

# How the Pandemic Changed My Teaching: The Moral Dilemma of Going Back



TLL Speaker Series  
MIT  
16 February 2022

# How the Pandemic Changed My Teaching: The Moral Dilemma of Going Back



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MIT  
16 February 2022



Weekend long reads



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Life & Arts

# 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

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- 
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Humankind is now facing a global crisis. Perhaps the biggest crisis of our generation. The decisions people and governments take in the next few weeks will shape the years to come. They will shape not just our lives but the world we live in. We must act

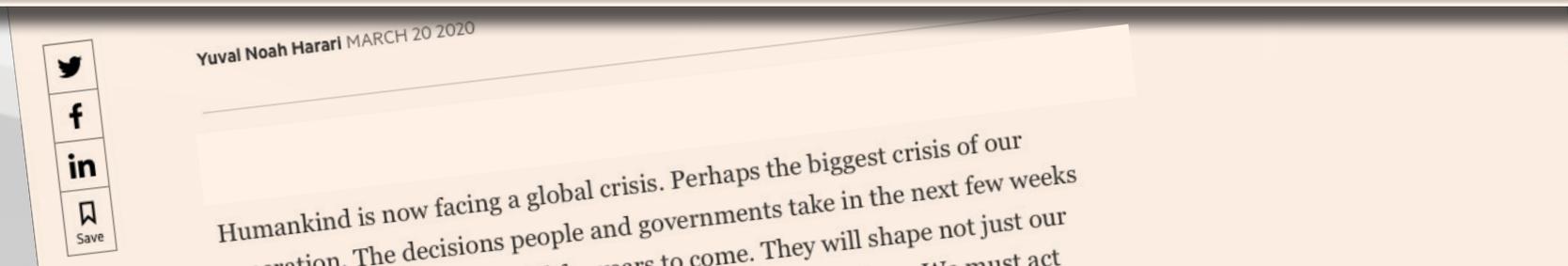


Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are pressed into service, 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.



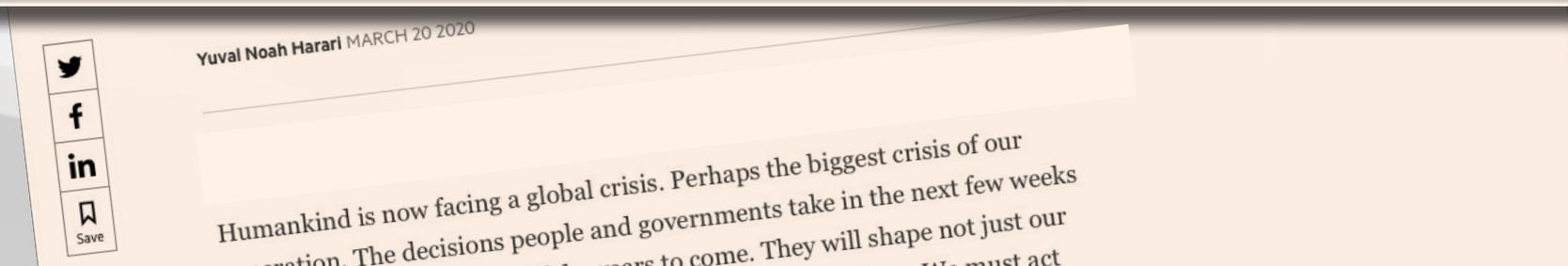


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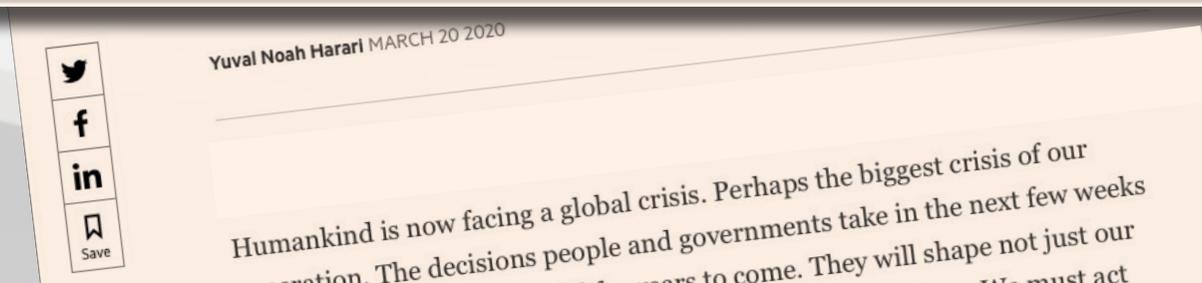


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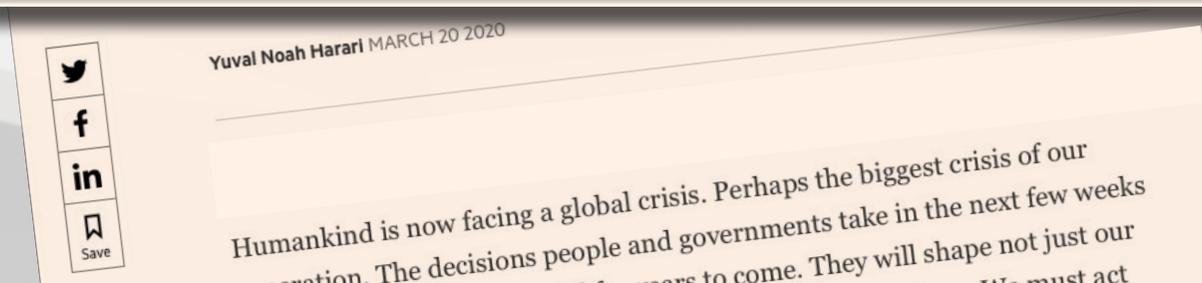


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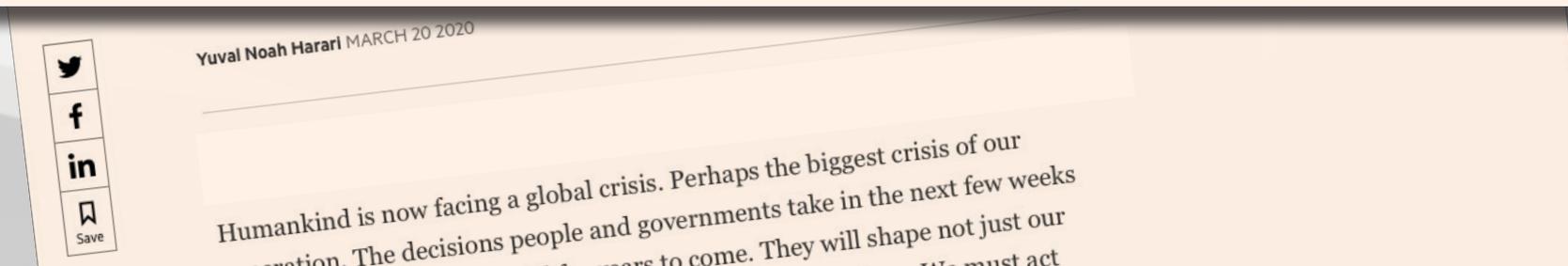




Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are pressed into use. Entire countries

## Will remote teaching become a fixture of life?

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.



March 2020

AP50

1 before (and just after) pandemic





# Team based

1 before (and just after) pandemic

# Project based

1 before (and just after) pandemic





# Intrinsic motivation

1 before (and just after) pandemic



1 before (and just after) pandemic

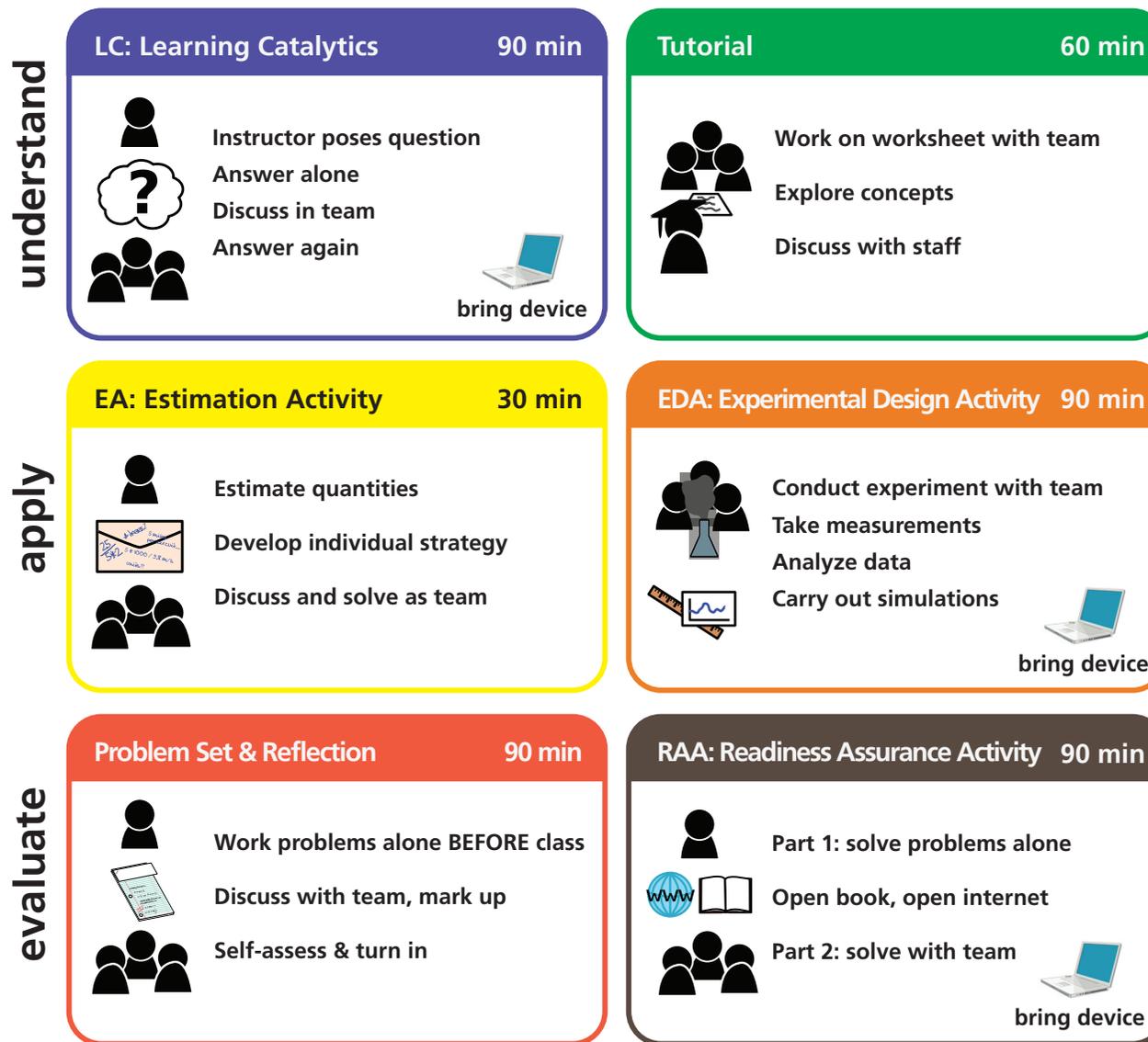


**no lectures**

**no exams**

**1** before (and just after) pandemic

# blend of 6 scaffolded "best practices"



1 before (and just after) pandemic

A group of four students are gathered around a wooden box containing a project. One student is using a tool to work on the box, while the others look on with interest and smiles. The box has a white board with colorful dots and lines on it. The background shows a well-lit room with windows and some equipment.

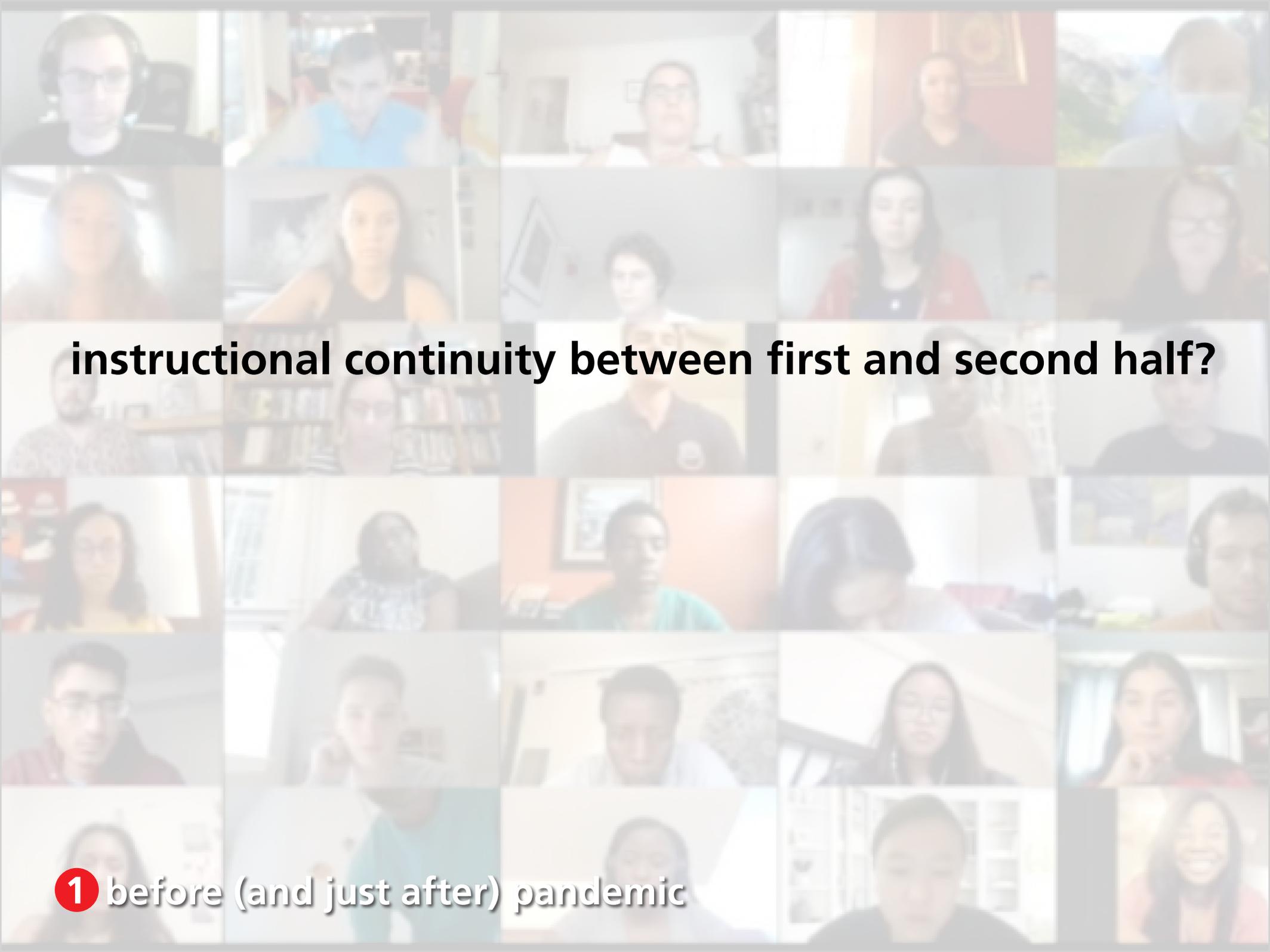
[bit.ly/ap50class](https://bit.ly/ap50class)

**1** before (and just after) pandemic



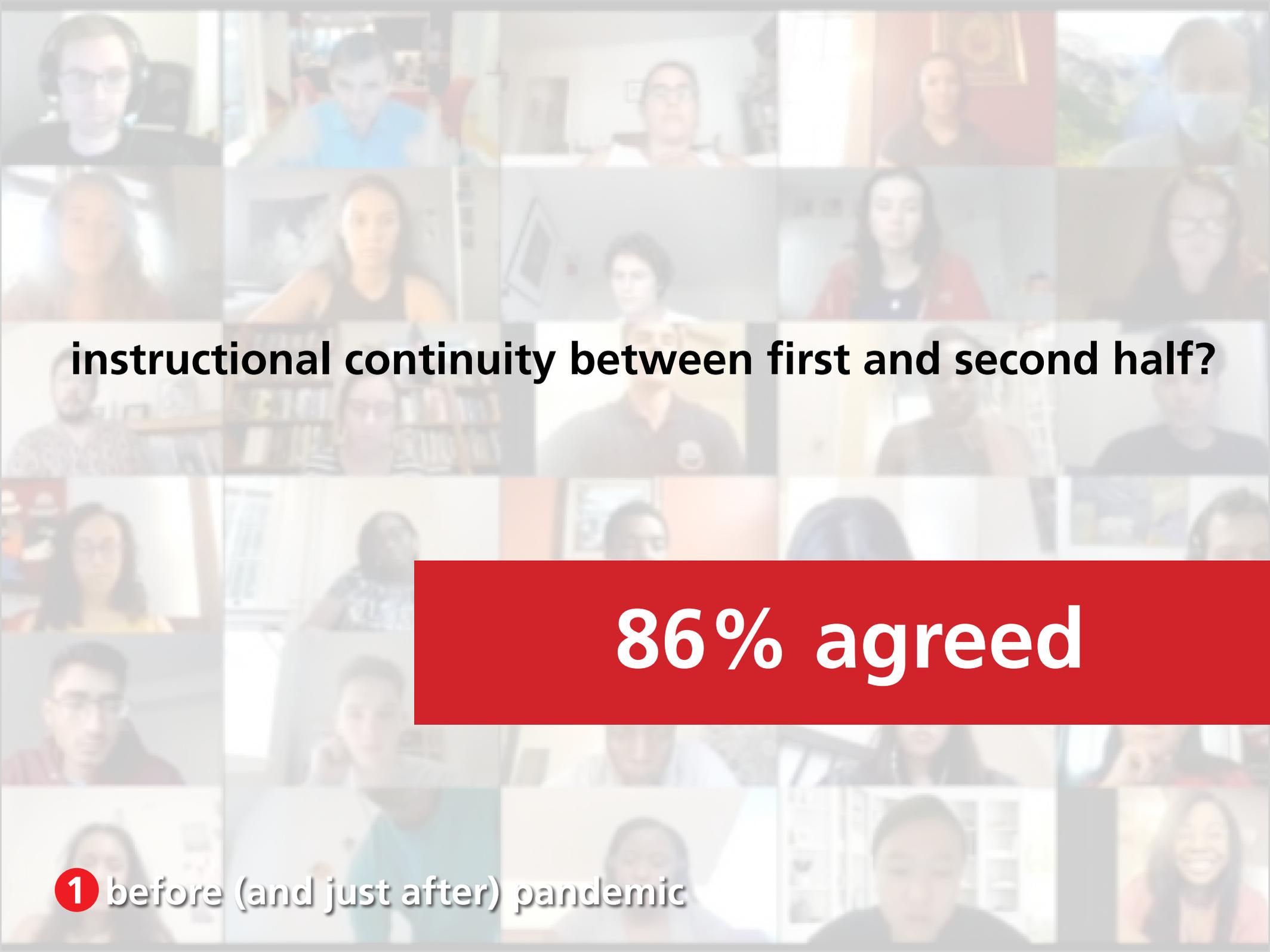
March 13, 2020

1 before (and just after) pandemic



**instructional continuity between first and second half?**

**1** before (and just after) pandemic



**instructional continuity between first and second half?**

**86% agreed**

**1** before (and just after) pandemic



**Summer 2020**

# 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

- **Optimize face-to-face time**

## Changes implemented

- **Optimize face-to-face time**
- **Personalize instruction**

## Changes implemented

- **Optimize face-to-face time**
- **Personalize instruction**
- **Establish continuous accountability**

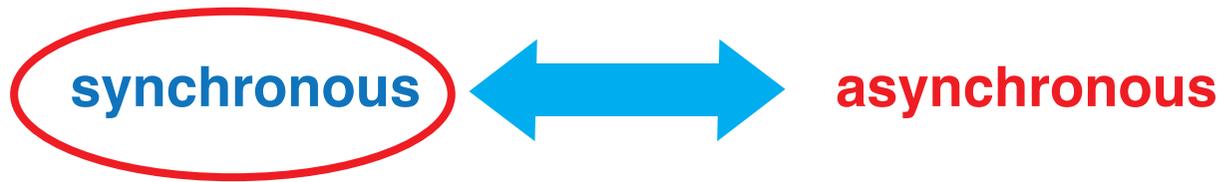
## **Optimize face-to-face time**

- **instructional face-to-face time**
- **team face-to-face time**

# Optimize instructional face-to-face time

synchronous ↔ asynchronous

# Optimize instructional face-to-face time



everybody together  
at the same *time*

# Optimize instructional face-to-face time

synchronous



asynchronous

instructor-paced



self-paced

# Optimize instructional face-to-face time

synchronous



asynchronous

instructor-paced



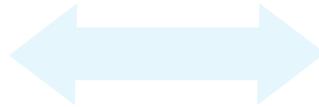
self-paced

everybody together  
at the same *pace*

# Optimize instructional face-to-face time

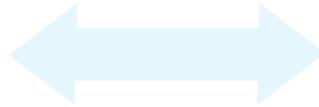
lecture

synchronous



asynchronous

instructor-paced

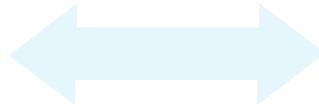


self-paced

# Optimize instructional face-to-face time

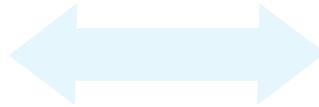
recorded lecture

synchronous



asynchronous

instructor-paced

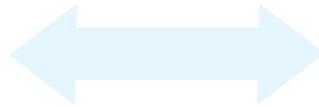


self-paced

# Optimize instructional face-to-face time

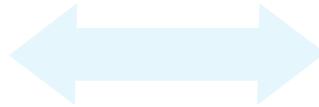
recorded lecture

synchronous



asynchronous

instructor-paced



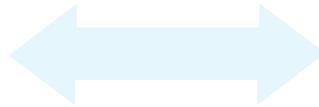
self-paced

**1.5x!**

# Optimize instructional face-to-face time

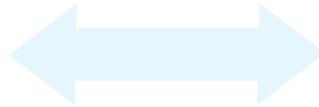
lab

synchronous



asynchronous

instructor-paced

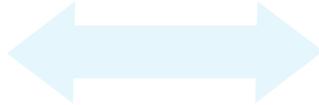


self-paced

# Optimize instructional face-to-face time

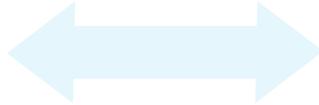
homework/study

synchronous



asynchronous

instructor-paced



self-paced

# Optimize instructional face-to-face time

synchronous



asynchronous

instructor-paced



self-paced

# Optimize instructional face-to-face time

synchronous



asynchronous

instructor-paced



self-paced

# Optimize instructional face-to-face time

synchronous



asynchronous

instructor-paced



self-paced

**more time to help students  
where it really matters!**

# Optimize team face-to-face time

**synchronous**

**collaborative work**

# Optimize team face-to-face time

**synchronous**

**collaborative work**

- not all students engaged
- inefficient team work
- poor use of staff time
- no quality control

# Optimize team face-to-face time

**synchronous**

**collaborative work**

- not all students engaged
- inefficient team work
- poor use of staff time
- no quality control

**asynchronous**

**individual  
work**

# Optimize team face-to-face time

**synchronous**

**collaborative work**

- not all students engaged
- inefficient team work
- poor use of staff time
- no quality control

**asynchronous**

**individual  
work**



**synchronous**

**team  
work**

# Optimize team face-to-face time

**synchronous**

**collaborative work**

- not all students engaged
- inefficient team work
- poor use of staff time
- no quality control

**asynchronous**

**individual  
work**



**synchronous**

**team  
work**



**team  
check**

# Optimize team face-to-face time

**synchronous**

**collaborative work**

- not all students engaged
- inefficient team work
- poor use of staff time
- no quality control

**asynchronous**

**individual  
work**

**all engaged**



**team  
work**

**efficient team**



**team  
check**

**quality control**

**synchronous**

# Personalize instruction

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

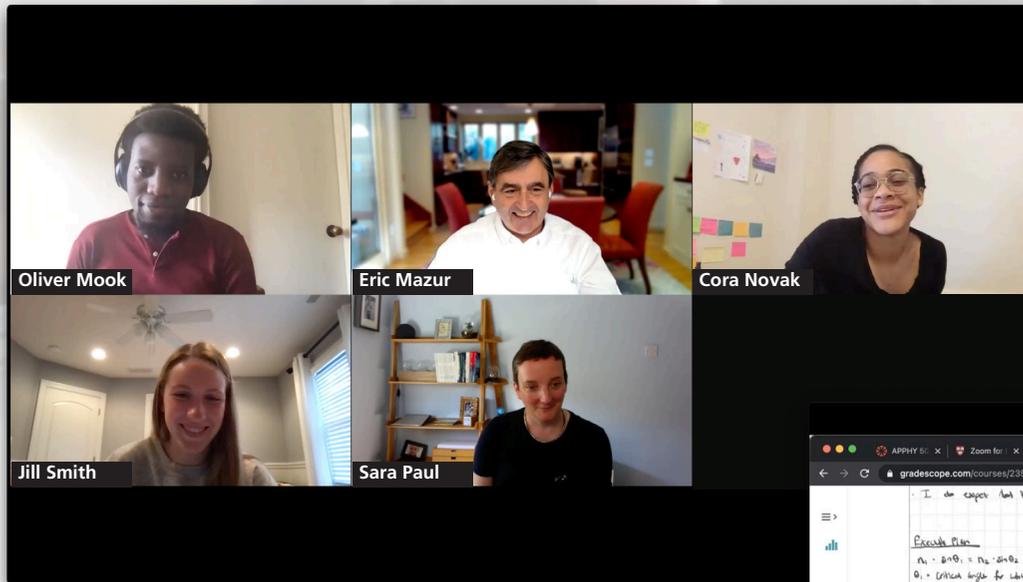
# Personalize instruction

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



Assignment Module 25 • UNGRADED

STUDENT: Codi-Ann Reid  
TOTAL POINTS: - / 0 pts

QUESTION 1: Cover Page (0 pts)  
QUESTION 2: Question 1 (0 pts)  
QUESTION 3: Question 2 (0 pts)  
QUESTION 4: Question 3 (0 pts)  
QUESTION 5: Reflection (0 pts)

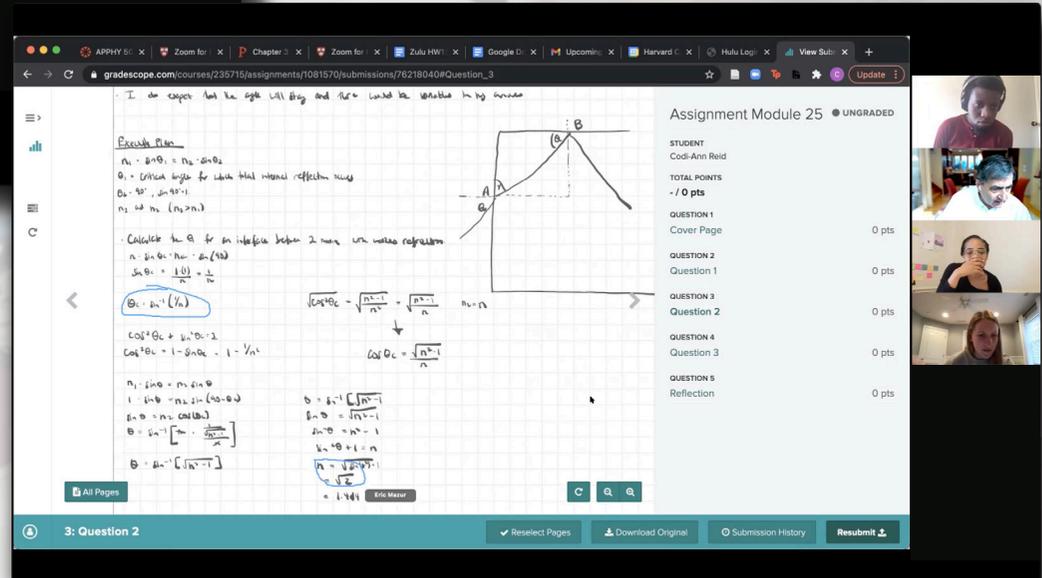
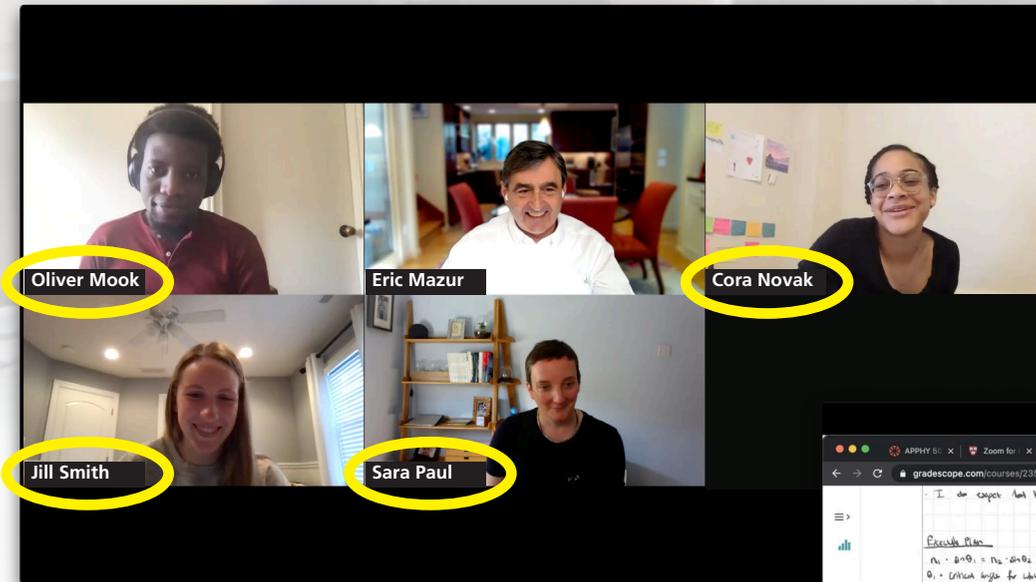
Handwritten work on a grid background includes:

- Example 1:  $n_1 \sin \theta_1 = n_2 \sin \theta_2$ ,  $\theta_1 = 90^\circ$ ,  $n_2 \sin \theta_2 = n_1$ ,  $\theta_2 = \sin^{-1}(n_1/n_2)$
- Calculate the  $\theta_c$  for an interface between 2 media with indices  $n_1$  and  $n_2$ :  
 $n_1 \sin \theta_c = n_2 \sin 90^\circ$   
 $\sin \theta_c = \frac{n_2}{n_1}$   
 $\theta_c = \sin^{-1}(n_2/n_1)$
- Diagram showing a ray incident at point A on a boundary, refracted at point B, and reflected at point C. Angles  $\theta_1$  and  $\theta_2$  are indicated.
- Equations:  $\cos^2 \theta_c + \sin^2 \theta_c = 1$ ,  $\cos^2 \theta_c = 1 - \sin^2 \theta_c = 1 - (n_2/n_1)^2$ ,  $\cos \theta_c = \sqrt{1 - (n_2/n_1)^2}$
- Final result:  $\theta_c = \sin^{-1}(n_2/n_1)$



# Personalize instruction

every student on front row & address each by their name



# Establish continuous accountability

*Inside Higher Ed, Yes, Virginia, there is a better way to grade*

**2** reimagining course



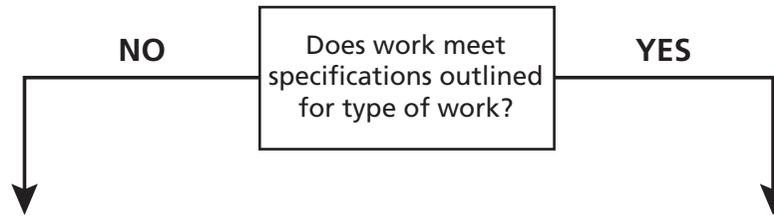
**Establish continuous accountability**

**Specifications grading**

***Inside Higher Ed, Yes, Virginia, there is a better way to grade***

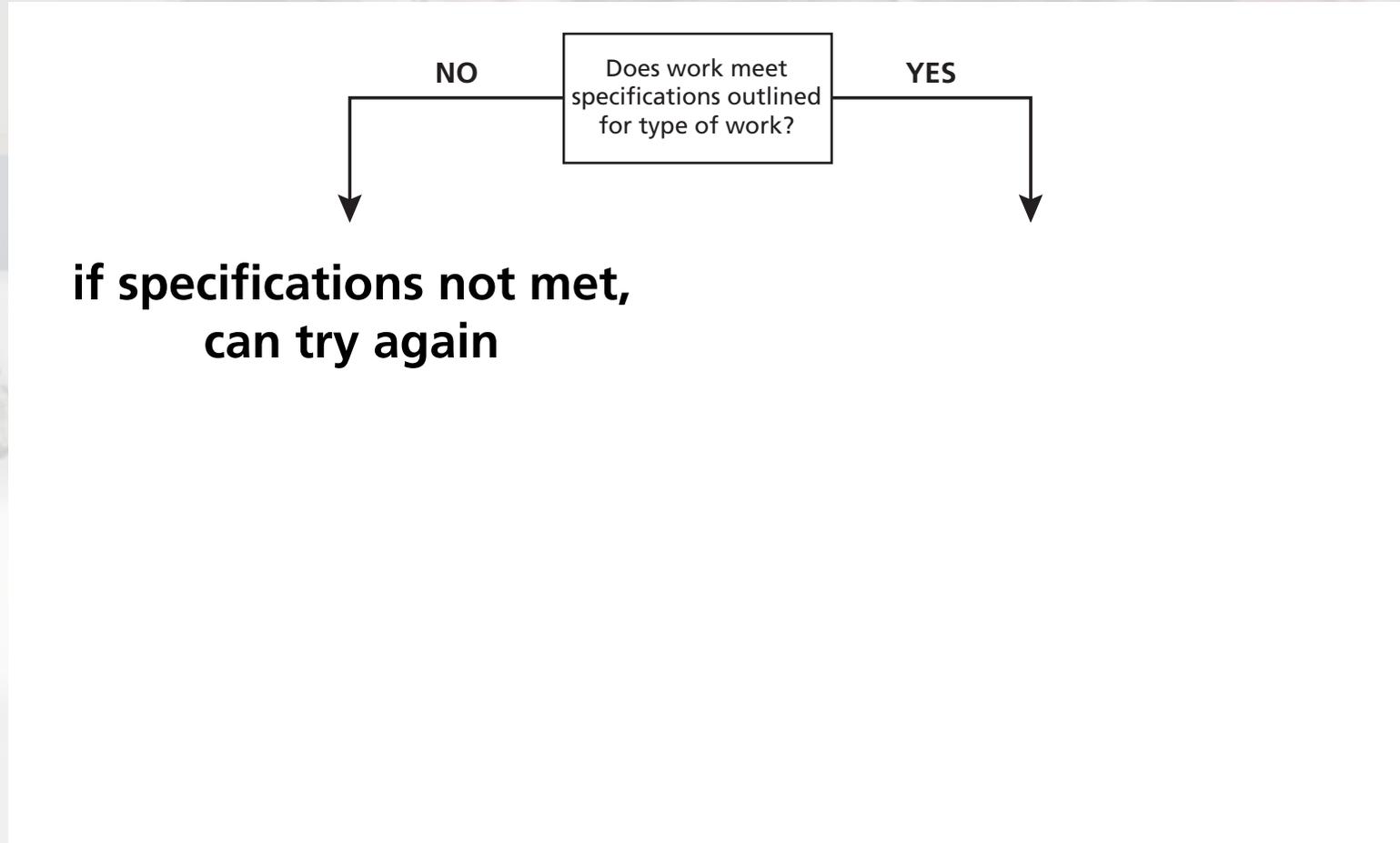
**2** reimagining course

# Establish continuous accountability



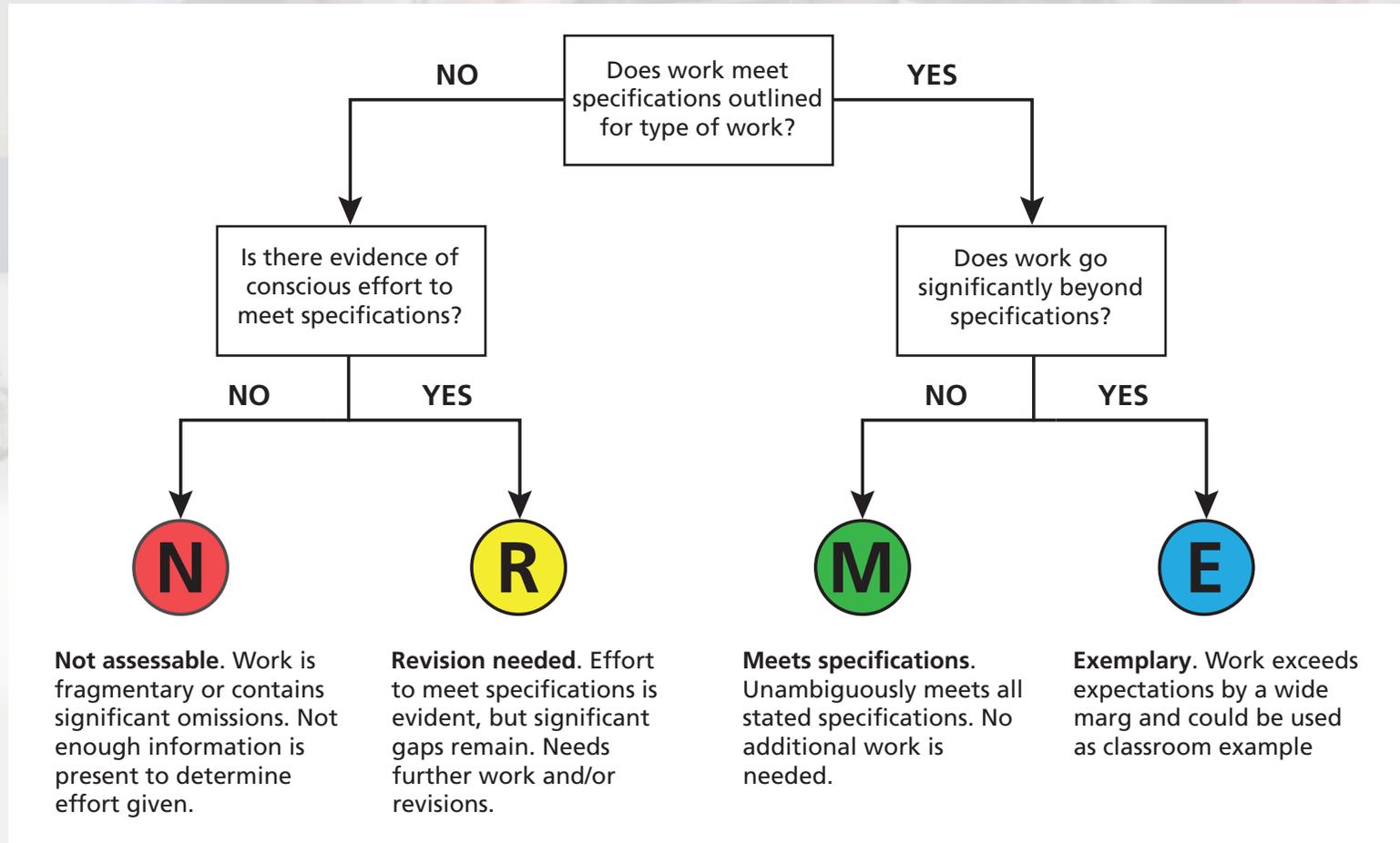
**Inside Higher Ed, *Yes, Virginia, there is a better way to grade***

# Establish continuous accountability



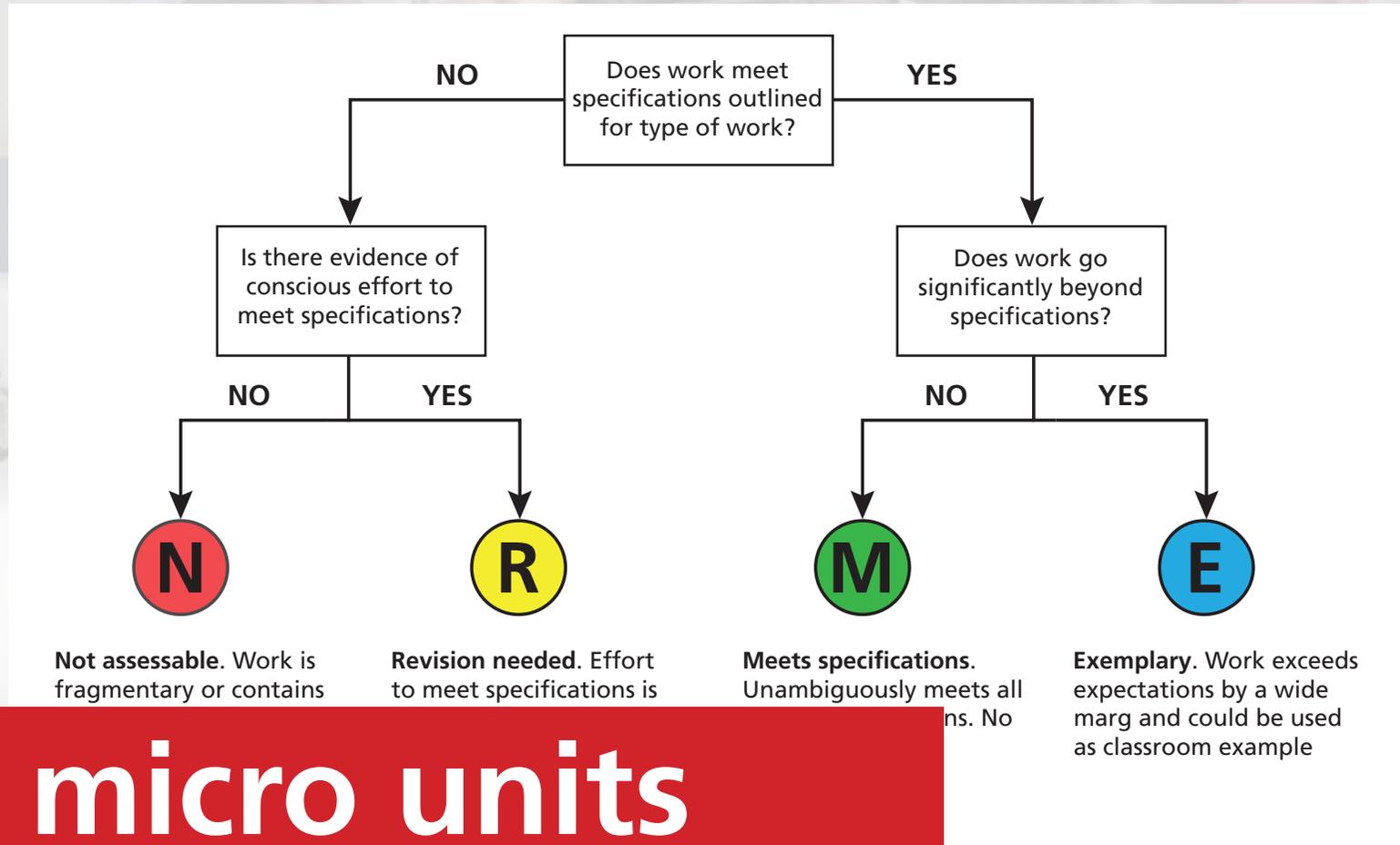
**Inside Higher Ed, *Yes, Virginia, there is a better way to grade***

# Establish continuous accountability



**Inside Higher Ed, Yes, Virginia, there is a better way to grade**

# Establish continuous accountability



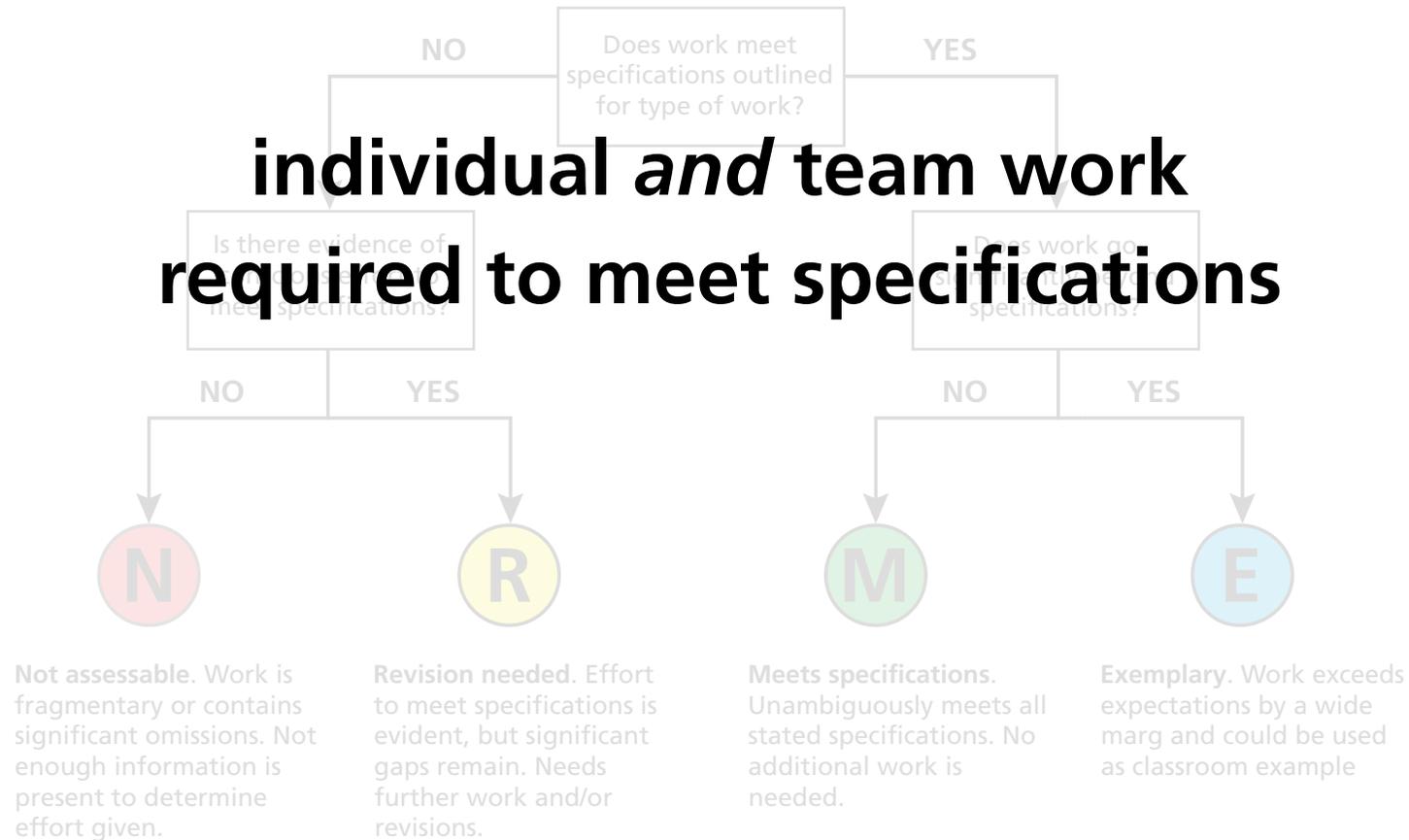
## 68 micro units

Inside Higher Ed, *Yes, Virginia, there is a better way to grade*

**2** reimagining course

# Establish continuous accountability

## individual *and* team work required to meet specifications



**Inside Higher Ed, *Yes, Virginia, there is a better way to grade***

# Establish continuous accountability

**individual *and* team work  
required to meet specifications**

**course grade determined by number of units  
for which specifications were met**

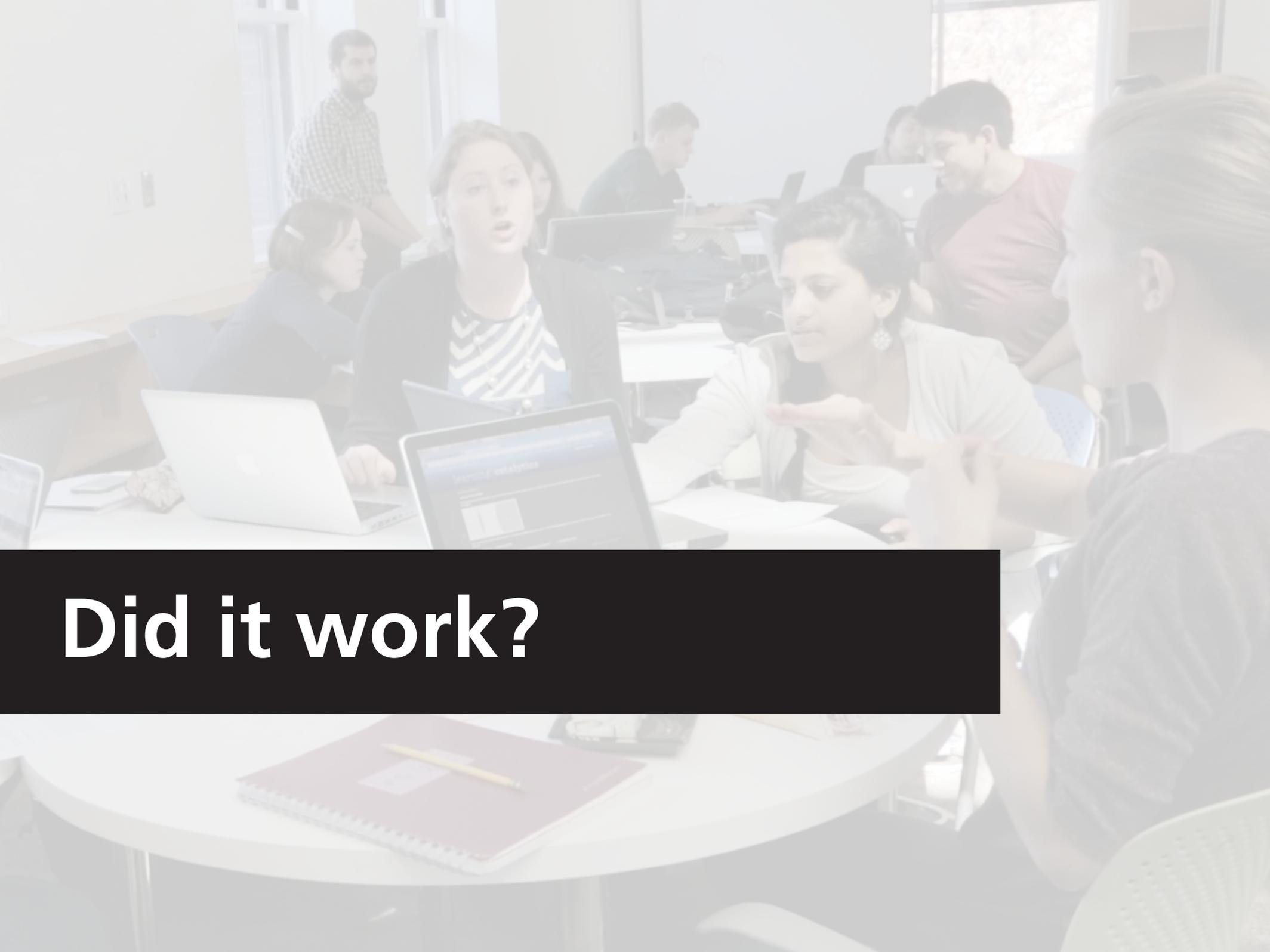
**N**  
Not assessable. Work is fragmented or contains significant omissions. Not enough information is present to determine effort given.

**R**  
Revision needed. Effort evident, but significant gaps remain. Needs further work and/or revisions.

**M**  
Meets specifications. Work meets stated specifications. No additional work is needed.

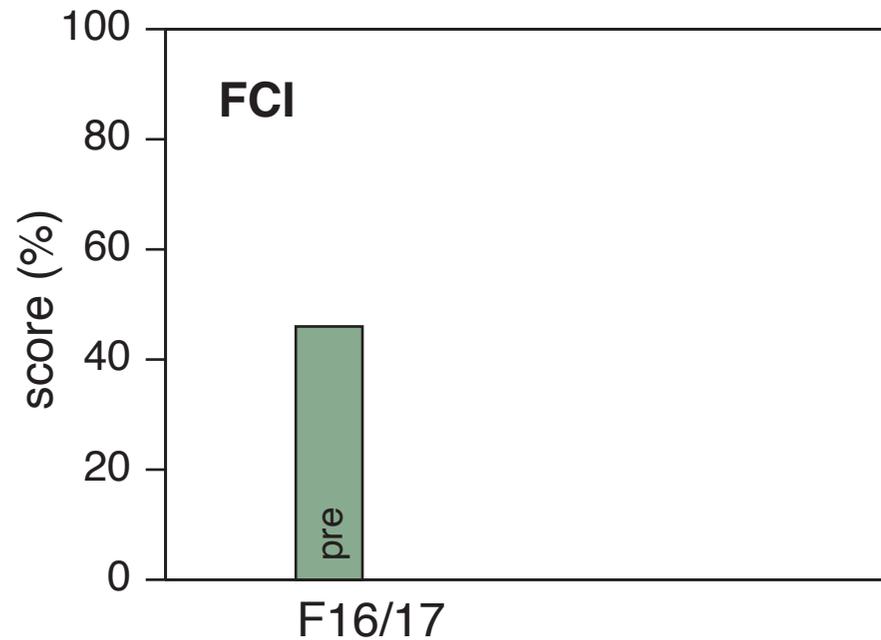
**E**  
Exemplary. Work exceeds standards and could be used as classroom example

**Inside Higher Ed, *Yes, Virginia, there is a better way to grade***

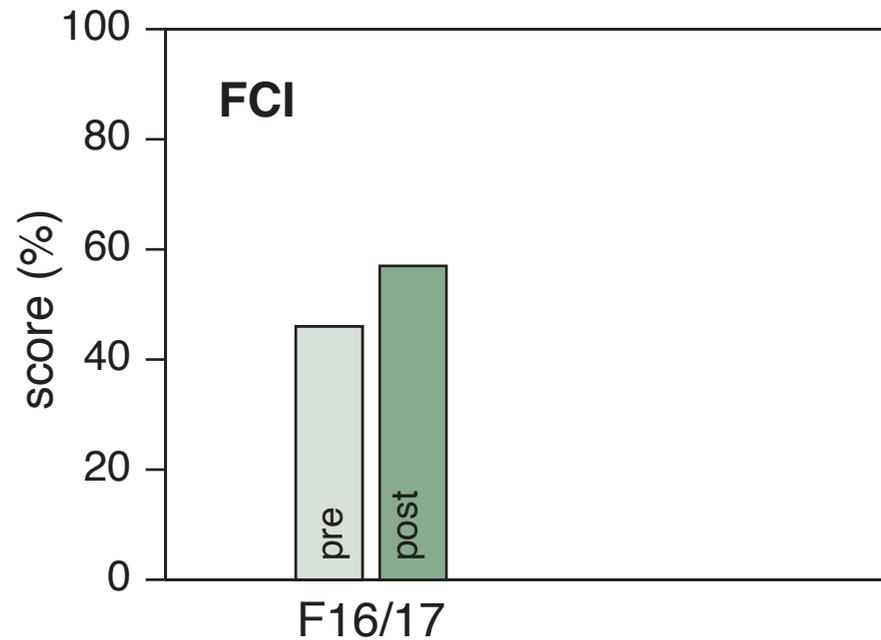


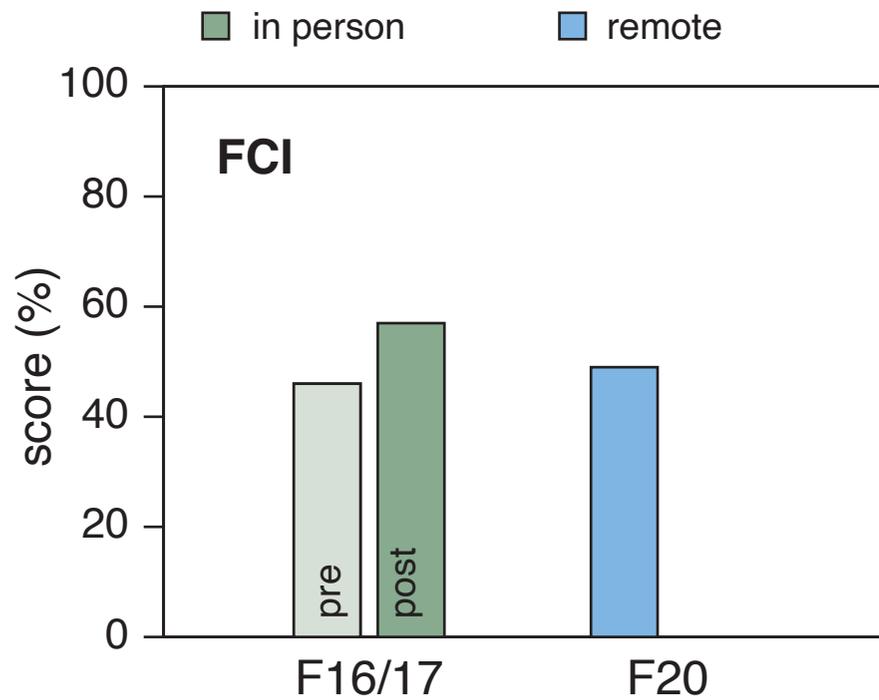
**Did it work?**

# Fall Content Learning Gain

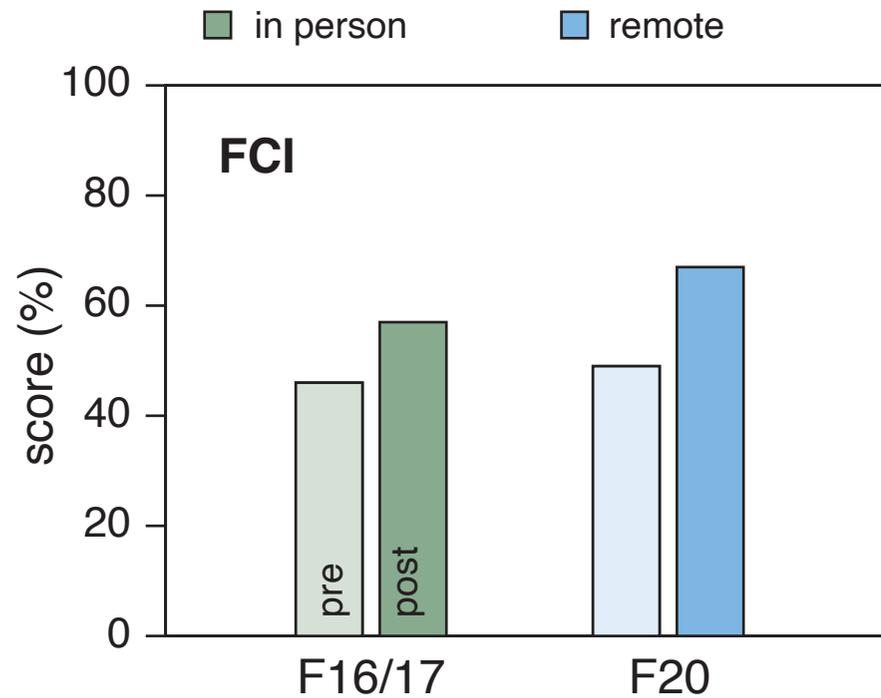


# Fall Content Learning Gain

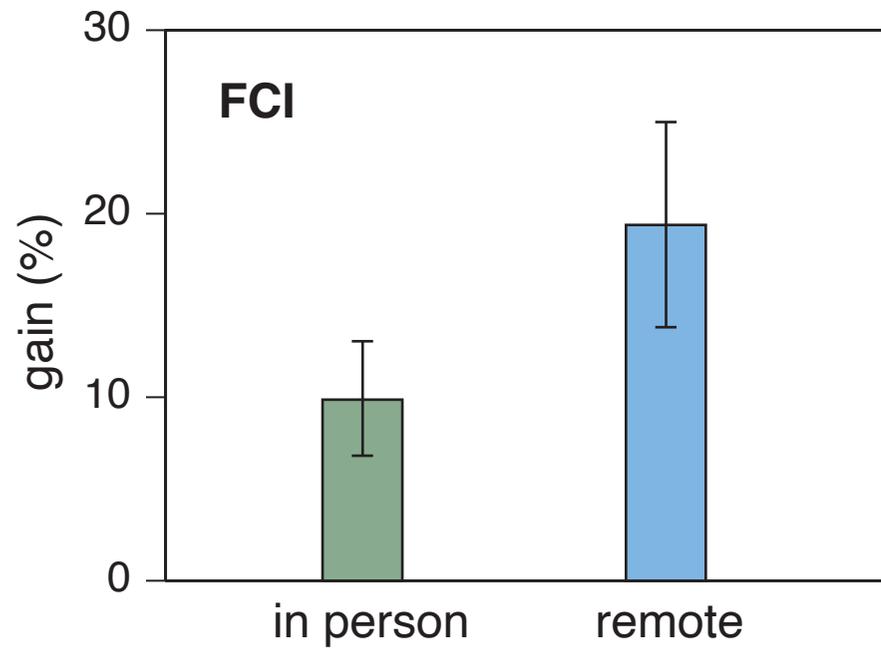




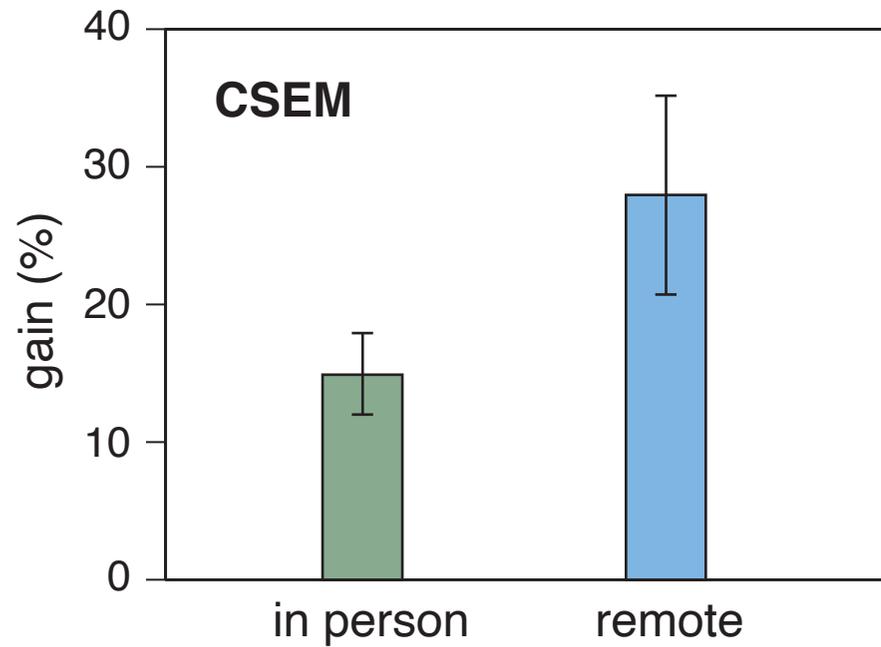
# Fall Content Learning Gain



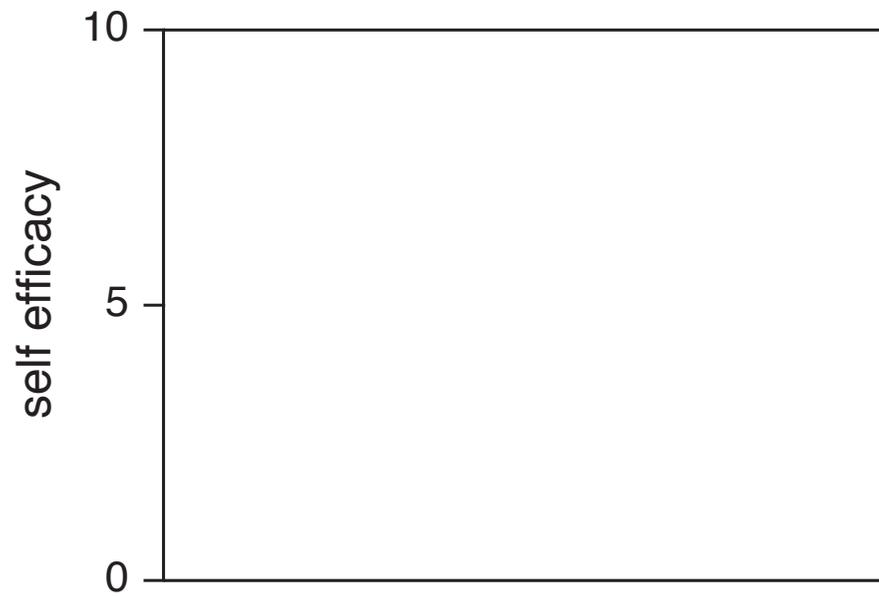
# Fall Content Learning Gain



# Spring Content Learning Gain



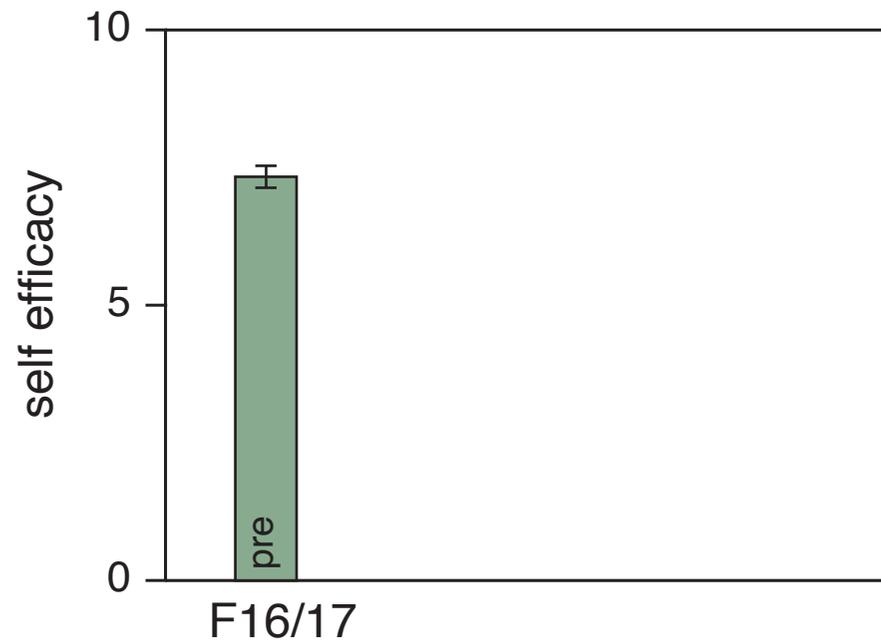
# Self Efficacy



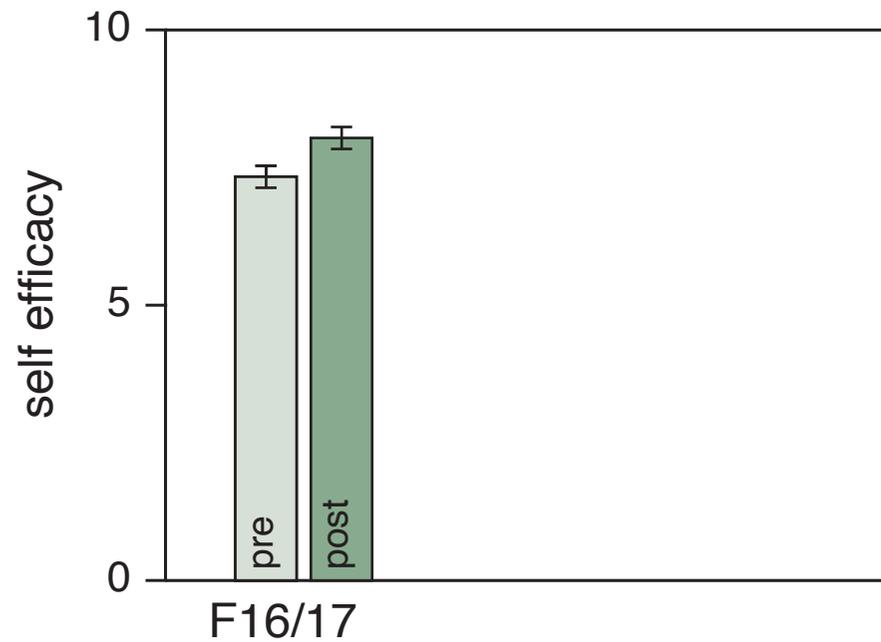
# Self Efficacy

**belief in ability to succeed in a given domain**

# Self Efficacy

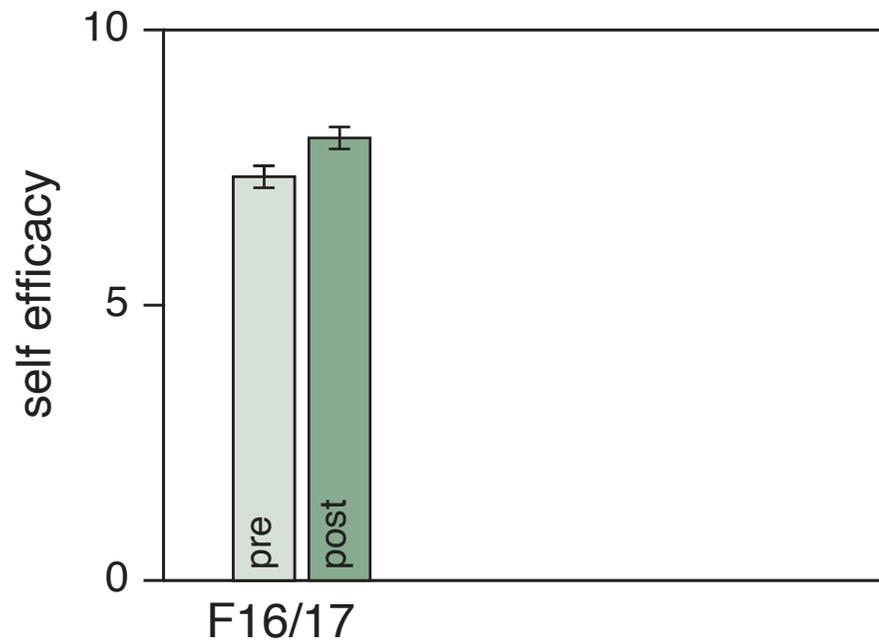


# Self Efficacy

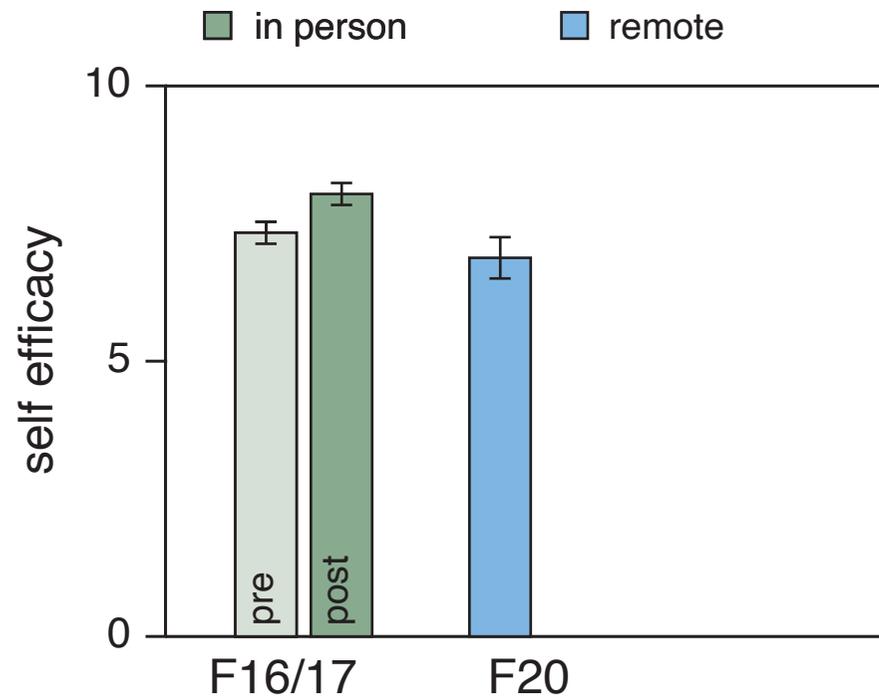


## Self Efficacy

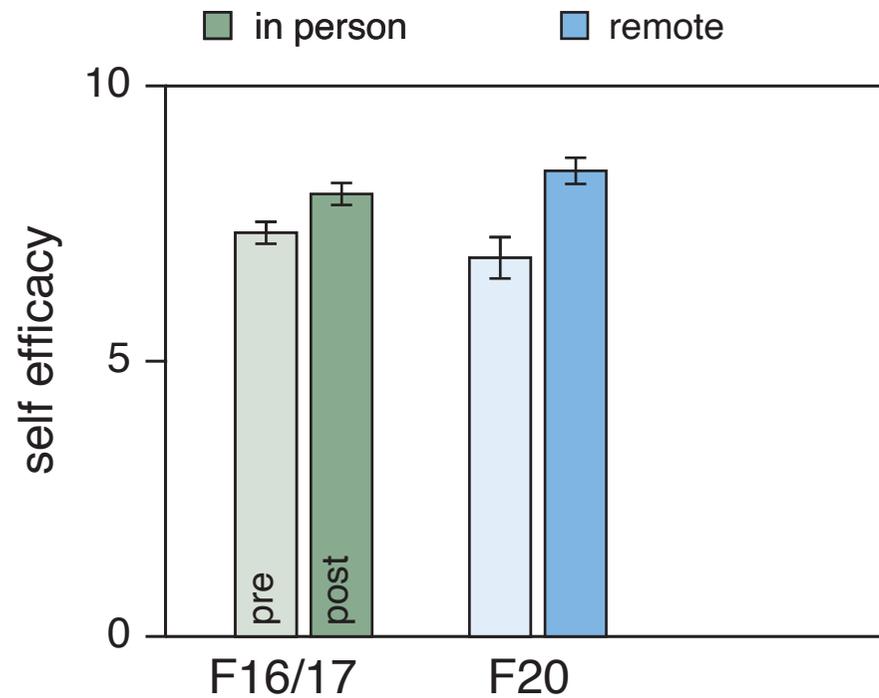
***SE down* in lecture courses!**



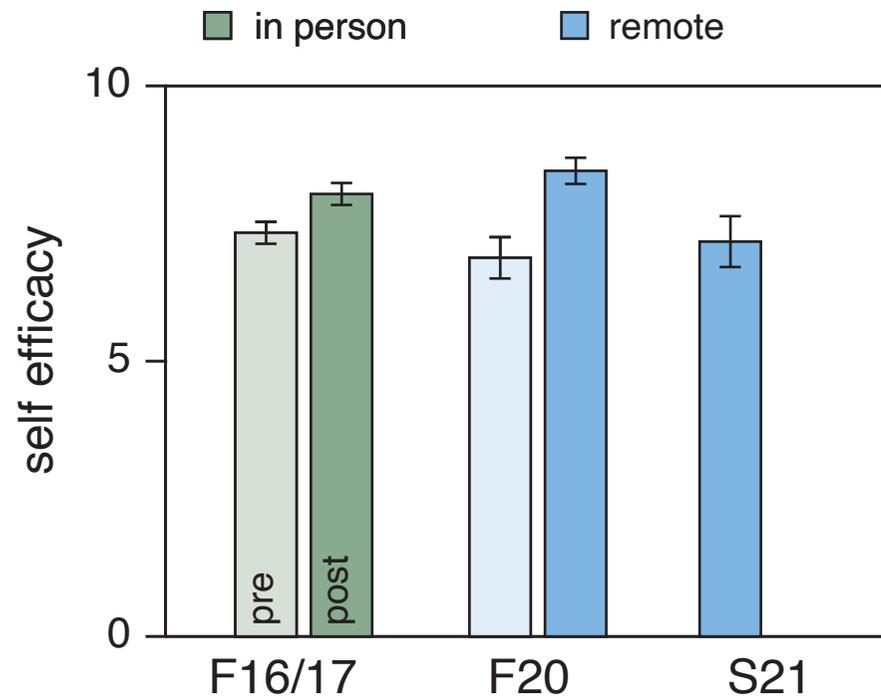
# Self Efficacy



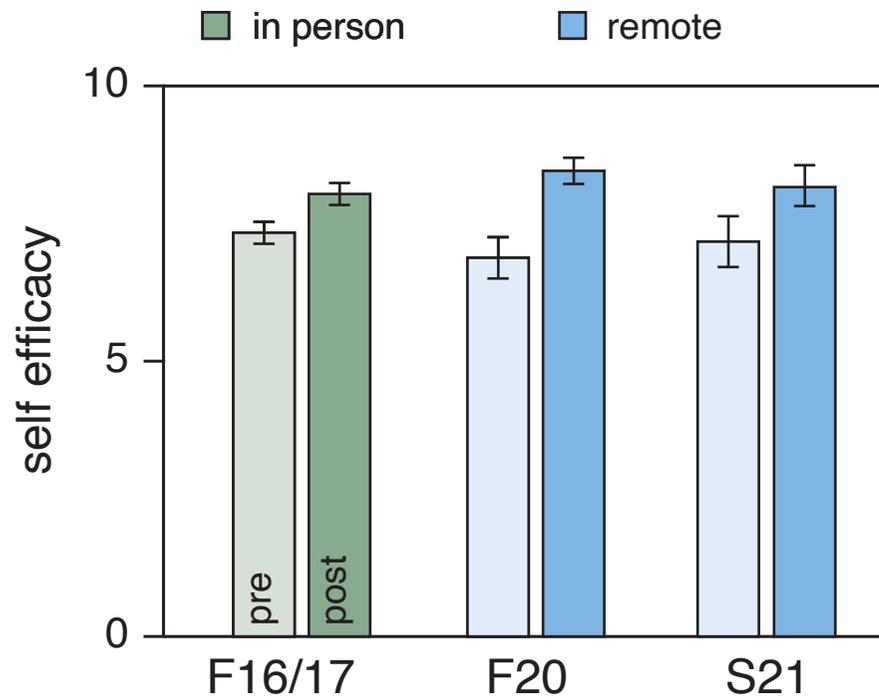
# Self Efficacy



# Self Efficacy



# Self Efficacy



## Doubling of

- content learning gains
- physics self-efficacy gains

### *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.



# What do students say?

## *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.

**3** results

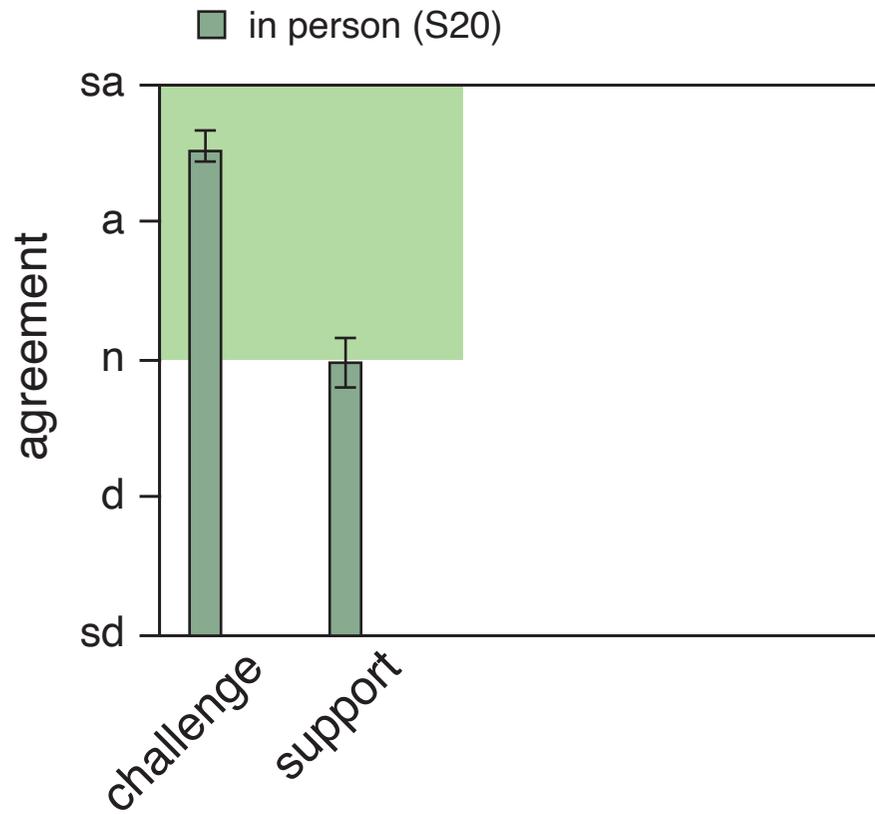
# Agile Feedback Survey (Talbert)

- 1. I was challenged intellectually**
- 2. I had plenty of support**
- 3. I am closer to mastering the ideas of the course now**
- 4. I made progress because of my own efforts and choices**
- 5. I felt I was part of a community of learners**

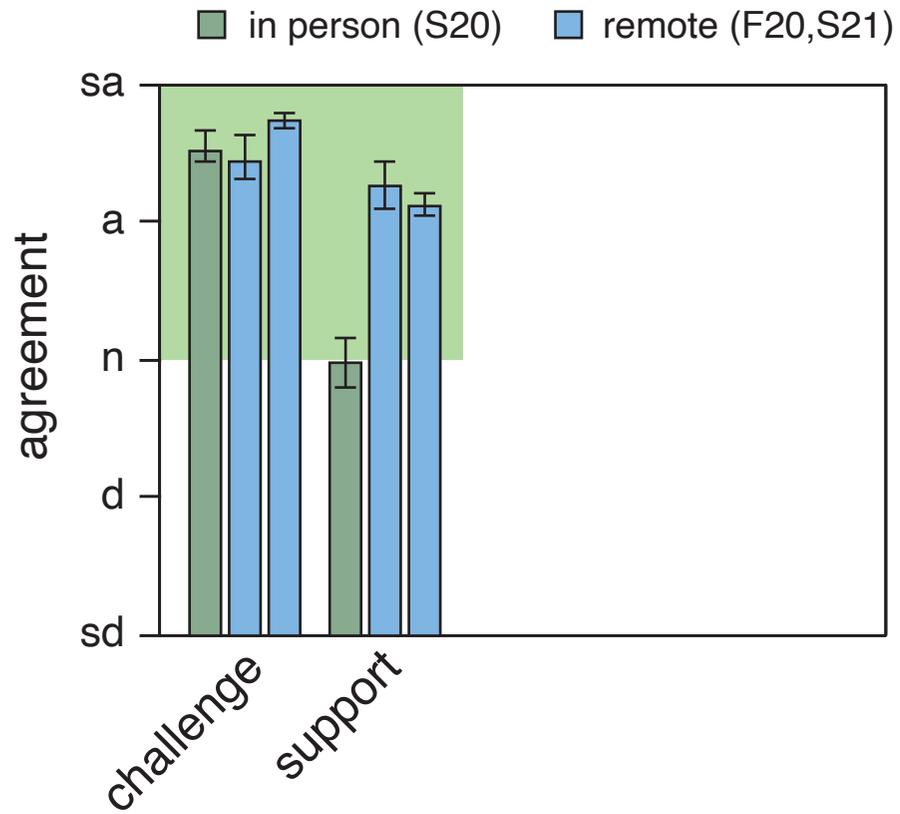
# Agile Feedback Survey (Talbert)

- 1. I was challenged intellectually (challenge)**
- 2. I had plenty of support (support)**
3. I am closer to mastering the ideas of the course now
4. I made progress because of my own efforts and choices
5. I felt I was part of a community of learners

# challenge vs. support



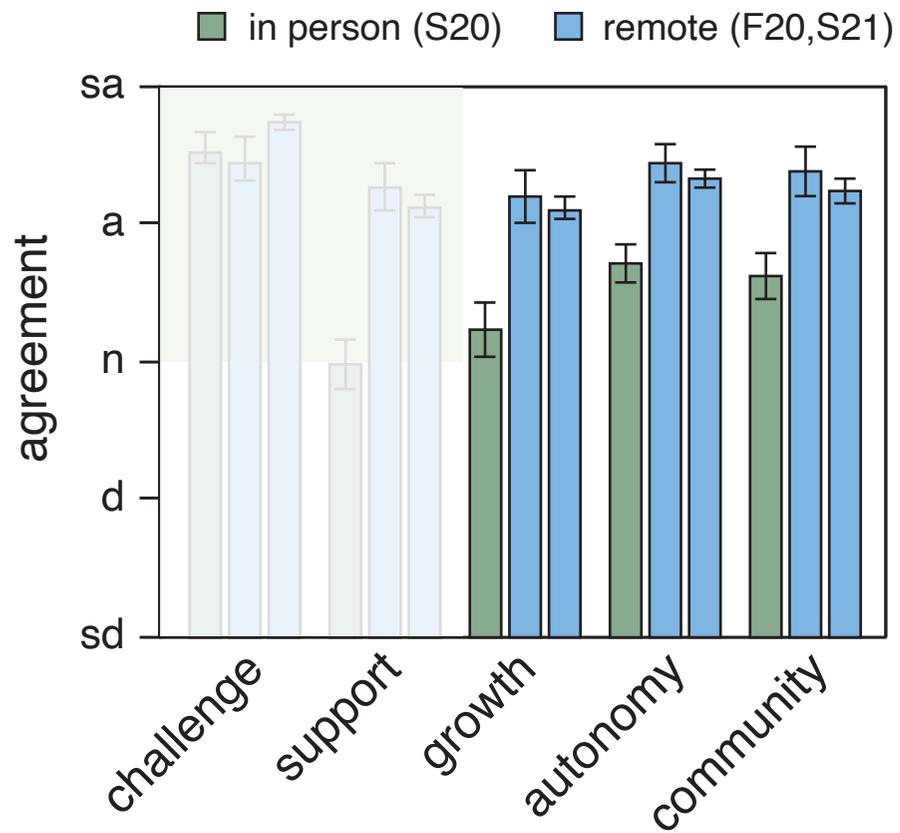
# challenge vs. support



# self-determination

1. I was challenged intellectually (challenge)
2. I had plenty of support (support)
- 3. I am closer to mastering the ideas of the course now (growth)**
- 4. I made progress because of my own efforts and choices (auton.)**
- 5. I felt I was part of a community of learners (relatedness)**

# self-determination



## Improved

- sense of growth and autonomy
- sense of support and community
- course evaluation

**3** results

## Improved

- sense of growth and autonomy
- sense of support and community
- course evaluation

**It worked for students too!**

**3** results

ikbeat

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The New York Times

COLUMN | HIGHER

Maps and Cases

State Reopening Tracker

Vaccine Rollout

Second D

**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.

**3** results

lkbeat

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Second D

**I did my best teaching ever remotely!**

Research Shows Students Falling Months Behind During Virtual Learning

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.

**So, now what?**

# Building together





# Project Fairs



**Revert back?**

Christina Gamboa

David Turner



Louis Collins

Amanda McKeever

Andrew Brown

Debra Linton



Matt Jenkins



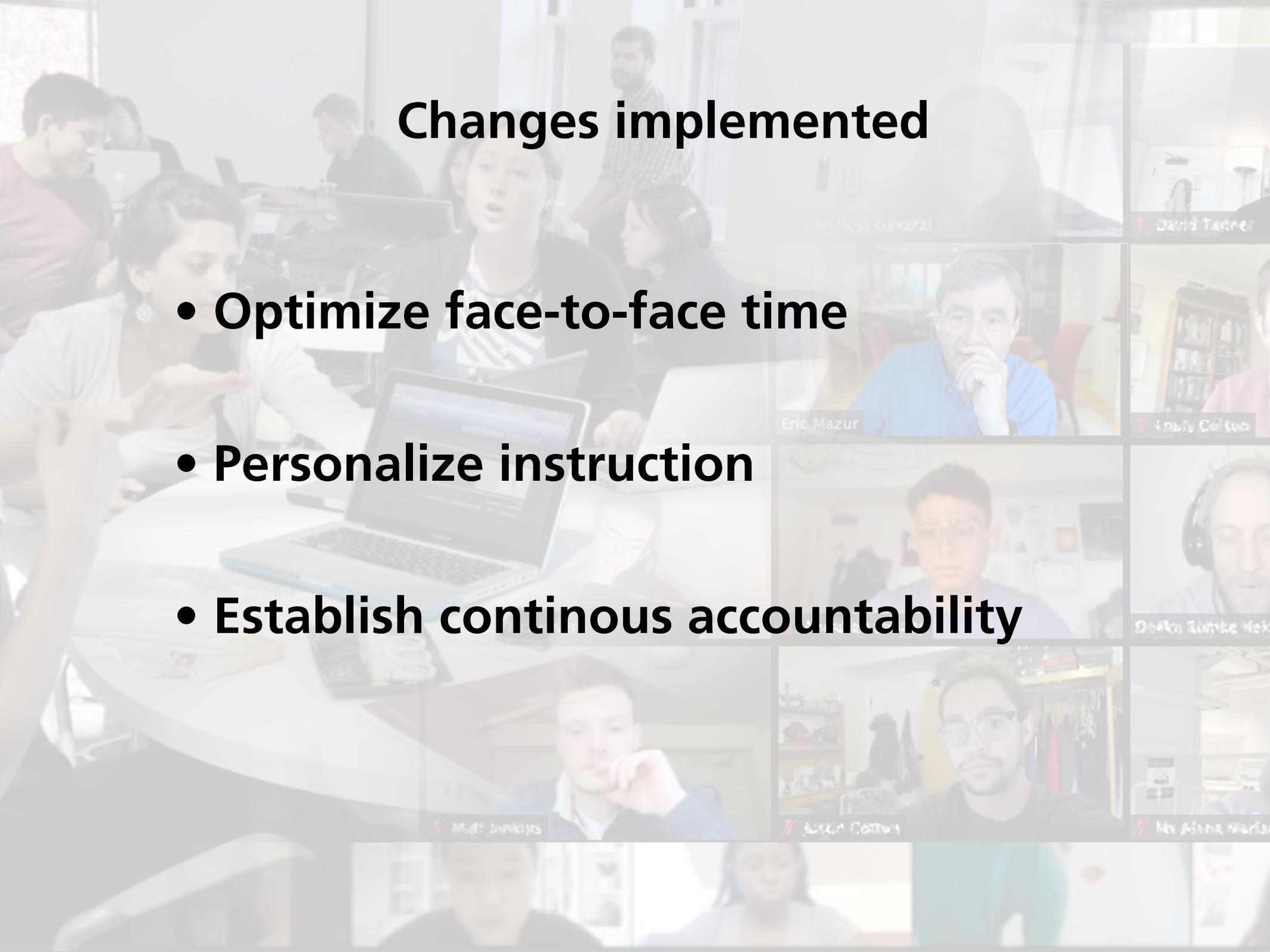
Justin Cohen



Benjamin Harris

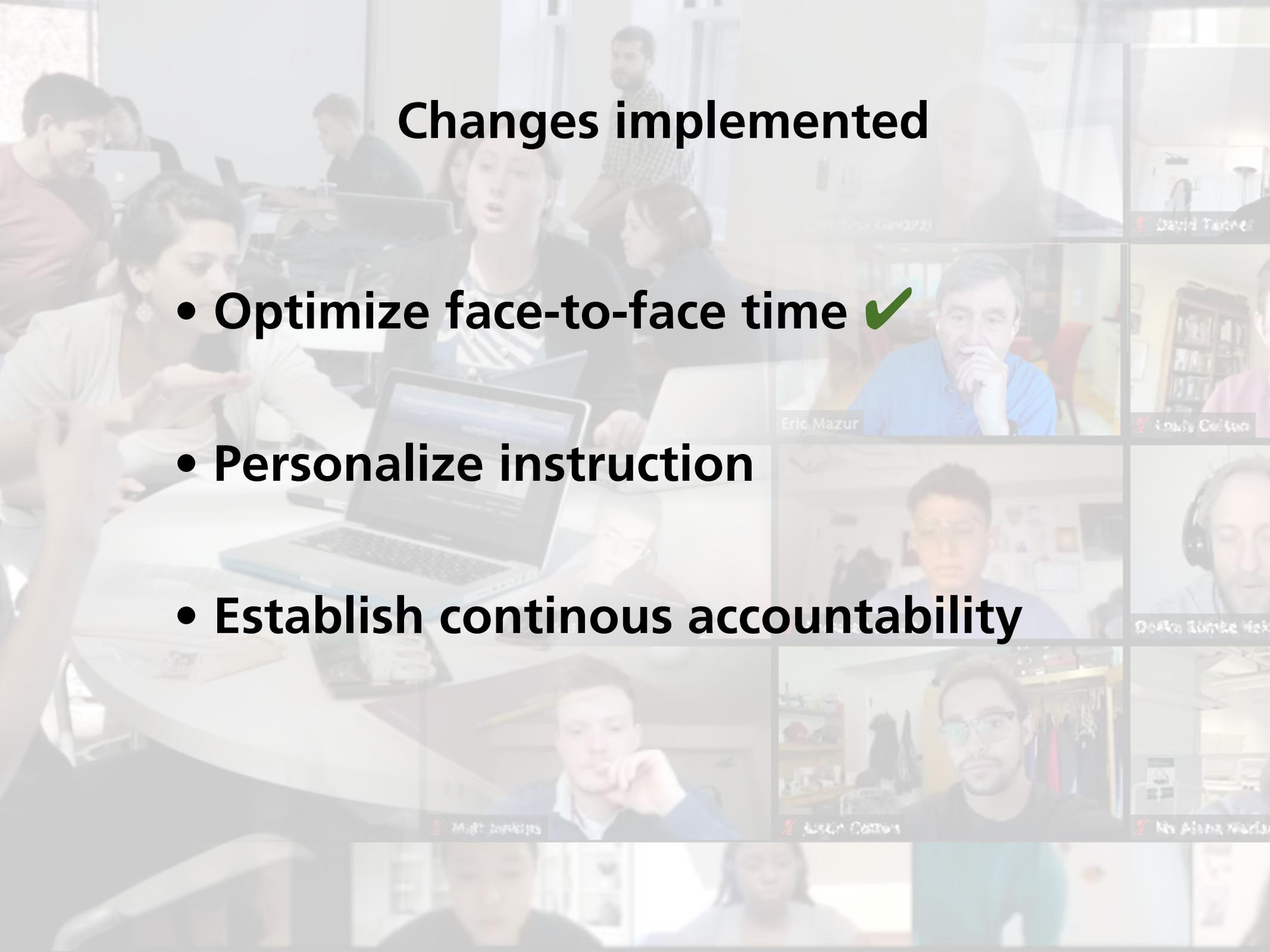
# Changes implemented

- **Optimize face-to-face time**
- **Personalize instruction**
- **Establish continuous accountability**



# Changes implemented

- **Optimize face-to-face time** ✓
- **Personalize instruction**
- **Establish continuous accountability**



# Changes implemented

- Optimize face-to-face time ✓
- Personalize instruction
- Establish continuous accountability ✓



# (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 AP50. 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.



**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.

## “Multimodal approach”

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 Zoom room and you will 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, but of course you will be able to see a large amount of people – you can just talk to each other. In both cases, whenever your team is ready to have its work validated by the teaching team or if you have a question, you will notify us on Slack and one of us will visit your Zoom room or come to your table in person. **Note:** Face coverings are **mandatory** for any in-person meetings (see below for additional details).

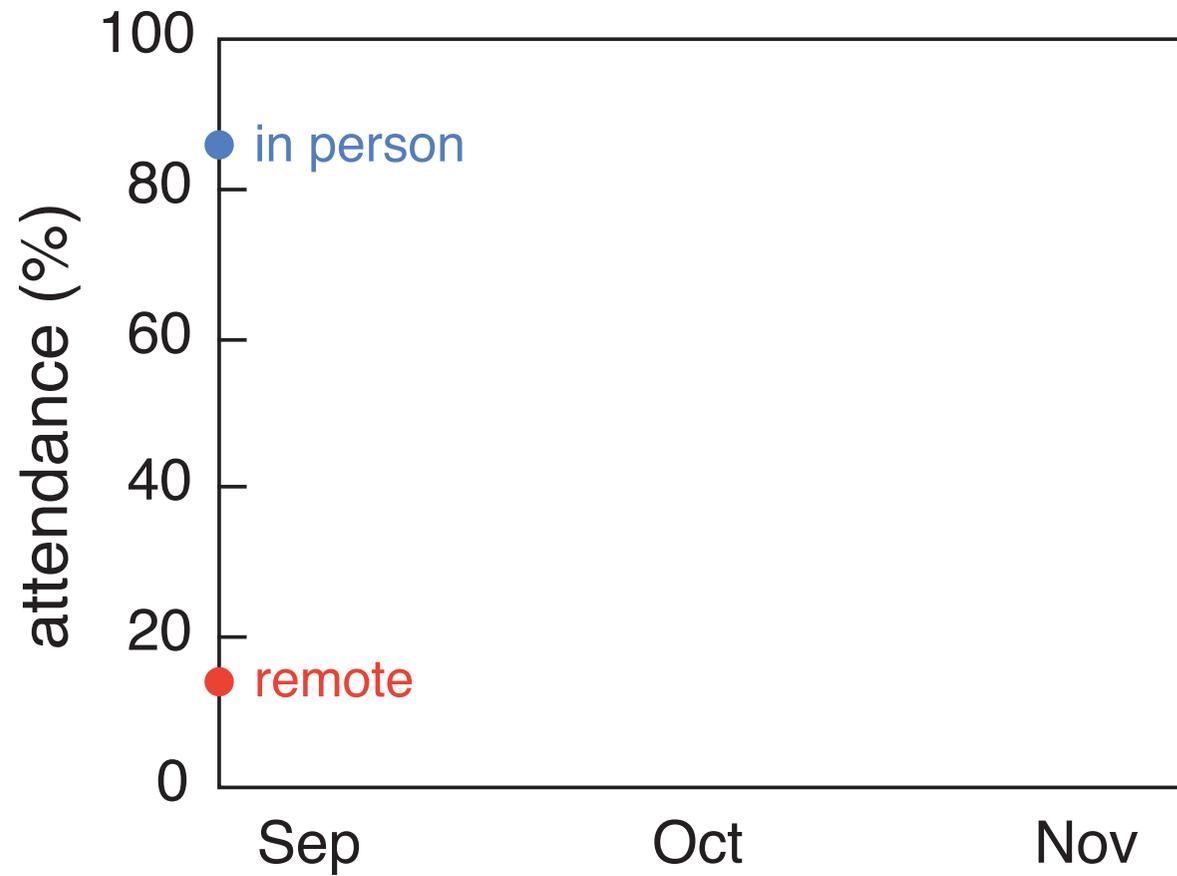
You **don't need to commit to in-person or online in advance**, and you can switch back and forth as you please, **provided the entire team agrees to participate at the same time and in the same modality for a given activity** (all in-person or all online). To facilitate that process, we will ask you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

## Sections – Logistics

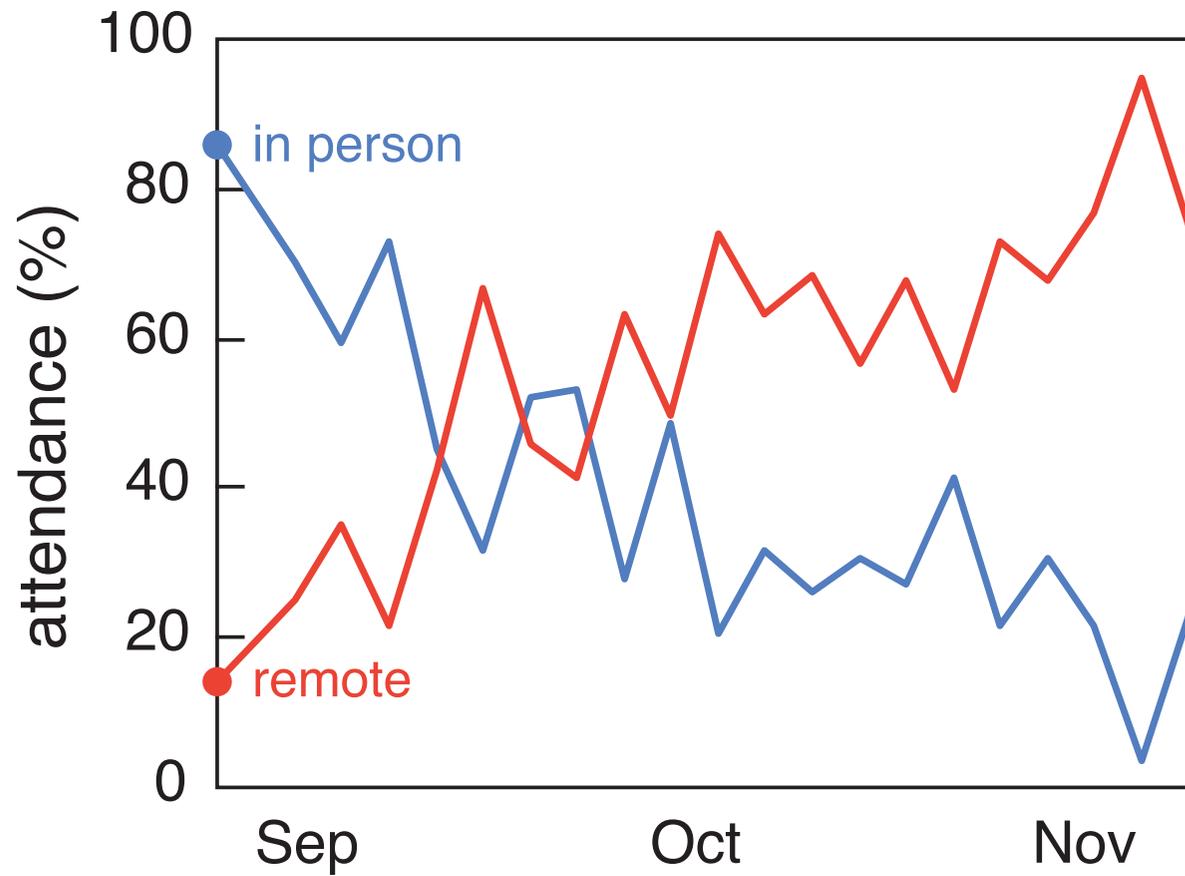
...in Pierce Hall 301. If you participate online, begin your section by going to the [AP50 Teaching Team Room](#) on Zoom. All ... the AP50 Teaching Team Room on ...

- 2021-2022 Fall
- Home
- Announcements
- Syllabus
- Modules
- Assignments
- Slack
- Grades
- Discussions
- Pages
- People
- Manage Course
- Library Reserves
- Academic Integrity Policy
- Support Resources
- Panopto
- Collaborations
- Outcomes
- Rubrics
- Quizzes
- Files
- Settings

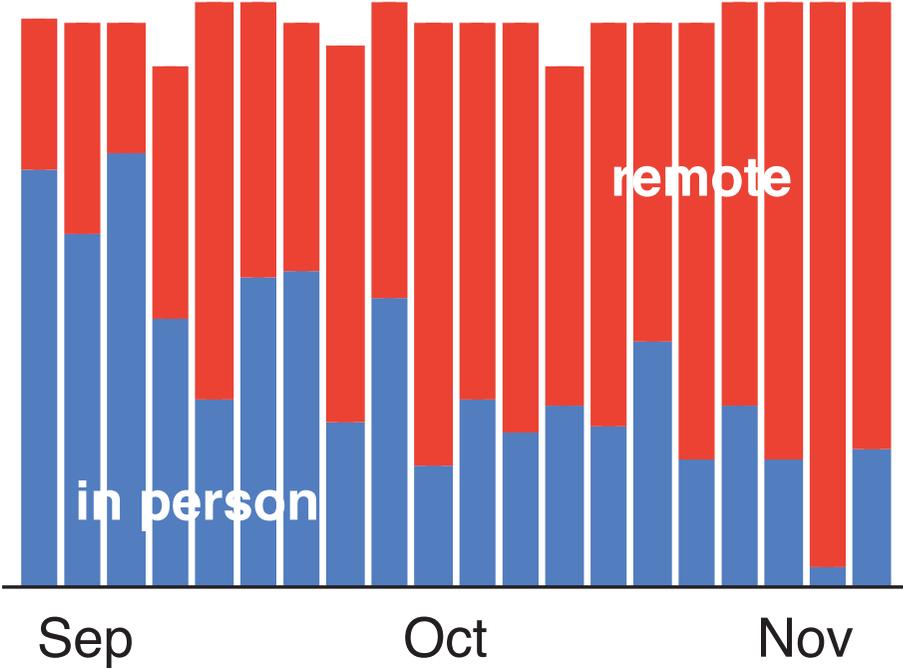
# in-person vs. remote



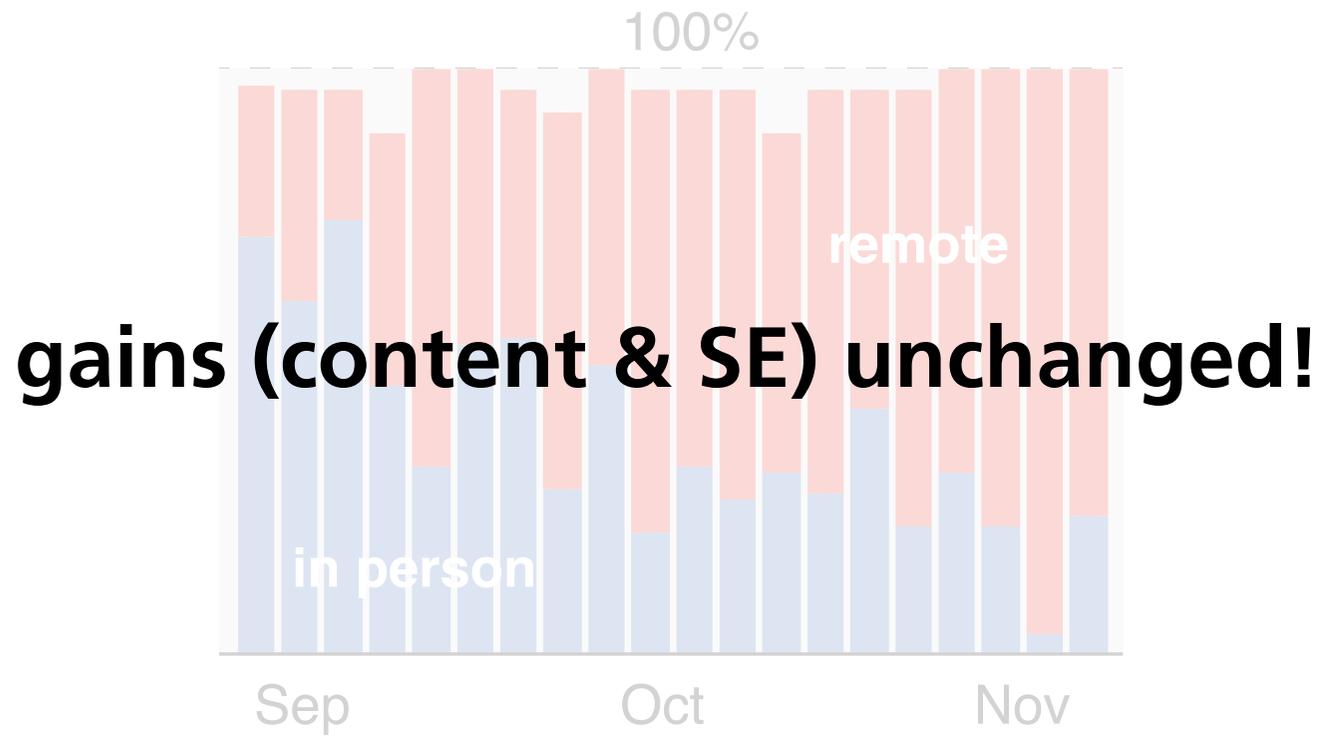
# in-person vs. remote



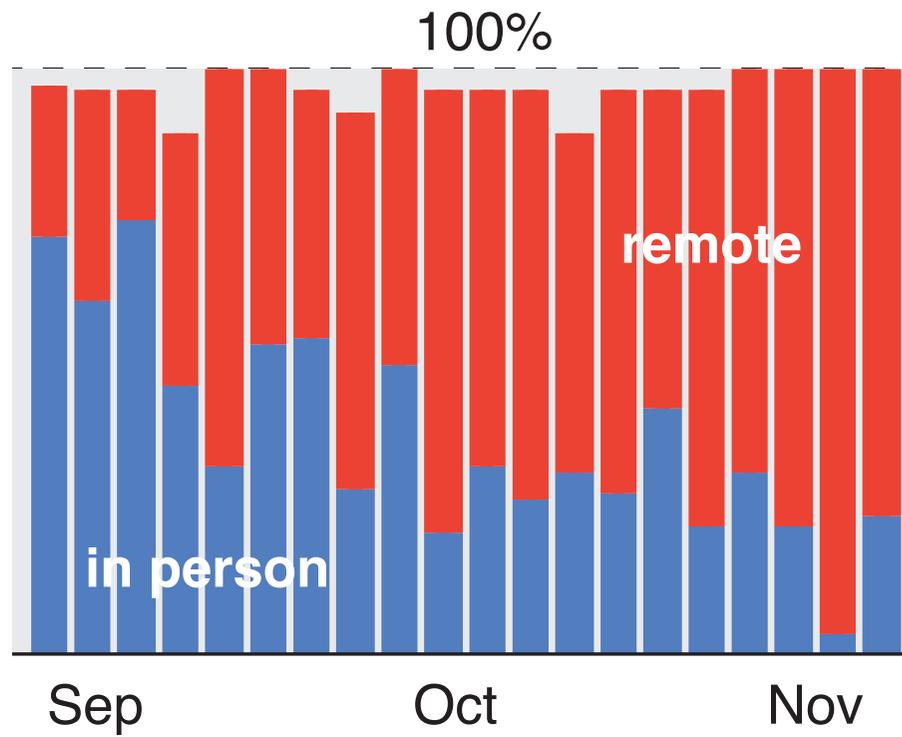
# attendance



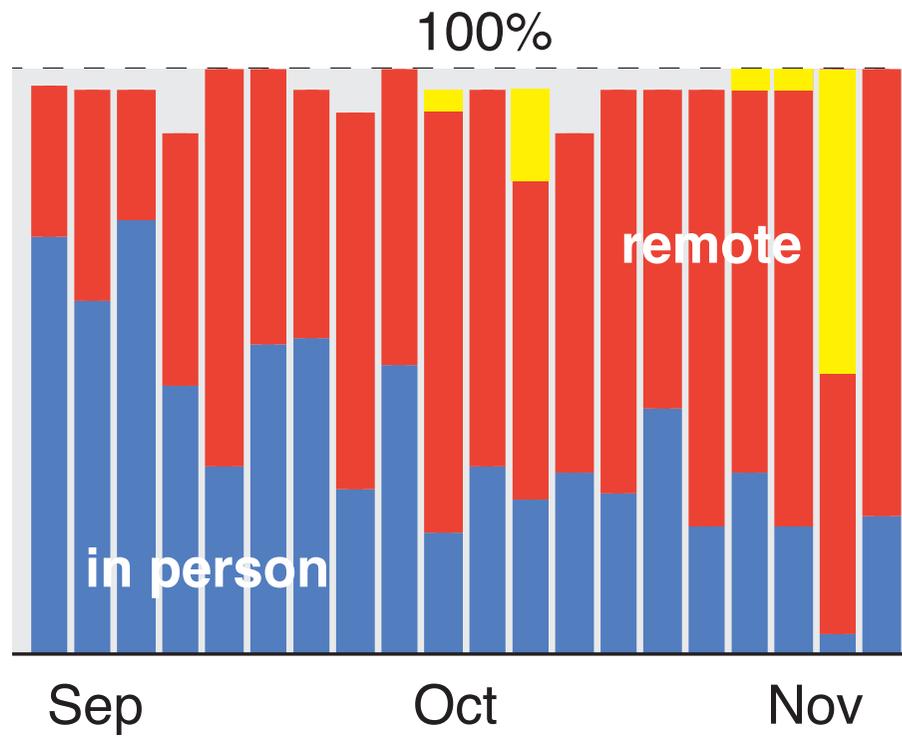
# attendance



# attendance



# time-shifts





**“breaking down classroom walls”**

Christina Gonzalez

David Turner

Eric Mazur

Louis Colton

Ariana McKeever

Andreas Bonatz

Debra Smithe McK

Matt Jenkins

Justin Cohen

Mr. Anna Marlar



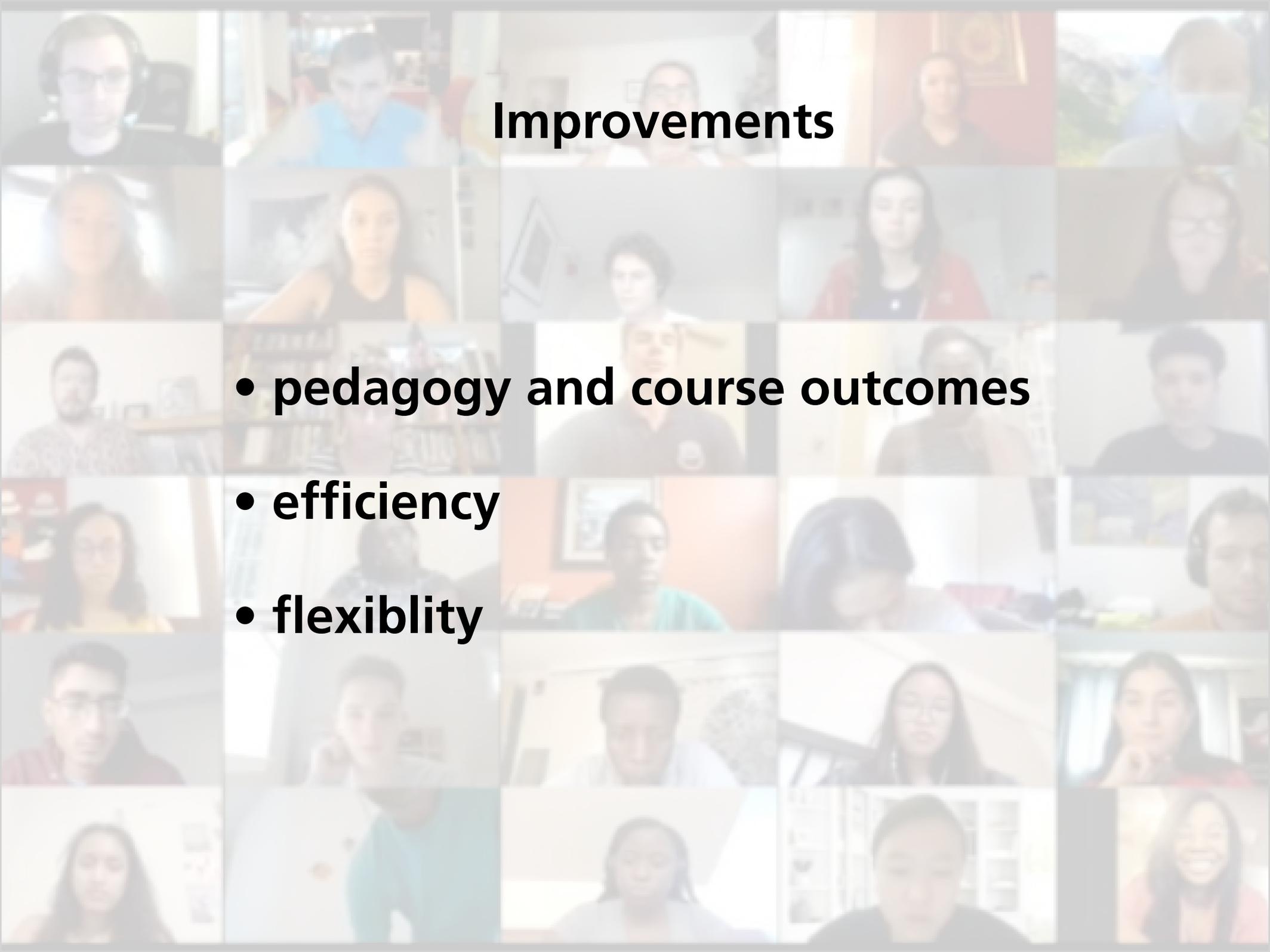
Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are

pres  
tire

**Remote teaching may well become a fixture of life**

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.





# Improvements

- **pedagogy and course outcomes**
- **efficiency**
- **flexibility**

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