Innovating education to educate innovators

NMES Faculty Education Network – Distinguished Speaker Series/King’s Education Talk
King’s College, London
June 25, 2021
Innovating education to educate innovators

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try something different?
all of them
Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole
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 changes.

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
You won't forget this

Consider atoms at rim of hole
Higher learning gains
Higher learning gains

<table>
<thead>
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<th>normalized gain (%)</th>
<th>lecturing</th>
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<tbody>
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</tr>
<tr>
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<tr>
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<td>0</td>
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</tbody>
</table>

A graph showing the normalized gain in learning through lecturing.
Higher learning gains for peer instruction compared to lecturing.
Higher learning gains
Better retention
INSTRUCTION
“How can I transfer online what I do in the classroom?”
(challenge)

“What can I do online that I cannot do in the classroom?”
(opportunity)
Moving online

synchronous ↔ asynchronous
Moving online

synchronous ↔ asynchronous

everybody together at the same time
Moving online

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Moving online

synchronous ↔ asynchronous

instructor-paced ↔ self-paced

everybody together at the same pace
Moving online

lecture

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Moving online

recorded lecture

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Moving online

lab

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Moving online

homework/study

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Moving online

- Synchronous
- Asynchronous
- Instructor-paced
- Self-paced
Moving online

- synchronous
- asynchronous
- instructor-paced
- self-paced
Moving online

- Synchronous → Asynchronous
- Instructor-paced → Self-paced
Moving online

synchronous → asynchronous
instructor-paced → self-paced

more time for personalized instruction!
Education in 21st century is not just about:

• transferring information

• getting students to do what we do

social engagement in & out of classroom a must!