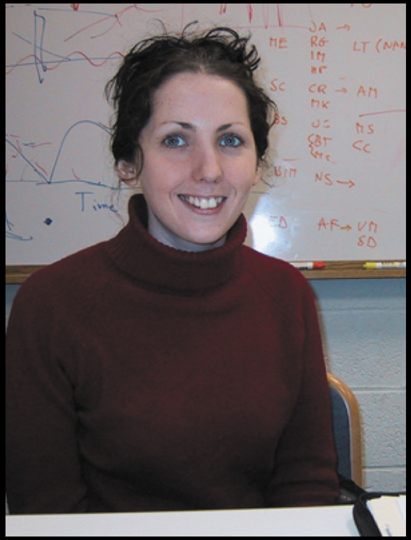
The Interactive Classroom

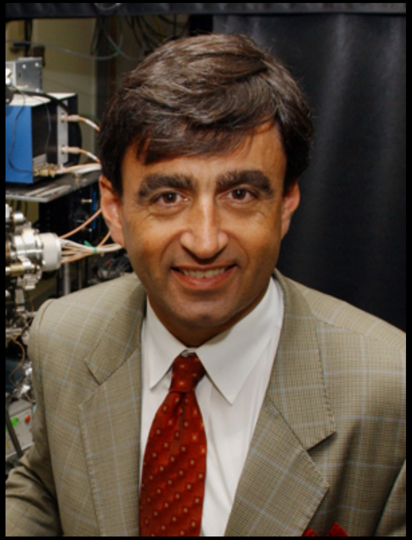
204th AAS Meeting
Denver, CO, 31 May 2004

VE RI TAS
HARVARD



Veronica McCauley

Suvendra Dutta



Eric Mazur

and also....

Programming:

Michael Tucker
Jean Moreau
Olaf Jonmaker
Vijay Salagala
Juston Payne

Editing:

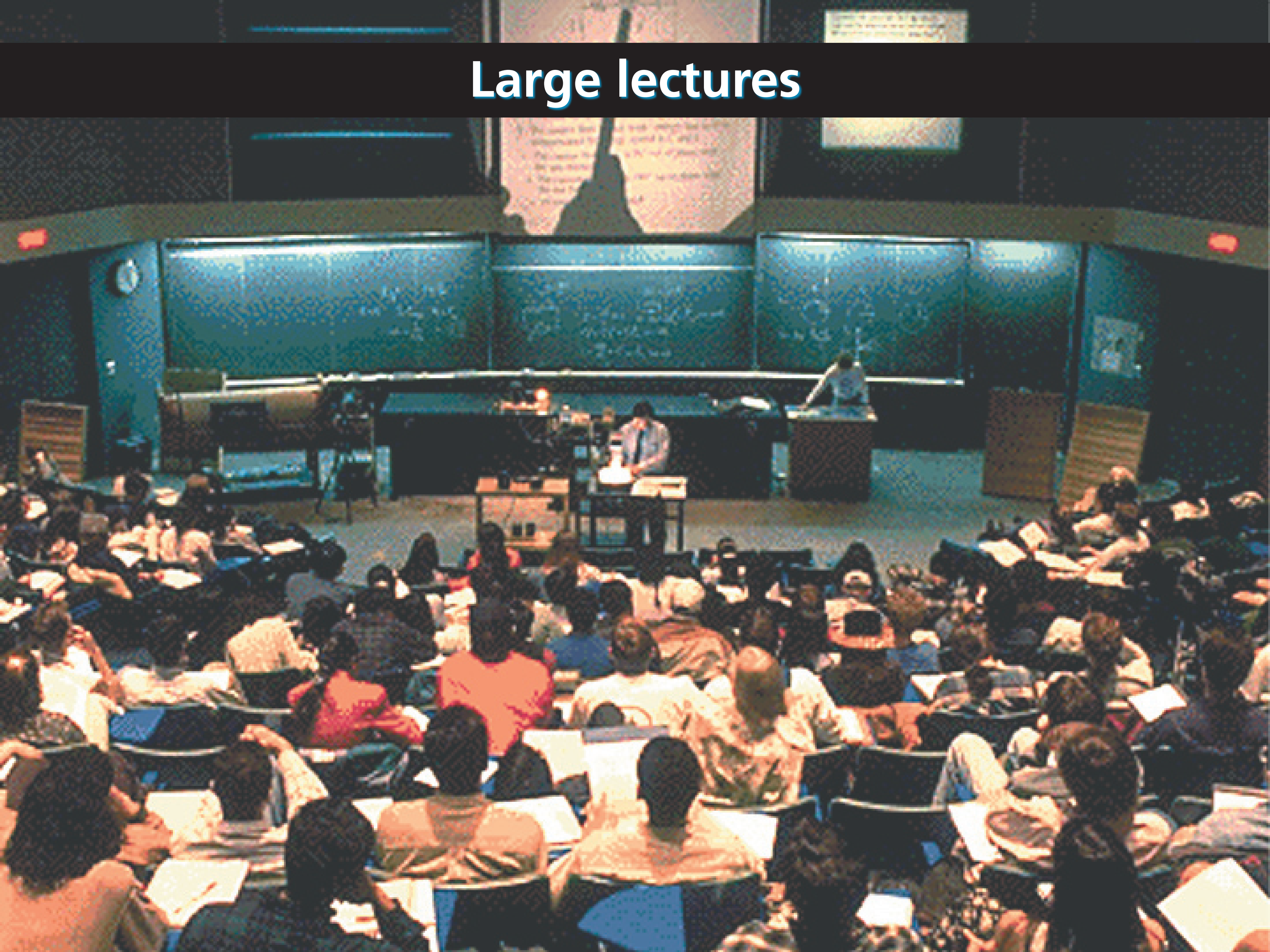
Prof. Ed. Ginsberg (UMass Boston)
Prof. Peter Dourmashkin (MIT)
Prof. Chris Gould (USC)

Beta testing:

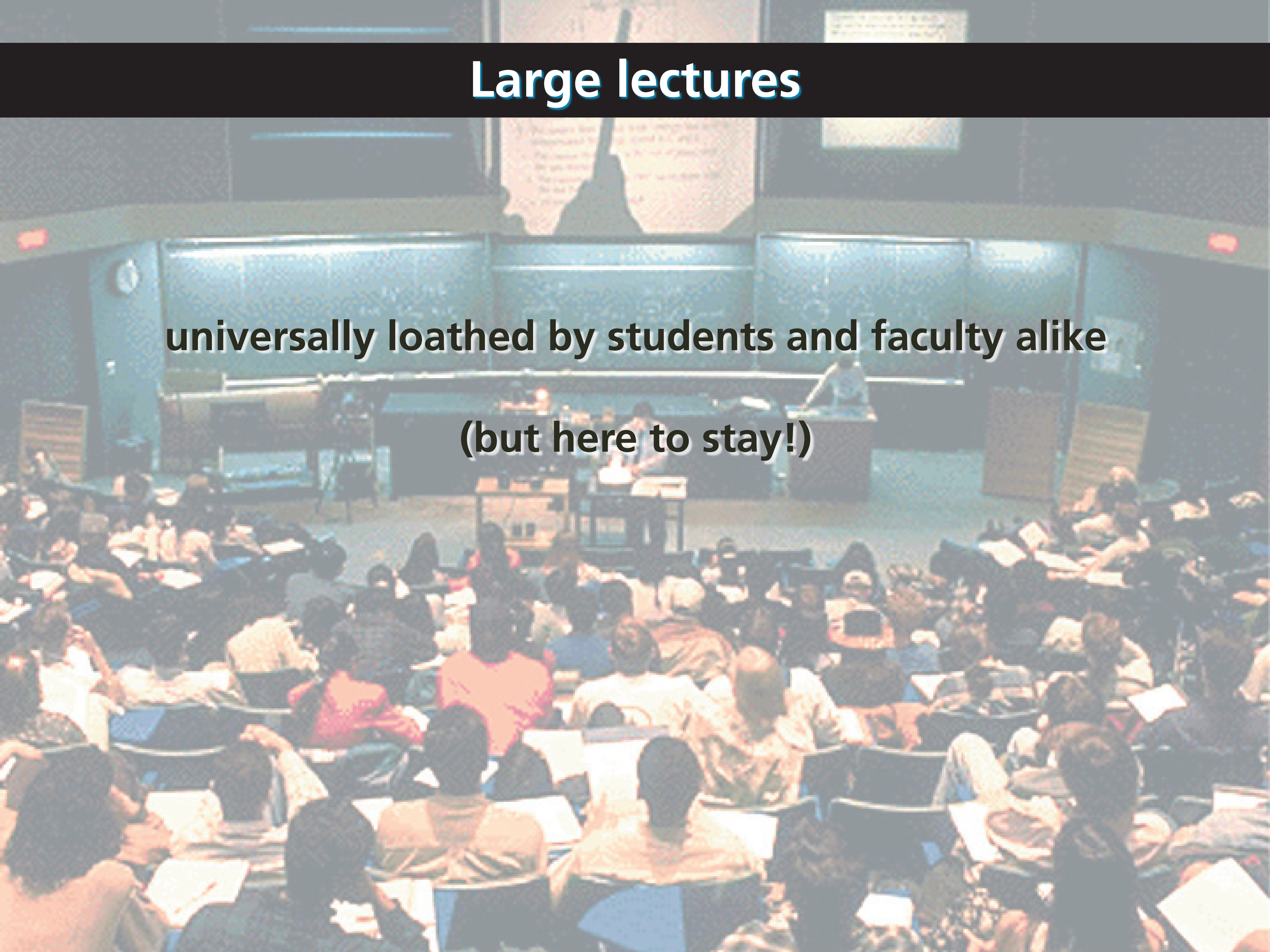
Prof. John Belcher (MIT)
Andrew McKinney (MIT)
Sue Gautsch (USC)
Prof. Catherine Crouch (Swarthmore)
Prof. Clifford V. Johnson (USC)

…and hundreds of students in dozens of courses

Large lectures



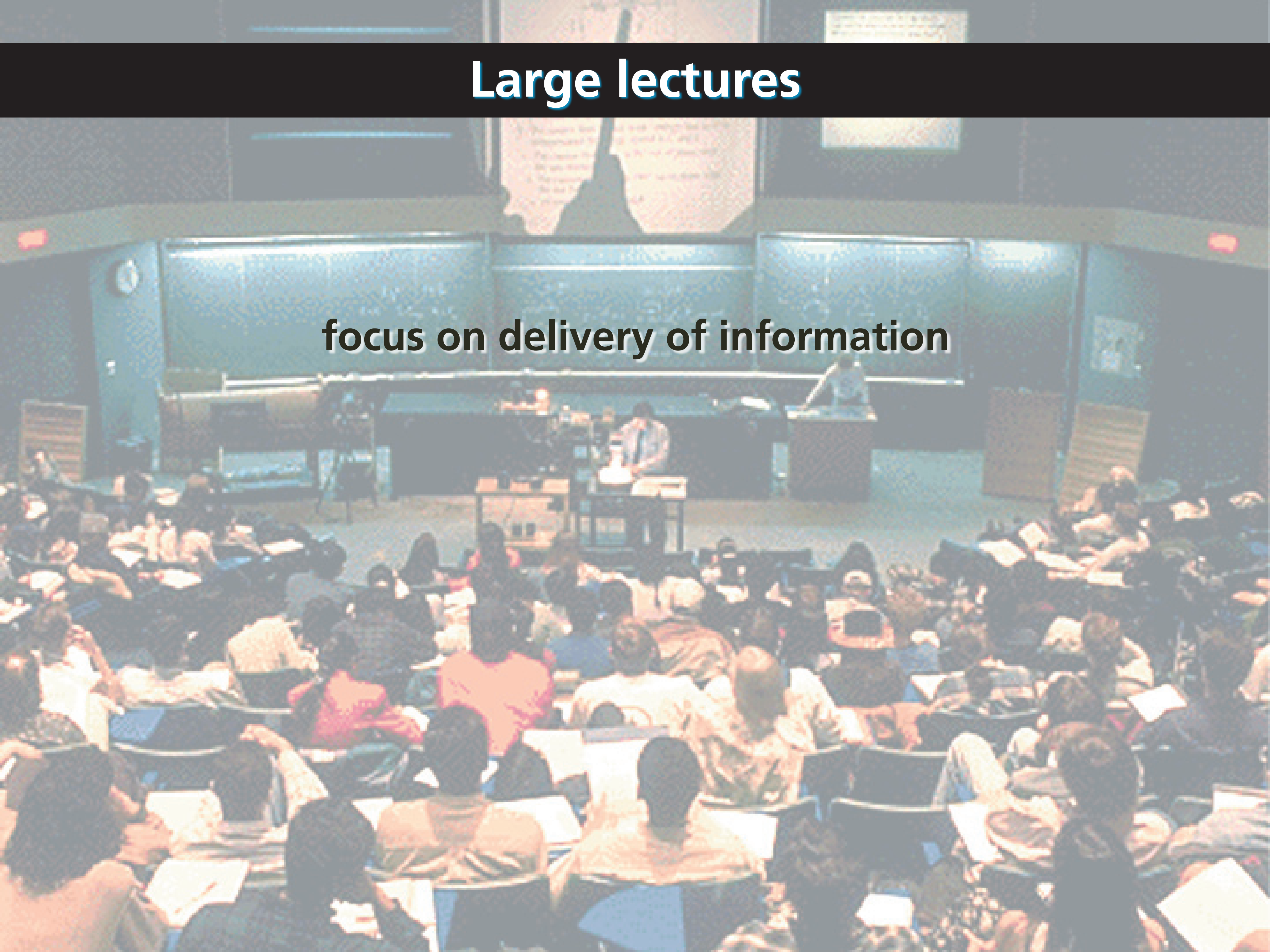
Large lectures



universally loathed by students and faculty alike

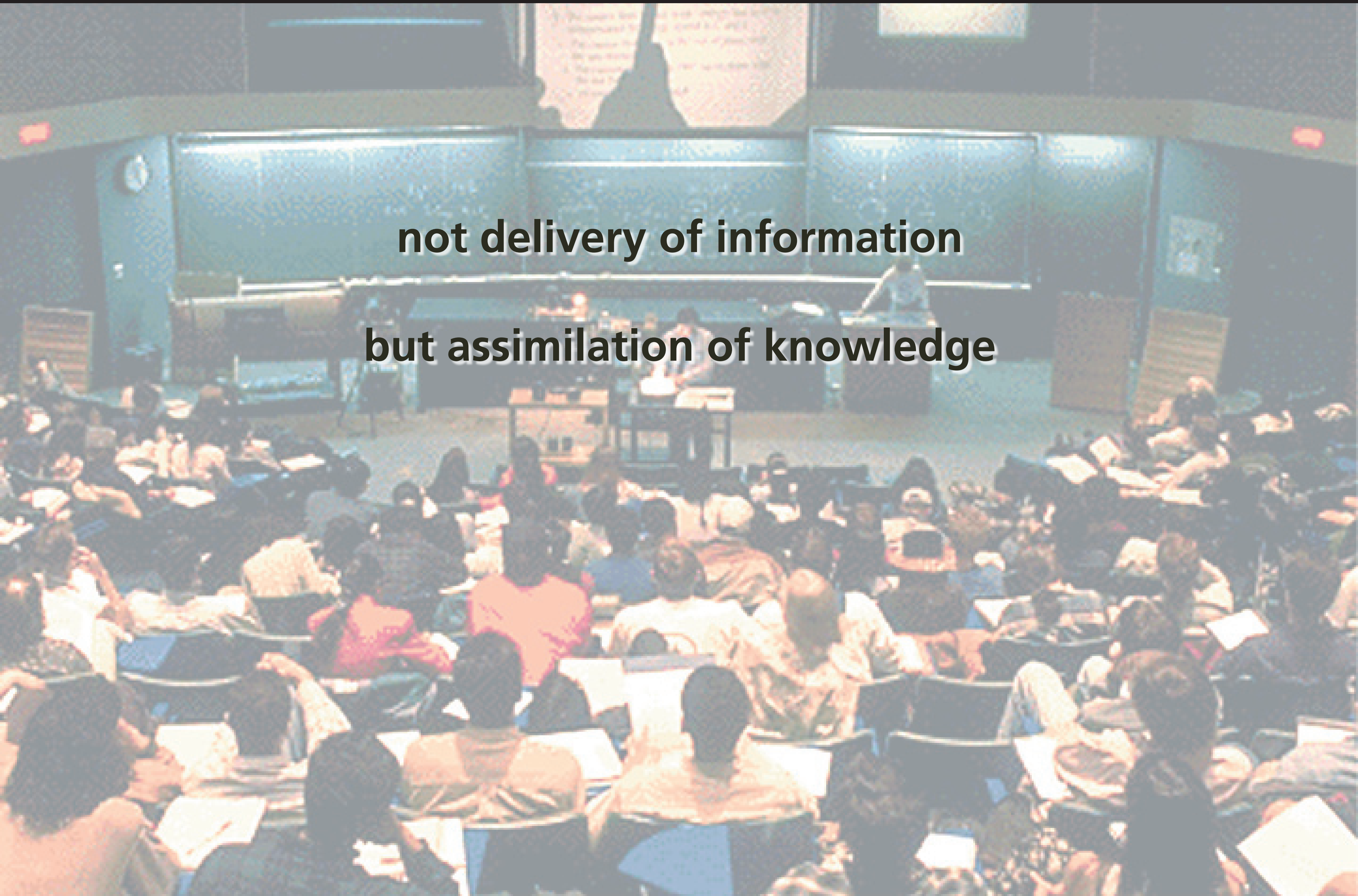
(but here to stay!)

Large lectures



focus on delivery of information

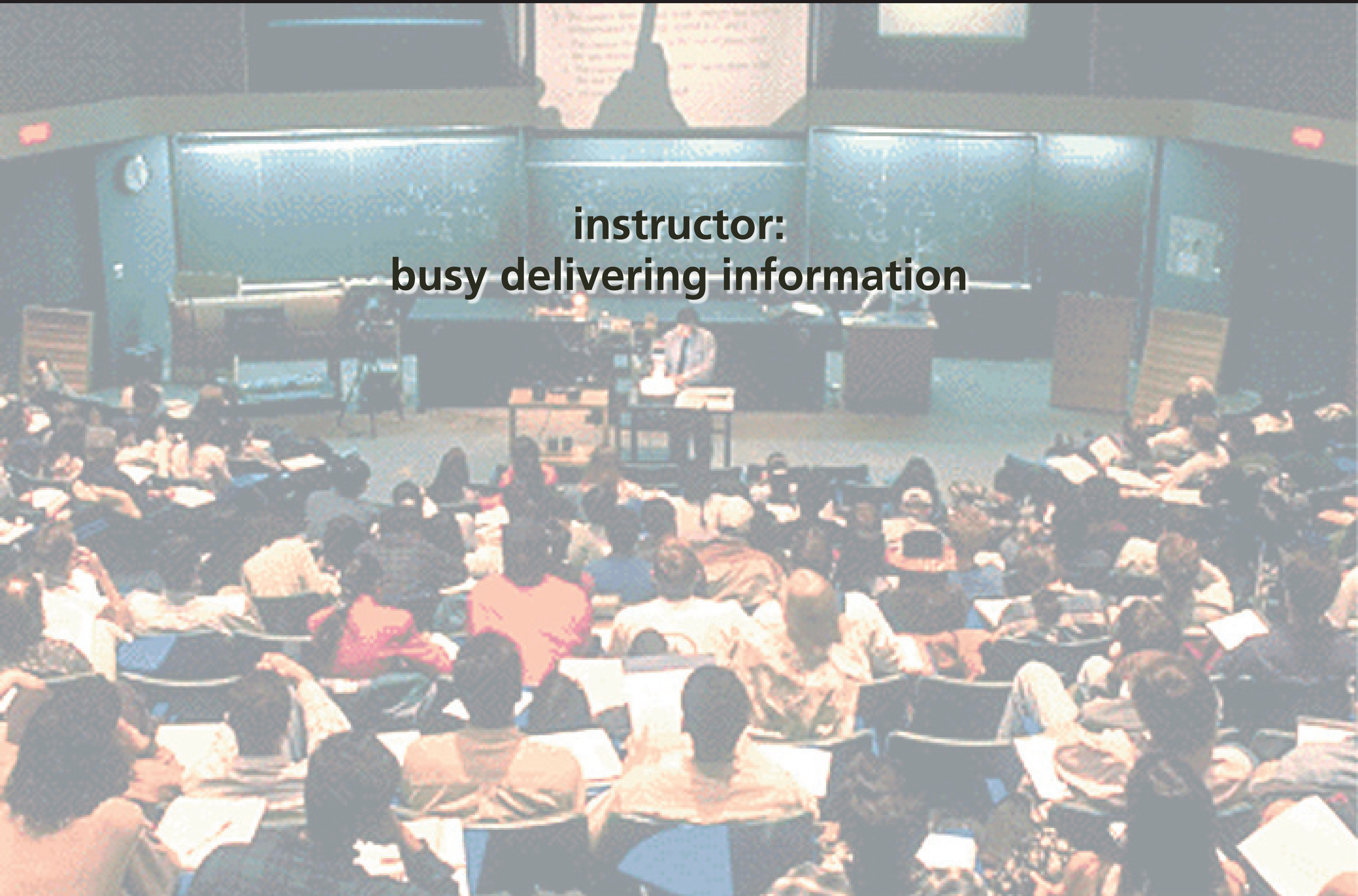
Large lectures



not delivery of information

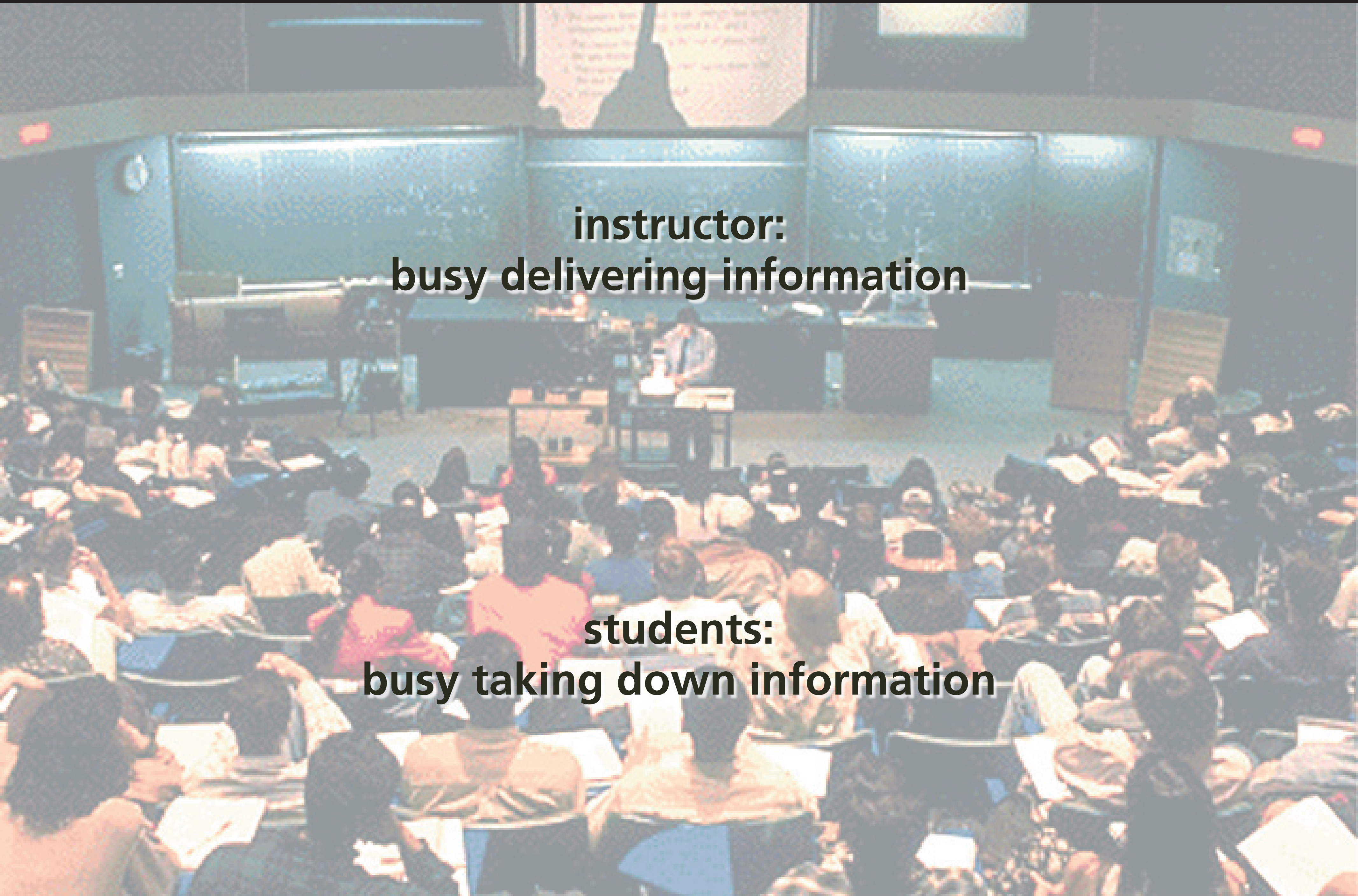
but assimilation of knowledge

Large lectures



instructor:
busy delivering information

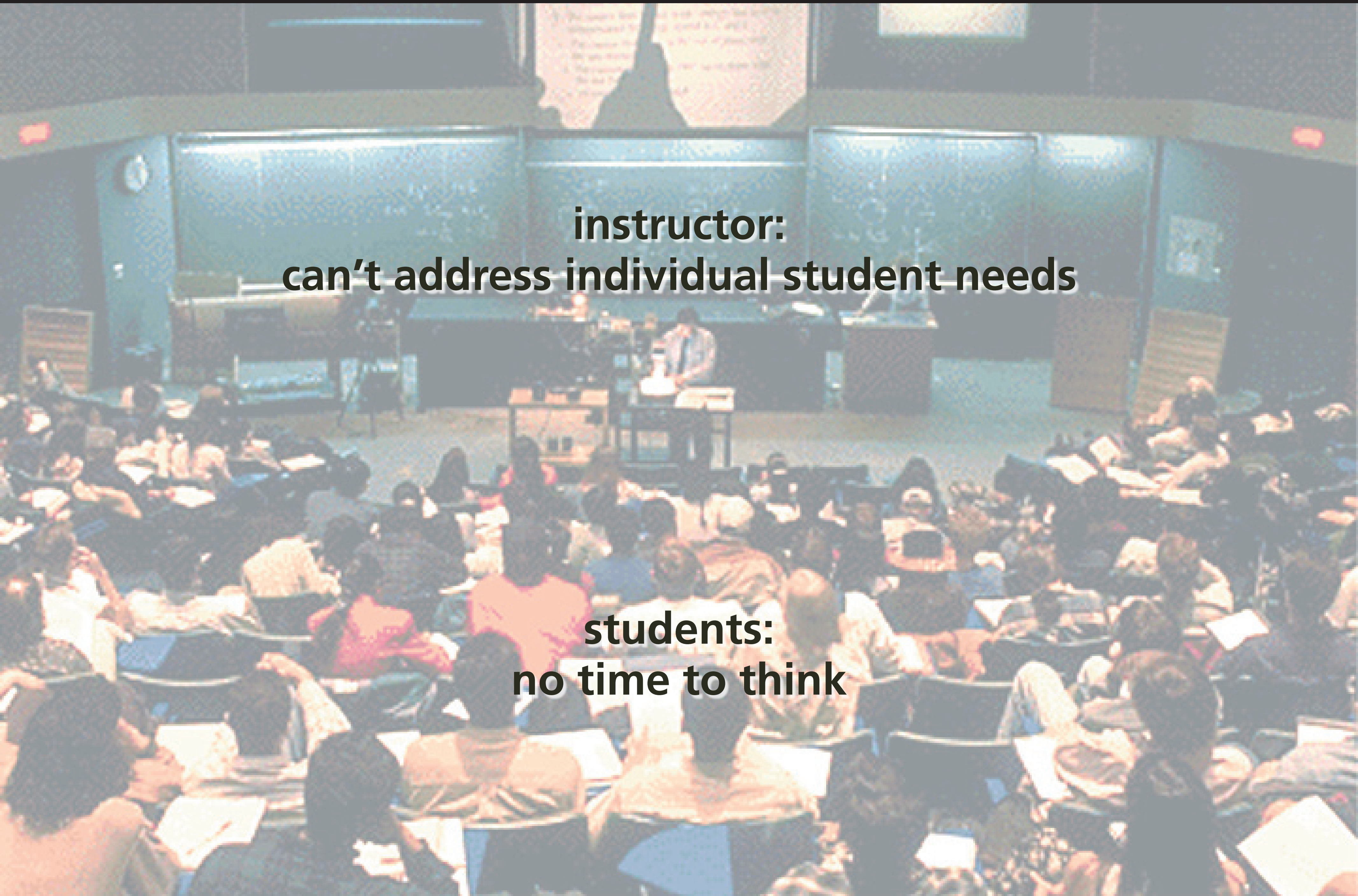
Large lectures



instructor:
busy delivering information

students:
busy taking down information

Large lectures

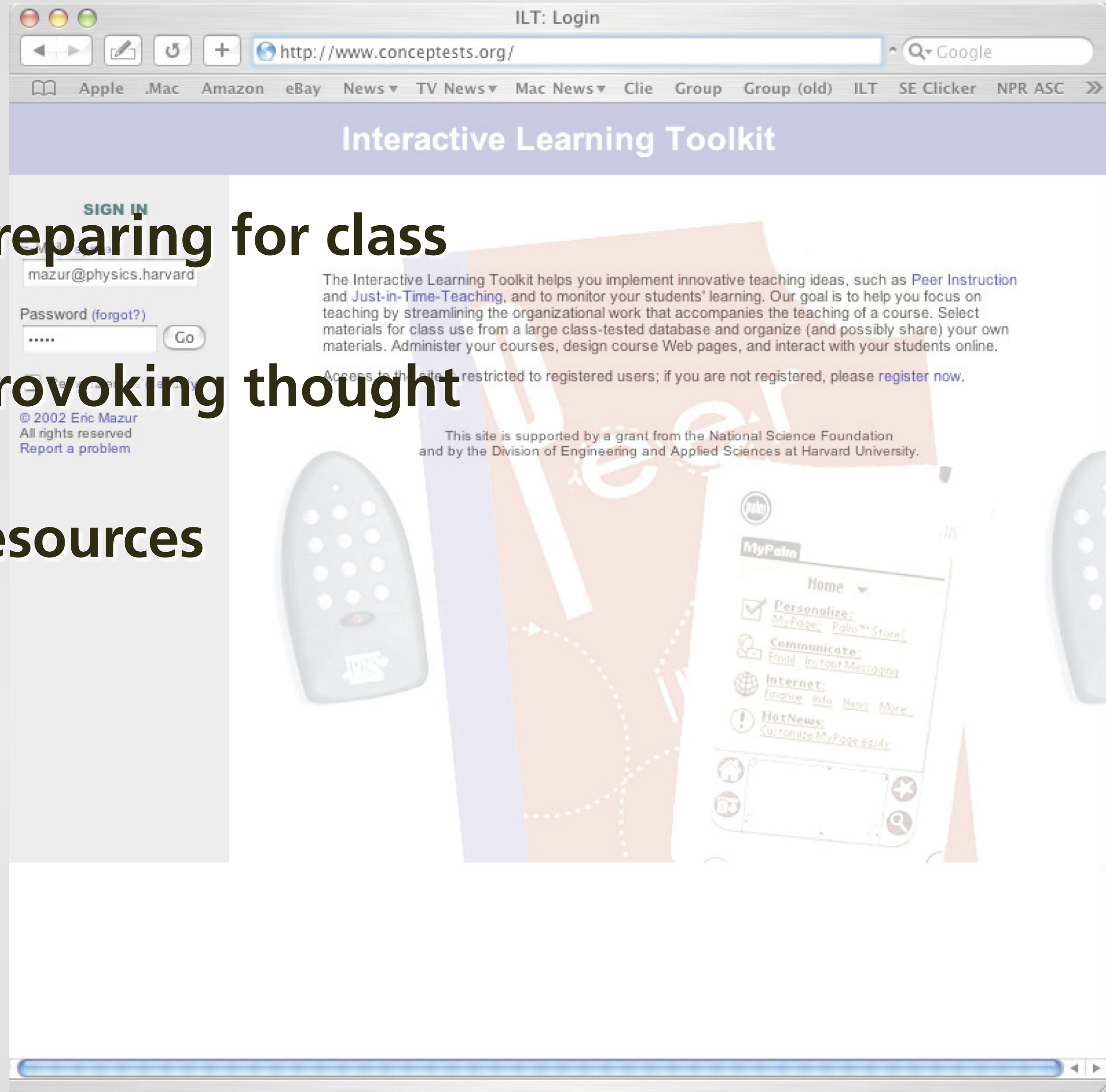


instructor:
can't address individual student needs

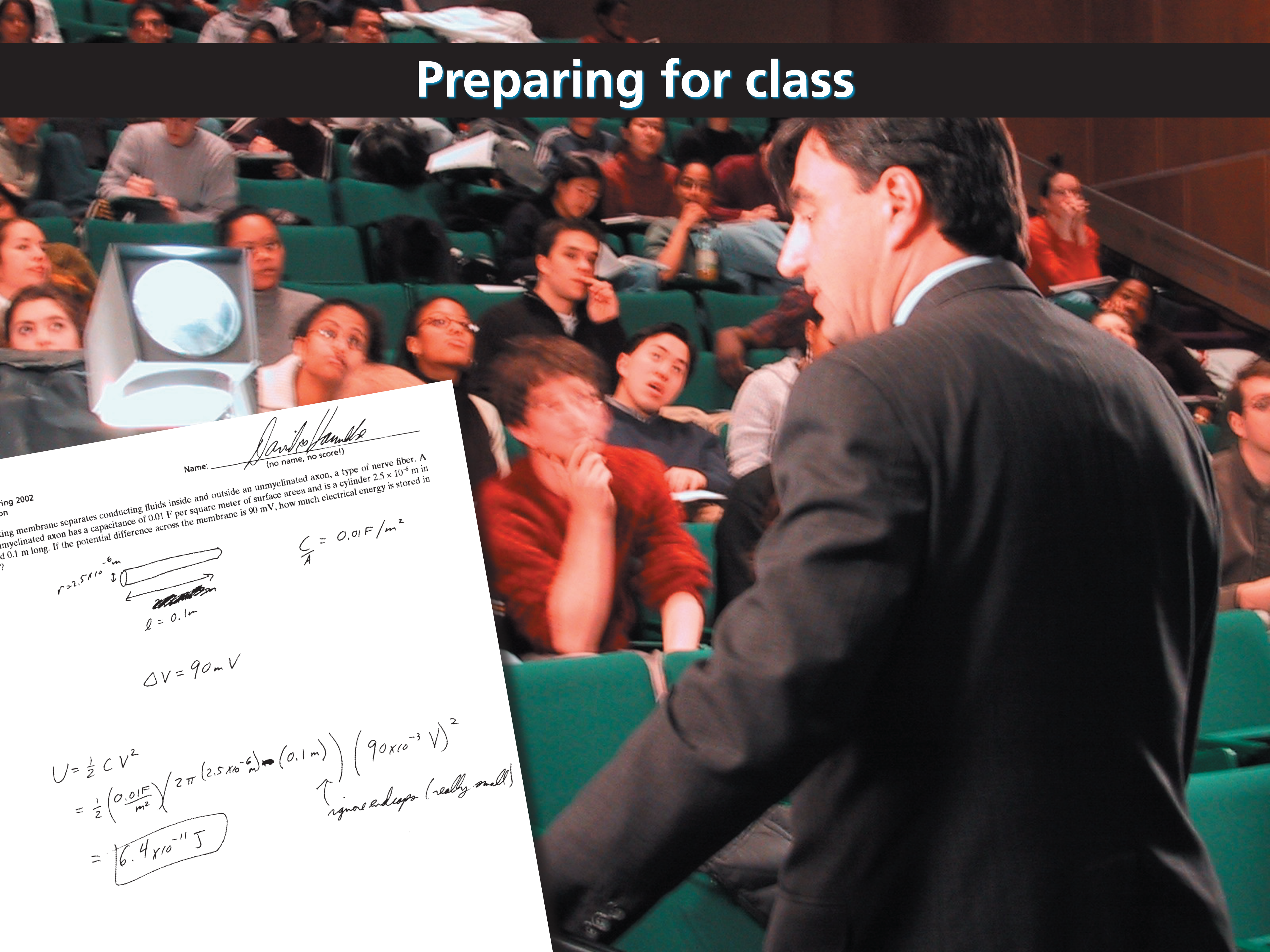
students:
no time to think

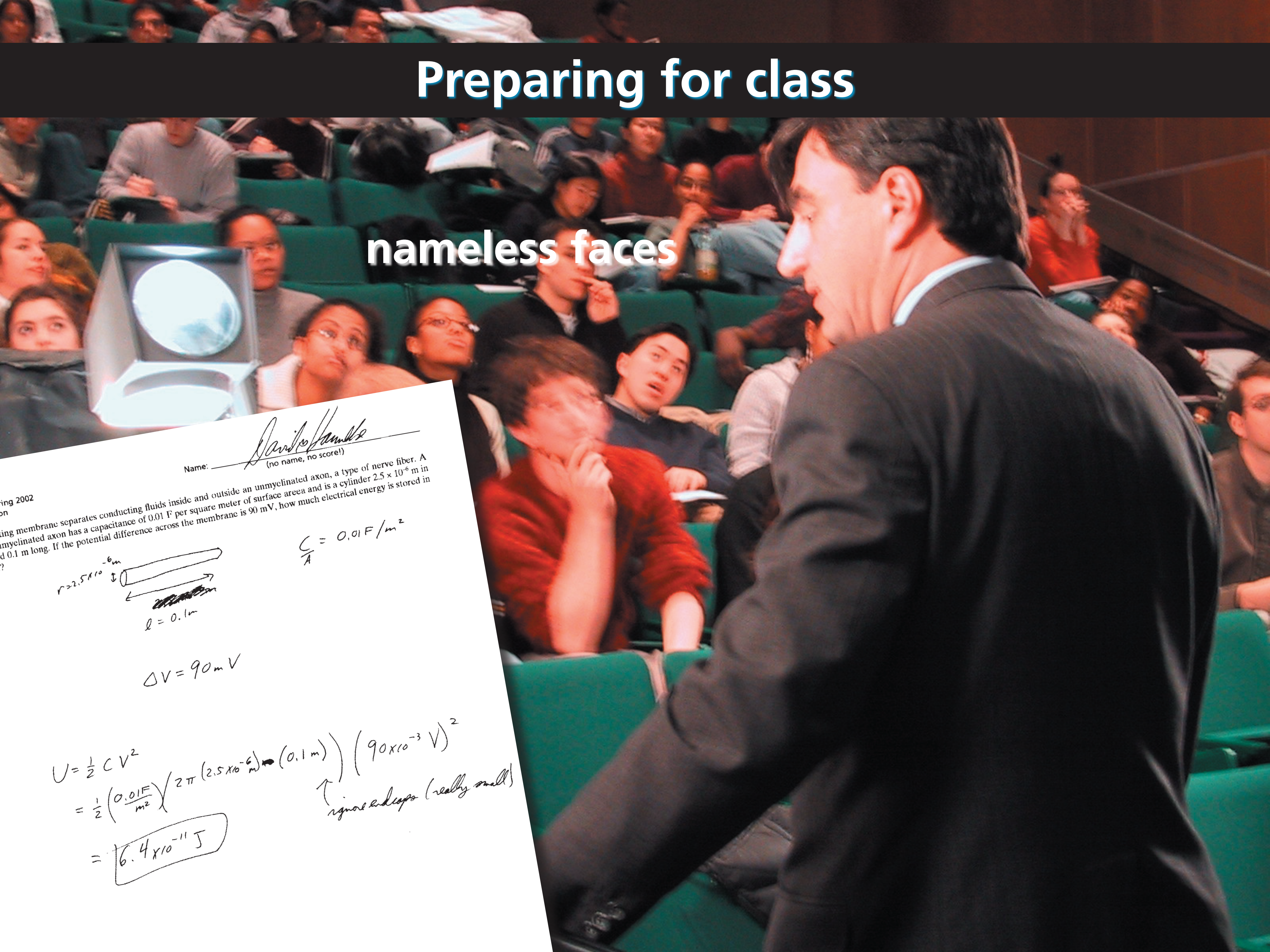
Outline

- preparing for class
- provoking thought
- resources



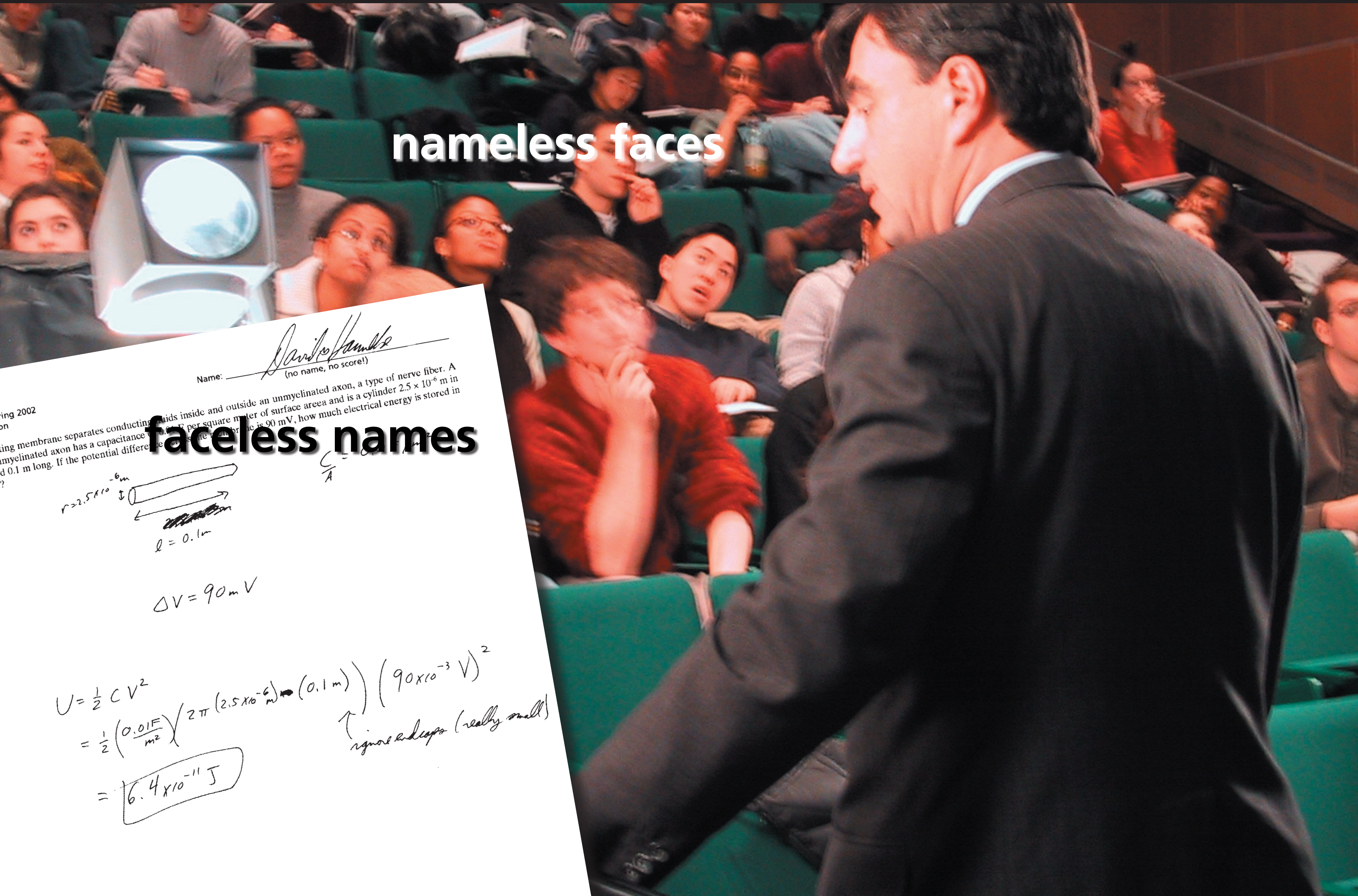
Preparing for class



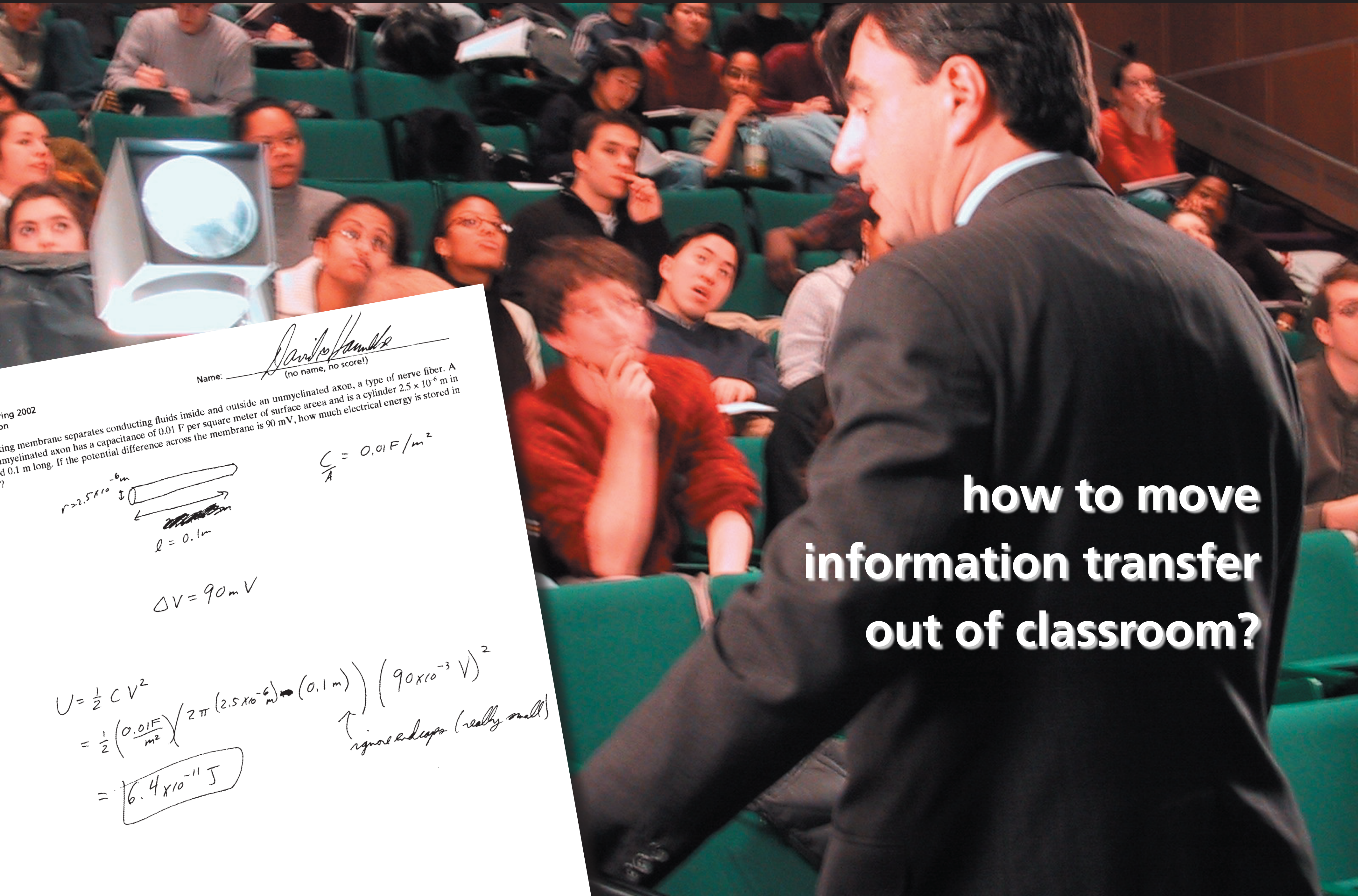


Preparing for class
nameless faces
Name:
(no name, no score!)
ring 2002
on
ting membrane separates conducting fluids inside and outside an unmyelinated axon, a type of nerve fiber. A
nmyelinated axon has a capacitance of 0.01 F per square meter of surface areea and is a cylinder 2.5 × 10⁻⁶ m in
d 0.1 m long. If the potential difference across the membrane is 90 mV, how much electrical energy is stored in

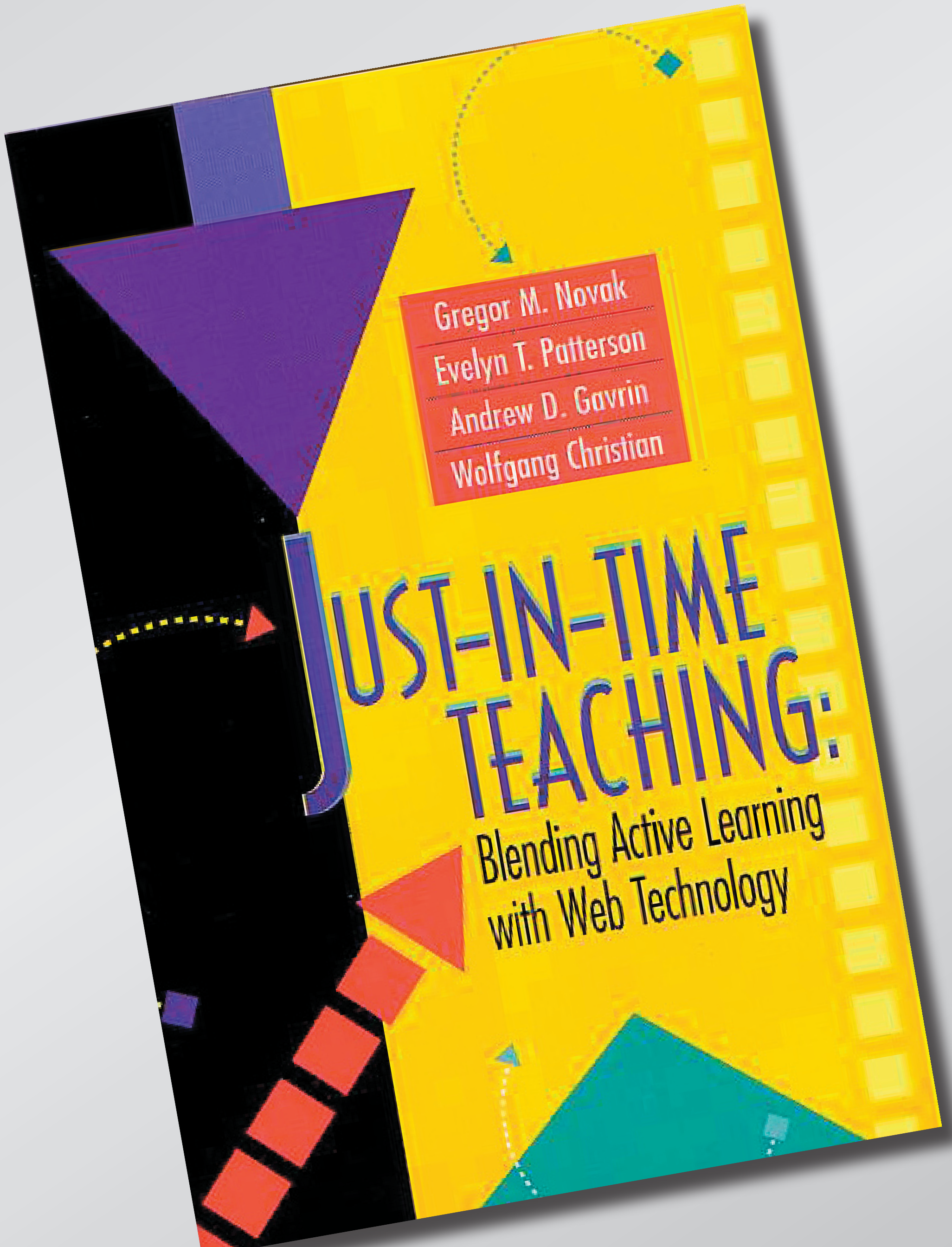
Preparing for class



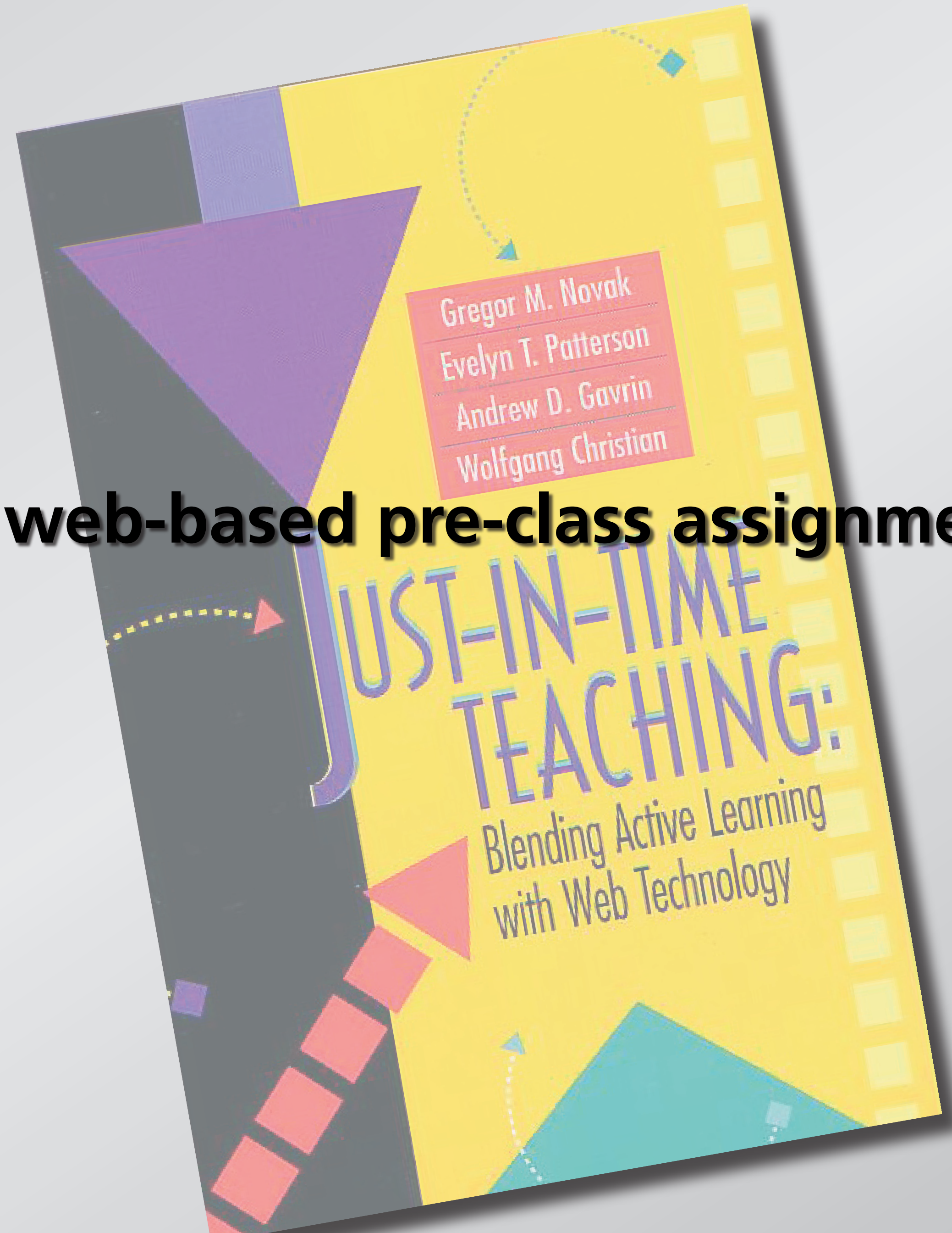
Preparing for class



Preparing for class

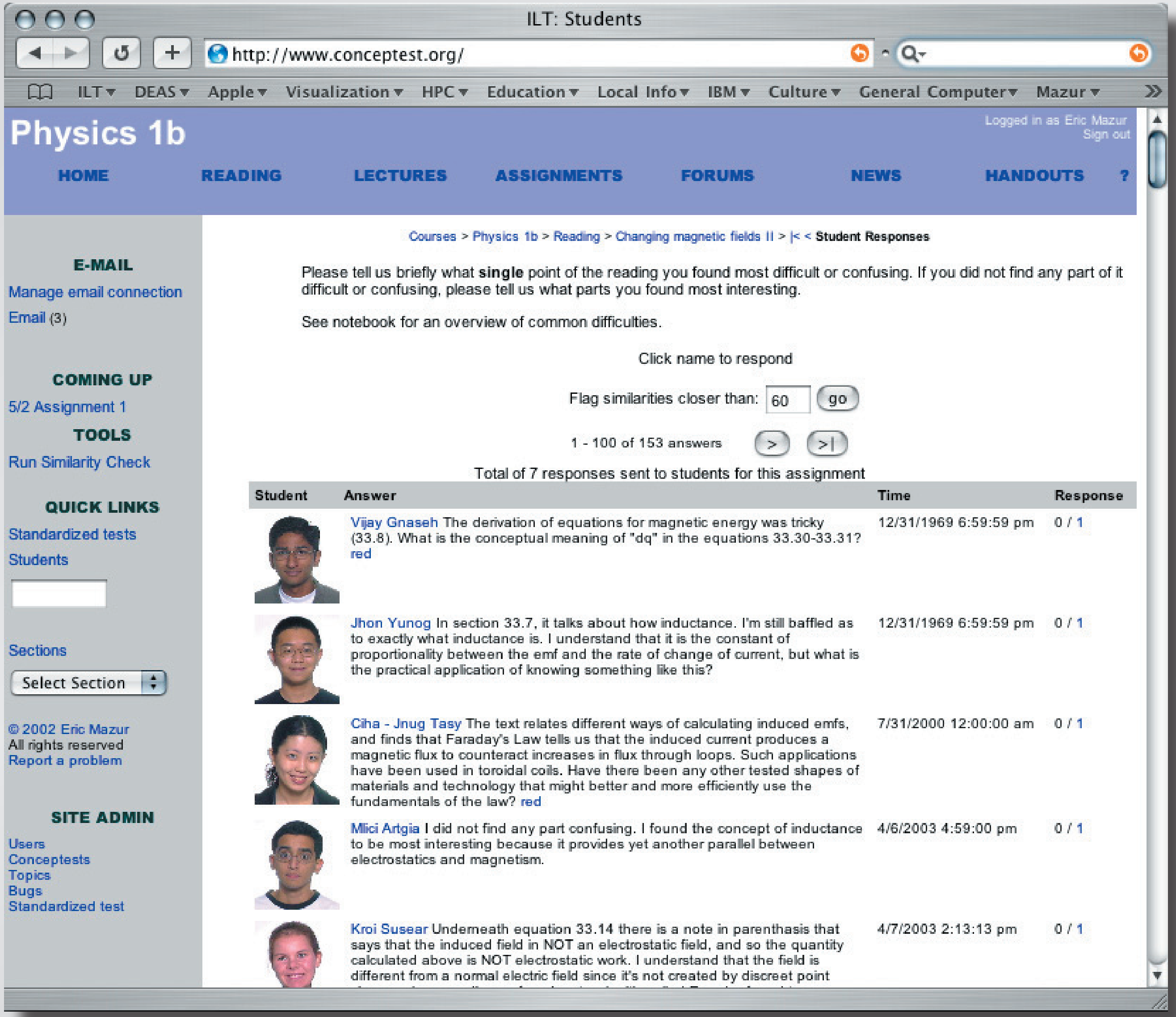


Preparing for class

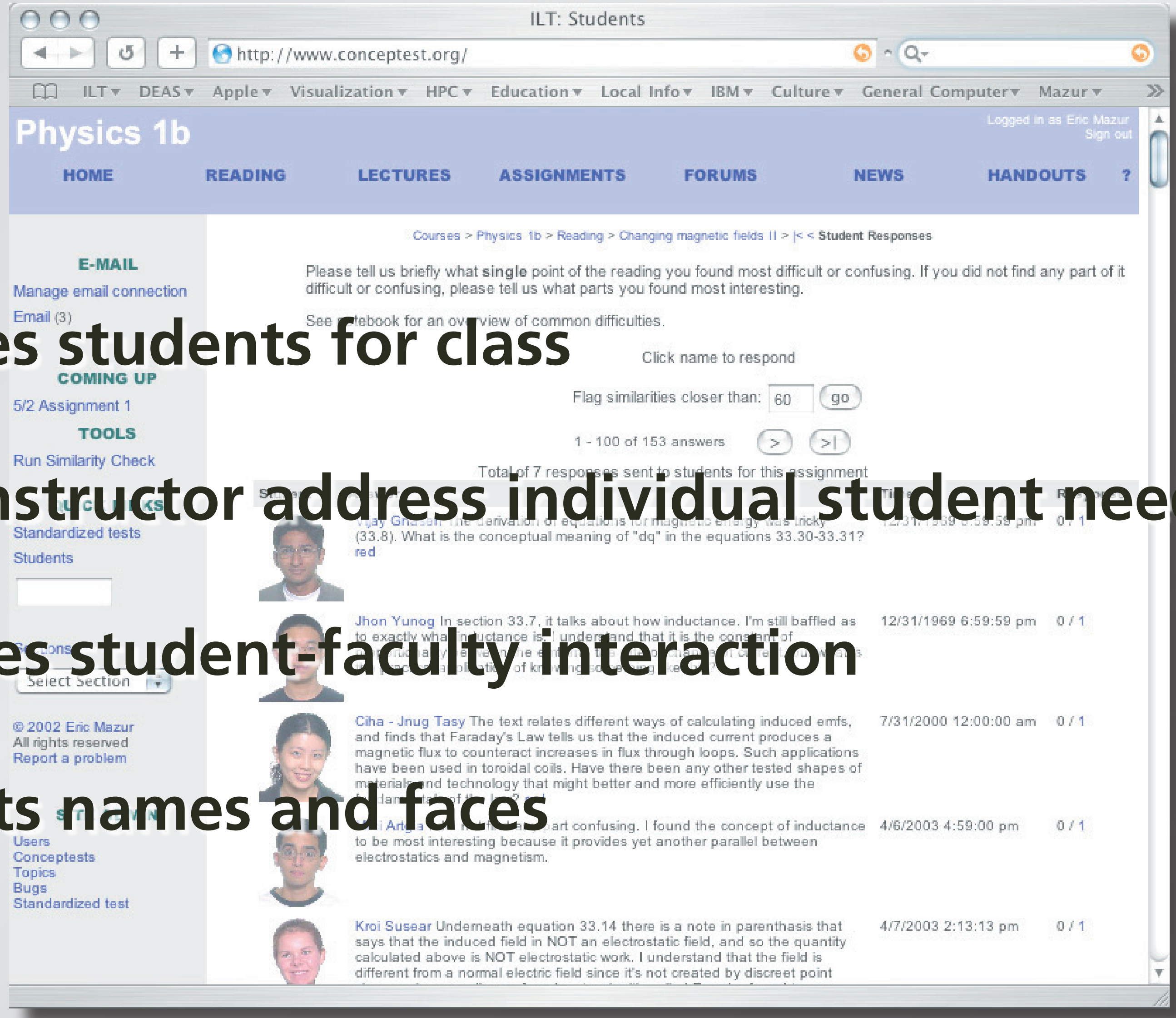


web-based pre-class assignment

Preparing for class



Preparing for class

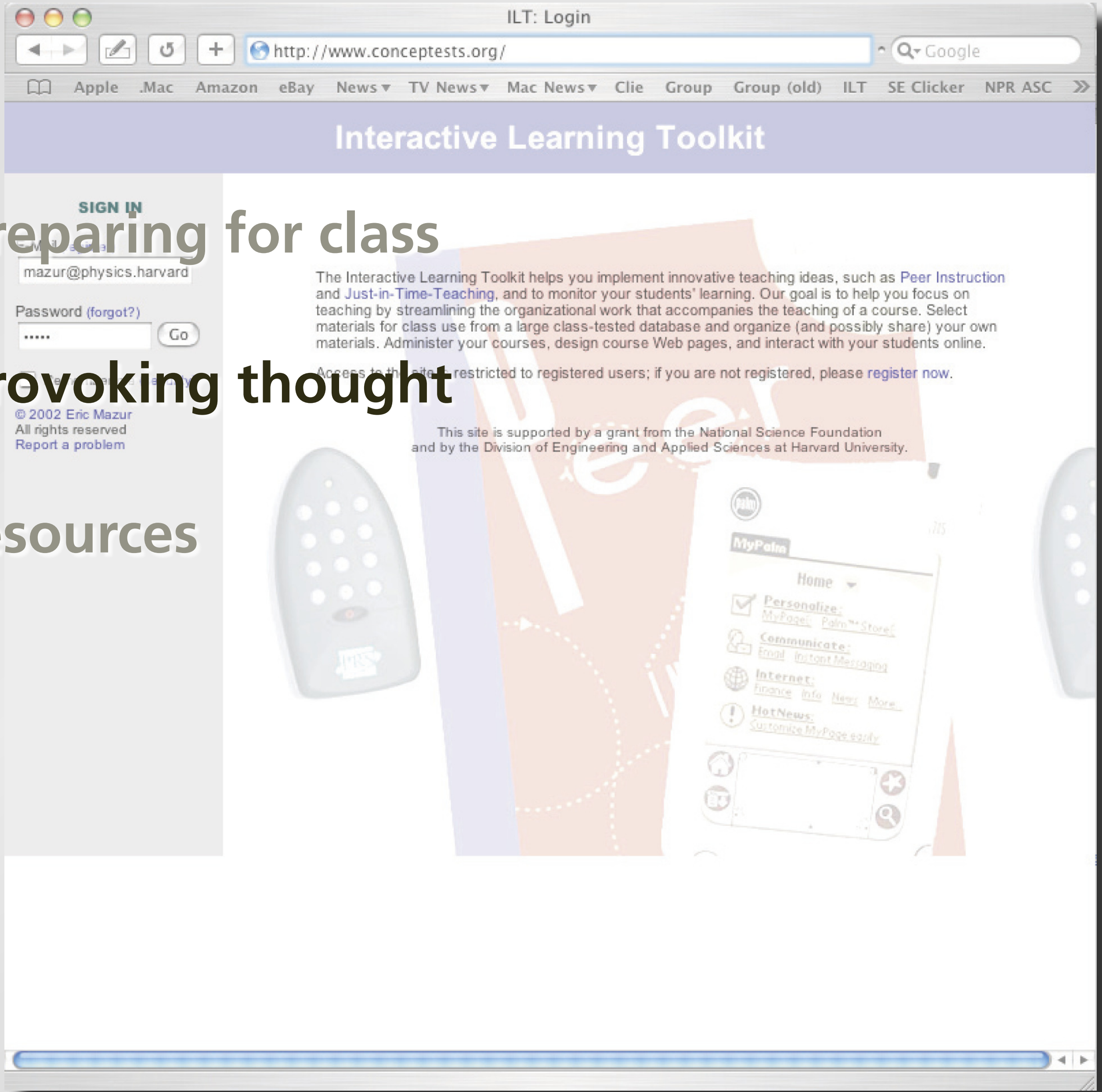


Benefits:

- prepares students for class
- helps instructor address individual student needs
- increases student-faculty interaction
- connects names and faces

Outline

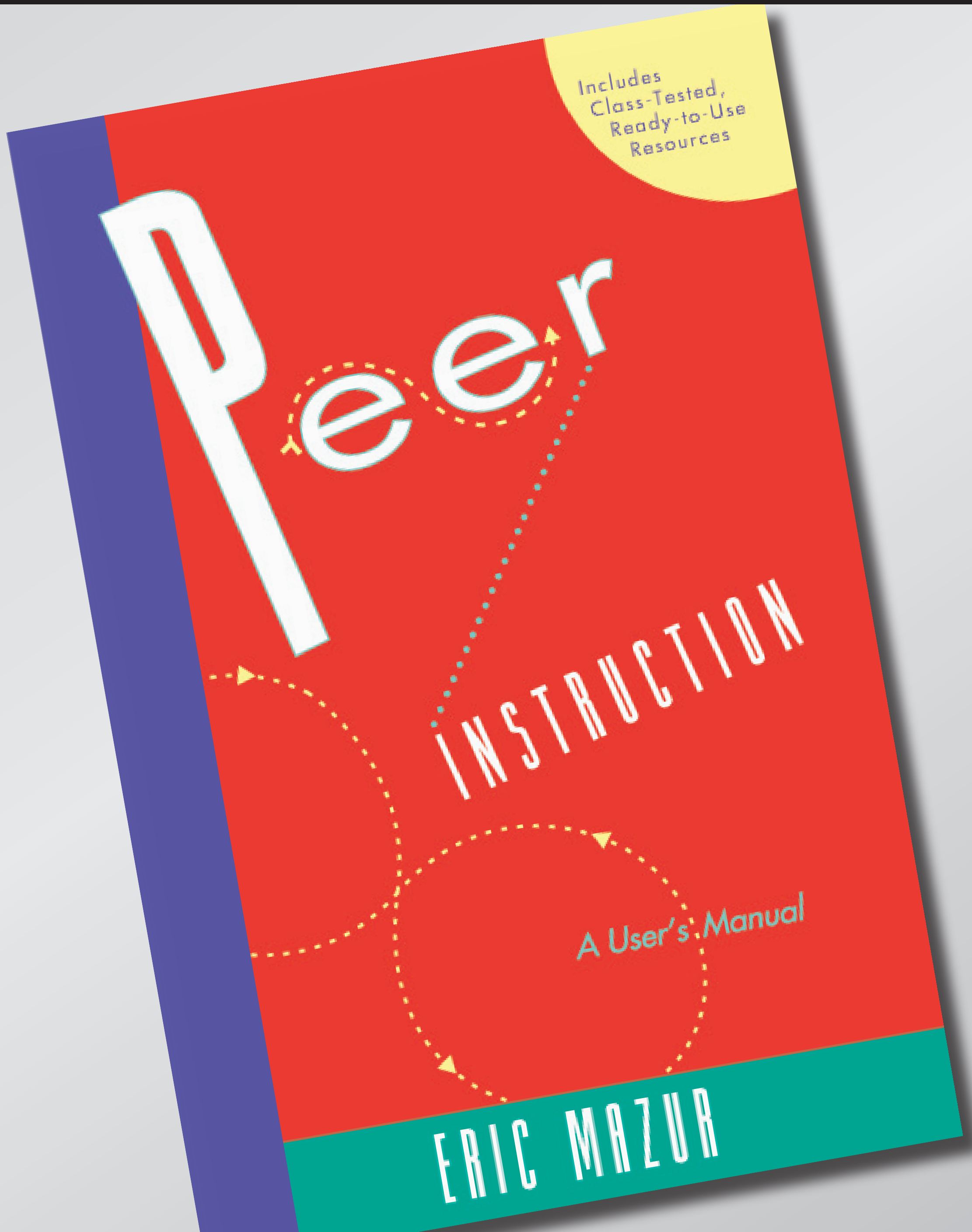
- preparing for class
- provoking thought
- resources



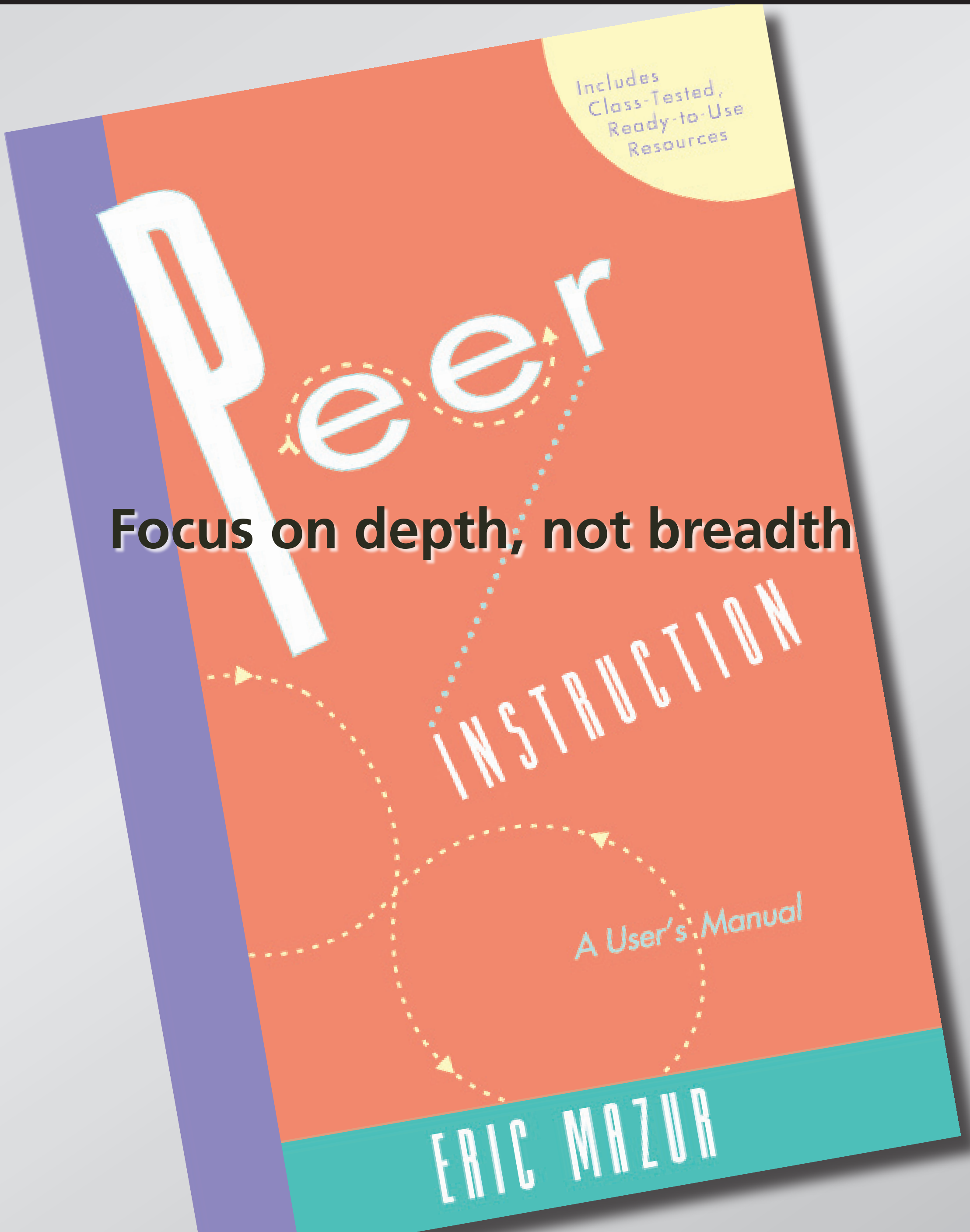
Provoking thought

What to do in class?

Provoking thought



Provoking thought



Focus on depth, not breadth

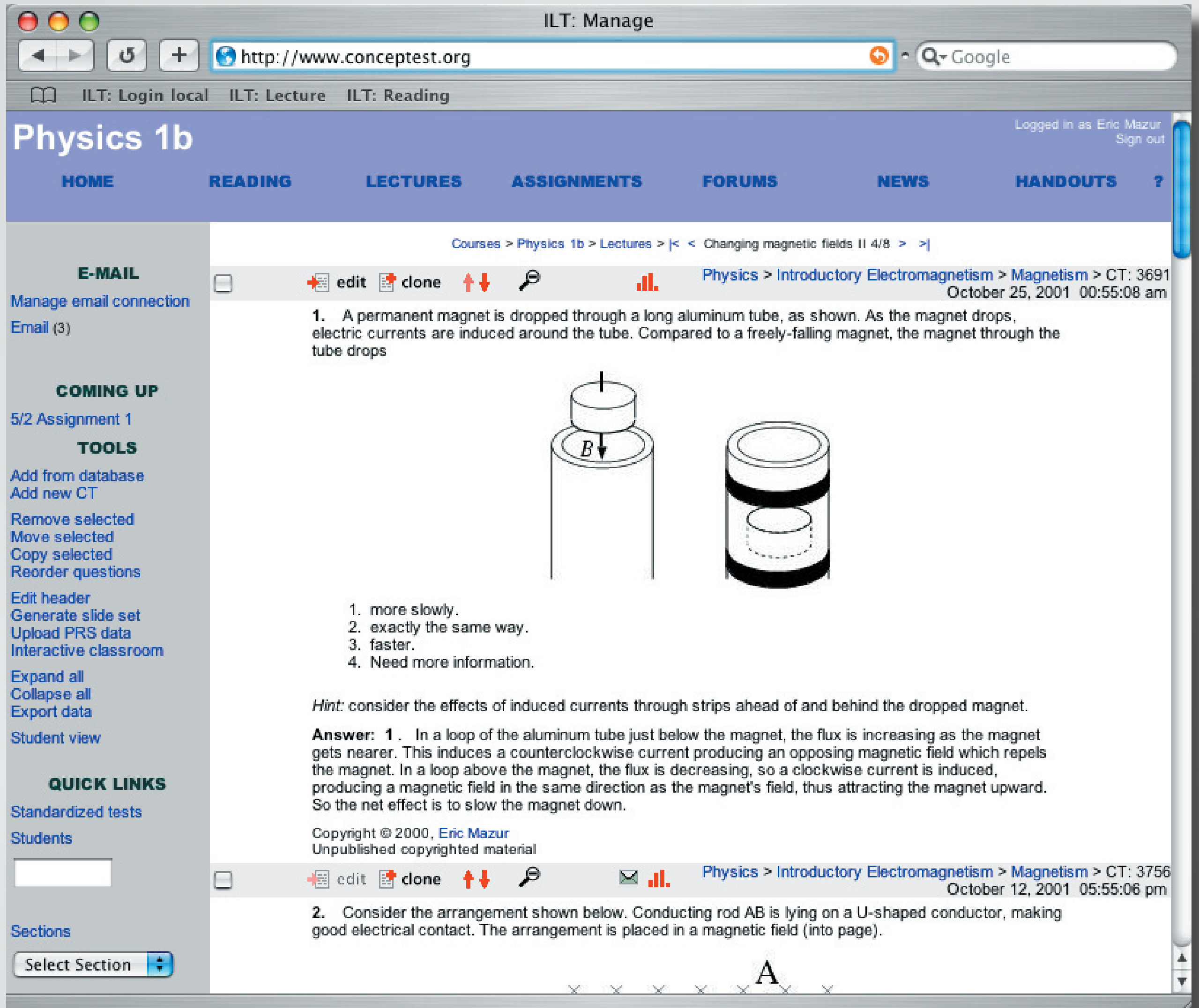
Provoking thought

Provoking thought

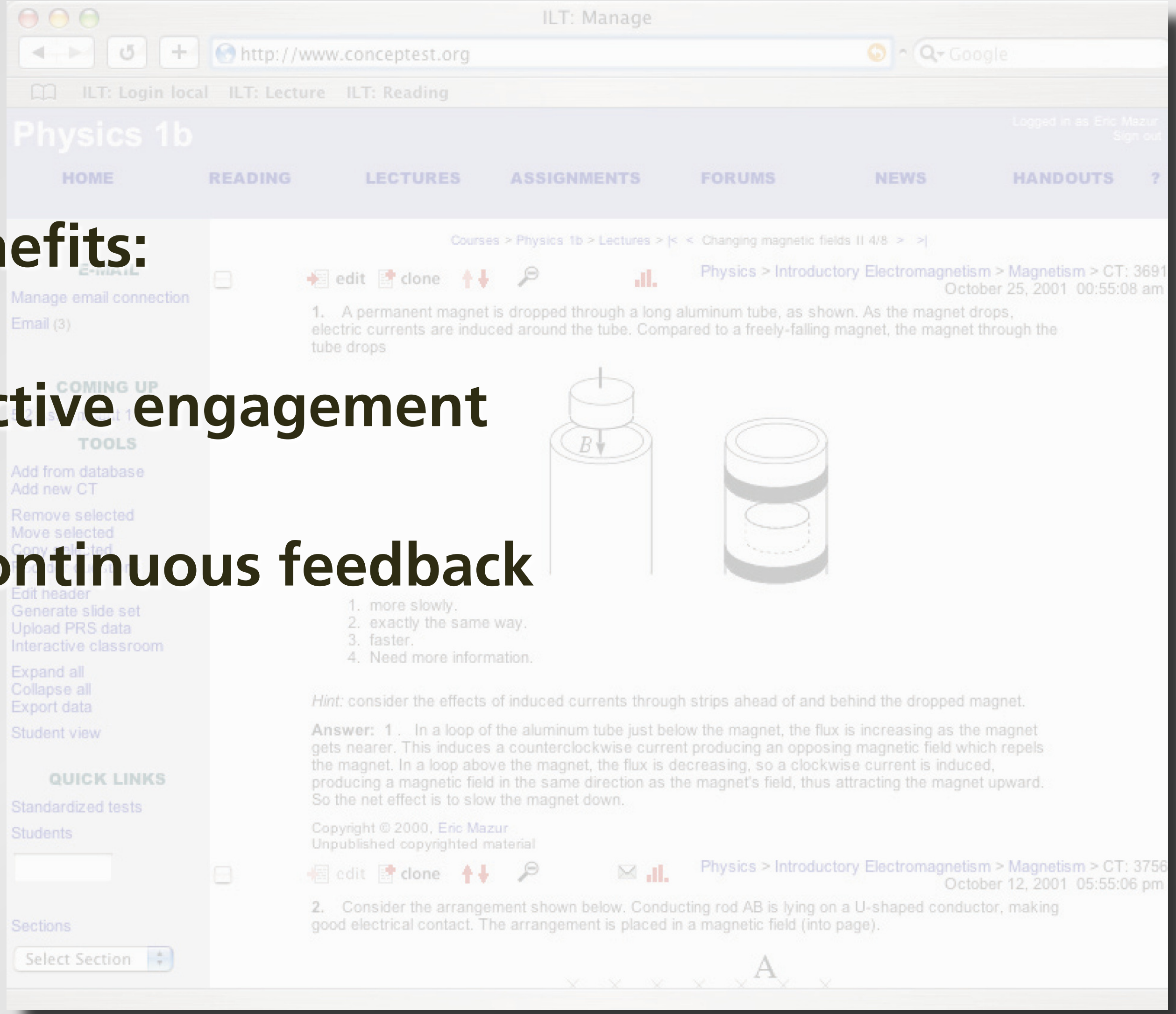
Some hurdles:

- finding materials
- collecting and managing feedback
- providing materials to students

Provoking thought



Provoking thought



Benefits:

- active engagement
- continuous feedback

Outline

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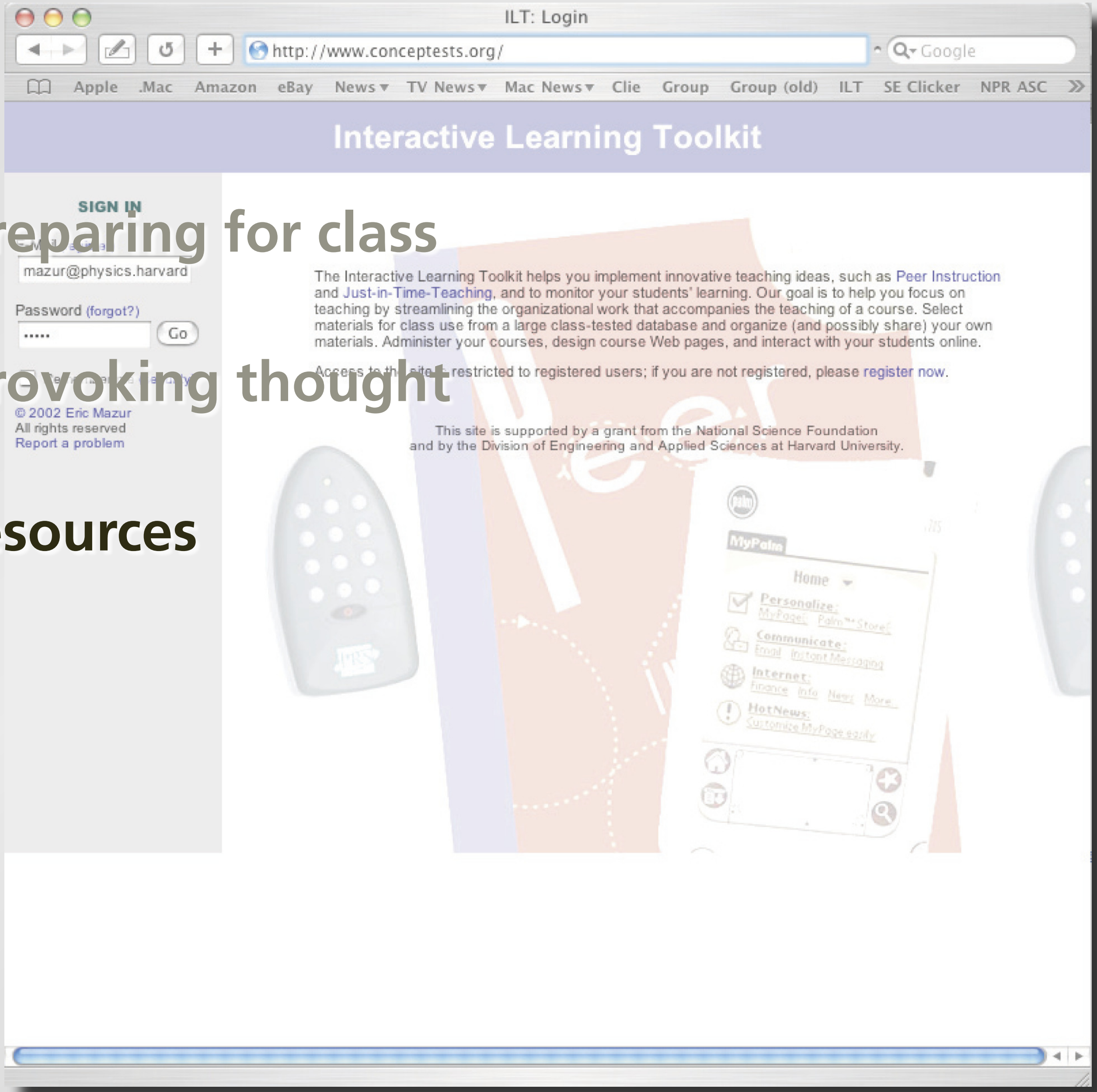
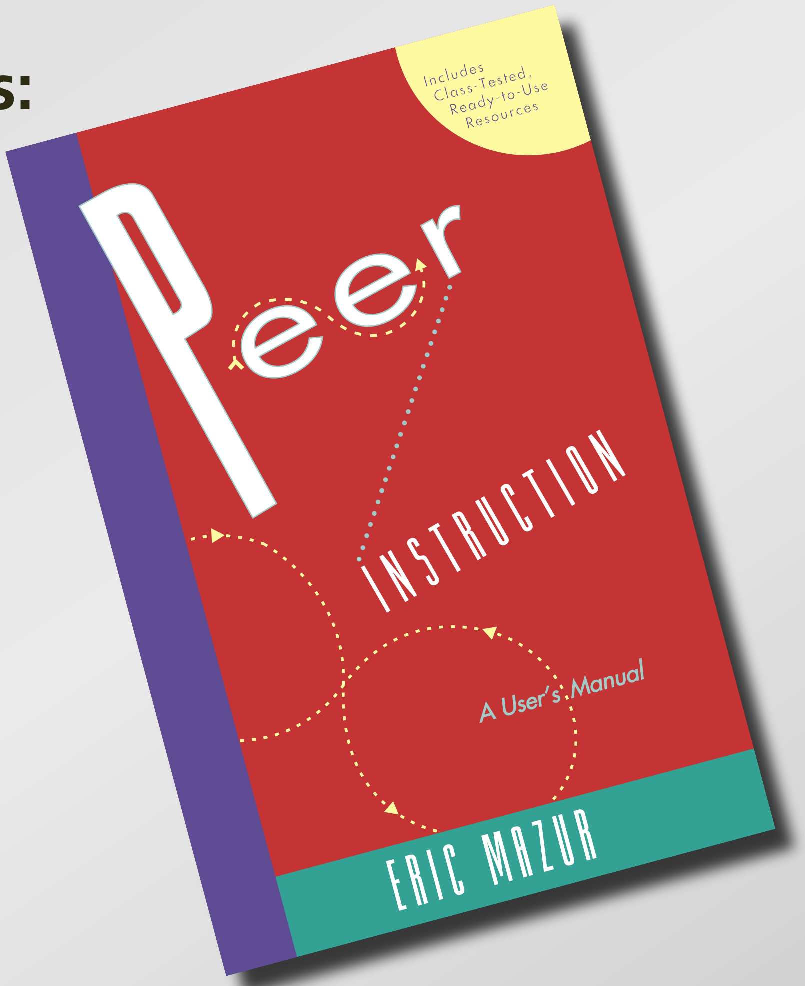
- provoking thought
- resources



Resources

Books with ConcepTests:

- **Physics (Prentice Hall)**



Resources

Books with ConcepTests:

- Physics (Prentice Hall)
- Chemistry (Prentice Hall)

Resources

Books with ConcepTests:

- Physics (Prentice Hall)
- Chemistry (Prentice Hall)
- Astronomy (Prentice Hall)

Resources

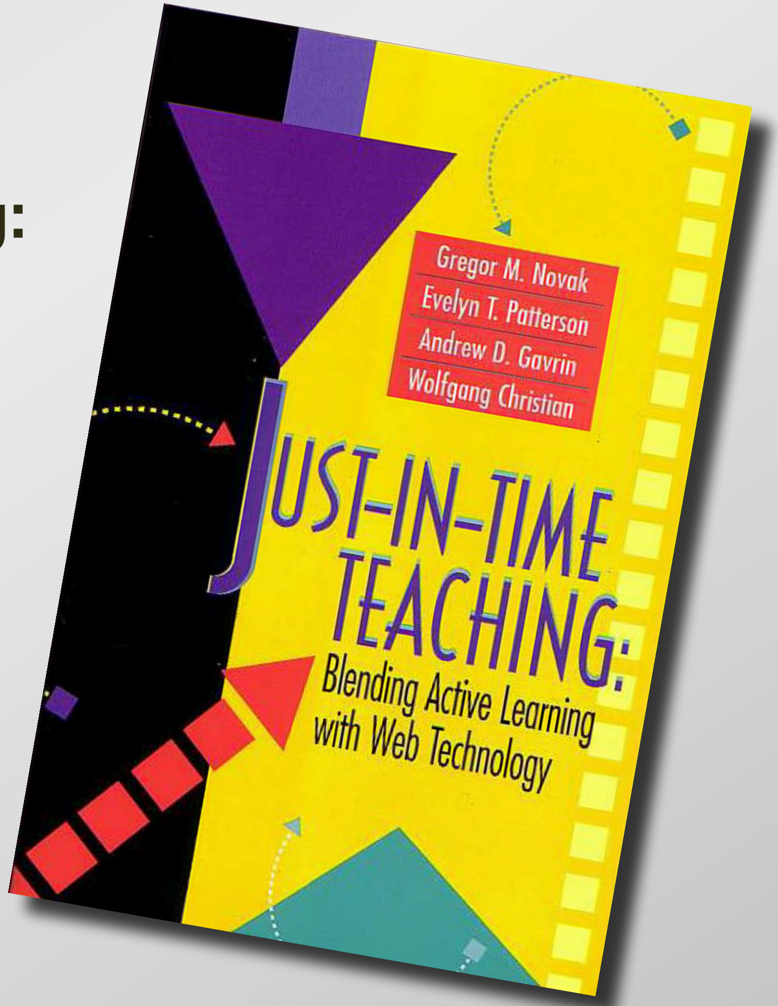
Books with ConcepTests:

- Physics (Prentice Hall)
- Chemistry (Prentice Hall)
- Astronomy (Prentice Hall)
- Calculus (Wiley)

Resources

Information on Just-in-Time-Teaching:

- **Prentice Hall book**
- **http://www.jitt.org**

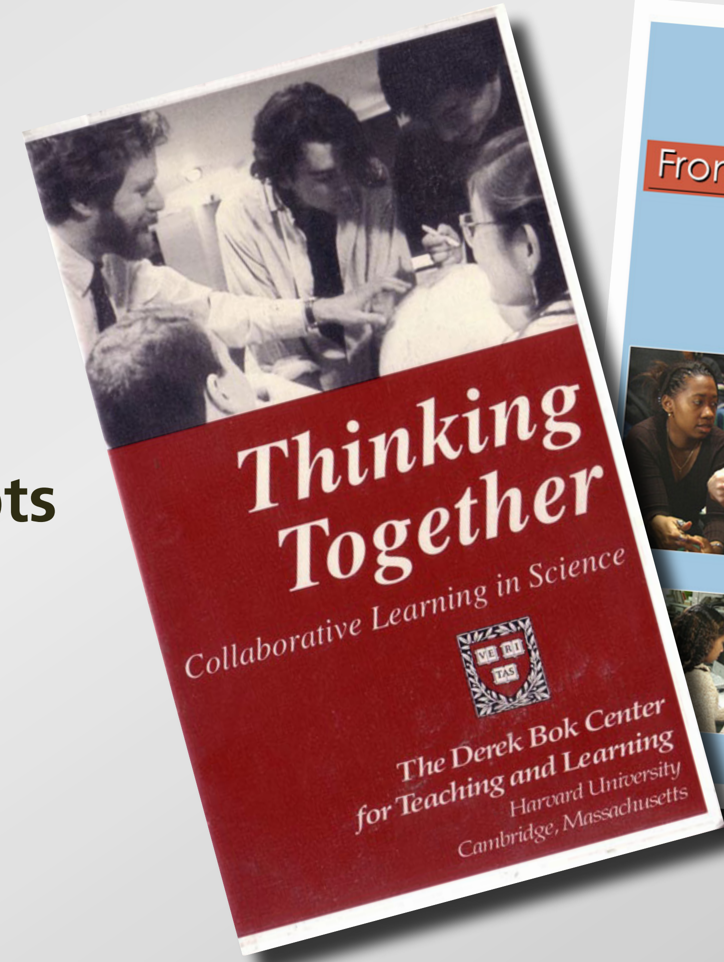


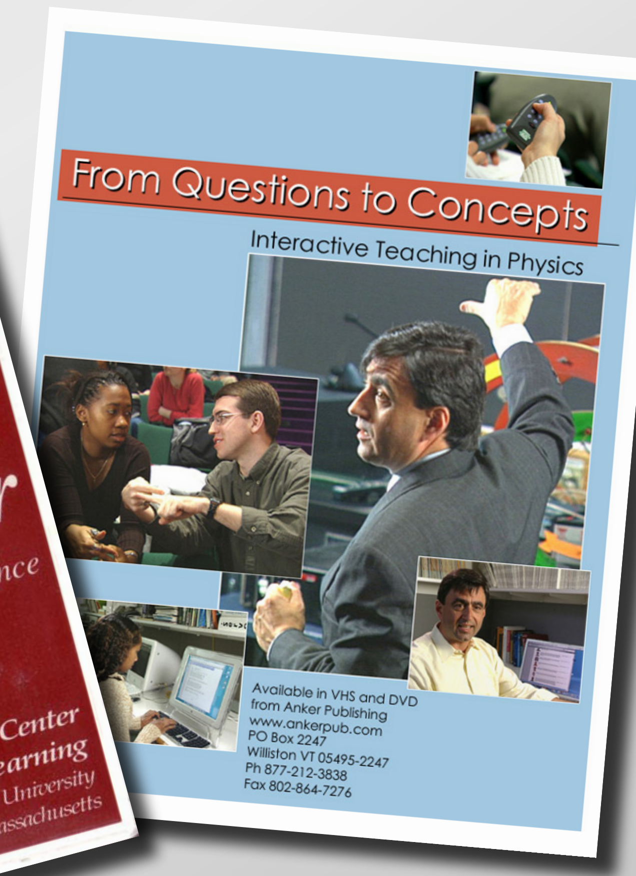
Resources

Videos:

- Thinking together
- From questions to concepts

http://www.ankerpub.com

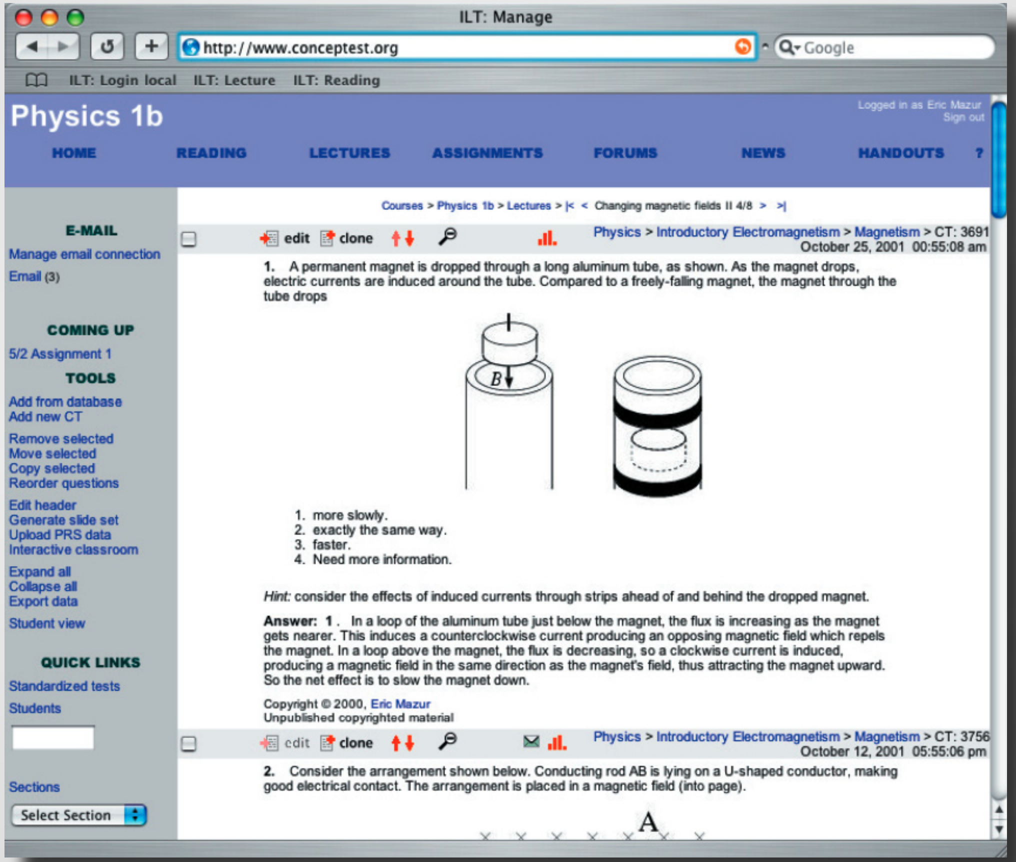




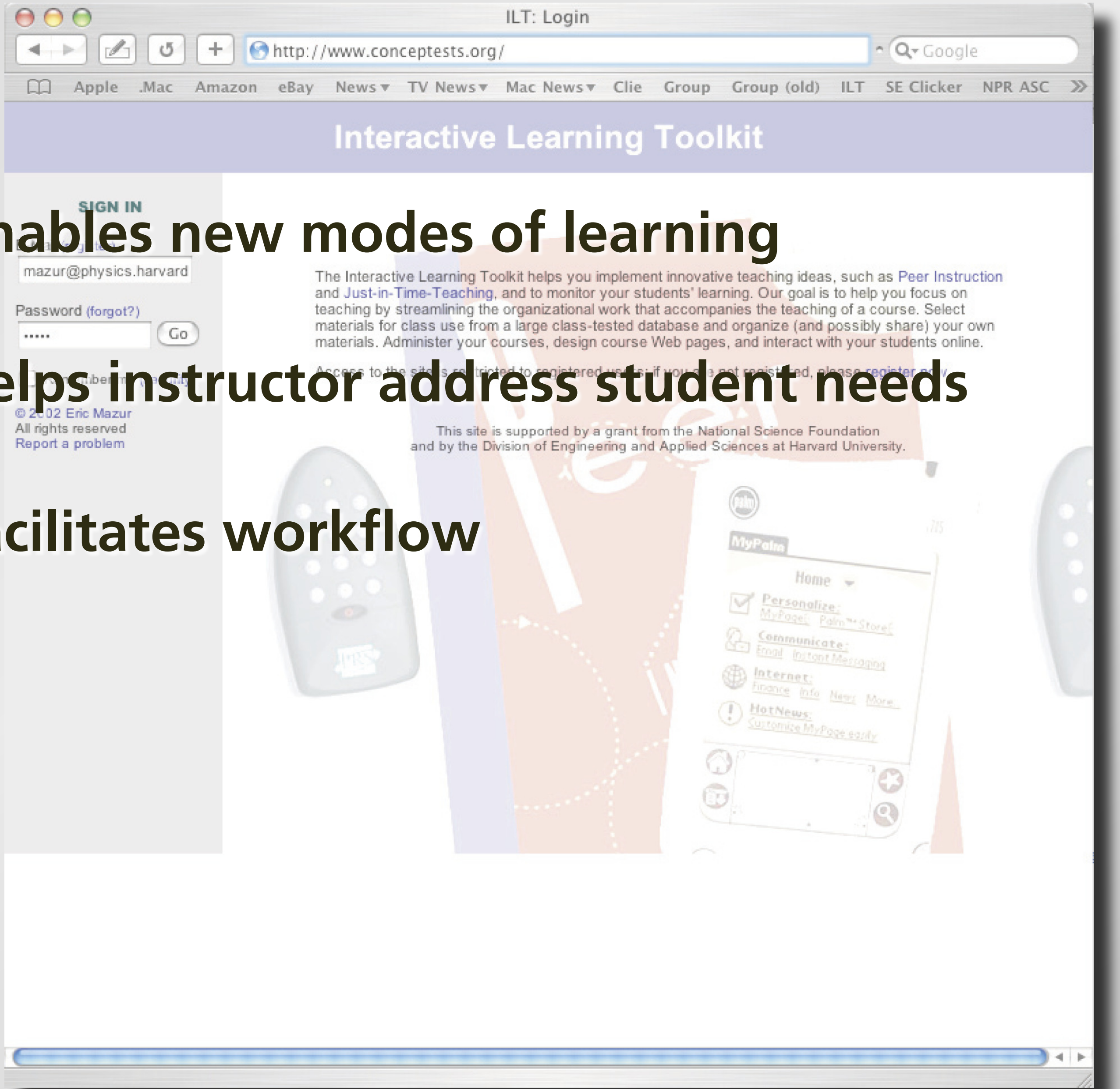
Resources

Course management:

http://deas.harvard.edu/ilt

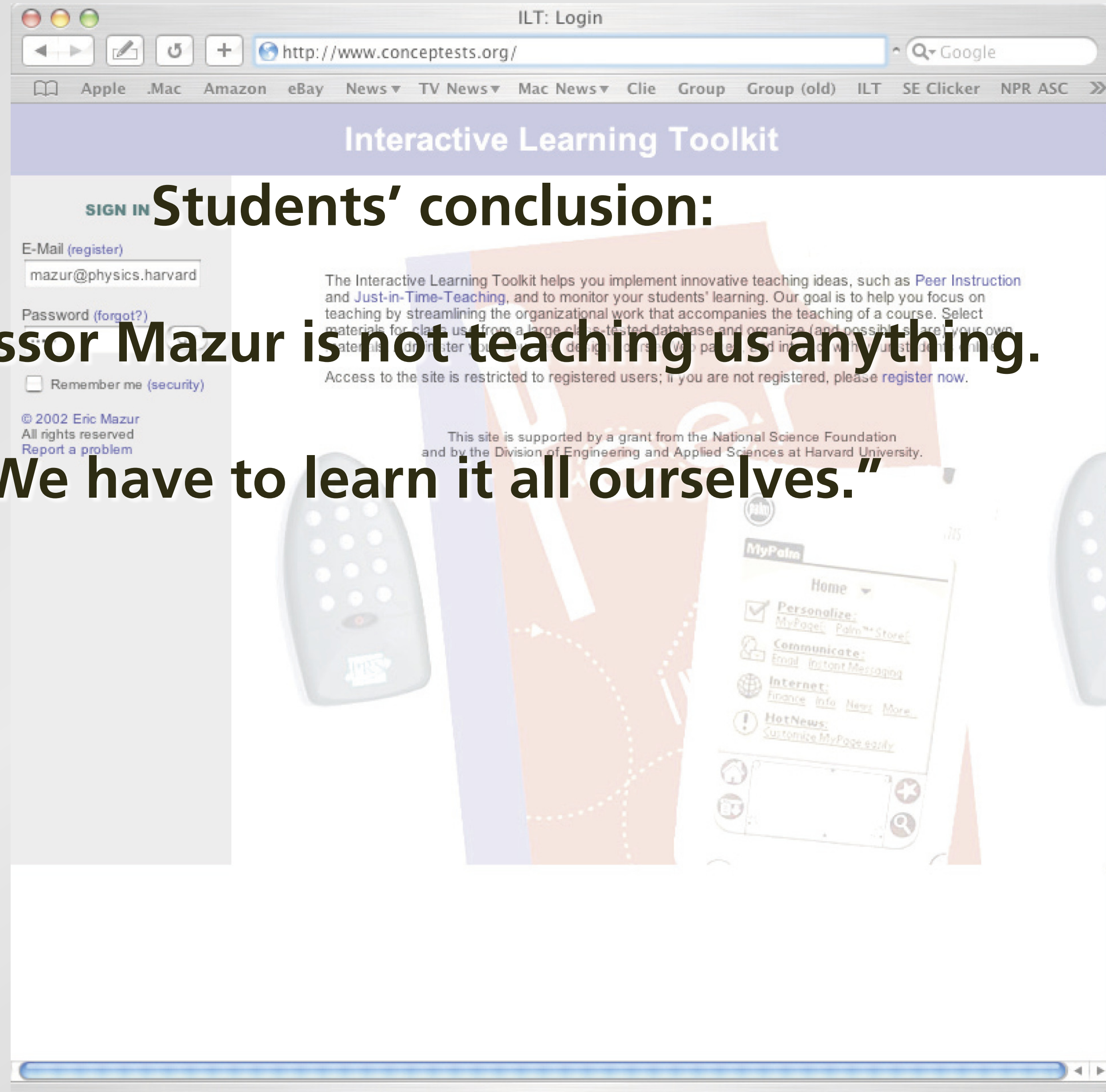


Summary



- enables new modes of learning
- helps instructor address student needs
- facilitates workflow

Summary

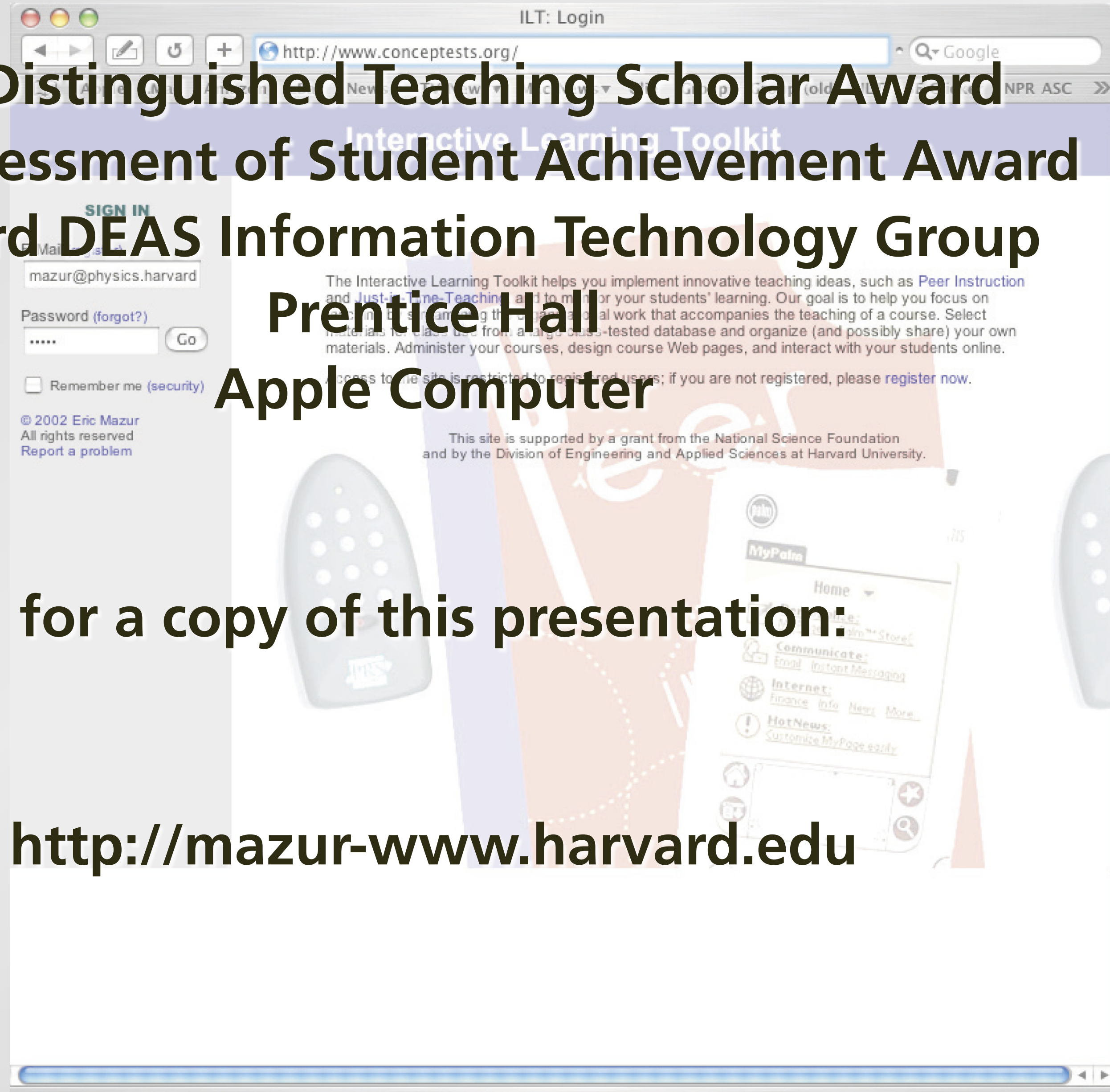


Students' conclusion:

"Professor Mazur is not teaching us anything.

We have to learn it all ourselves."

Support:



NSF Distinguished Teaching Scholar Award
NSF Assessment of Student Achievement Award
Harvard DEAS Information Technology Group
Prentice Hall
Apple Computer

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