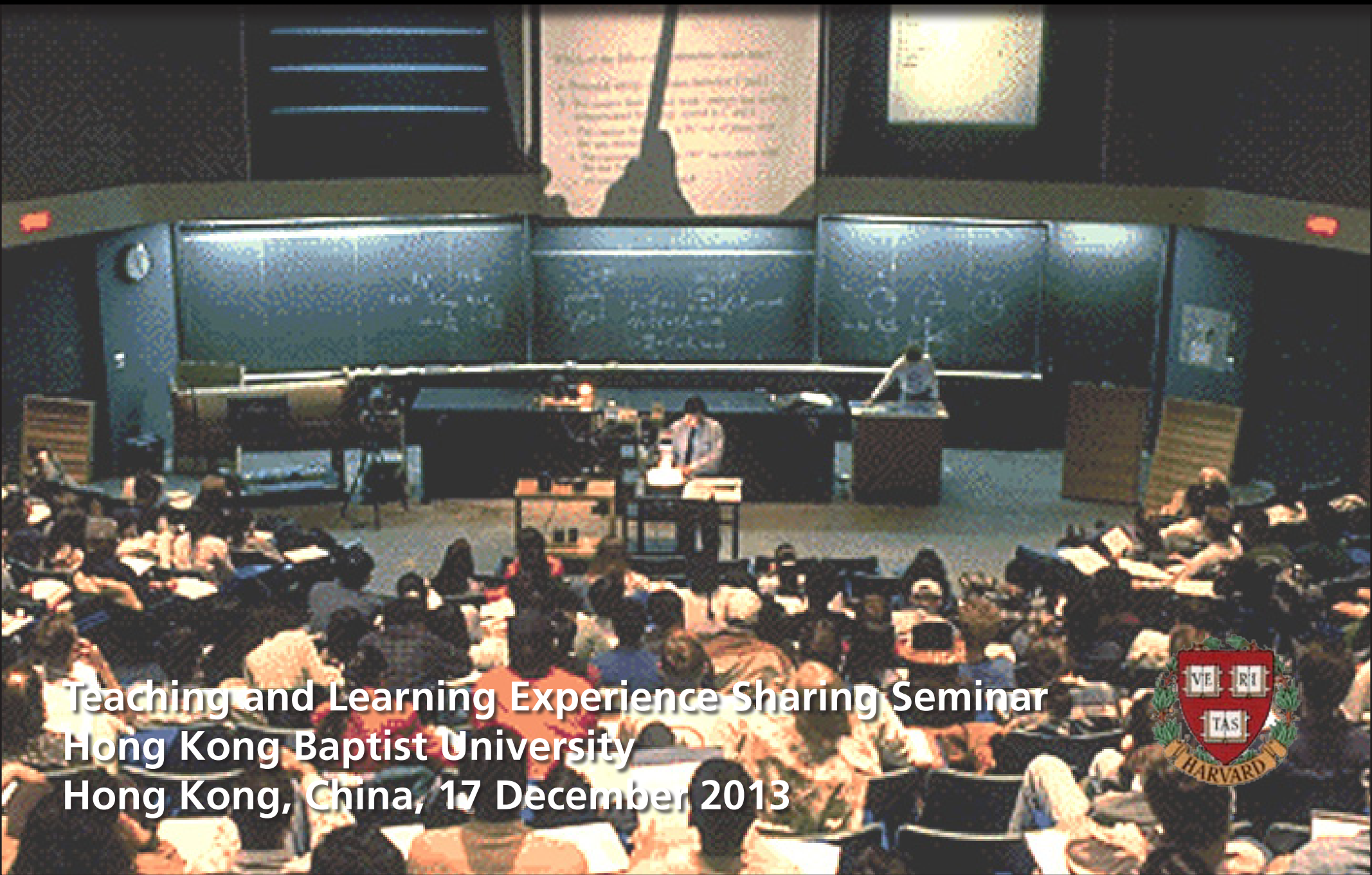


Engaging Students One-on-one, All at Once (Part I)



Teaching and Learning Experience Sharing Seminar
Hong Kong Baptist University
Hong Kong, China, 17 December 2013



Engaging Students One-on-one, All at Once (Part I)



@eric_mazur

Teaching and Learning Experience Sharing Seminar
Hong Kong Baptist University
Hong Kong, China, 17 December 2013



Think of something you are good at

EDUCACION

Think of something you are good at

***How* did you become good at this?**









1 education

2 PI


3 test



1 education

2 PI

3 test

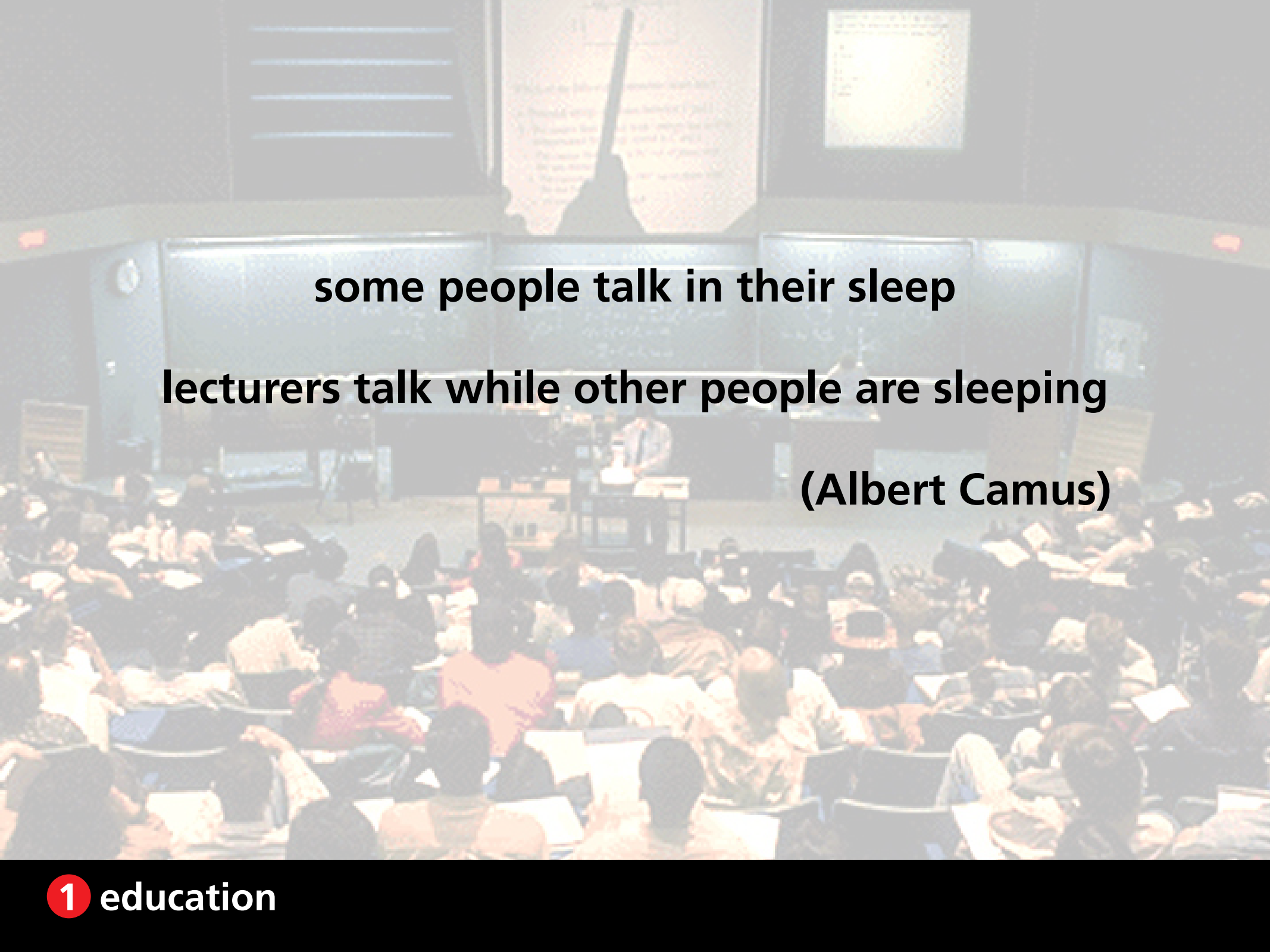


**What happens
in a lecture?**



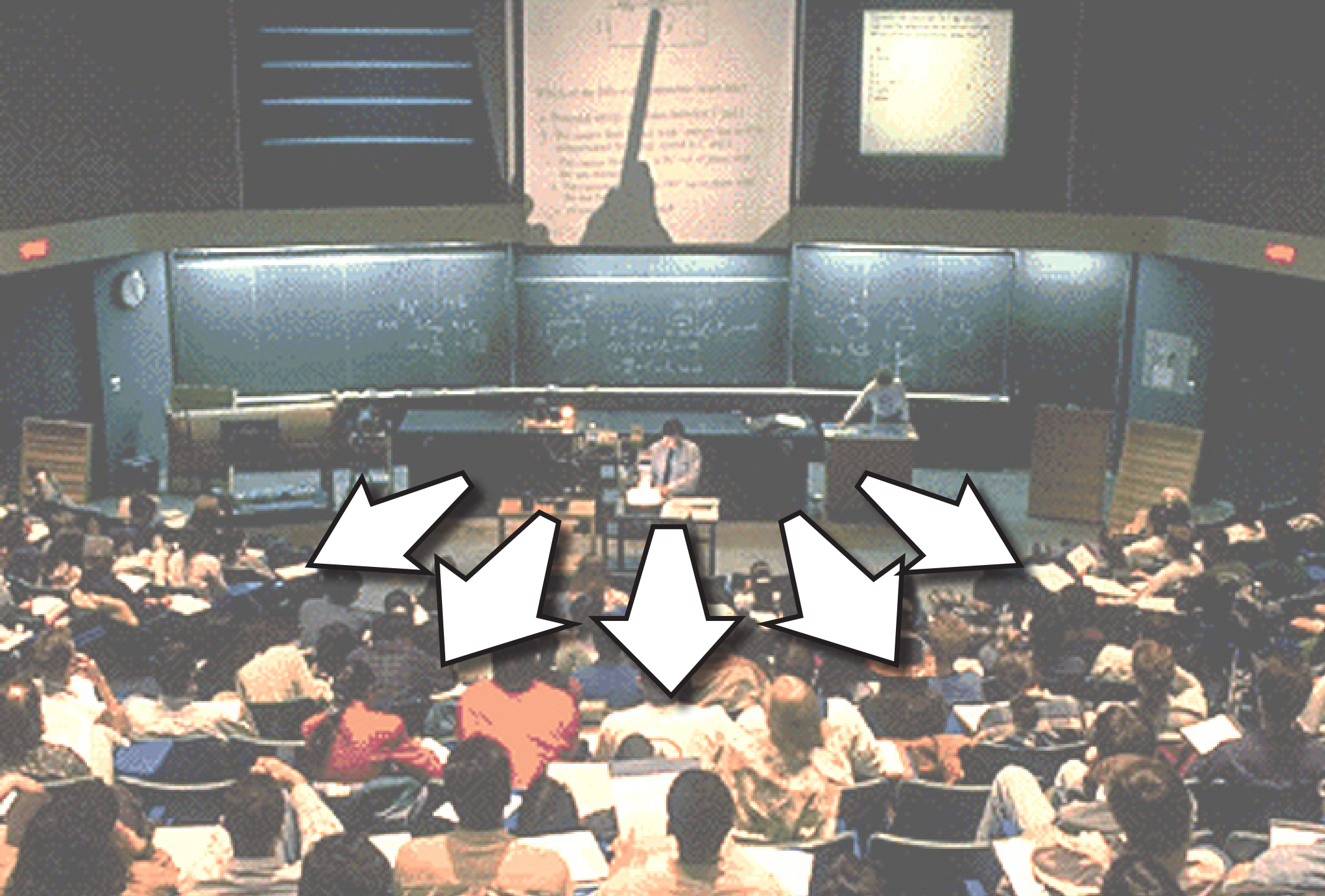
A wide-angle photograph of a large lecture hall. The room is filled with students seated in rows of chairs. Many students appear to be asleep, with their heads resting on their desks or hands. At the front of the room, a lecturer is standing near a podium, addressing the class. Behind the lecturer are several large projection screens displaying text and diagrams. The room has a high ceiling and a curved front wall.

some people talk in their sleep

A photograph of a large lecture hall filled with students. Many students are sleeping, with their heads resting on their desks or hands. The room has a curved wall with several large screens or whiteboards at the front. A lecturer is visible at a podium in the center of the front. The overall atmosphere is one of a lecture where many students are not paying attention.

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

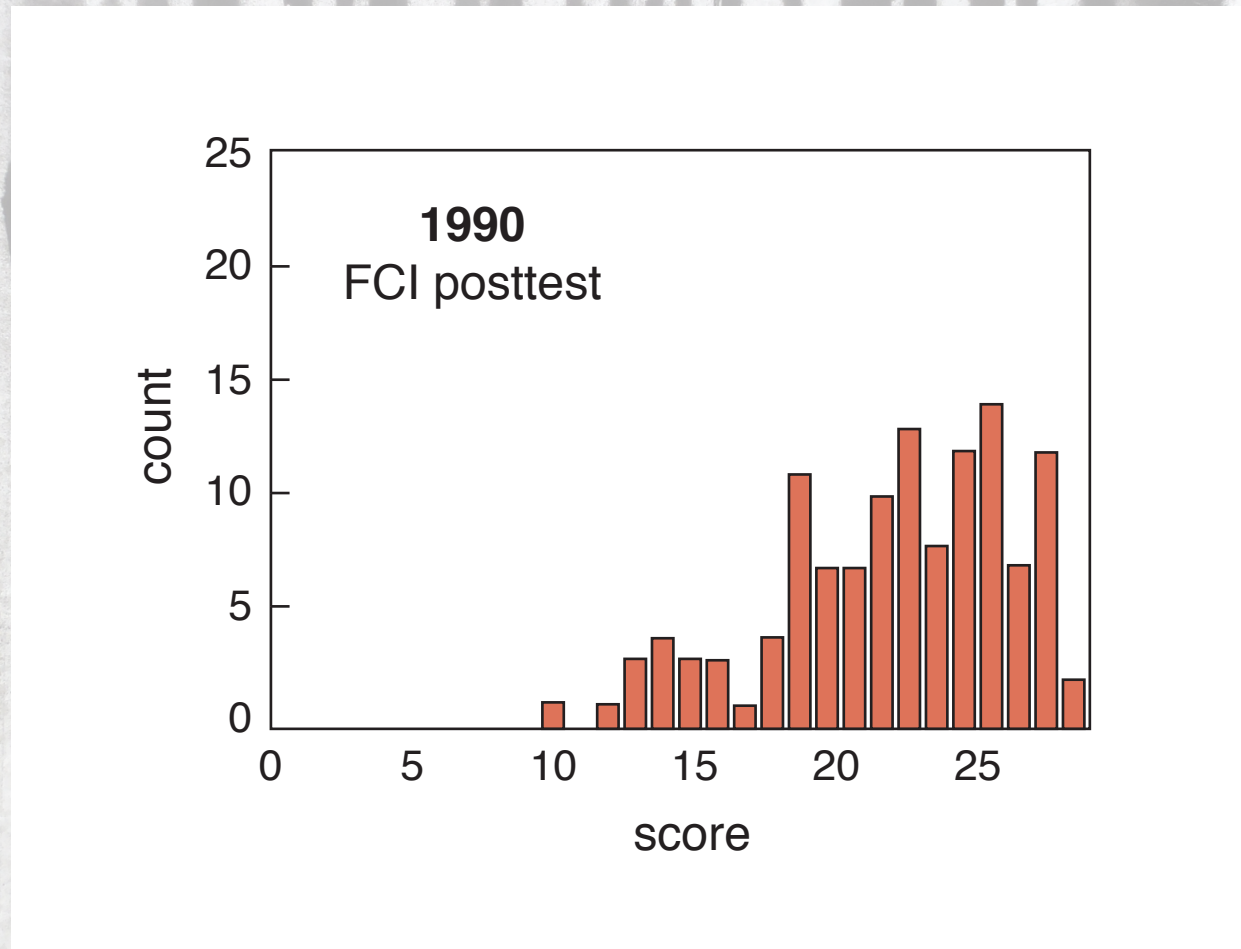




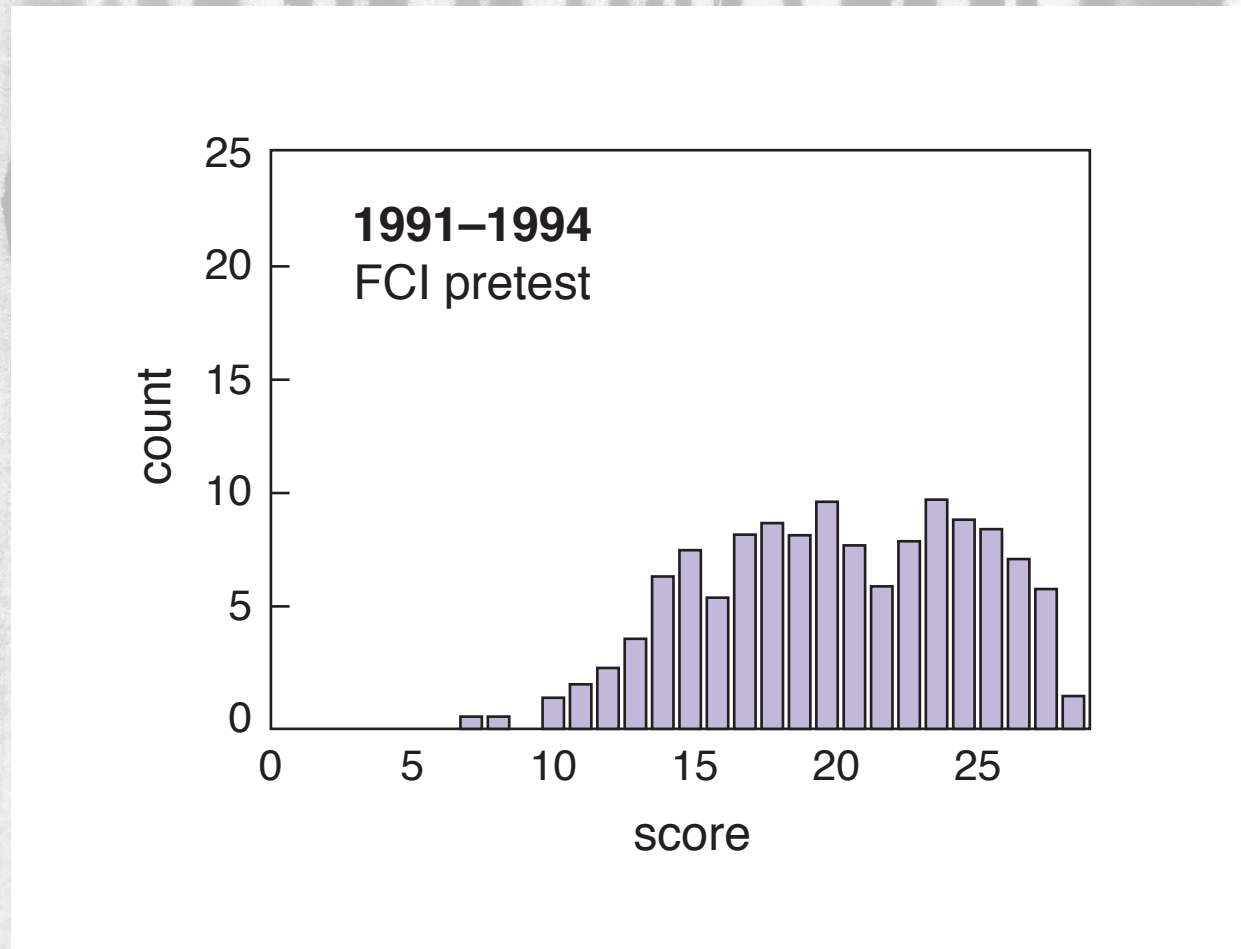
The result?

EDUCACION

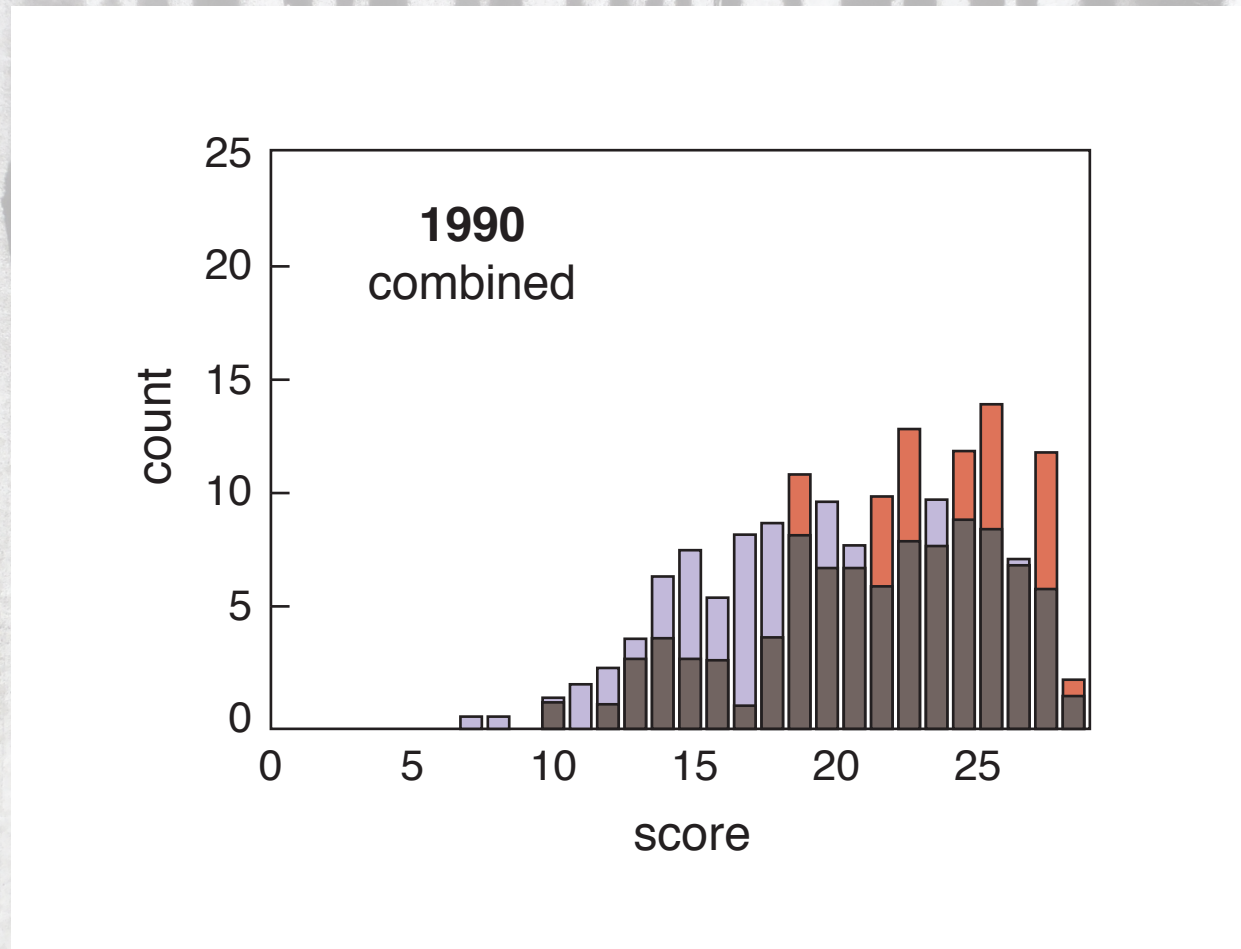
education is not just information transfer

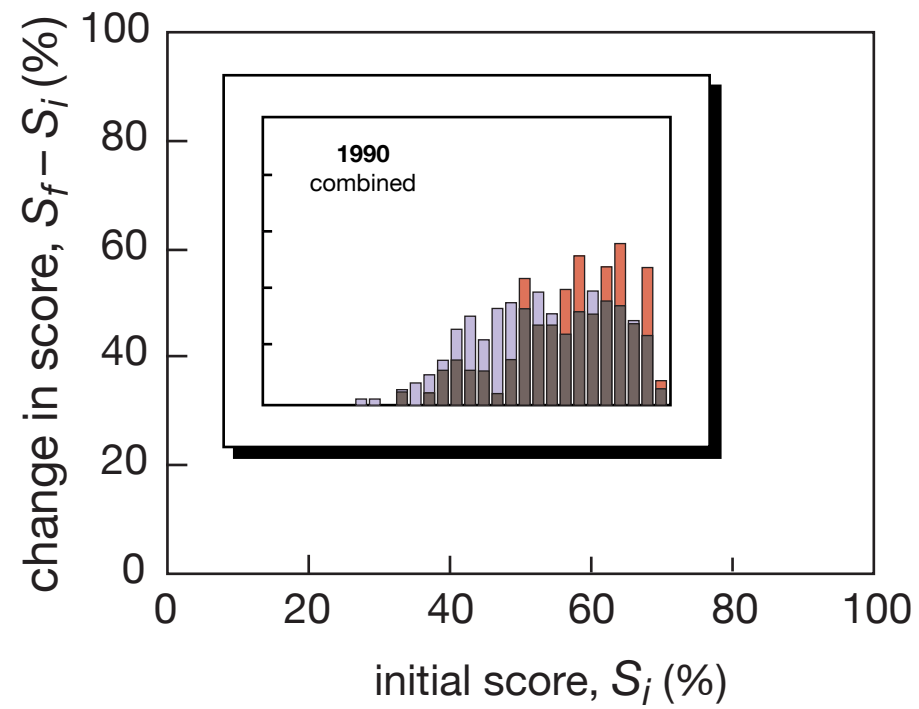


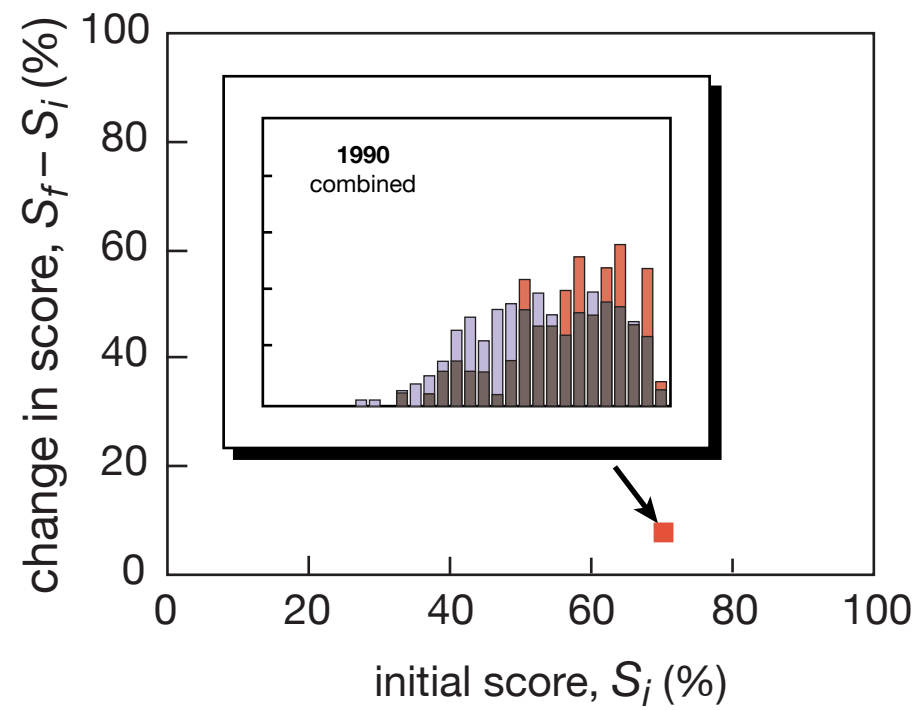
education is not just information transfer

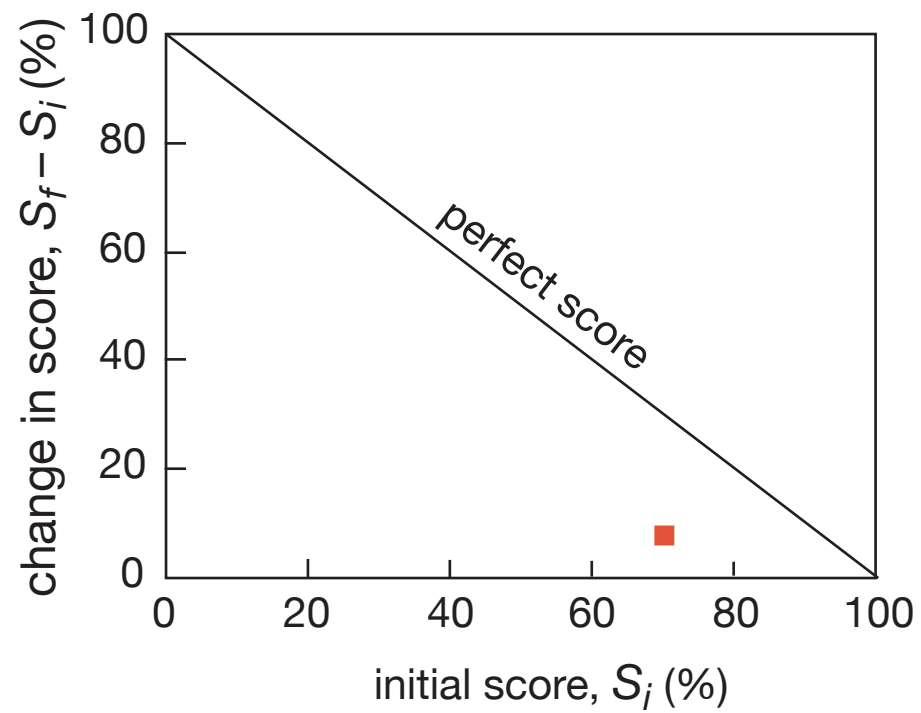


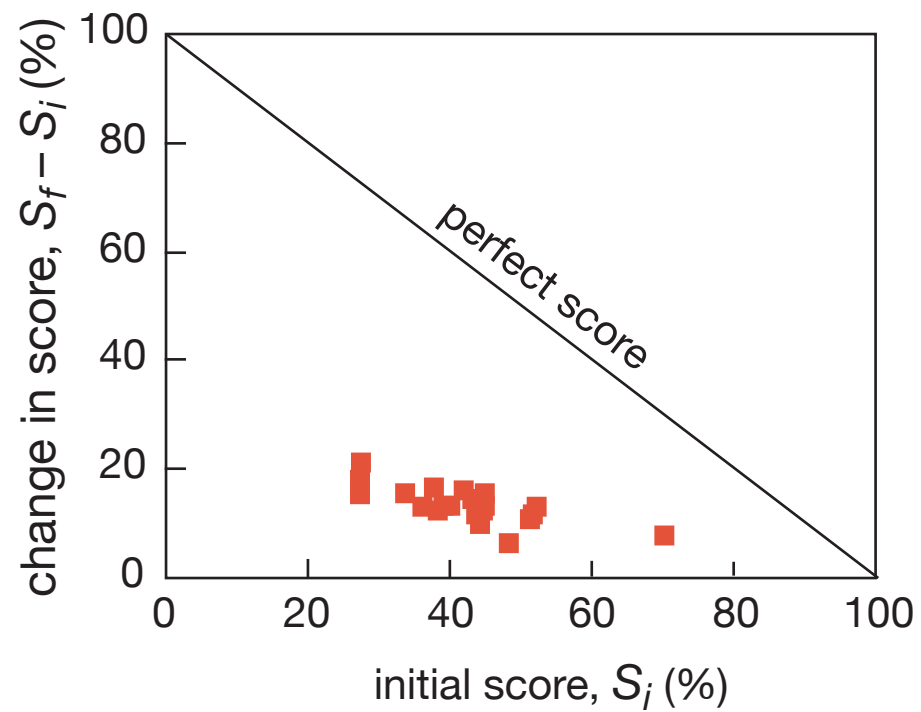
education is not just information transfer





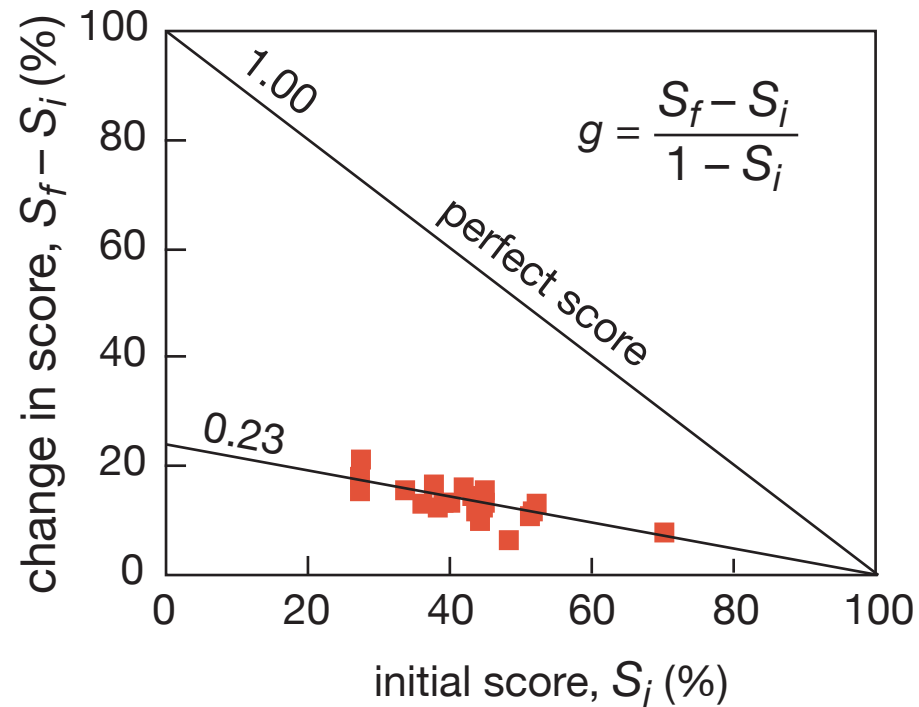






R.R. Hake, *Am. J. Phys.* 66, 64 (1998)

only one quarter of maximum gain realized



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

not transfer but assimilation of information is key





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)

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





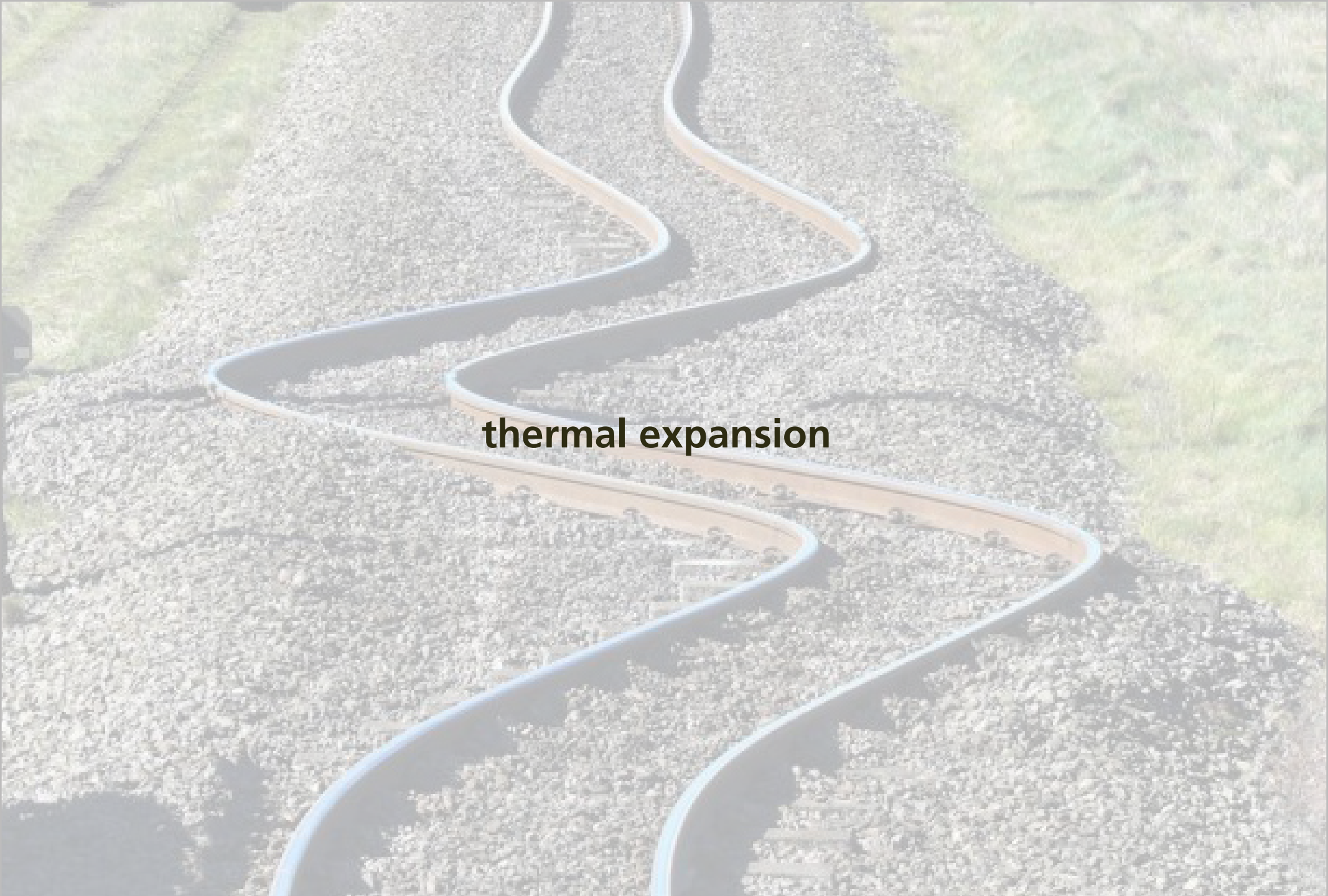
1 education

2 PI

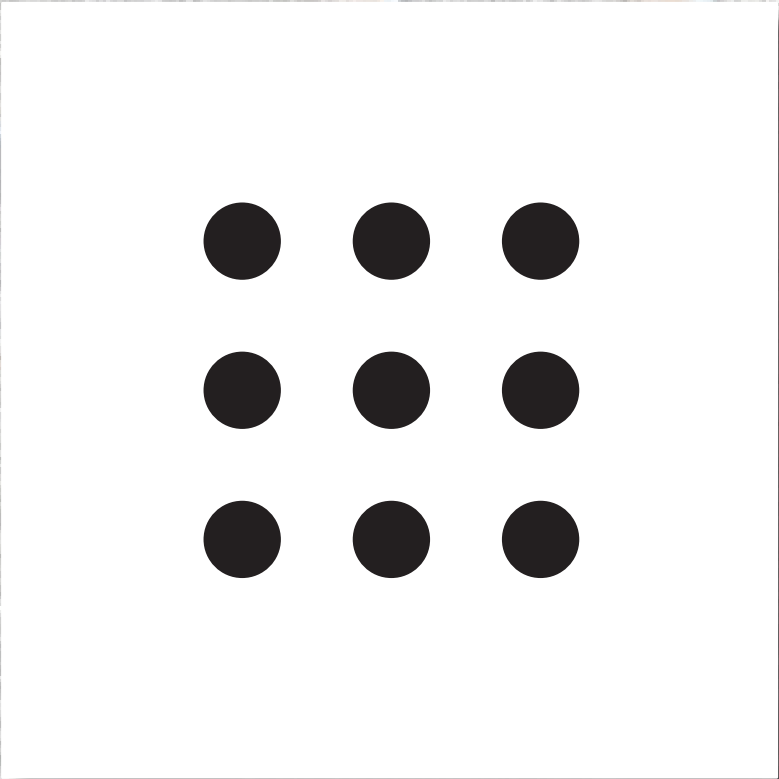


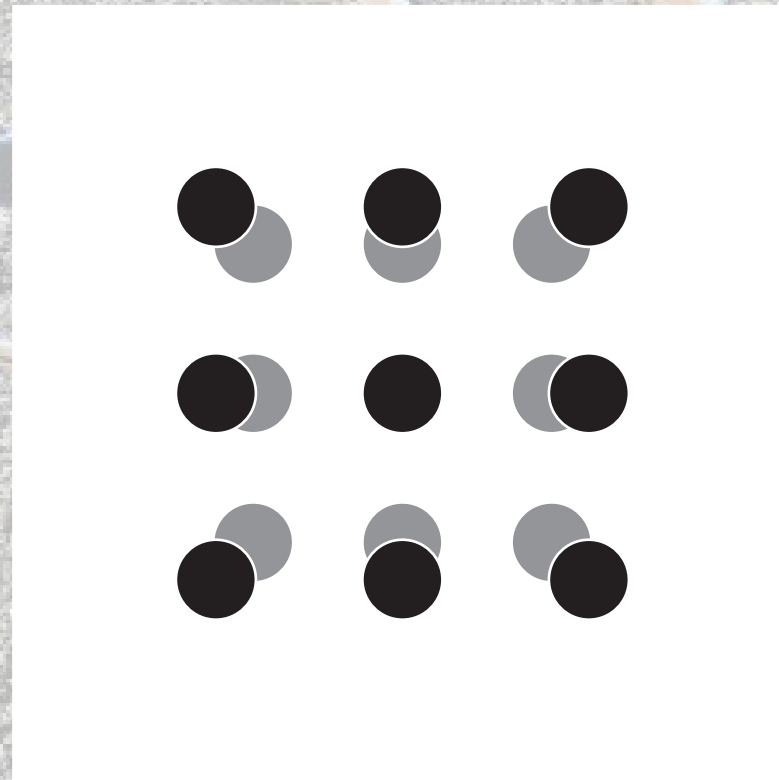
1 education

2 PI

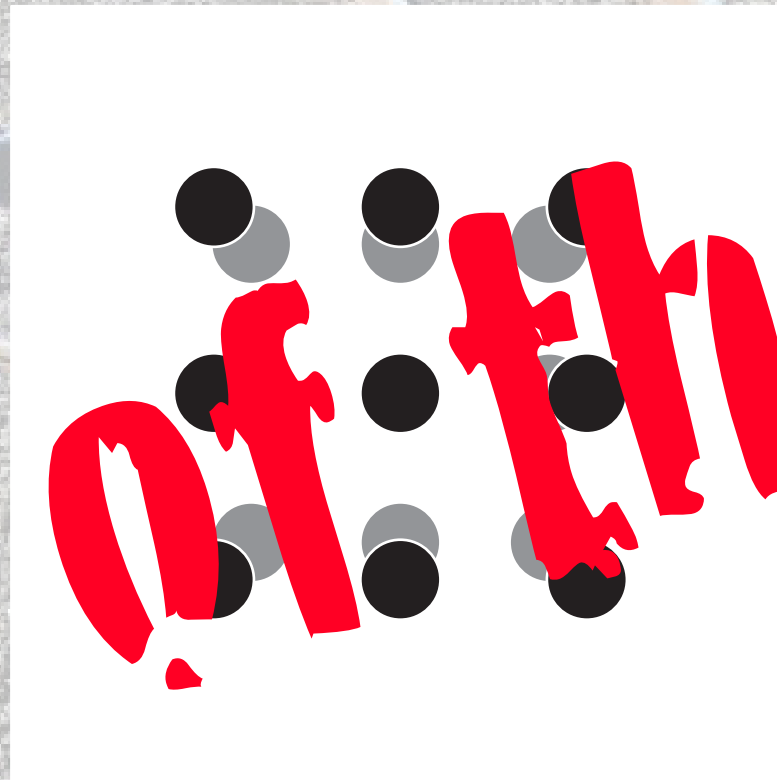
An aerial photograph of a railway track. The track is composed of two parallel rails, which are slightly wavy or curved. The track is laid on a bed of dark gravel. The surrounding area is green grass. The text "thermal expansion" is overlaid in the center of the image.

thermal expansion





all of them



1 education

2 PI

**Consider a rectangular metal plate
with a circular hole in it.**



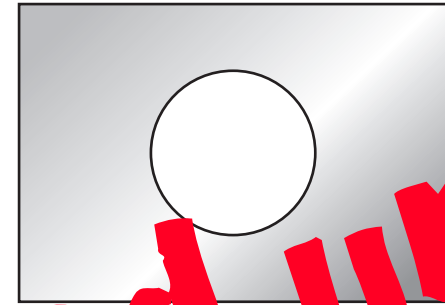
Consider a rectangular metal plate with a circular hole in it.



When the plate is uniformly heated, the diameter of the hole

- 1. increases.**
- 2. stays the same.**
- 3. decreases.**

Consider a rectangular metal plate with a circular hole in it.



When the plate is uniformly heated, the diameter of the hole

1. increases.
2. stays the same.
3. decreases.

you got all fired up!

Consider a rectangular metal plate with a circular hole in it.



When the plate is uniformly heated, the diameter of the hole

- 1. increases.**
- 2. stays the same.**
- 3. decreases.**

Before I tell you the answer...

Before I tell you the answer, let's analyze what happened.

Before I tell you the answer, let's analyze what happened.

You...

Before I tell you the answer, let's analyze what happened.

You...

1. made a commitment

Before I tell you the answer, let's analyze what happened.

You...

- 1. made a commitment**
- 2. externalized your answer**

Before I tell you the answer, let's analyze what happened.

You...

- 1. made a commitment**
- 2. externalized your answer**
- 3. moved from the answer/fact to reasoning**

Before I tell you the answer, let's analyze what happened.

You...

- 1. made a commitment**
- 2. externalized your answer**
- 3. moved from the answer/fact to reasoning**
- 4. became emotionally invested in the learning process**

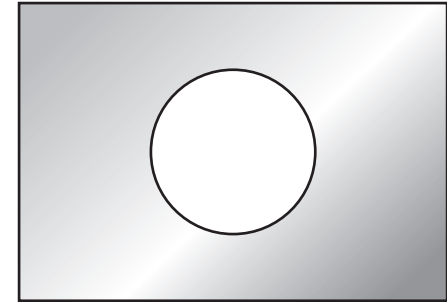
Consider a rectangular metal plate with a circular hole in it.



When the plate is uniformly heated, the diameter of the hole

- 1. increases.**
- 2. stays the same.**
- 3. decreases.**

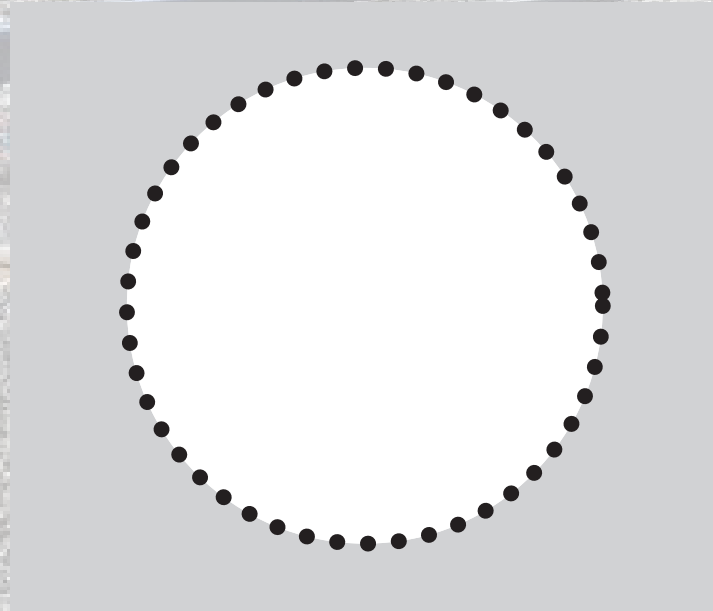
Consider a rectangular metal plate with a circular hole in it.



When the plate is uniformly heated, the diameter of the hole

- 1. increases. ✓**
- 2. stays the same.
- 3. decreases.

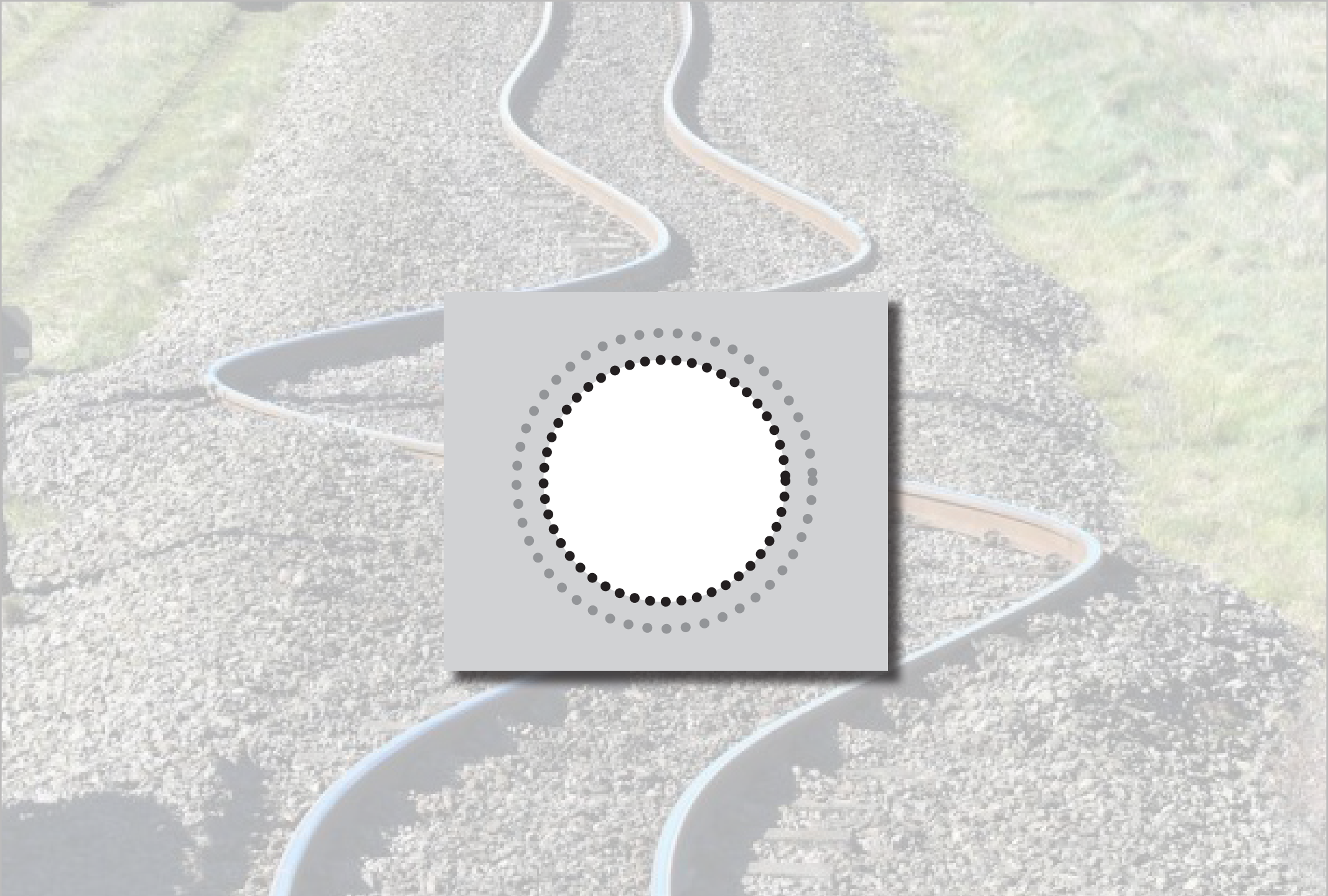
consider atoms at rim of hole



1 education

2 PI

3 test

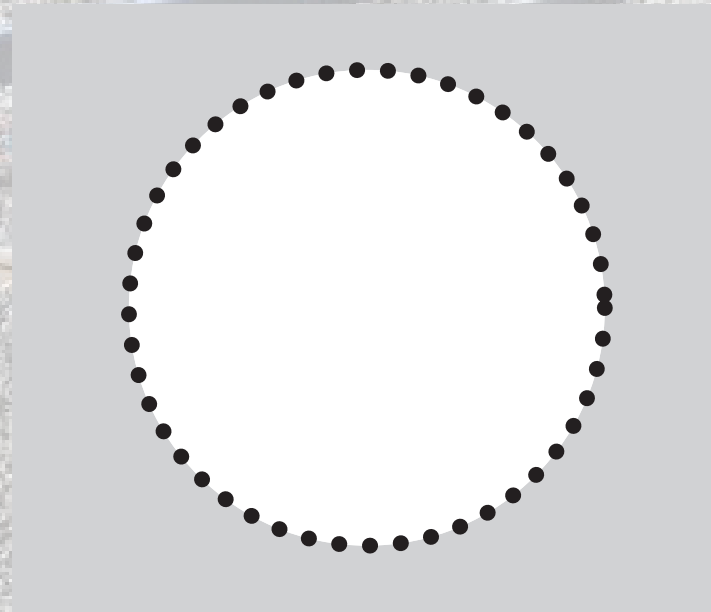


1 education

2 PI

3 test

consider atoms at rim of hole

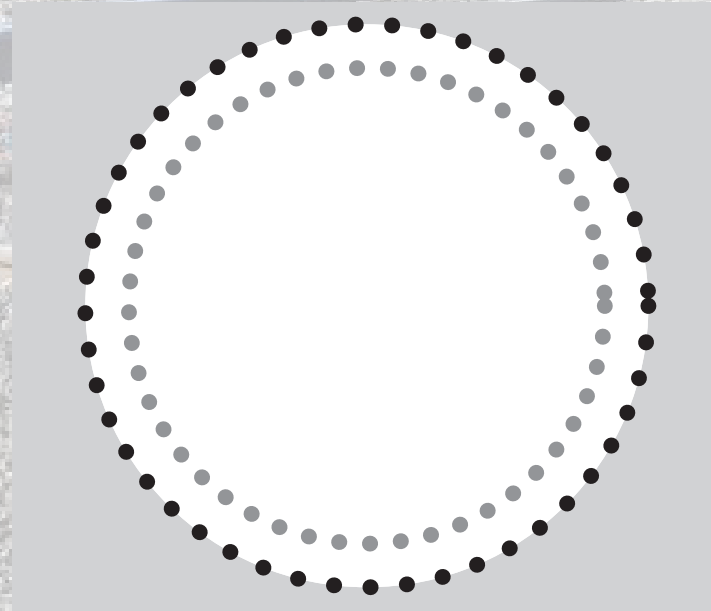


1 education

2 PI

3 test

consider atoms at rim of hole



consider atoms at rim of hole

you won't forget this

1 education

2 PI

3 test

Peer

back to PI

INSTRUCTION

1 education

2 PI

3 test

Peer
Greater learning gains



INSTRUCTION

1 education

2 PI

3 test

The diagram features a large, light blue 'Y' shape on the left side. The word 'Peer' is written in large, white, sans-serif font, with the 'P' partially obscured by the 'Y'. Below 'Peer', the word 'INSTRUCTION' is written in a smaller, white, sans-serif font. Two red, bold, sans-serif phrases are overlaid on the diagram: 'Greater learning gains' is positioned above 'Better retention'. A dashed yellow line with arrowheads at both ends forms a loop around the word 'Peer'. A dotted blue line with arrowheads at both ends forms a loop around the word 'INSTRUCTION'.

Greater learning gains

Better retention

1 education

2 PI

3 test



1 education

2 PI

3 test

in a lecture, students...

1 education

2 PI

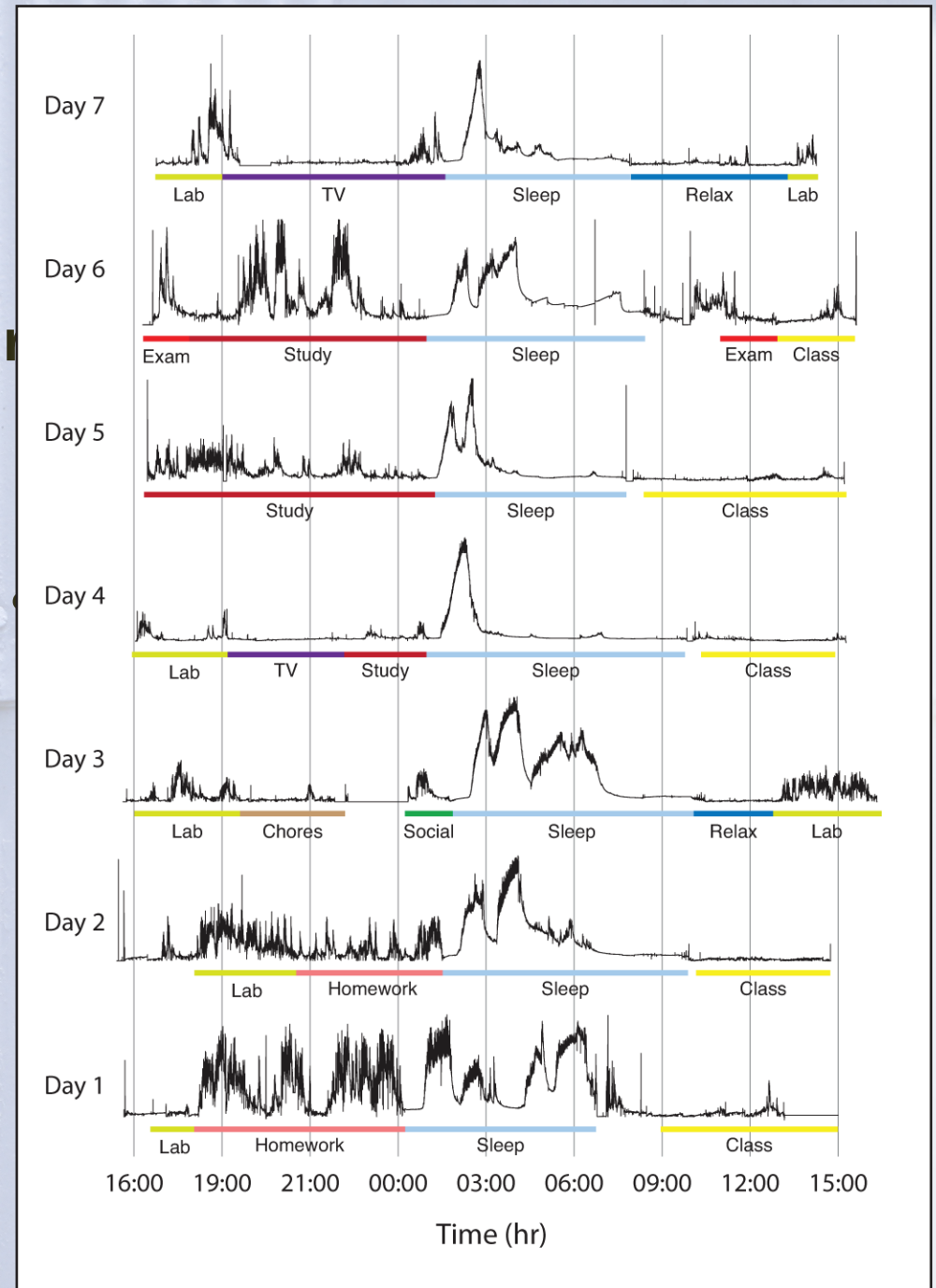
3 test

in a lecture, students...

1. don't pay utmost attention

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

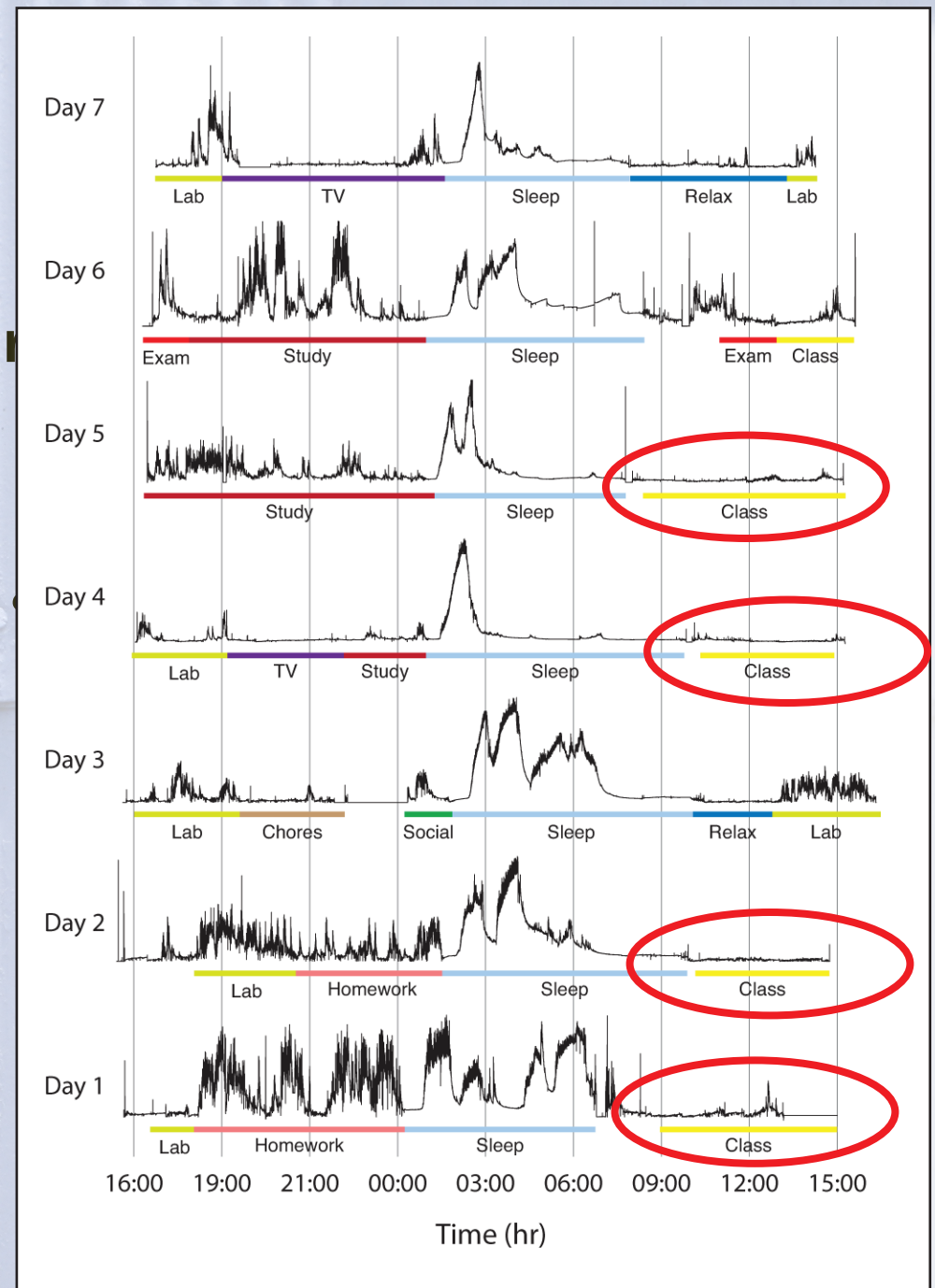
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

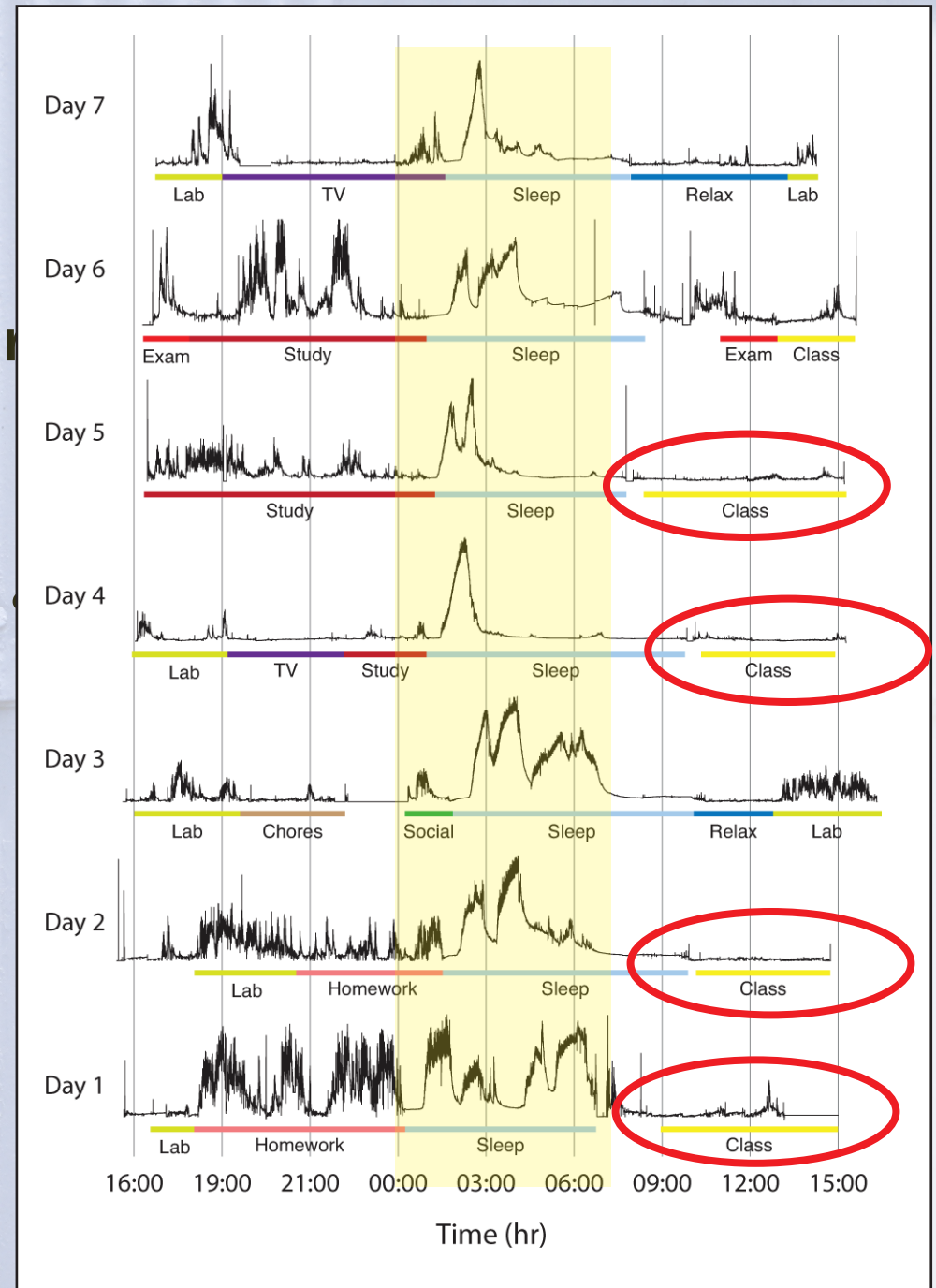
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

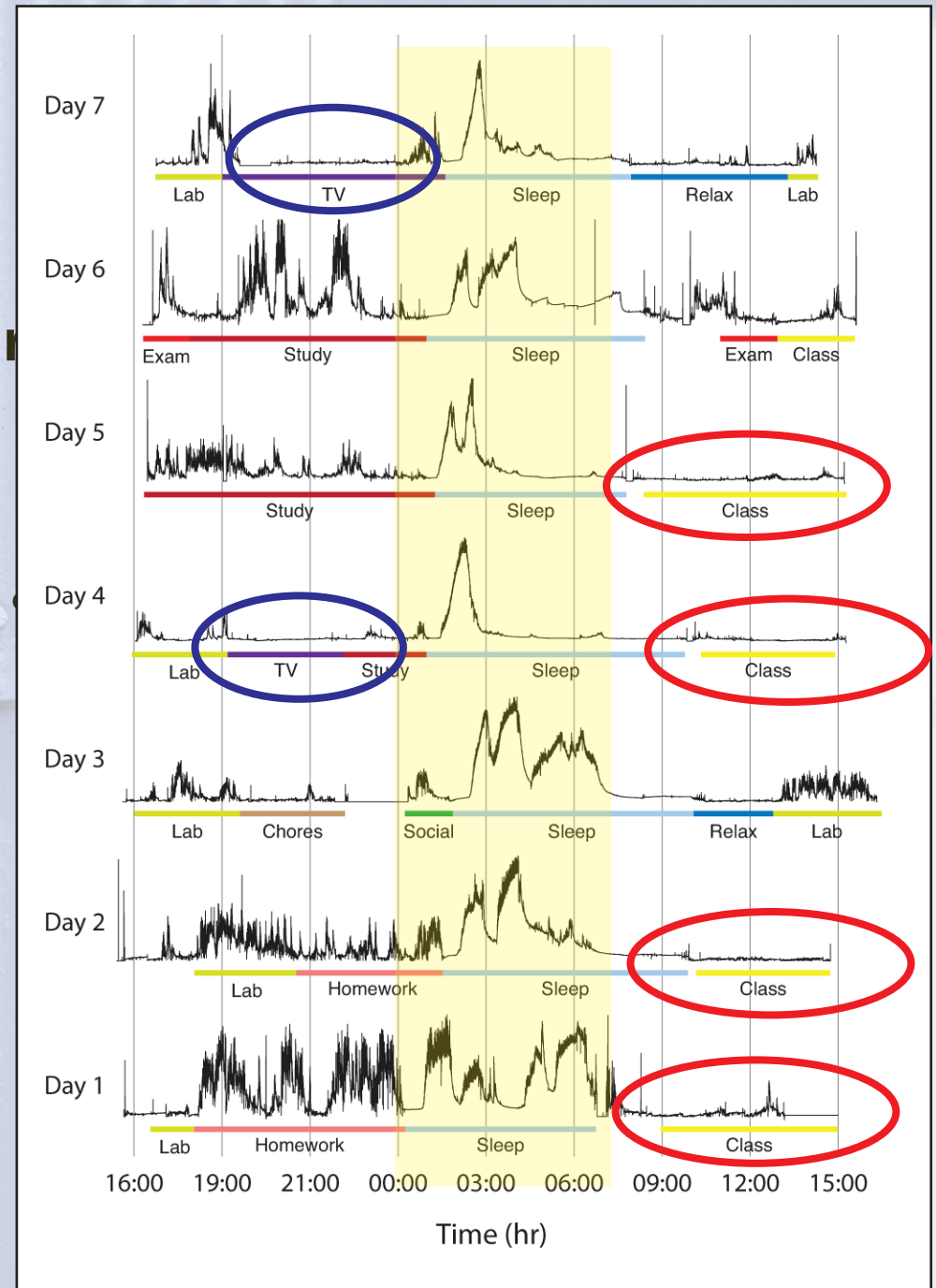
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

1 education

2 PI

3 test

in a lecture, students...

1. don't pay utmost attention

2. think they know it



<http://www.babble.com>

1 education

2 PI

3 test

2 short video lectures on calico cats, same content

doi: 10.3758/s13423-013-0442-z

1 education

2 PI

3 test

2 short video lectures on calico cats, same content

fluent video



speaks fluidly w/o notes

upright

maintains eye contact

doi: 10.3758/s13423-013-0442-z

1 education

2 PI

3 test

2 short video lectures on calico cats, same content

fluent video



**speaks fluidly w/o notes
upright
maintains eye contact**

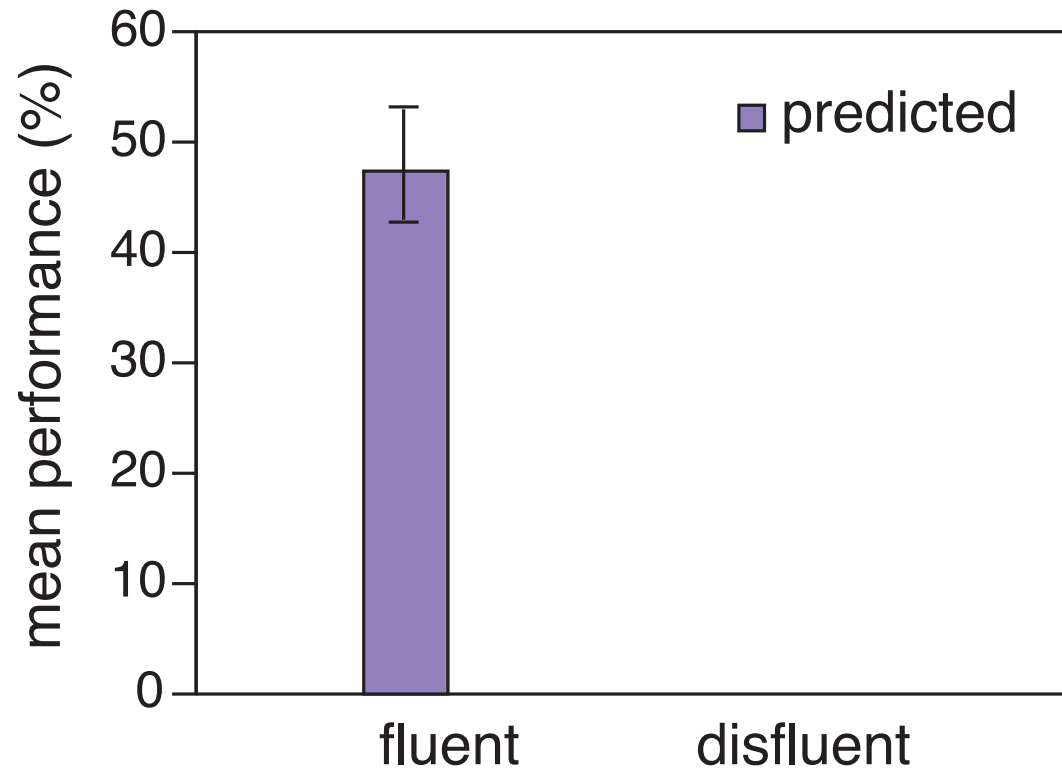
disfluent video



**speaks haltingly from notes
slumped
looks away**

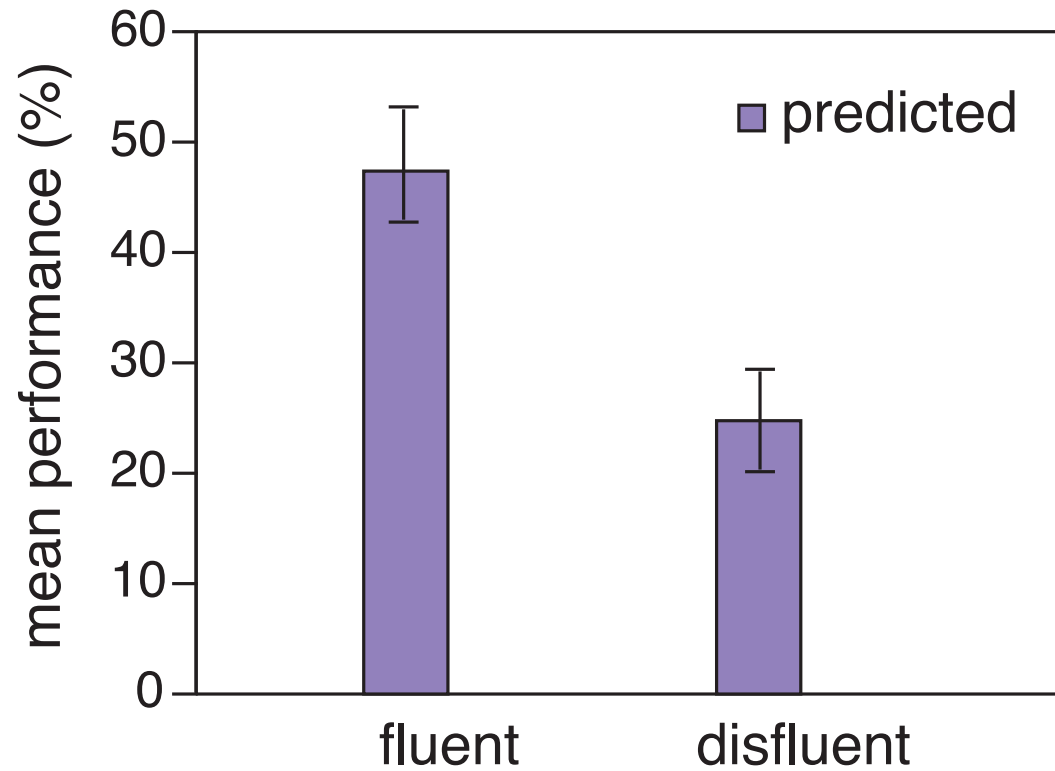
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judgement of learning



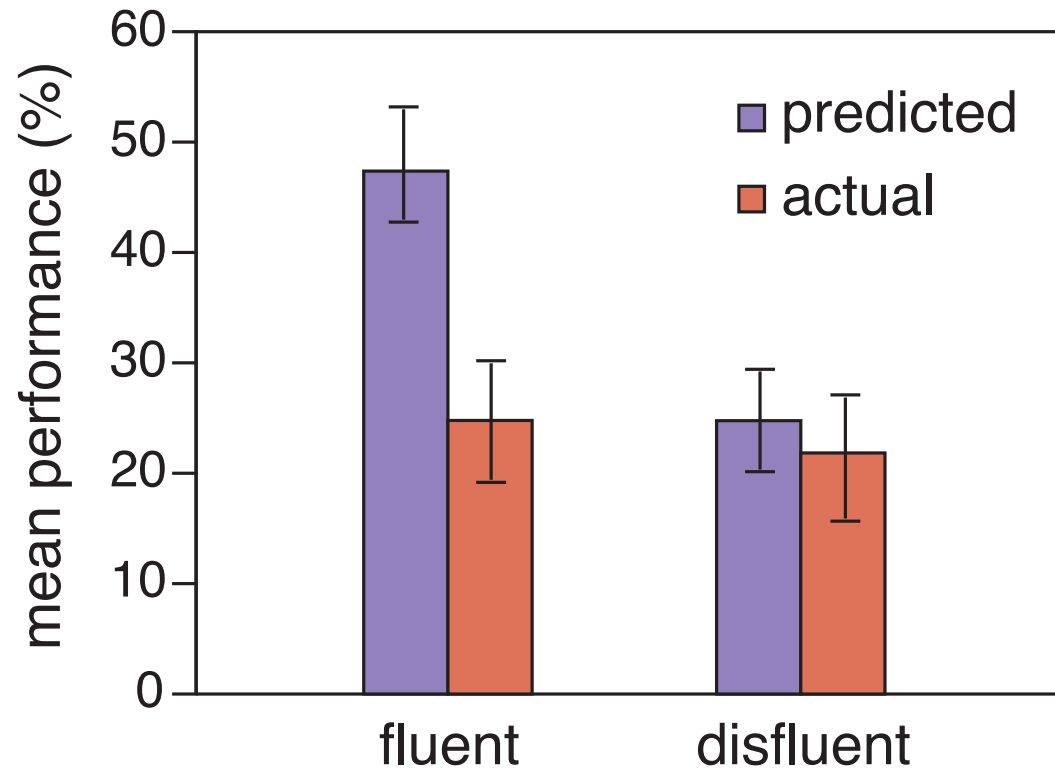
doi: 10.3758/s13423-013-0442-z

judgement of learning



doi: 10.3758/s13423-013-0442-z

judgement of learning



doi: 10.3758/s13423-013-0442-z

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 test

The background is a faded, classical-style painting. It depicts a face, possibly a classical figure, with multiple eyes visible. The face is rendered in a pale, yellowish-tan color, and the eyes are a light blue or grey. The painting is set against a background of vertical stripes in yellow and red. The overall style is reminiscent of a classical portrait, but with a surreal or illusionary twist due to the multiple eyes.

an illusion. . .

1 education

2 PI

3 test



Education is not just about:

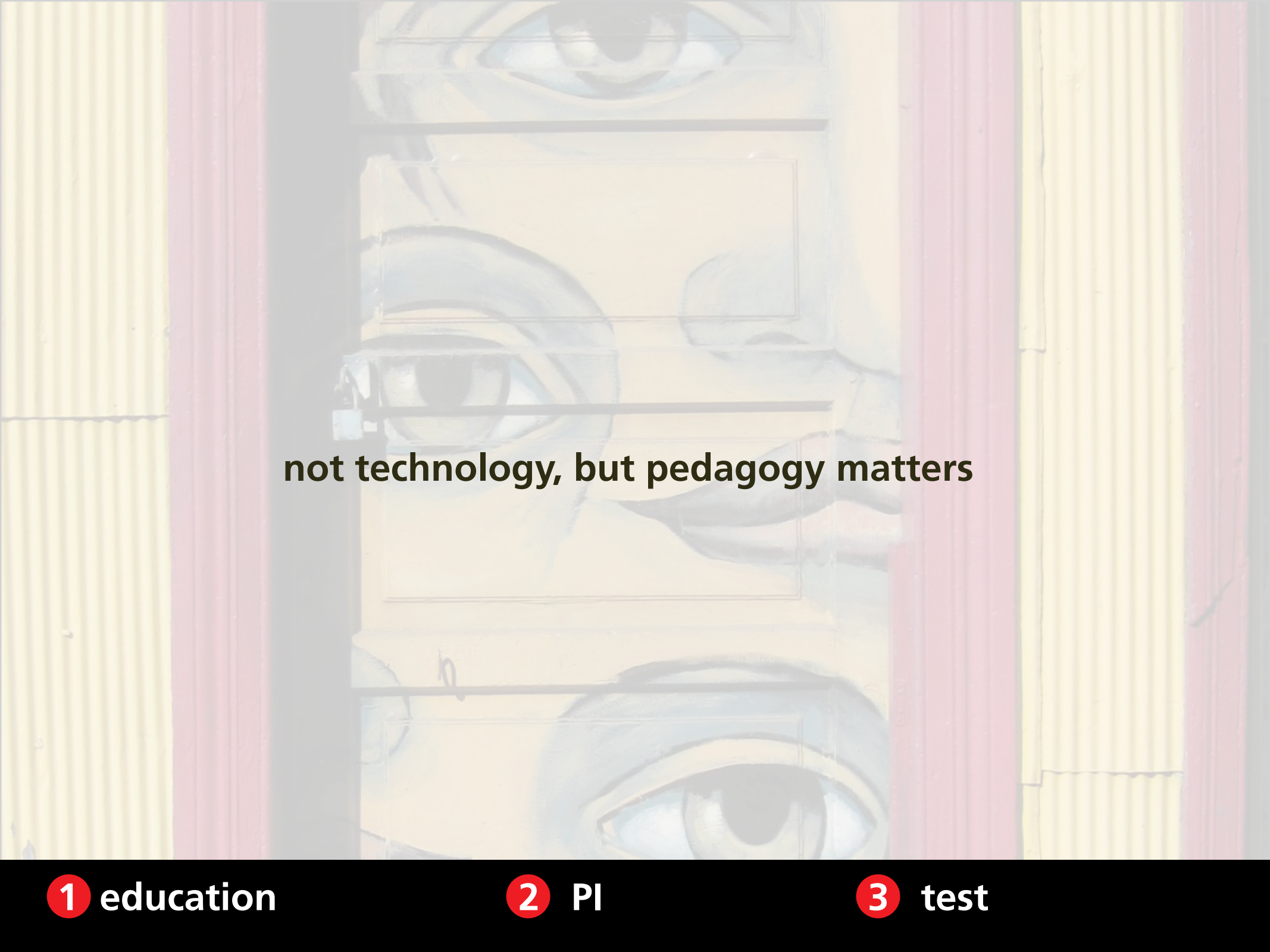
- **transferring information**
- **getting students to do what we do**



Education is not just about:

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

active participation a must!



not technology, but pedagogy matters

1 education

2 PI

3 test



Join now!

PeerInstruction.net

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