Twilight of the Lecture: Peer Instruction for Active Learning

Faculty Development Workshop
Touro College
New York, NY, 23 April 2021
Twilight of the Lecture: Peer Instruction for Active Learning

Faculty Development Workshop
Touro College
New York, NY, 23 April 2021
an illusion...
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)
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 (out of class)

2. assimilation of that information (in class)
1. transfer of information (out of class)

2. assimilation of that information (in class)
question
question

think
question

think

poll
question
think
poll
discuss
repoll
question

think

poll

discuss

repoll

explain
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.
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
Higher learning gains
Higher learning gains

<table>
<thead>
<tr>
<th>Normalized Gain (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

- **Lecturing**: 20%
- **PI**: 80%

*Note: The graph shows the normalized gain in learning for lecturing and PI methods.*
Higher learning gains
Better retention
information
transfer

sense-making
campus

information
transfer

instructor-paced
synchronous
lecture

home

sense-making

self-paced
asynchronous
home work/study
information transfer

instructor-paced
synchronous
lecture

sense-making

self-paced
asynchronous
home work/study
instructor-paced synchronous online lecture

instructor-paced synchronous online lecture

self-paced asynchronous home work/study

Instructor-paced synchronous online lecture

Information transfer

Sense-making

Information transfer
campus
information transfer
instructor-paced synchronous lecture

home
information transfer
instructor-paced asynchronous recorded lecture

home
sense-making
self-paced asynchronous home work/study
instructor-paced synchronous lecture

instructor-paced asynchronous recorded lecture

self-paced asynchronous home work/study

ALONE!
<table>
<thead>
<tr>
<th>campus</th>
<th>home</th>
</tr>
</thead>
<tbody>
<tr>
<td>sense-making</td>
<td>information transfer</td>
</tr>
<tr>
<td>instructor-led synchronous peer instruction</td>
<td>self-paced asynchronous pre-class reading</td>
</tr>
</tbody>
</table>
Self-paced asynchronous online information transfer

Instructor-led synchronous online sense-making
interactive

self-paced
asynchronous

online
information
transfer

instructor-led
synchronous

online
sense-making
Improving education

synchronous ↔ asynchronous
Improving education

eybody together at the same time

synchronous ↔ asynchronous

time
Improving education

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

- synchronous
- asynchronous
- instructor-paced
- self-paced

everybody together at the same pace
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 ↔ asynchronous

instructor-paced ↔ self-paced
Improving education

synchronous  ➔  asynchronous

instructor-paced  ↔  self-paced
Improving education

synchronous → asynchronous
instructor-paced → self-paced
Improving education

synchronous \(\rightarrow\) asynchronous

instructor-paced \(\rightarrow\) self-paced

more time to help students where it really matters!
for a copy of this presentation:

mazur.harvard.edu

resource sheet: bit.ly/fliponline

Follow me! @eric_mazur