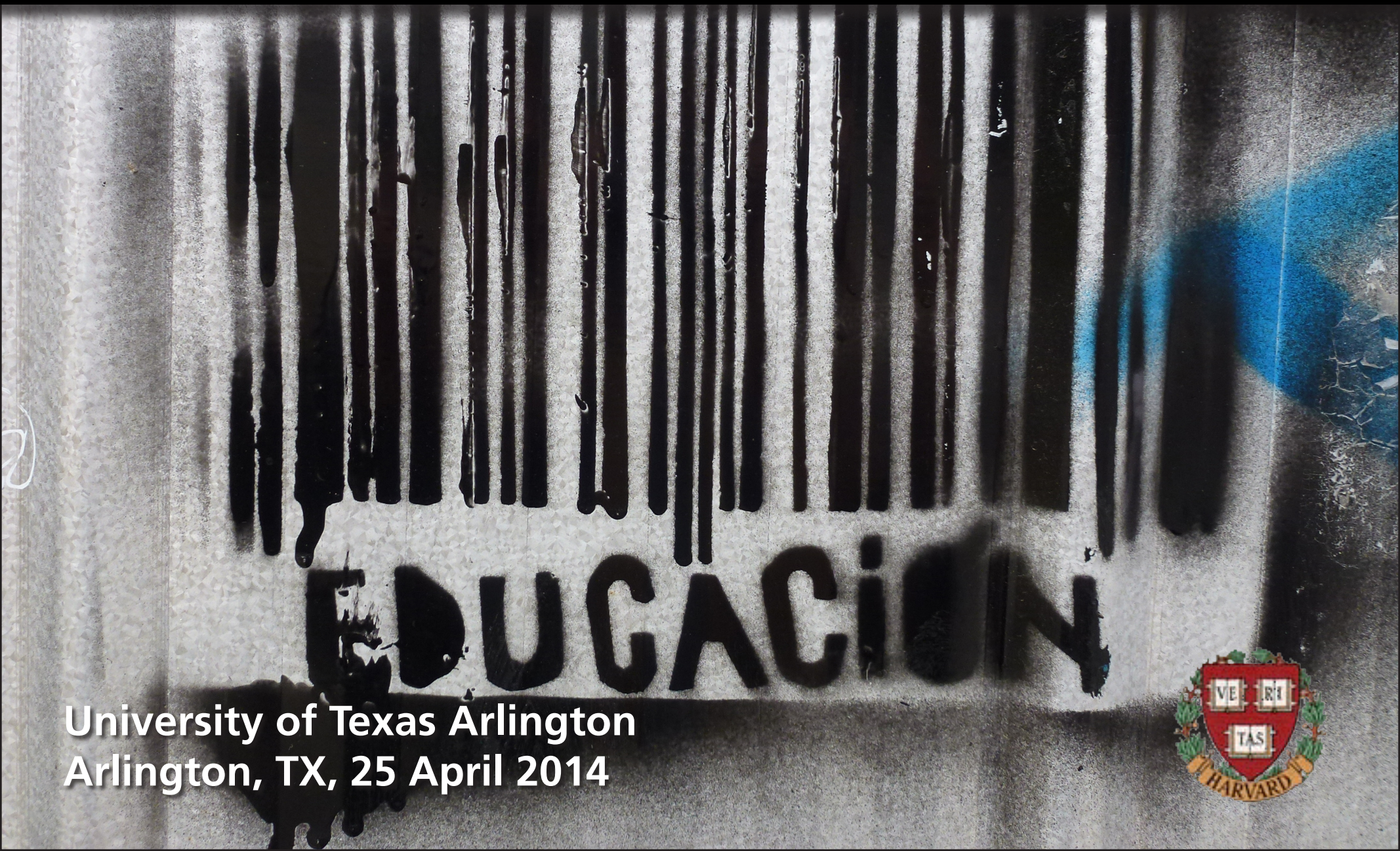


# Confessions of a converted lecturer



University of Texas Arlington  
Arlington, TX, 25 April 2014





# Confessions of a converted lecturer

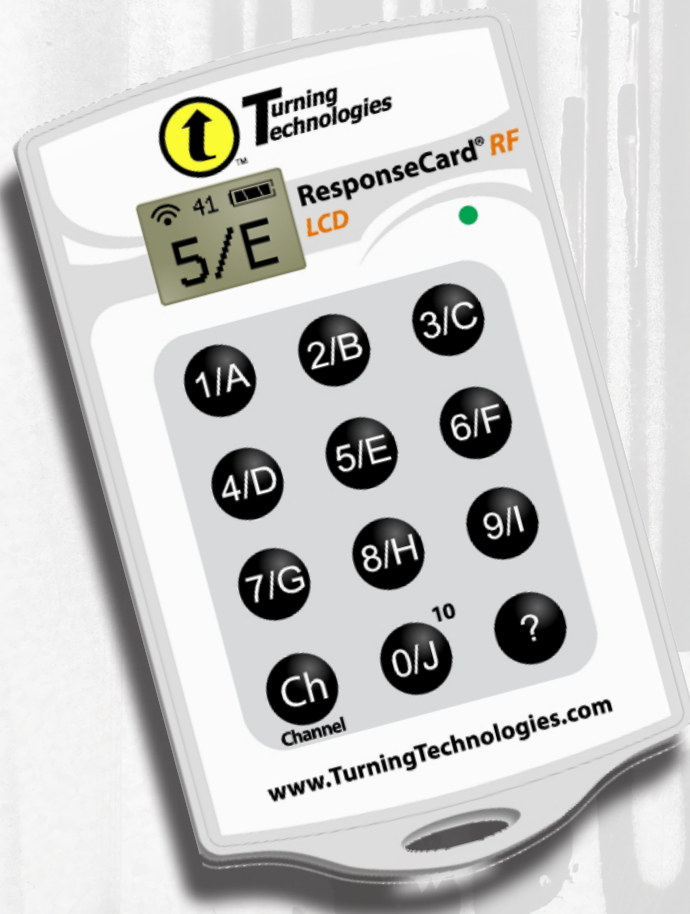


**@eric\_mazur**

University of Texas Arlington  
Arlington, TX, 25 April 2014







- no ON/OFF button
- only last “click” counts
- display shows recorded answer





[www.TurningTechnologies.com](http://www.TurningTechnologies.com)





unique ID on back of clicker



**Think of something you are good at**

**EDUCACION**



**Think of something you are good at**

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



**Became good at it by:**

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



















1 education

2 PI

3 test






1 education

2 PI

3 test





**What happens  
in a lecture?**



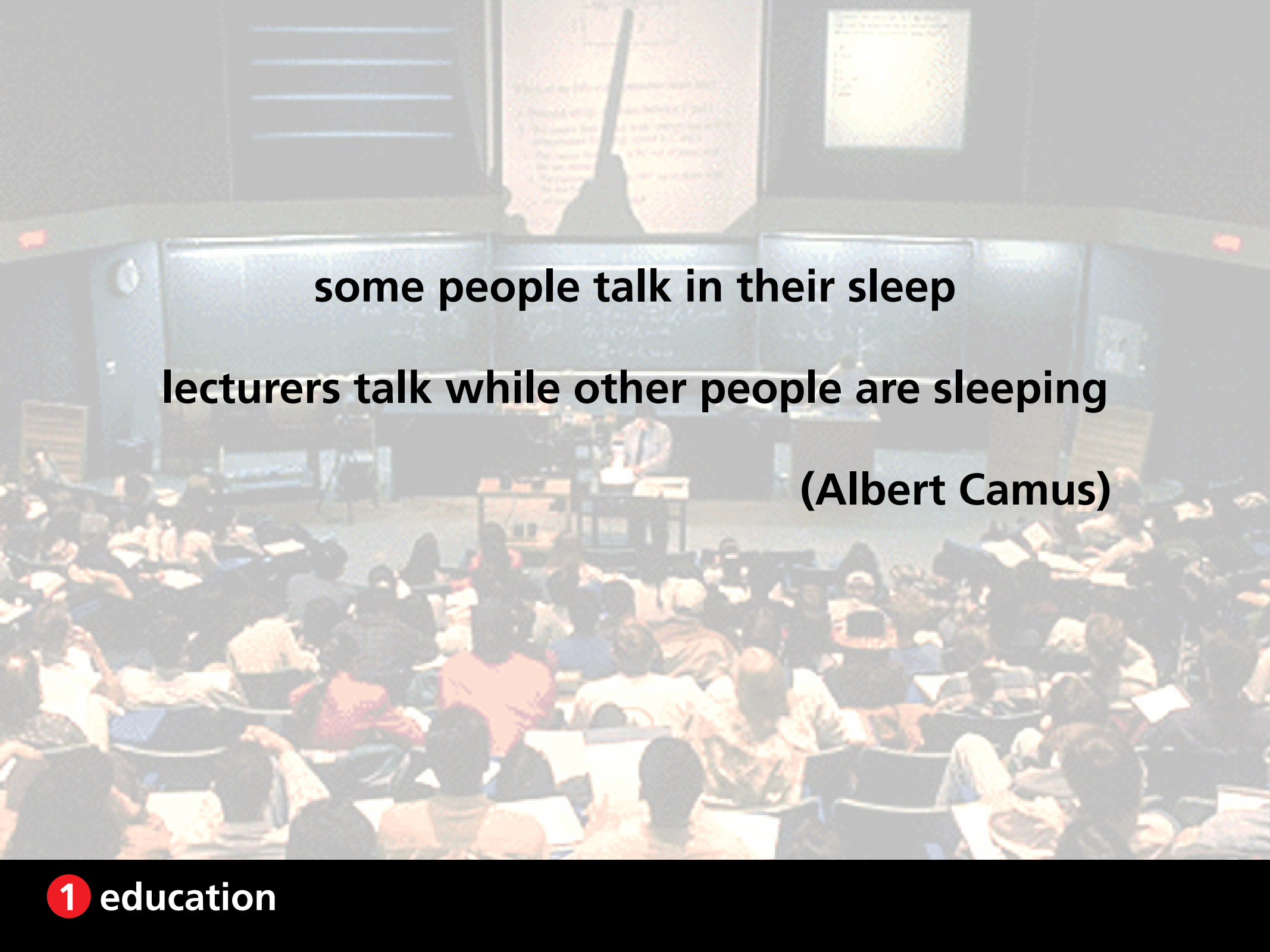




A wide-angle photograph of a large lecture hall. In the foreground, many students are seated at desks, many of whom appear to be sleeping or resting their heads on their desks. The room is filled with students, and the desks are arranged in rows. At the front of the hall, a lecturer is standing near a podium, addressing the class. Behind the lecturer are several large projection screens displaying text and diagrams. The room has a curved ceiling and walls, and the overall atmosphere is one of a large-scale educational setting.

**some people talk in their sleep**



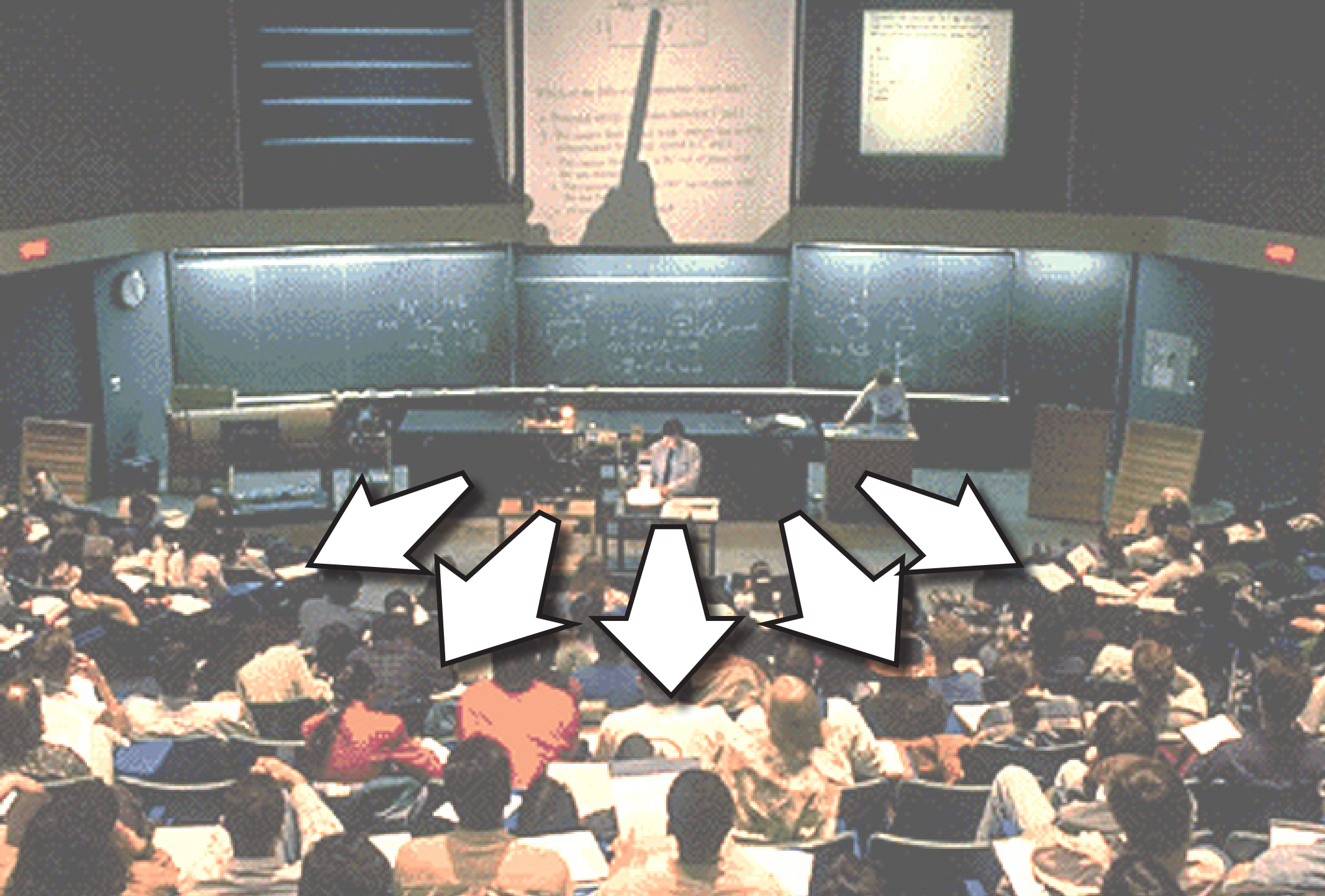
A large lecture hall filled with students. In the foreground, many students are sleeping with their heads down. In the background, a lecturer is standing at a podium, addressing the class. The room has large windows and a curved wall.

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











The result?

EDUCACION



**Lack of learning**

**EDUCACION**



**Lack of learning**

**Lack of retention**



**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

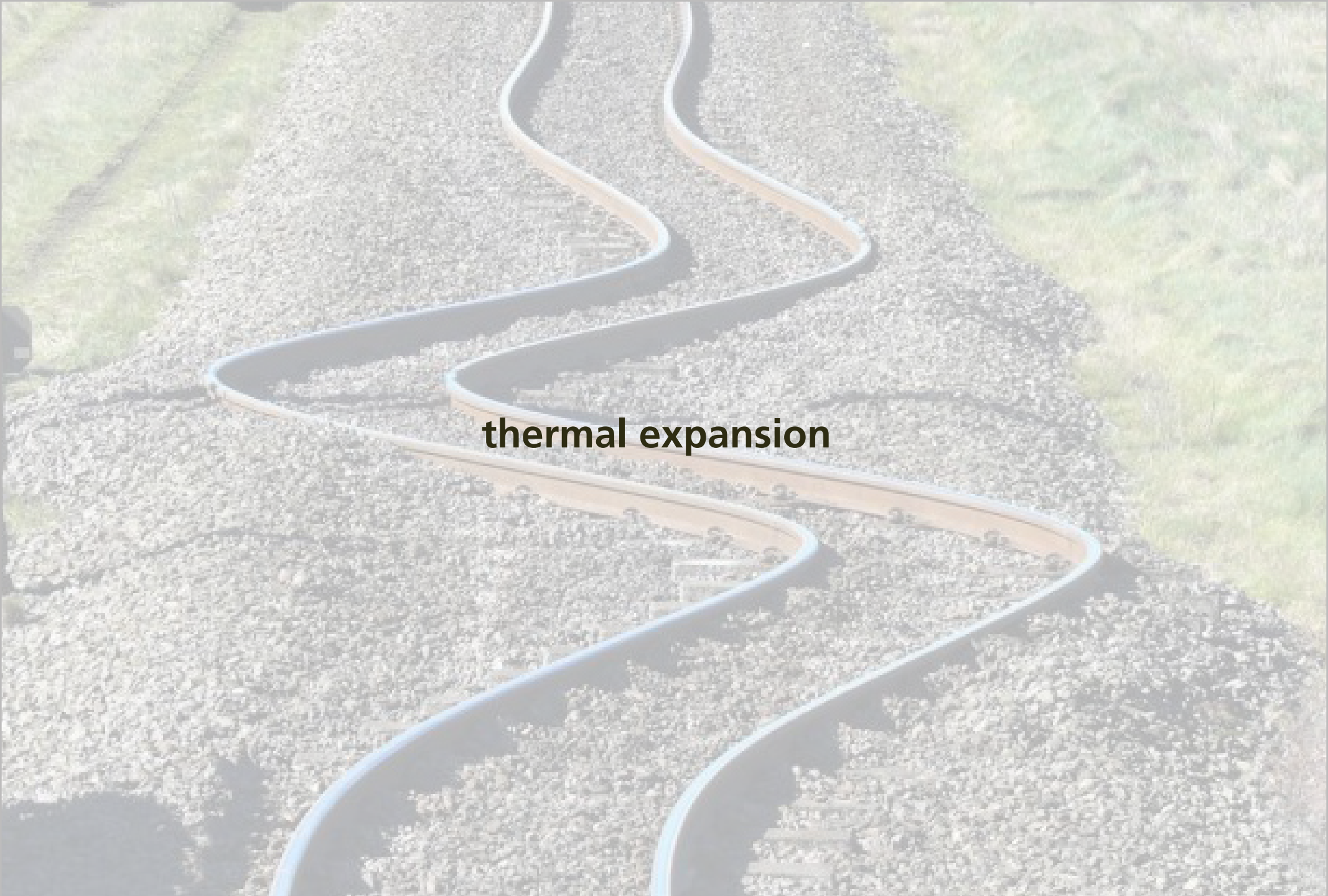
**2** PI



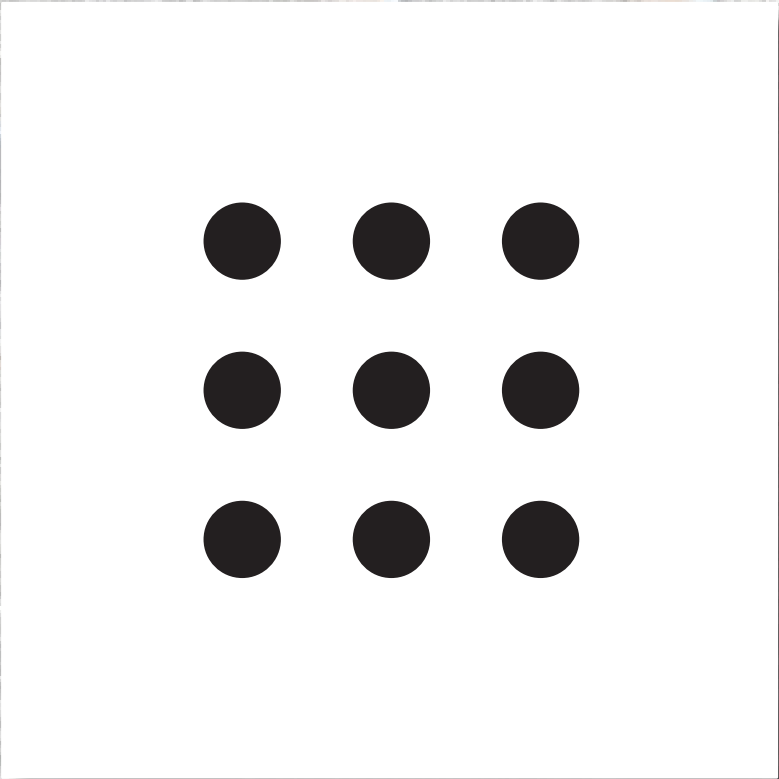
1 education

2 PI

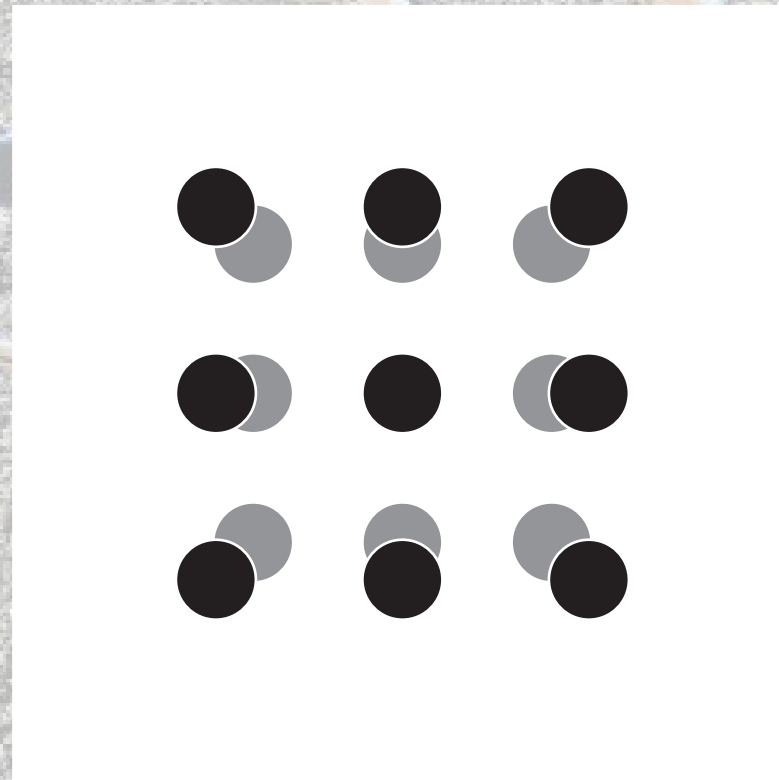


An aerial photograph of a railway track. The track is composed of two parallel rails, one of which is highlighted in a light blue color. The track is laid on a bed of dark grey gravel. The track itself is wavy, curving back and forth across the frame. The surrounding area is covered in green grass. The text "thermal expansion" is written in a bold, black, sans-serif font, centered over the middle of the track.

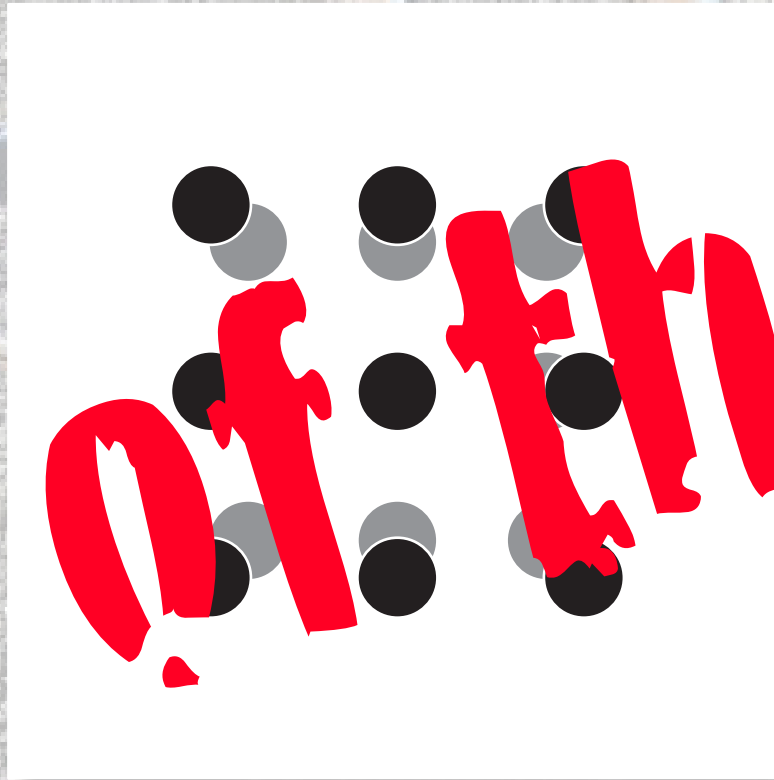
**thermal expansion**







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.**

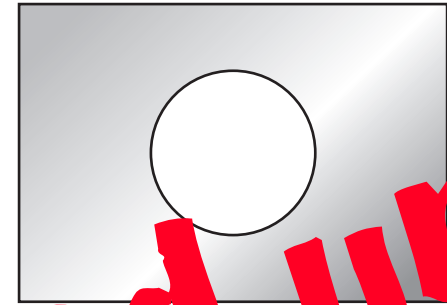


**When the plate is uniformly heated, the diameter of the hole**

- 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...**

**1** education

**2** PI

**3** test

**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.**



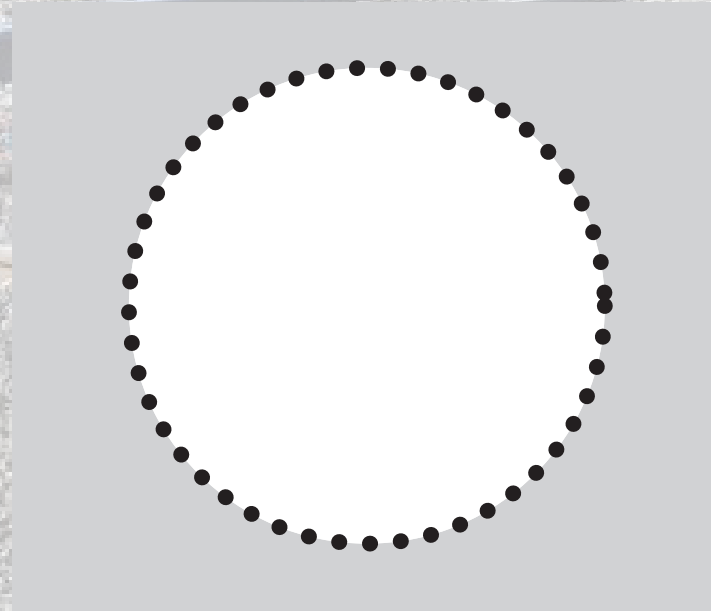
**Consider a rectangular metal plate with a circular hole in it.**



**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

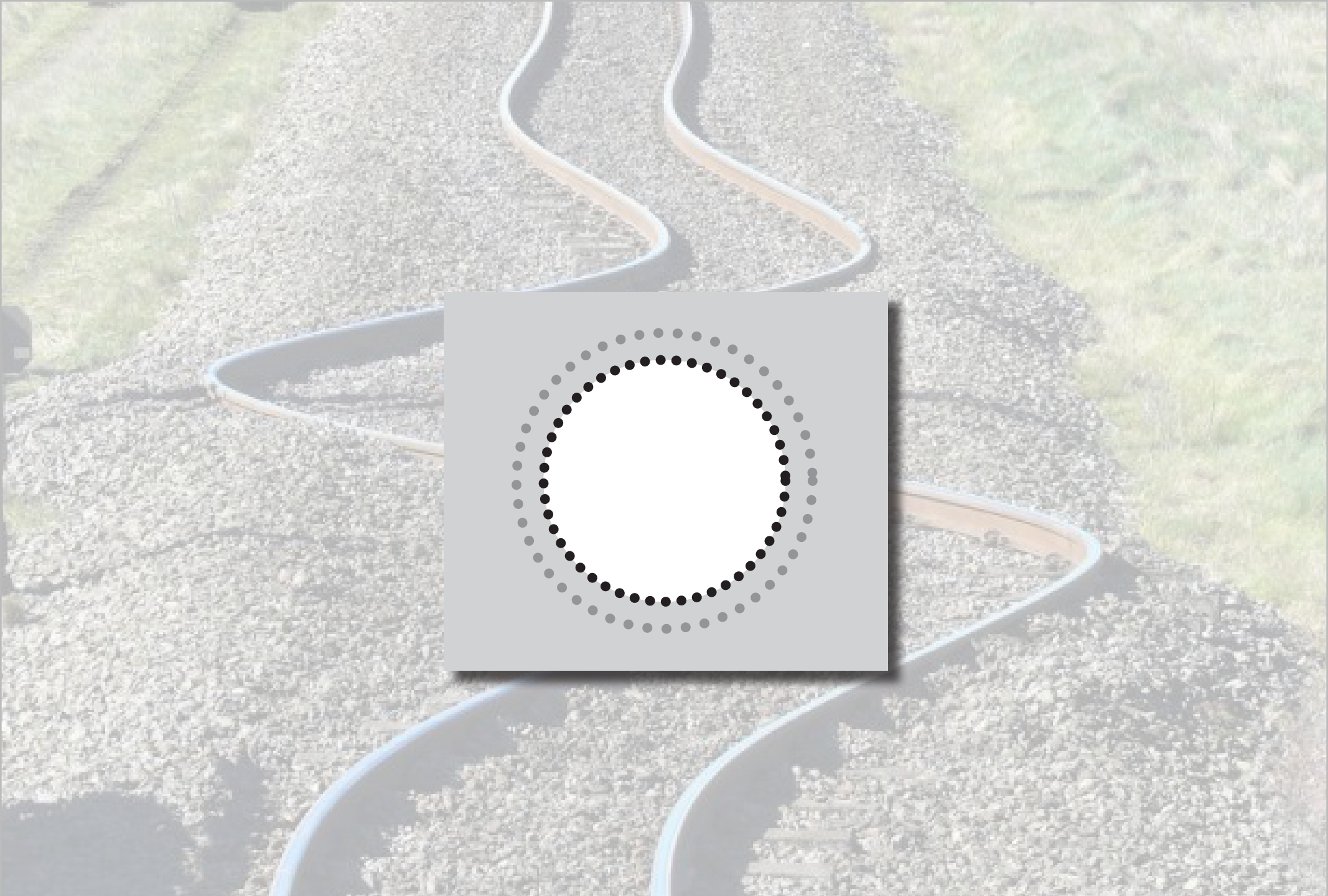


1 education

2 PI

3 test



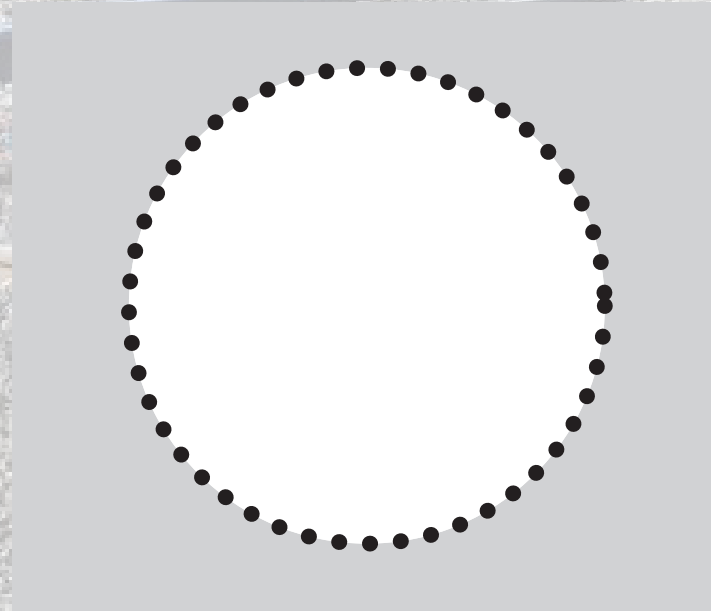


**1** education

**2** PI

**3** test

consider atoms at rim of hole



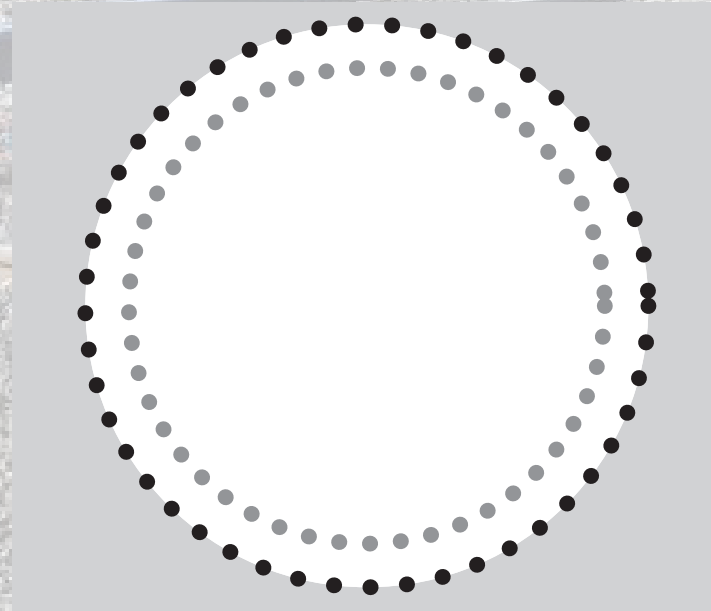
1 education

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



1 education

2 PI

3 test



The diagram features a large, light blue, tilted word 'Peer' in the background. A dashed yellow line with arrowheads starts from the left, passes through the word 'Peer', and continues upwards and to the right. A dotted blue line starts from the left, passes through the word 'INSTRUCTION', and continues upwards and to the right, ending near the word 'Peer'. The text 'Greater learning gains' and 'Better retention' is written in a bold, red, sans-serif font, tilted to follow the upward trajectory of the lines.

**Greater learning gains**

**Better retention**

**INSTRUCTION**

**1 education**

**2 PI**

**3 test**





**1** education

**2** PI

**3** test



in a lecture, students...

**1** education

**2** PI

**3** test



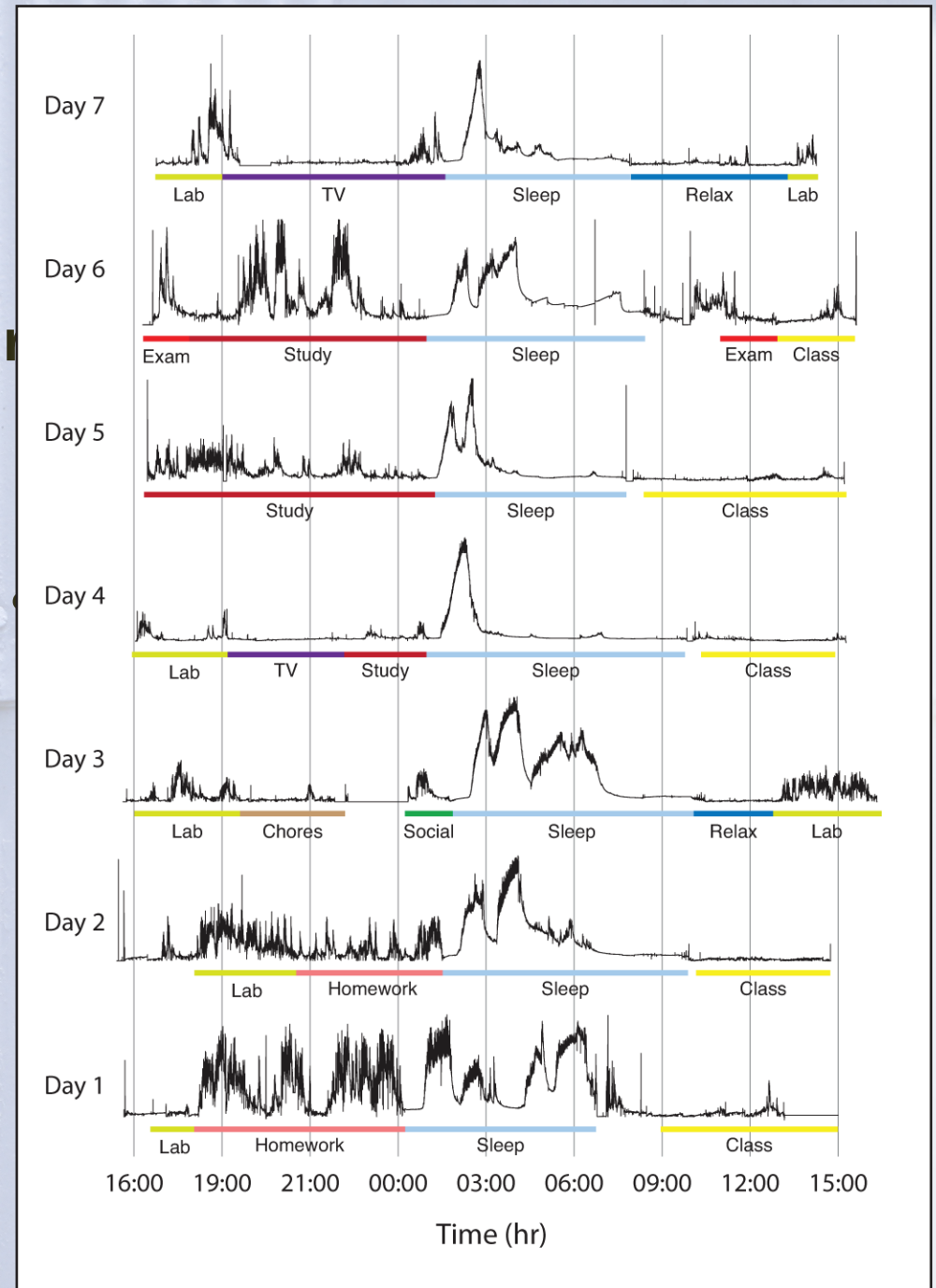
**in a lecture, students...**

**1. don't pay utmost attention**



in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

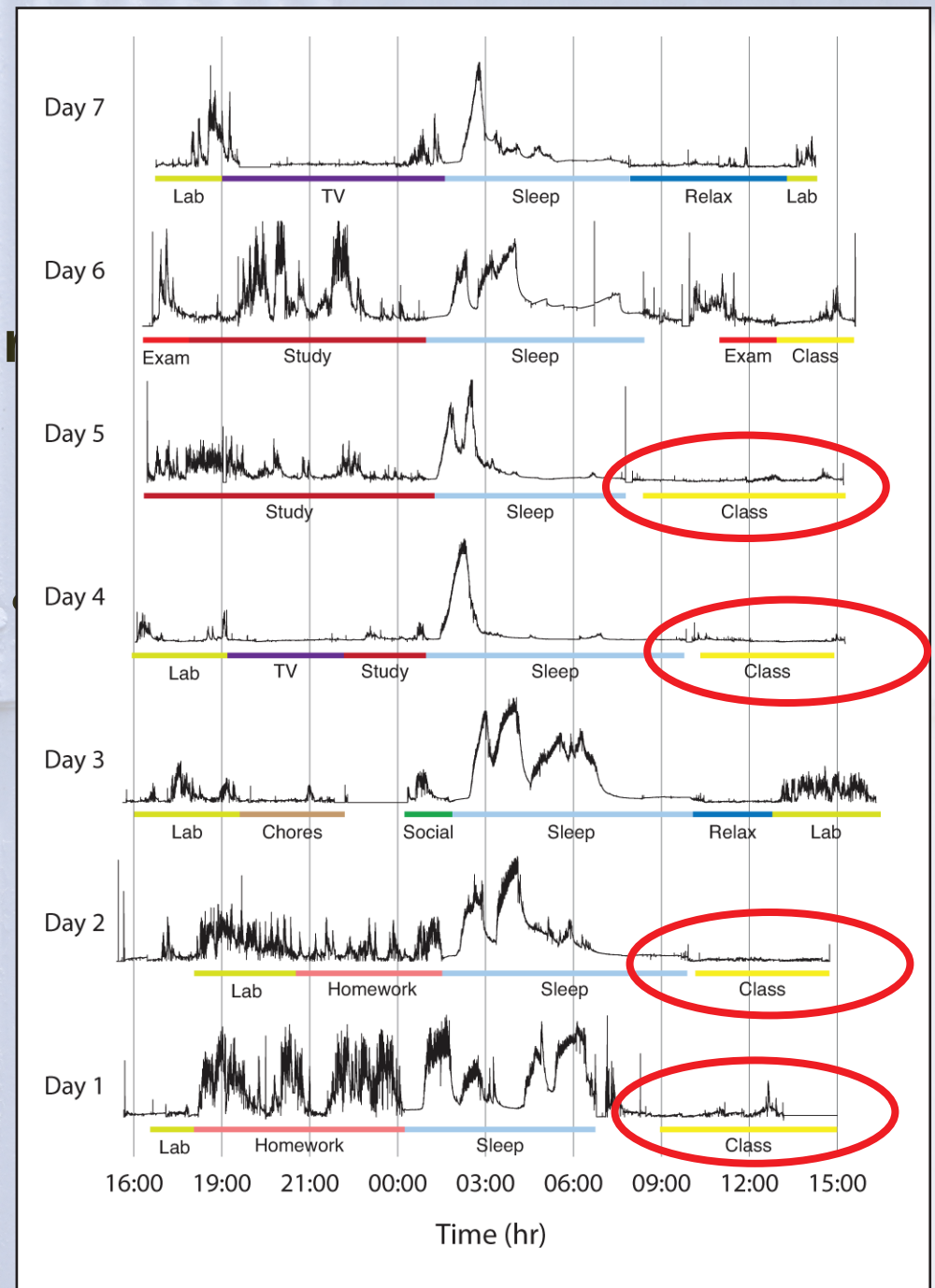
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

1 education

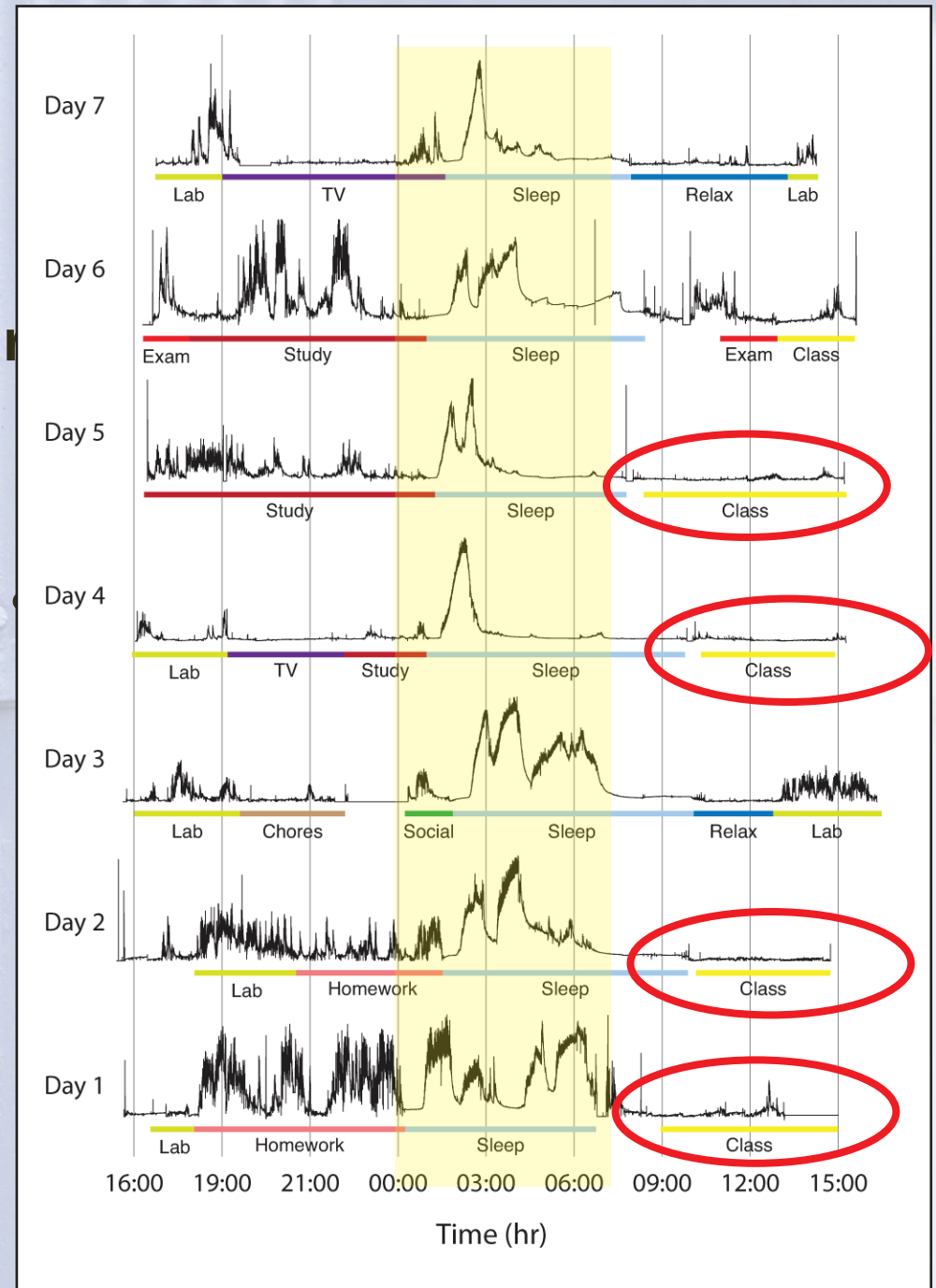
2 PI

3 test



in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

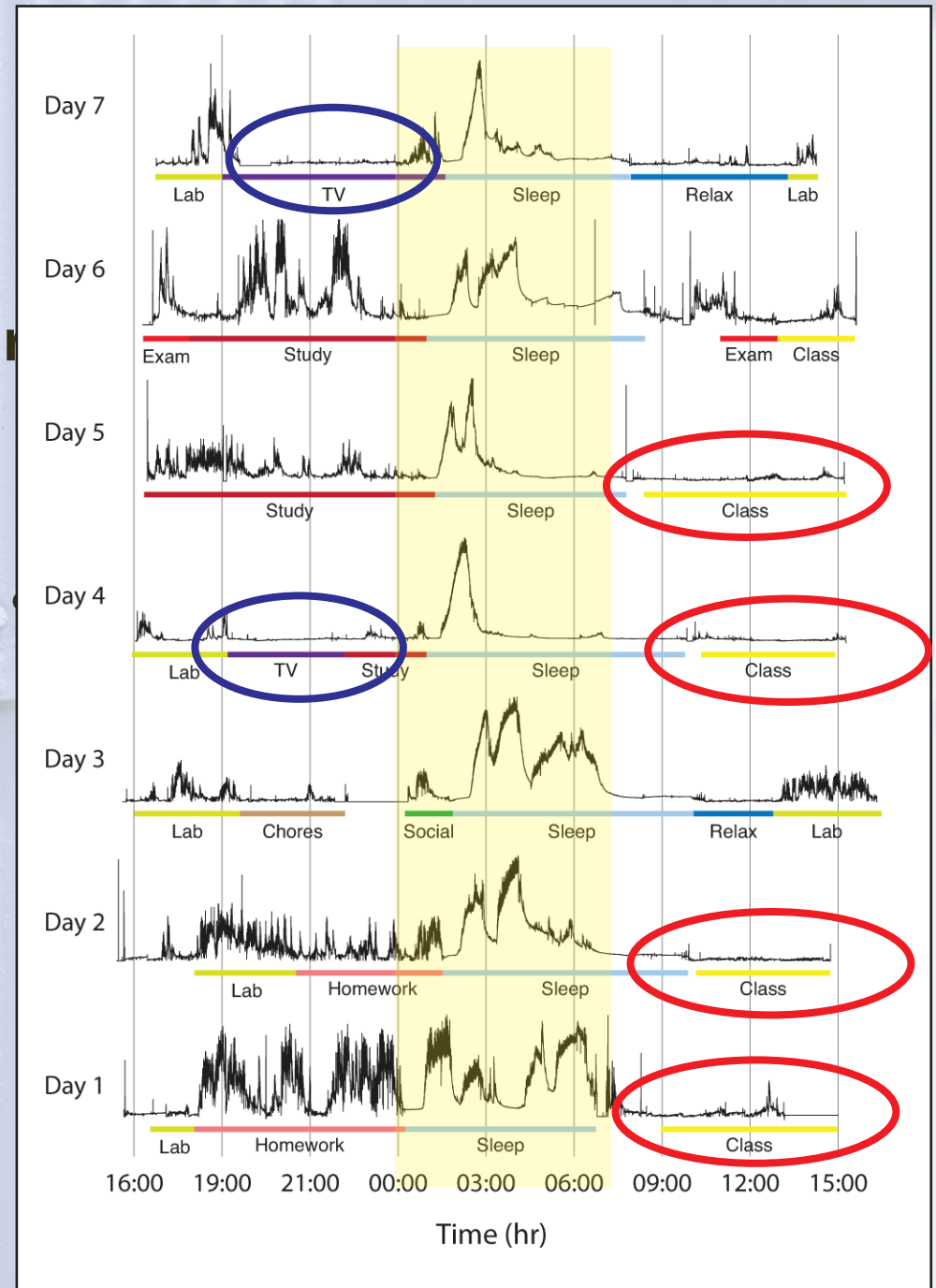
1 education

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**

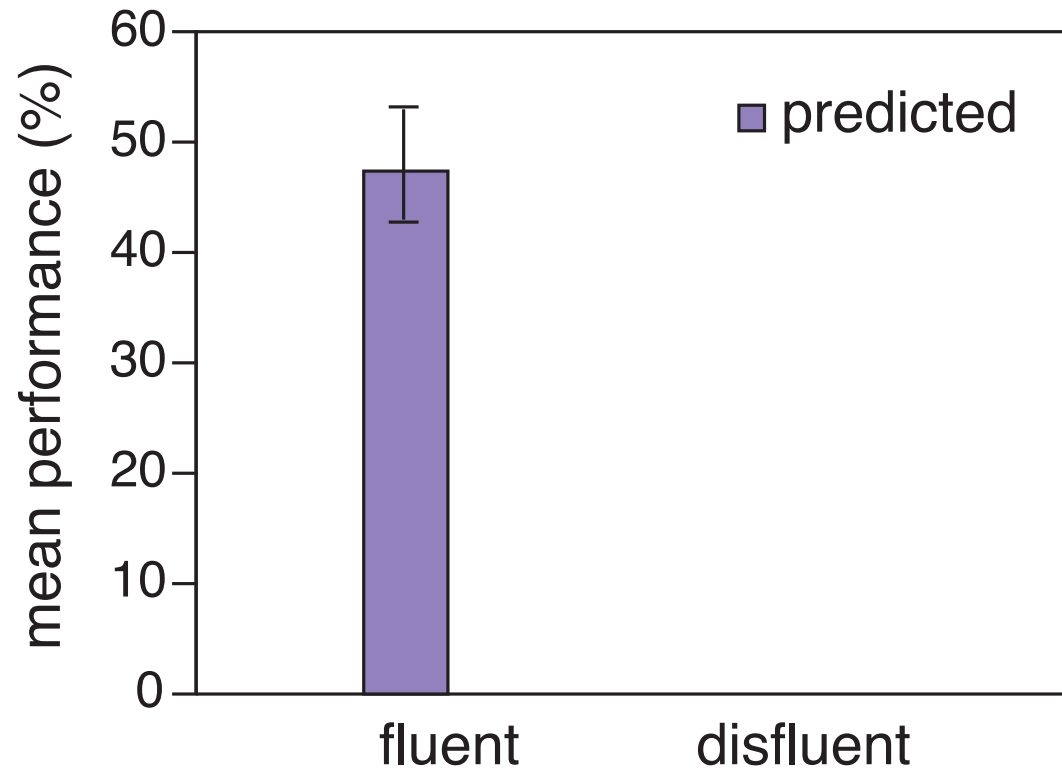
**disfluent video**



**speaks haltingly from notes  
slumped  
looks away**

doi: 10.3758/s13423-013-0442-z

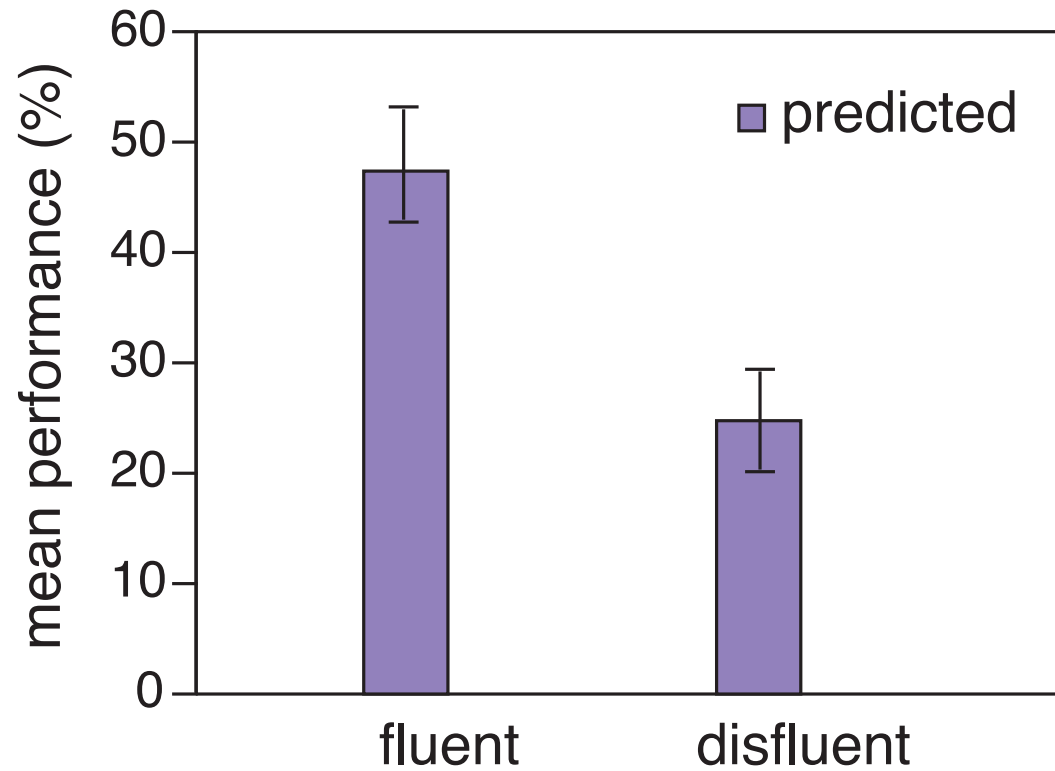
## judgement of learning



doi: 10.3758/s13423-013-0442-z

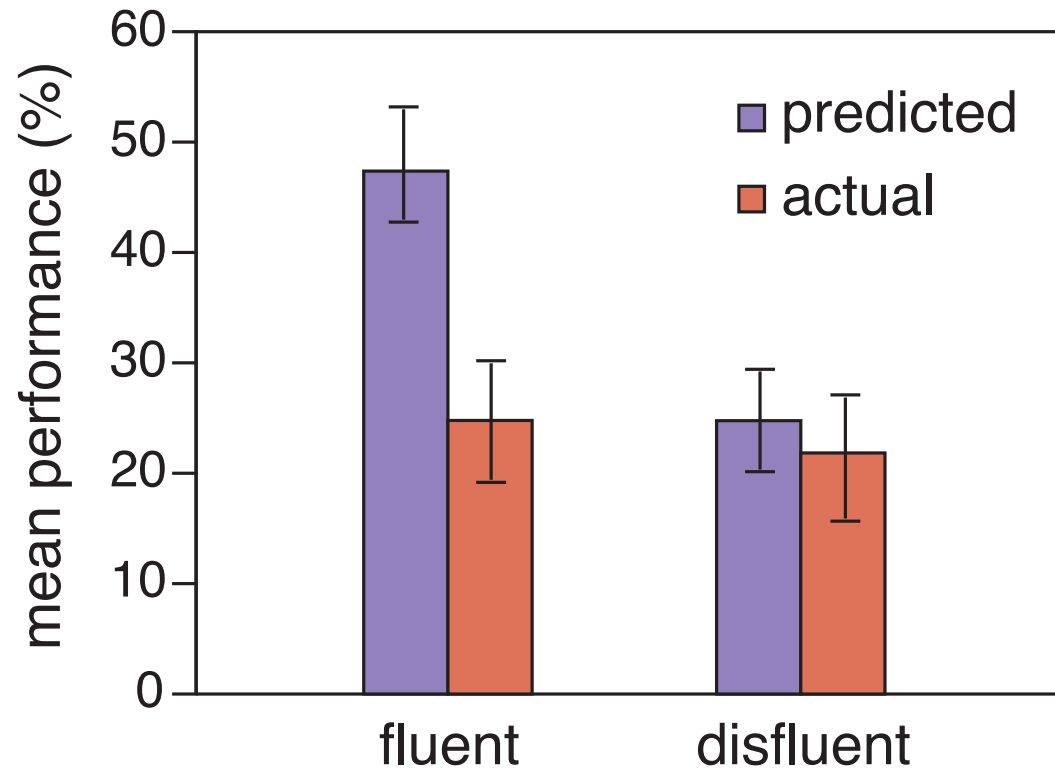


## judgement of learning



doi: 10.3758/s13423-013-0442-z

## 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 large and detailed. The overall style is reminiscent of a classical portrait, but with a surreal element of multiple eyes. The text 'an illusion...' is overlaid in a bold, red, serif font.

**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!**





**Join now!**

**PeerInstruction.net**

**Funding:**

**National Science Foundation**

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