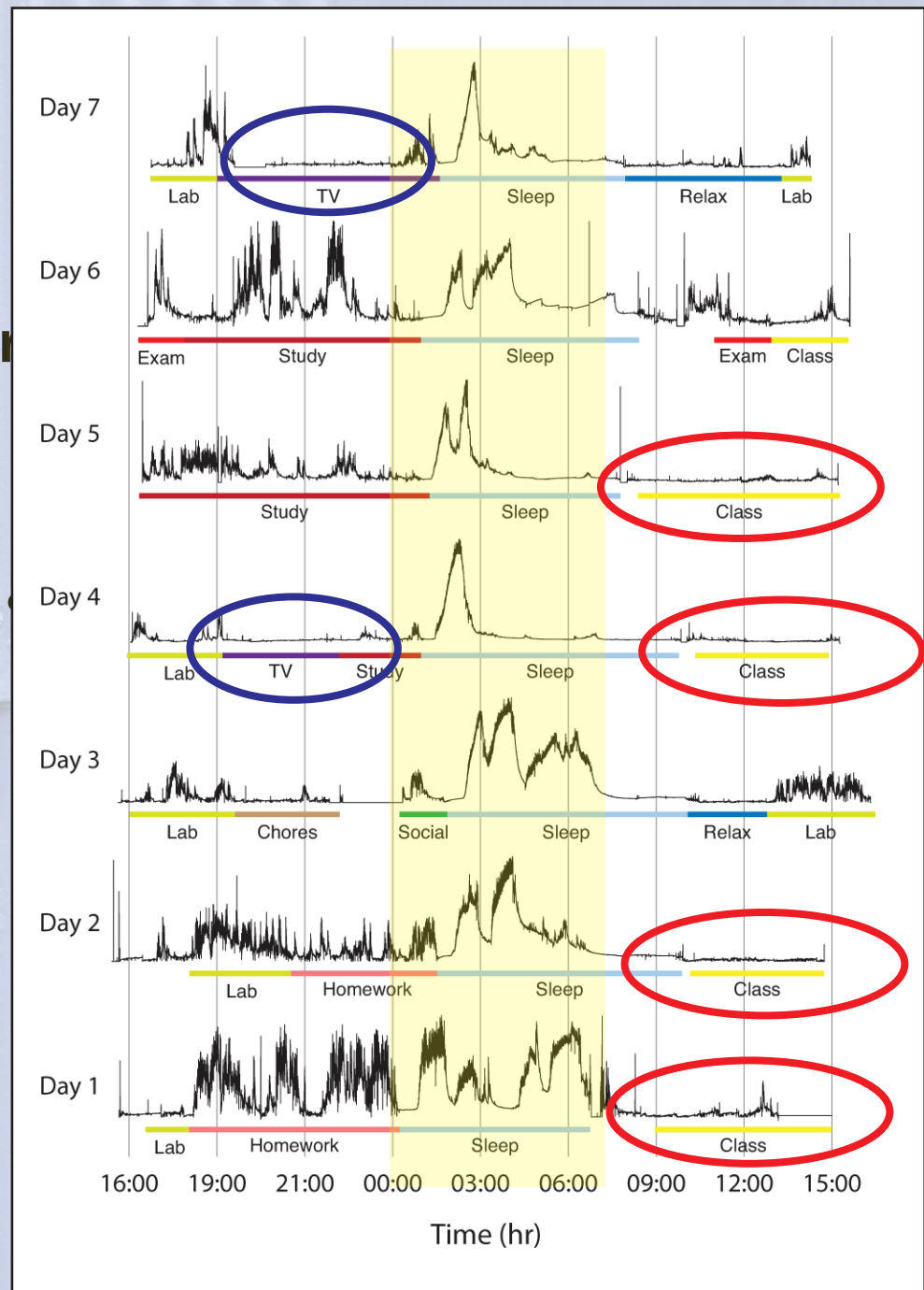
1 education

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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