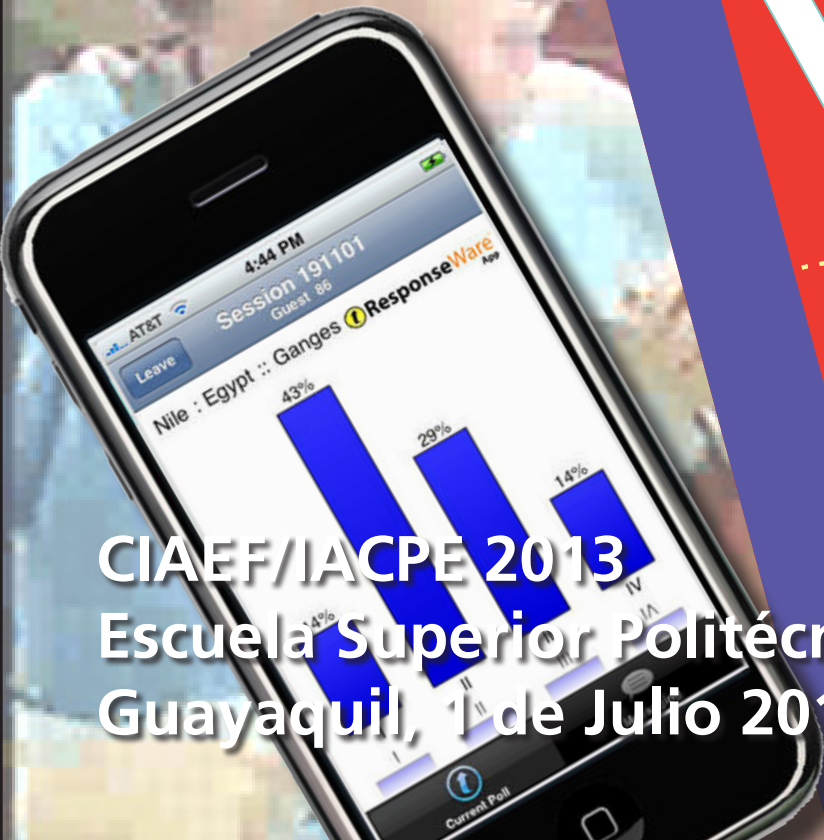


# ConcepTest design workshop



CIAEF/IACPE 2013  
Escuela Superior Politécnica del Litoral  
Guayaquil, 1 de Julio 2013

# ConcepTest design workshop



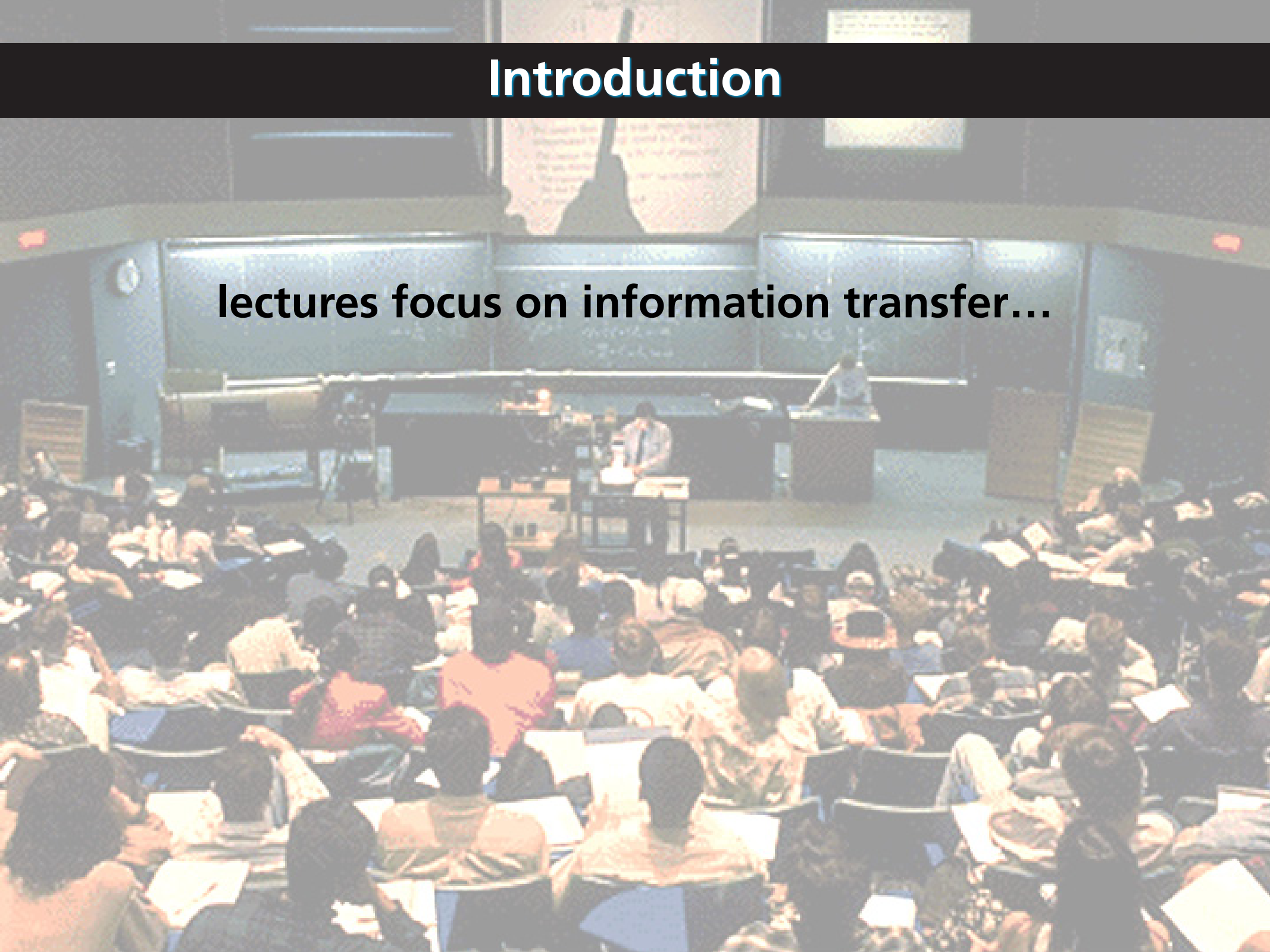
@eric\_mazur

CIAEF/IACPE 2013  
Escuela Superior Politécnica del Litoral  
Guayaquil, 1 de Julio 2013



# Introduction

**lectures focus on information transfer...**

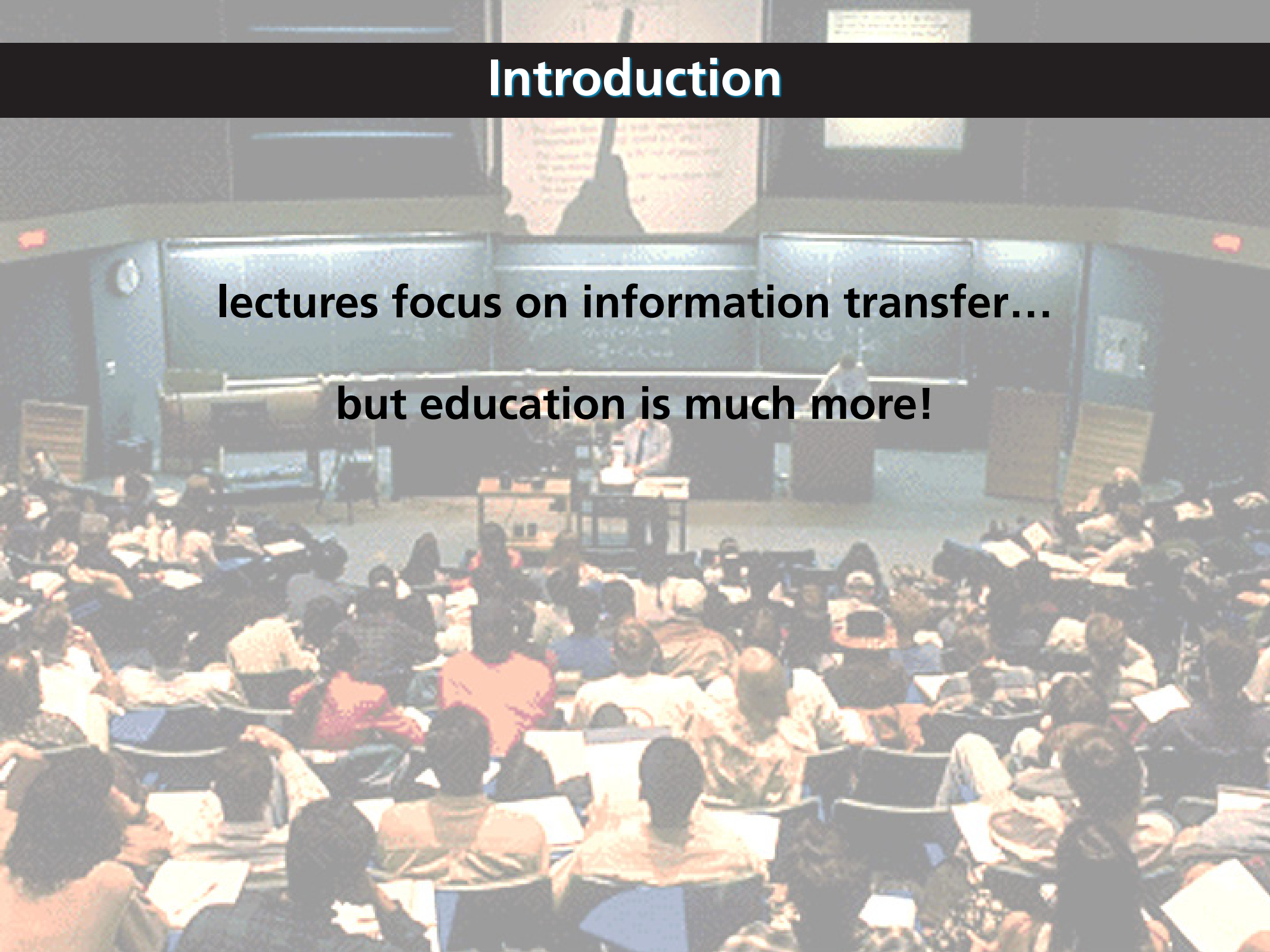




# Introduction

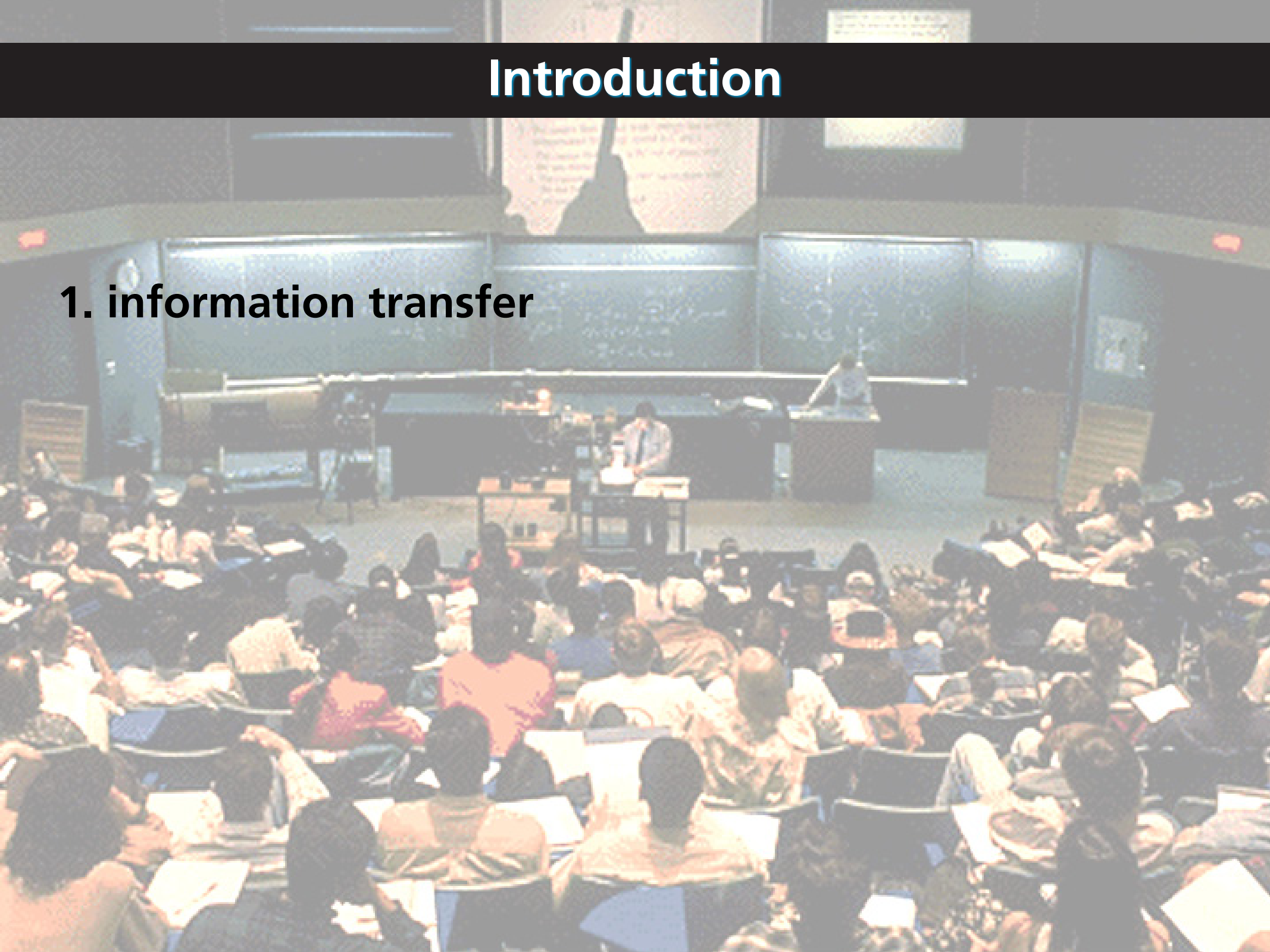
**lectures focus on information transfer...**

**but education is much more!**



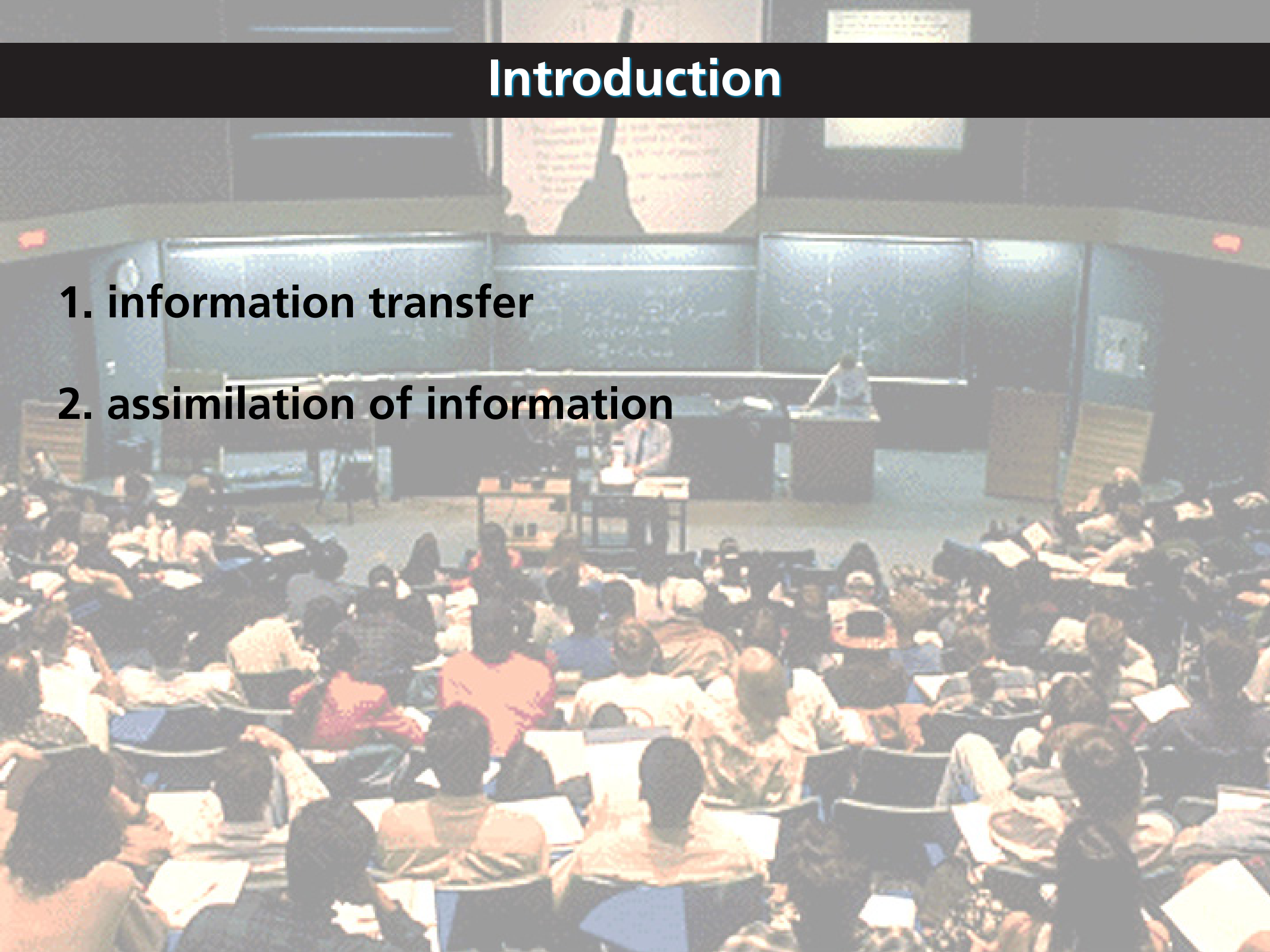
# Introduction

## 1. information transfer



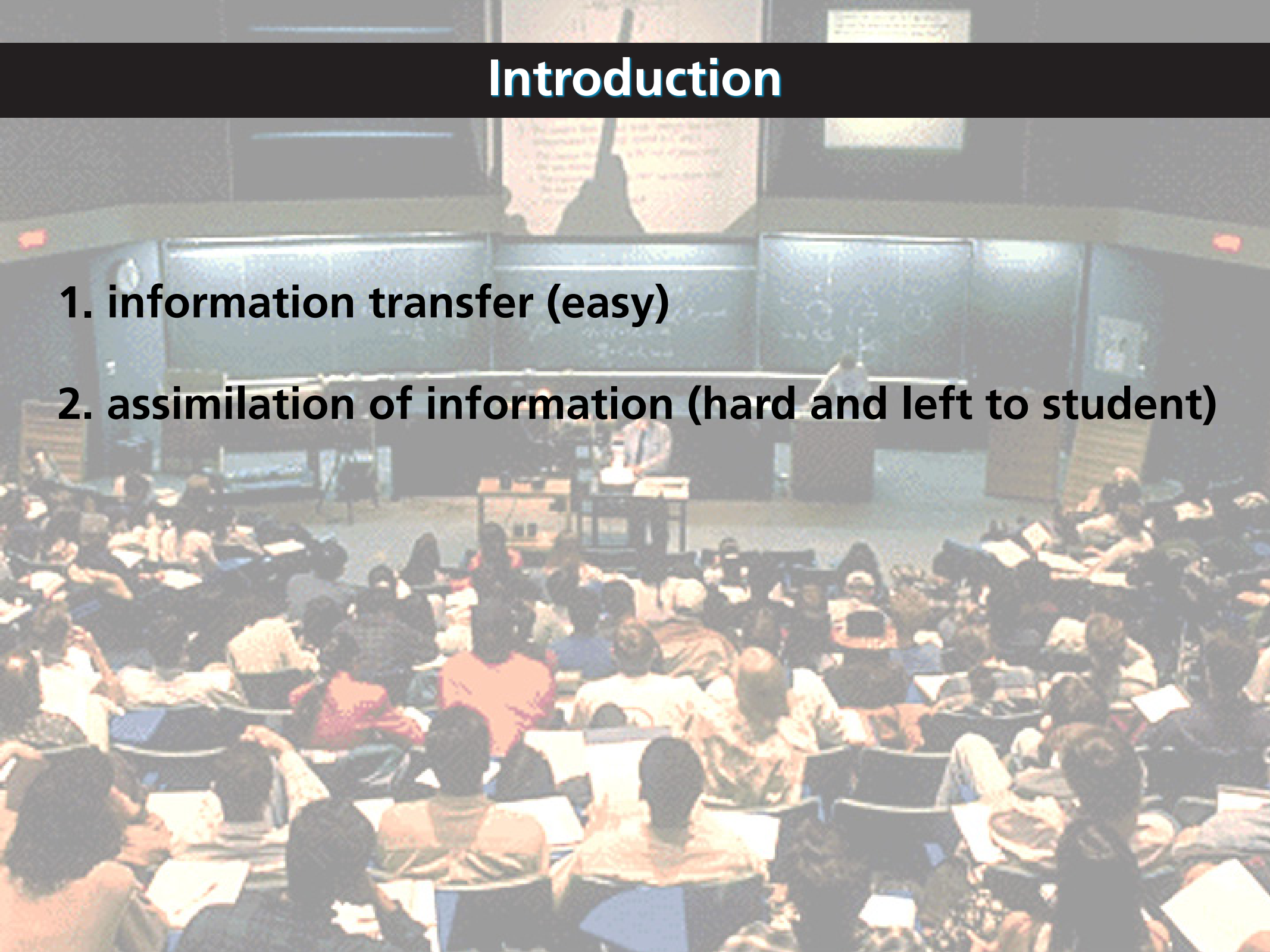
# Introduction

1. information transfer
2. assimilation of information



# Introduction

1. information transfer (easy)
2. assimilation of information (hard and left to student)



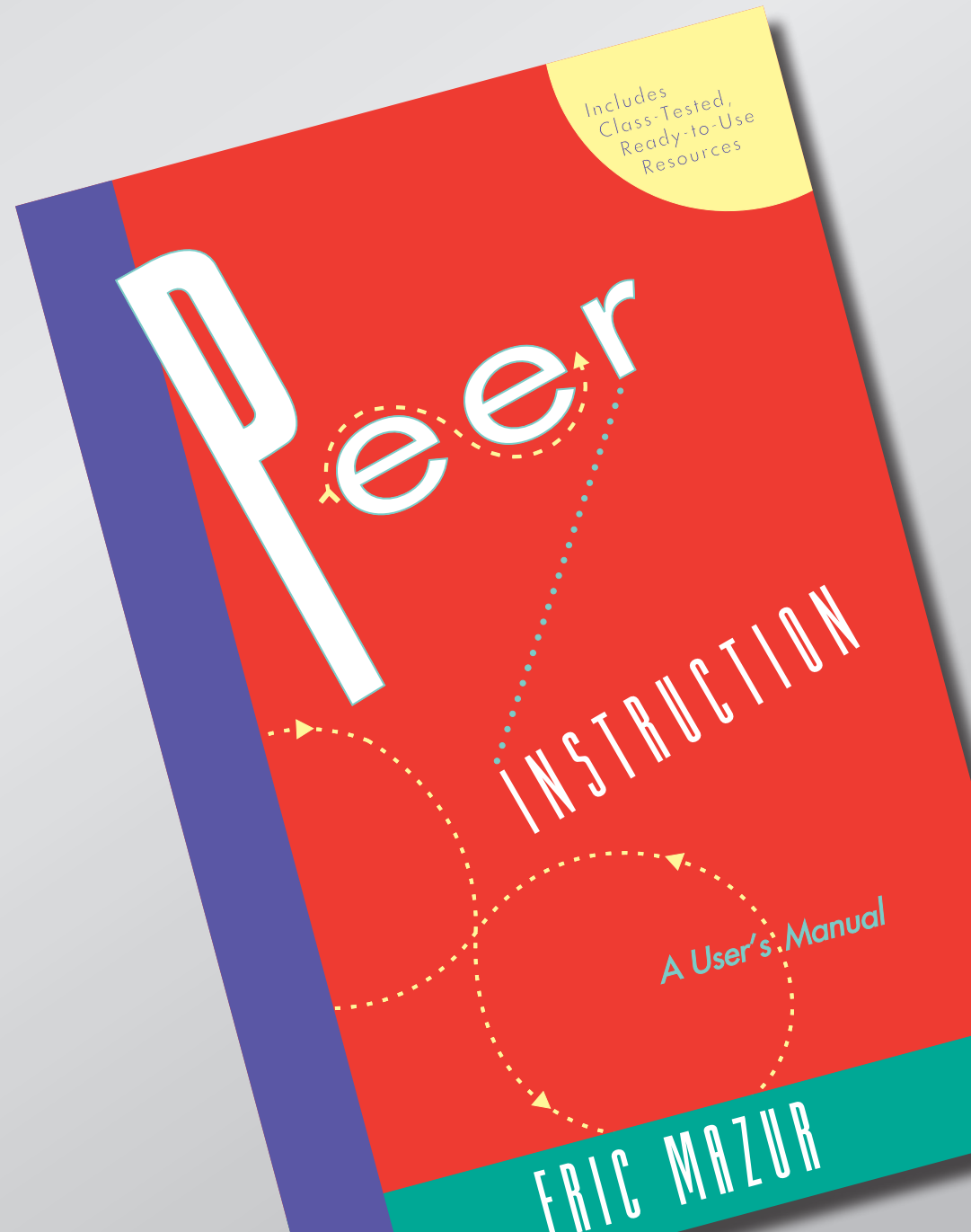
# Introduction

**Solution: move information transfer out of classroom!**



# Introduction

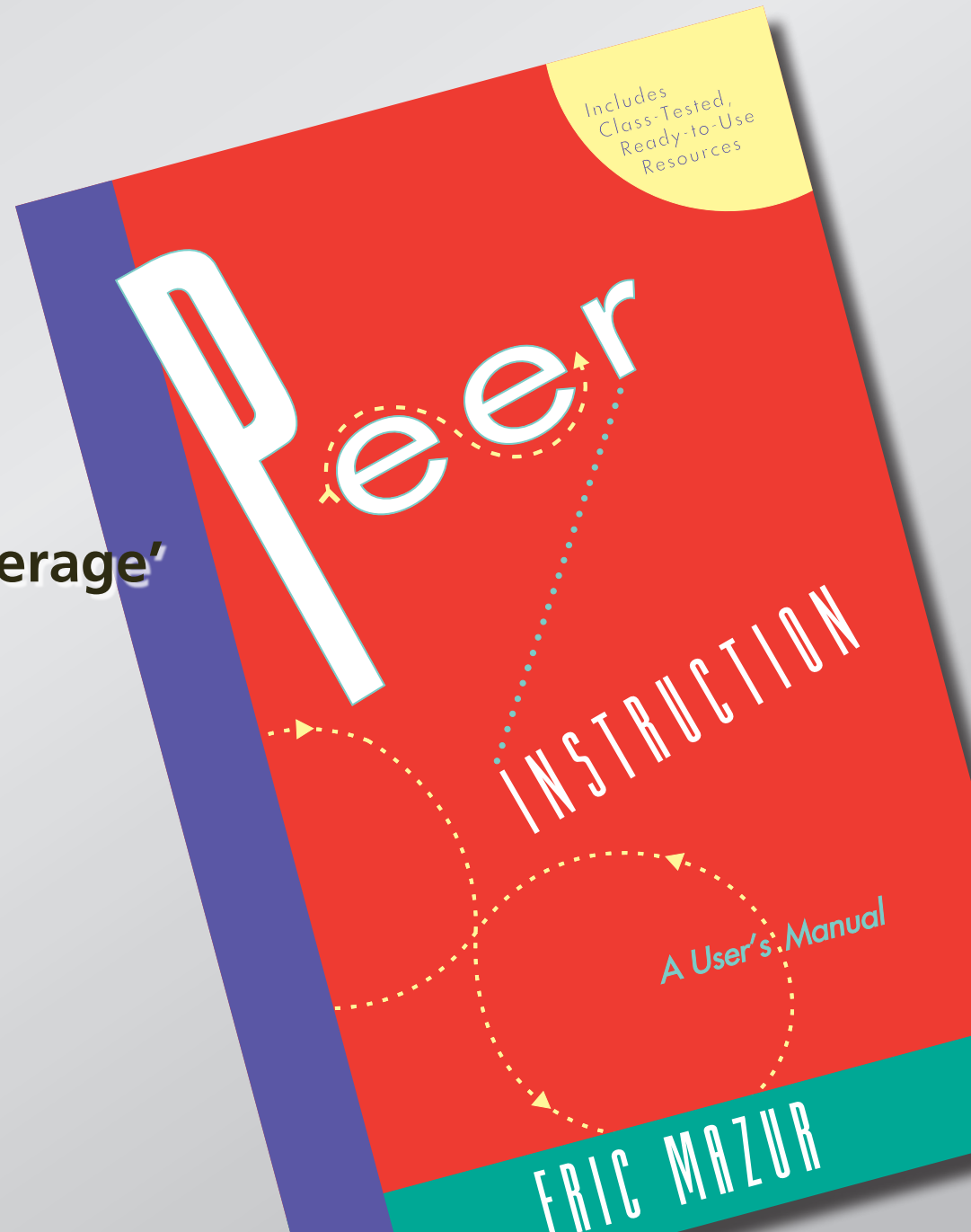
## Peer Instruction (PI)



# Introduction

## Main features:

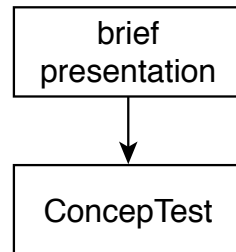
- pre-class assignment
- in-class: depth, not 'coverage'
- ConcepTests



# Introduction

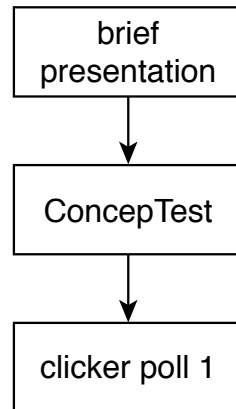
brief  
presentation

# Introduction

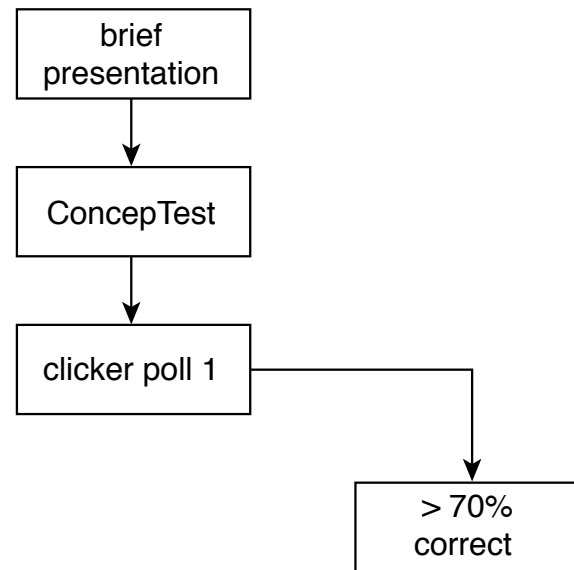




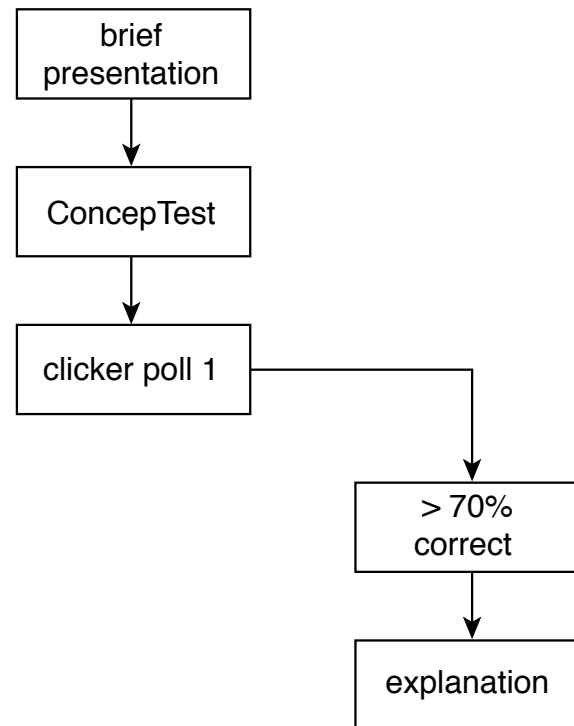
# Introduction



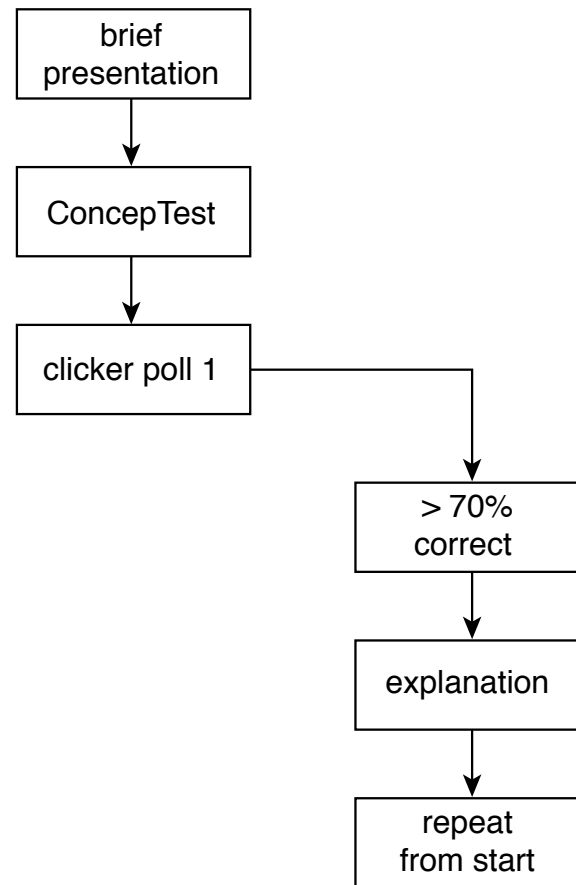
# Introduction



# Introduction

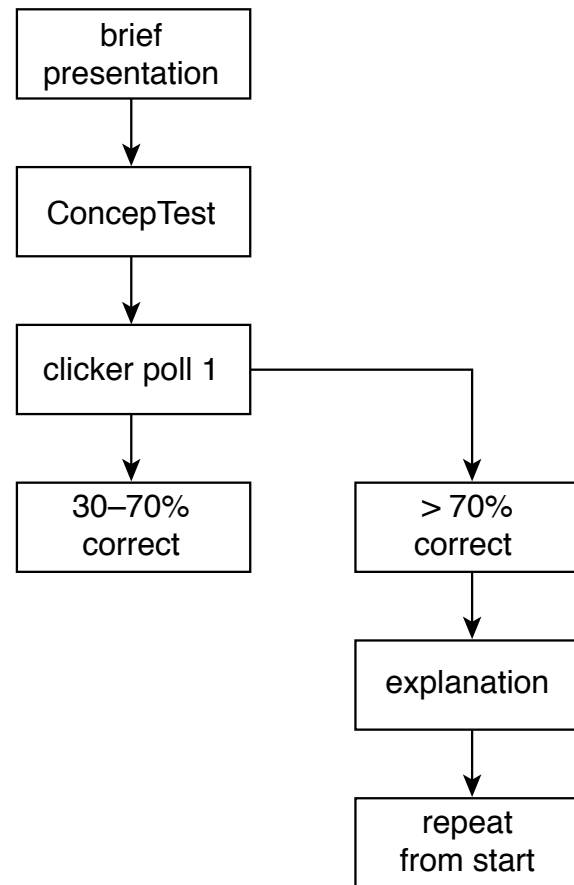


# Introduction

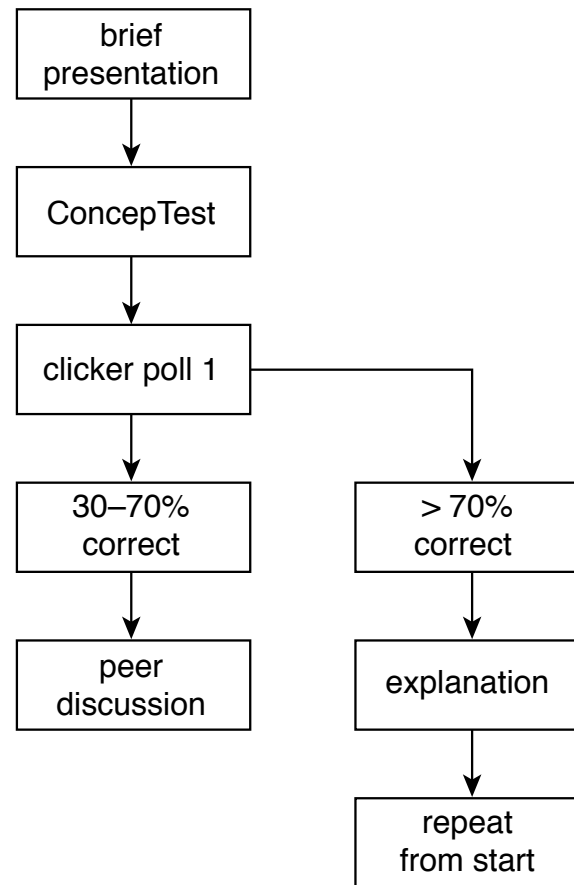




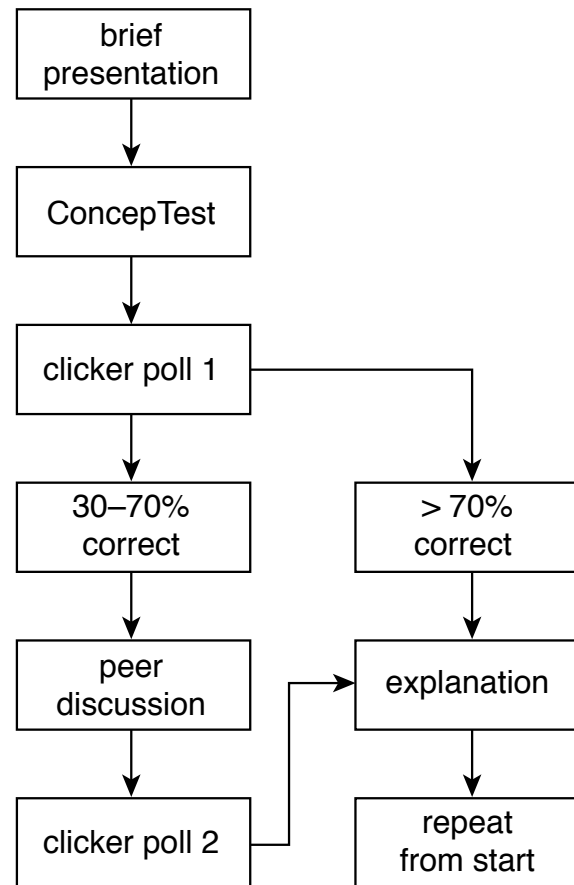
# Introduction



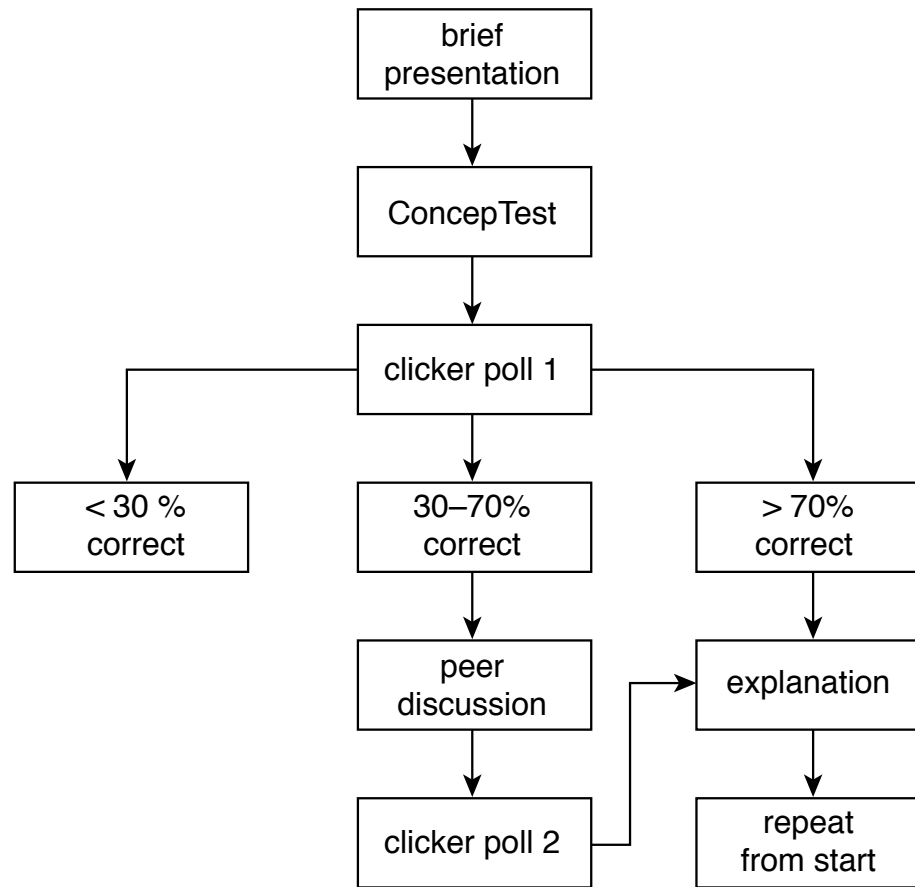
# Introduction



# Introduction

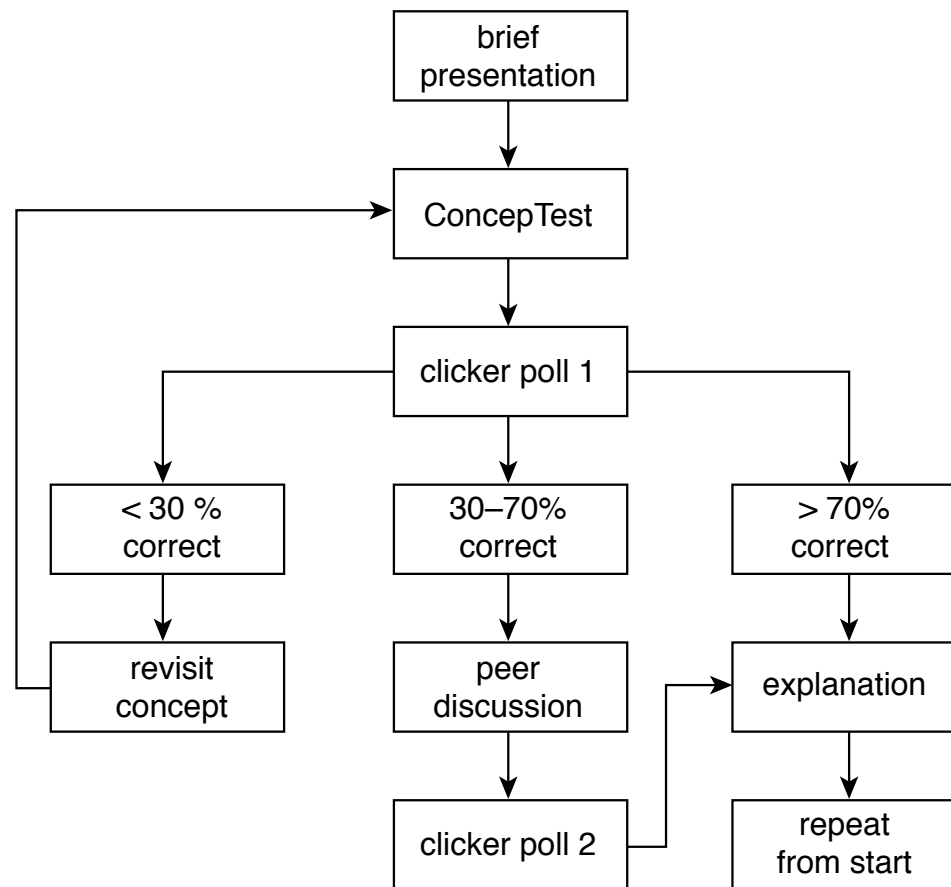


# Introduction

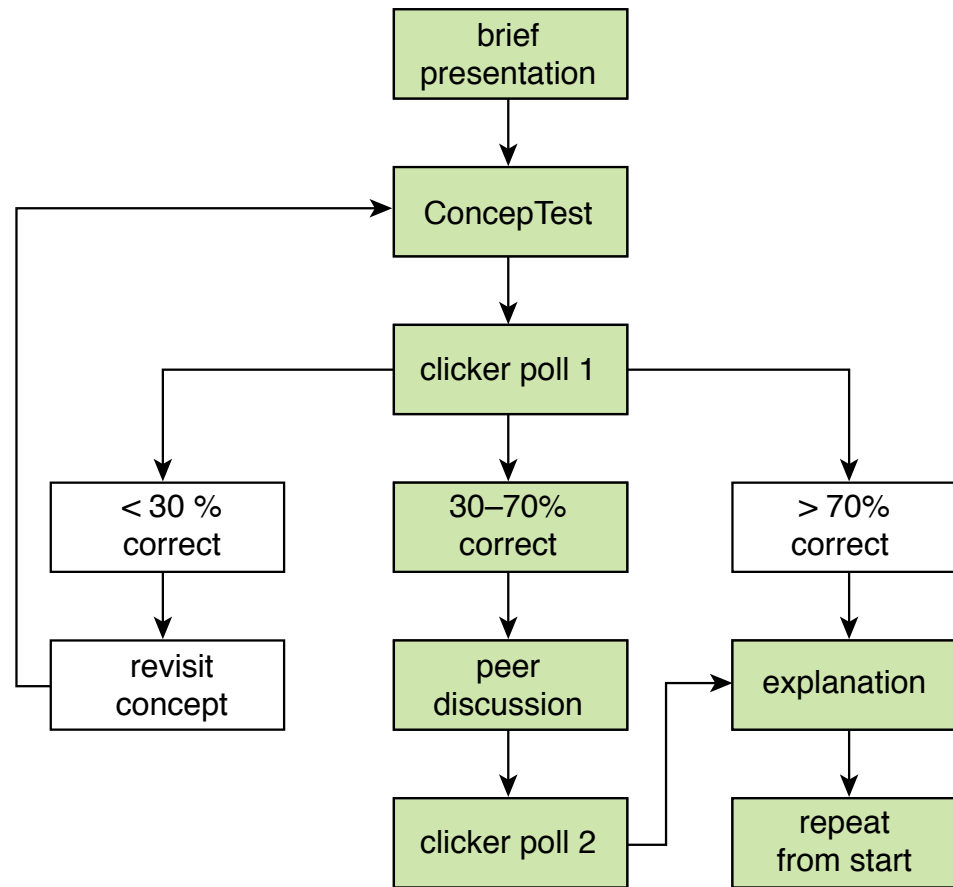




# Introduction



# Introduction



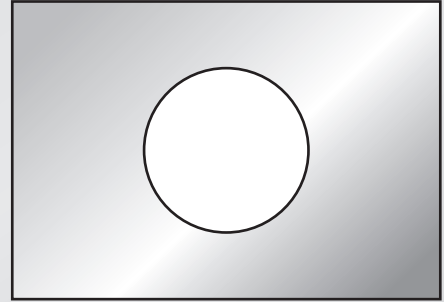
# Introduction

**PI:**

- **helps students overcome difficulties**
- **encourages deep learning**
- **provides depth, not “coverage”**
- **helps you become aware of misconceptions**

# Let's try it!

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



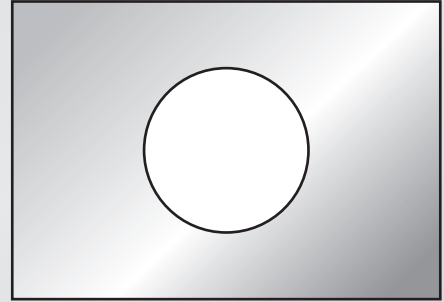


# Let's try it!

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.

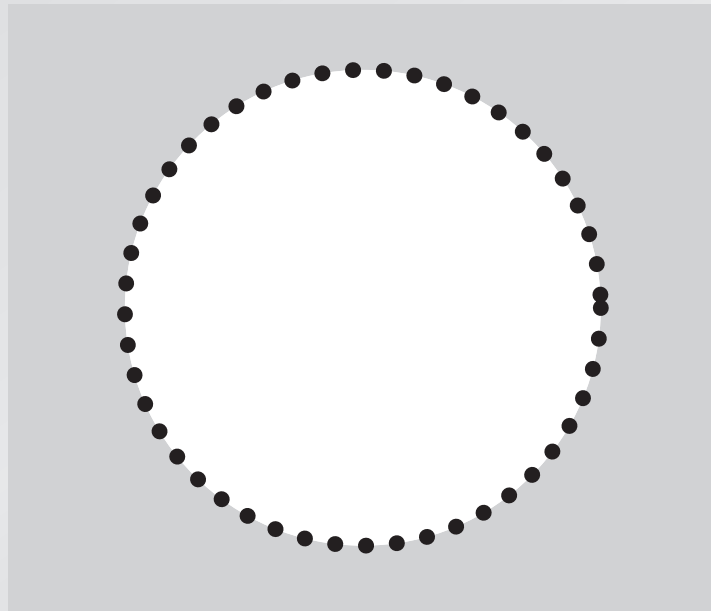


# Let's try it!

*It's easy to fire up the audience!*

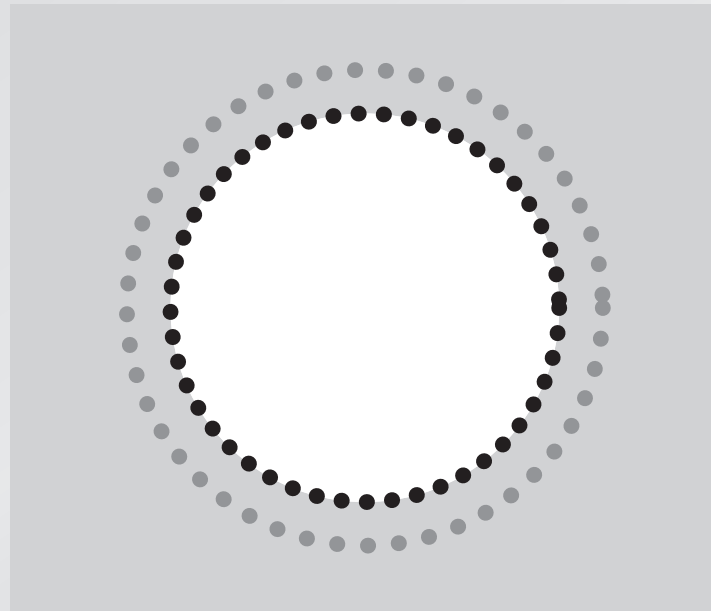
# Let's try it!

consider the atoms at the rim of the hole



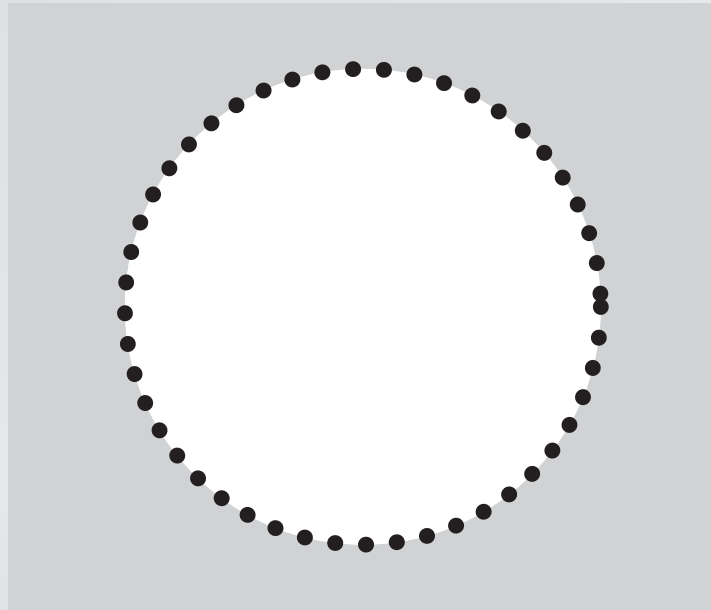
# Let's try it!

consider the atoms at the rim of the hole



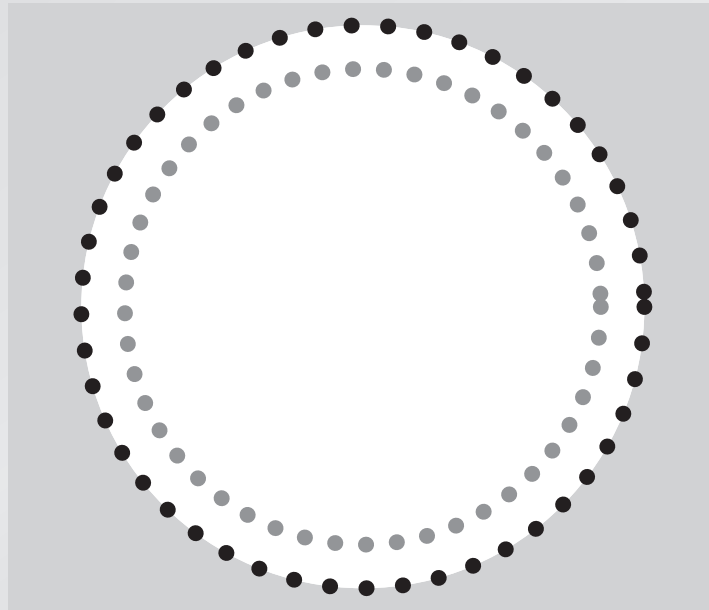
# Let's try it!

consider the atoms at the rim of the hole



# Let's try it!

consider the atoms at the rim of the hole



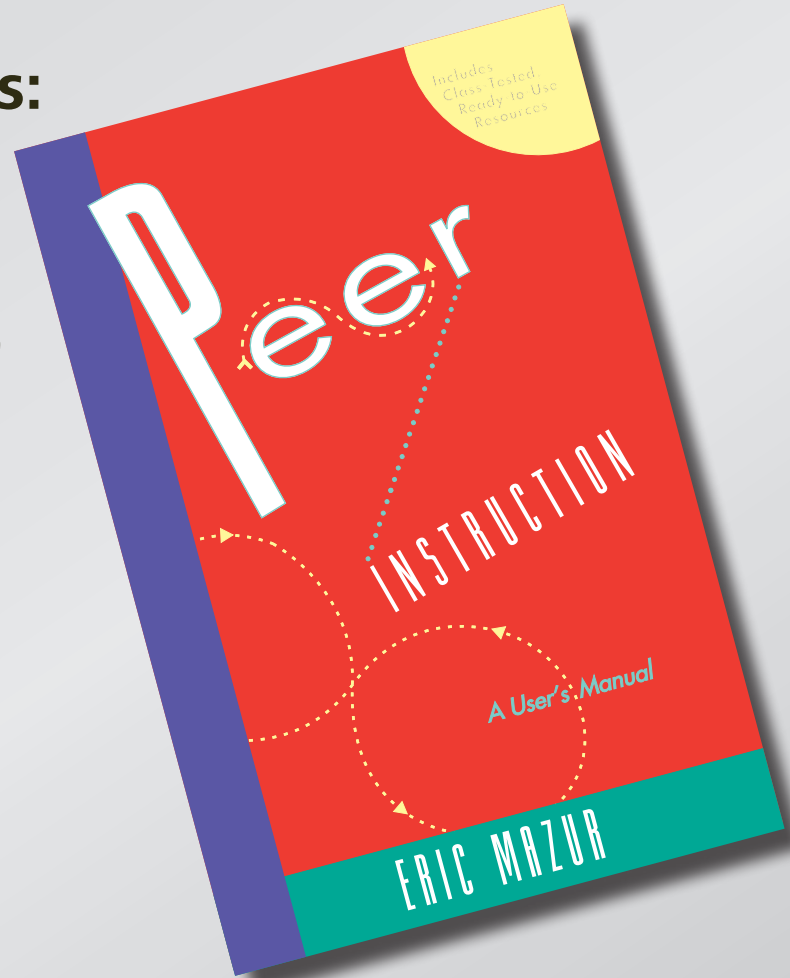
# Frequently Asked Questions

*“How do I write/find good questions for...?”*

# ConceptTests

## Books with ConceptTests:

- Physics (Prentice Hall)





# ConcepTests

## Books with ConcepTests:

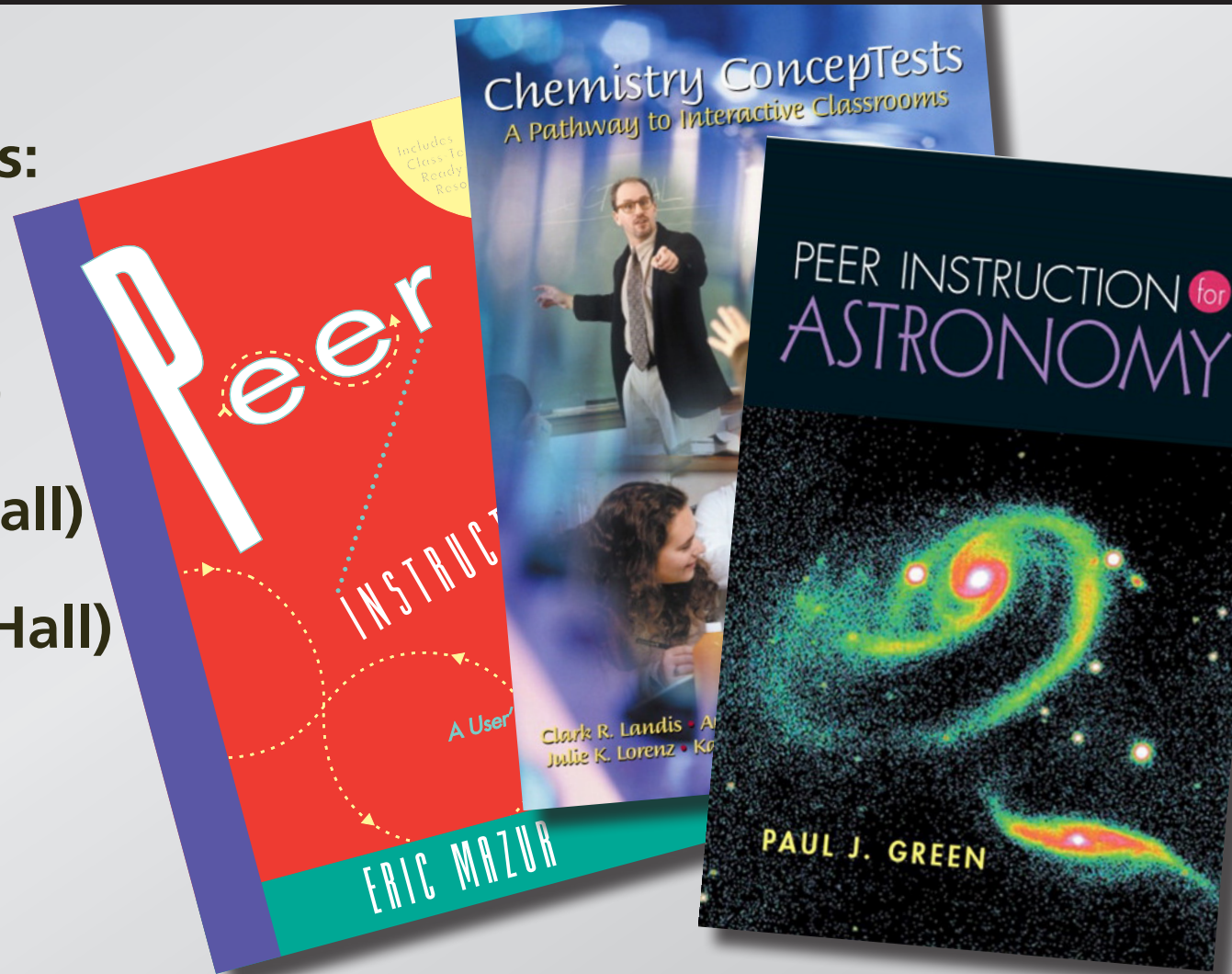
- Physics (Prentice Hall)
- Chemistry (Prentice Hall)



# ConcepTests

## Books with ConcepTests:

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



# ConcepTests

## Books with ConcepTests:

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



# ConcepTests

... or try searching Google:

<subject> "Peer Instruction"

<subject> ConcepTest

<subject> "Concept Test"

<subject> clickers



# ConcepTests

## Types of questions

- survey
- model testing
- discussion
- select from list

# Let's try it!

Which of the following airlines tries to save fuel by suggesting that its passengers use the bathroom before boarding?

1. Delta Airlines
2. Lufthansa
3. All Nippon Airways
4. British Midland Airways
5. Air France
6. JAL
7. Aboriginal Air Services
8. Aeroflot
9. Are you kidding me? None of the above.



# Let's try it!

Which of the following airlines tries to save fuel by suggesting that its passengers use the bathroom before boarding?

1. Delta Airlines
2. Lufthansa
3. **All Nippon Airways** ✓
4. British Midland Airways
5. Air France
6. JAL
7. Aboriginal Air Services
8. Aeroflot
9. Are you kidding me? None of the above.



# ConcepTests

hole in plate/circumference

model

airline

fact



# ConcepTests

hole in plate/circumference

model

airline

fact

fact-recall not engaging

# Evaluating questions

***“What constitutes a good question?”***

# Evaluating questions

**Good conceptual questions (ConceptTests):**

- **focus on interpretation/model (not recall)**
- **stimulate discussion**
- **are not “leading questions”**
- **are of manageable difficulty**

# Evaluating questions

**Let's evaluate some questions!**

# Getting started

*"I still need help getting started..."*



**Join now!**

**PeerInstruction.net**

**Funding:**

**National Science Foundation**

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