Workshop on Peer Instruction

Becas Santander Skills | Innovation in Teaching
Laspau
1 December 2021
quick reflection
quick reflection

think of something you are good at
quick reflection

how did you become good at that?
Goal of this session

demonstrate how to integrate
Peer Instruction in your teaching approach
Getting to know each other

Did you have fun doing the pre-assignment?

A. It was fun!
B. Meh!
C. I hate preassignments
D. I hate to admit it, but I didn’t do it
Getting to know each other

Did you gain a new insight from the pre-assignment?

A. Yes, from the article or video
B. Yes, from the discussion with others
C. Both!
D. No
E. I already told you, I didn’t do the pre-assignment
Getting to know each other

When you were a student in college, averaging over all the classes you attended in all your courses, for what percentage of all these classes did you prepare yourself by reading the material ahead of class?

A. Every single class of all of the classes I took
B. About 90% of the classes
C. Three quarters of the classes
D. Half the classes
E. One quarter of the classes
F. A few or none of the classes
Icebreaker

Discuss pre-assignment on Perusall
75-student team & project based class!
Information transfer

Instructor-paced
Synchronous
Lecture

Sense-making

Self-paced
Asynchronous
Home work/study

Campus

Home
Information transfer
instructor-paced
synchronous
lecture

Sense-making
self-paced
asynchronous
home work/study
campus
- information transfer
  - instructor-paced synchronous lecture

home
- information transfer
  - instructor-paced synchronous online lecture

home
- sense-making
  - self-paced asynchronous home work/study
- **Campus**: Instructor-paced synchronous lecture
- **Home**:
  - Instructor-paced asynchronous recorded lecture
  - Sense-making
- **Home**: Self-paced asynchronous home work/study
instructor-paced synchronous lecture

instructor-paced asynchronous recorded lecture

home

self-paced asynchronous home work/study

ALONE!
Online

Information transfer

Self-paced asynchronous

Online

Sense-making

Instructor-led synchronous
interactive

online

information transfer

self-paced asynchronous

instructor-led synchronous

online

sense-making
interactive

- online
- information transfer
- self-paced
- asynchronous

- online
- sense-making
- instructor-led
- synchronous

two evidence-based approaches
let’s explore these two steps

- **online**
  - information transfer
  - self-paced
  - asynchronous

- **online**
  - sense-making
  - instructor-led
  - synchronous
instructor-led interactive sense-making
instructor-led interactive sense-making
instructor-led interactive sense-making

Peer Instruction...

• interactive teaching method
• promotes meaningful thinking
instructor-led interactive sense-making

You will experience Peer Instruction by…

1. answering question individually
2. discussing question in breakout rooms
3. reanswering question
instructor-led interactive sense-making

Go to: PollEv.com/ericmazur615
thermal expansion
all of them
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, 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
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole

you won't forget this
question ➔ think ➔ poll ➔ discuss ➔ repoll ➔ explain
Peer instruction
Higher learning gains

<table>
<thead>
<tr>
<th></th>
<th>Normalized Gain (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturing</td>
<td>20</td>
</tr>
<tr>
<td>PI</td>
<td>80</td>
</tr>
</tbody>
</table>
Peer instruction:
Higher learning gains
Better retention
self-paced asynchronous online information transfer sense-making

question

think

poll

discuss

repoll

explain

online instructor-led synchronous

think

poll

discuss

repoll

explain
Dyfrig Jones: “This sounds useful when there is a correct or incorrect answer to a question. But in many branches of the arts and humanities, questions are much more open, and often there isn’t a correct answer.”
Cinthia Reyes: “How good or bad would it be to use something like Kahoot instead of clickers? (Kahoot! forces people to try to answer quickly to gain points...)”
Why Peer Instruction works

• engages students to think
• individualizes learning
• students use similar discourse
• helps avoid the “expert blind spot”
Mateo Belgrano: “This is the great challenge. Students often ask for lectures, partly because the reading material is complex, partly because they are used to a more “passive” way of learning. How to motivate students to do the previous work?”
asynchronous information transfer

- online
- information transfer
- self-paced

- online
- sense-making
- instructor-led

asynchronous
asynchronous information transfer

Perusall...

• is a social learning platform
• takes information transfer out of classroom
Documents you can use with Perusall

• PDF, Word, html, or ePub files (free)
• video—YouTube, Vimeo, Google Drive, Dropbox (free)
• open access material (free)
• source code with syntax highlighting (free)
• books (purchased by students or institution)
self-paced asynchronous

information transfer

instructor-led synchronous

sense-making
campus

online

information transfer

self-paced asynchronous

online

sense-making

instructor-led synchronous
self-paced asynchronous
information transfer
instructor-led synchronous
sense-making
campus

sense-making

instructor-led
synchronous
peer instruction

home

information transfer

self-paced
asynchronous
pre-class reading
Compare with the “old” approach

campus

sense-making

instructor-led
synchronous
peer instruction

home

information transfer

self-paced
asynchronous
pre-class reading
Compare with the “old” approach

**Campus**
- information transfer
- instructor-paced
- synchronous
- lecture

**Home**
- sense-making
- self-paced
- asynchronous
- home work/study
Improving education

synchronous  ↔  asynchronous
Improving education

- synchronous
- asynchronous

everybody together at the same time
Improving education

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

everybody together at the same pace

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

lecture

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

recorded lecture

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

lab

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

homework/study

synchronous \leftrightarrow asynchronous
instructor-paced \leftrightarrow self-paced
Improving education

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

synchronous \rightarrow \text{asynchronous}

instructor-paced \rightarrow \text{self-paced}
Improving education

synchronous → asynchronous

instructor-paced → self-paced

more time to help students where it really matters!
Reflection

- asynchronous preparation
- synchronous time for discussion
Reflection

• asynchronous preparation
• synchronous time for discussion
• dig deeper post-session
for a copy of this presentation:

mazur.harvard.edu

resource sheet:  bit.ly/fliponline

Follow me!  @eric_mazur