Breaking down the classroom walls: Engaging student teams across time and space

ENLIGHT Teaching and Learning Conference
University of Ghent
Gent, Belgium, 18 November 2021
March 2020

1 before (and just after) pandemic
Team based

1 before (and just after) pandemic
Project based before (and just after) pandemic
Intrinsic motivation before (and just after) pandemic
before (and just after) pandemic
no lectures
no exams

before (and just after) pandemic
blend of 6 scaffolded “best practices”

<table>
<thead>
<tr>
<th>Understand</th>
<th>LC: Learning Catalytics</th>
<th>90 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor poses question</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Answer alone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss in team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Answer again</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Apply</th>
<th>EA: Estimation Activity</th>
<th>30 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate quantities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop individual strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss and solve as team</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluate</th>
<th>Problem Set &amp; Reflection</th>
<th>90 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work problems alone BEFORE class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss with team, mark up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-assess &amp; turn in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Tutorial</th>
<th>60 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work on worksheet with team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explore concepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss with staff</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>EDA: Experimental Design Activity</th>
<th>90 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct experiment with team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take measurements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyze data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carry out simulations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RAA: Readiness Assurance Activity</th>
<th>90 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1: solve problems alone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open book, open internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part 2: solve with team</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 before (and just after) pandemic
1. before (and just after) pandemic
Instructional continuity between first and second half of the course before (and just after) pandemic?
instructional continuity between first and second half?

86% agreed

before (and just after) pandemic
Moving online

“How can I transfer online what I do in the classroom?”
Moving online

“How can I transfer online what I do in the classroom?”
(challenge)
Moving online

“How can I transfer online what I do in the classroom?”
(challenge)
Moving online

“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)
Changes implemented

- Minimize sync/instructor-paced
- Personalize instruction
Minimize sync/instructor-paced

synchronous ↔ asynchronous

reimagining course
Minimize sync/instructor-paced

everybody together at the same time
Minimize sync/instructor-paced

- synchronous
- asynchronous
- instructor-paced
- self-paced
Minimize sync/instructor-paced

synchronous  ↔  asynchronous

instructor-paced  ↔  self-paced

everybody together at the same pace
Minimize sync/instructor-paced

lecture

synchronous ↔ asynchronous

instructor-paced ↔ self-paced
Minimize sync/instructor-paced

recorded lecture

synchronous ↔ asynchronous

instructor-paced ↔ self-paced

2 reimagining course
Minimize sync/instructor-paced
Minimize sync/instructor-paced

homework/study

synchronous ↔ asynchronous
instructor-paced ↔ self-paced
Minimize sync/instructor-paced

synchronous → asynchronous

instructor-paced ↔ self-paced
Minimize sync/instructor-paced

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

reimagining course
Minimize sync/instructor-paced

more time to help students where it really matters!
Personalize instruction instead of all students coming to instructor’s room...
Personalize instruction

instead of all students coming to instructor’s room...

...instructional staff visits each team’s own room
Personalize instruction

80 students in one room → 20 rooms with 4 students
Personalize instruction
every student on front row
Changes implemented

- Minimize sync/instructor-paced
- Personalize instruction
- Specifications Grading
Fall Content Learning Gain

![Bar chart showing learning gain for FCI in person and remote. The chart indicates a higher gain for remote learning.]
Spring Content Learning Gain

![Bar chart showing learning gain in person vs. remote for CSEM.]}
Self Efficacy

belief in ability to succeed in a certain domain
Doubling of

- content learning gains
- physics self-efficacy gains
Improved

• sense of growth and autonomy

• sense of support and community

• course evaluation

3 results

The abrupt switch to remote learning wiped out academic gains for many students in America, and widened racial and economic gaps. Catching up in the fall won’t be easy.
I did my best teaching ever remotely!

Research Shows Students Falling Months Behind During Virus Disruptions

The abrupt switch to remote learning wiped out academic gains for many students in America, and widened racial and economic gaps. Catching up in the fall won’t be easy.
I did my best teaching ever remotely! So, now what?
Revert back?
(Post?) Pandemic changes

Sections -- in person or online (same experience, either way!)

You and your team can decide not only when, but also how to participate in the regular weekly class meetings for APSO. You can meet with your team and the TFS and me in the classroom (Pierce Hall 301), during one of the two section times. Alternatively, you can meet with us via Zoom, ideally during those same time slots.

Multimodal approach

In person: You and your teammates will be seated around a table in Pierce Hall 301 and share your work with each other using Zoom. Members of the teaching staff will check in with you at the table. (Note: Unlike in the picture, face coverings are mandatory in the classroom.)

Online: You and your teammates will meet in your team’s Zoom meeting room and communicate and share your work with each other using Zoom. Members of the teaching staff will check in with you in your team’s Zoom room.

No matter how you participate, the experience will be the same, as we carry out all class activities on the same platforms in person and online. On Zoom, your team will meet in its own workspace, then you can share your work with each other via Zoom. In the in-person classroom your team will be seated at a table and also use Zoom to share work. Use either a laptop, tablet, or smartphone -- you can just talk to each other. In both cases, whenever your team is ready to have its work validated by the teaching team, it will be presented on Zoom. (Note: face coverings are mandatory for all in-person meetings. See below for additional details.)

You don’t need to commit to in-person or online in advance, and you can switch back and forth as you please, provided the entire team agrees to participate at the same time and in the same modality for a given activity (all in-person or all online). To facilitate that process, we will ask you for your preferences before we form teams and match you with people who have similar preferences.

Sections -- Logistics

In person: If you participate in person, begin your section by going to the APSO Teaching Team Room at Pierce Hall 301. If you participate online, begin your section by going to the APSO Teaching Team Room on Zoom. All
in-person vs. remote

prefer in-person (%)

<table>
<thead>
<tr>
<th>Month</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>80</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>
in-person vs. remote

prefer in-person (%)

<table>
<thead>
<tr>
<th>Month</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
</tr>
</thead>
<tbody>
<tr>
<td>prefer in-person (%)</td>
<td>80</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>

in-person attendance
Yuval Noah Harari: the world after coronavirus

This storm will pass. But the choices we make now could change our lives for years to come.

Yuval Noah Harari March 20 2020

Humankind is now facing a global crisis. Perhaps the biggest crisis of our
creation. The decisions people and governments take in the next few weeks
and for years to come. They will shape not just our
Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are pressed into service, because the risks of doing nothing are bigger. Entire countries serve as guinea-pigs in large-scale social experiments. What happens when everybody works from home and communicates only at a distance? What happens when entire schools and universities go online? In normal times, governments, businesses and educational boards would never agree to conduct such experiments. But these aren’t normal times.
Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are pressed into service, because the risks of doing nothing are bigger. Entire countries serve as guinea-pigs in large-scale social experiments. What happens when everybody works from home and communicates only at a distance? What happens when entire schools and universities go online? In normal times, governments, businesses and educational boards would never agree to conduct such experiments. But these aren’t normal times.

Remote teaching may well become a fixture of life
“breaking down classroom walls”