

Lessons from a year of remote teaching



X Lean Six-Sigma Congress
30 July 2021

/// Matt Jenkins

/// Justin Cohen

/// New Ajana Marjama Dissanayake

Lessons from a year of remote teaching



@eric_mazur

X Lean Six-Sigma Congress
30 July 2021

/// Matt Jenkins

/// Justin Cohen

/// New Aina Williams

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

- 
- 
- 
-  Save

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.



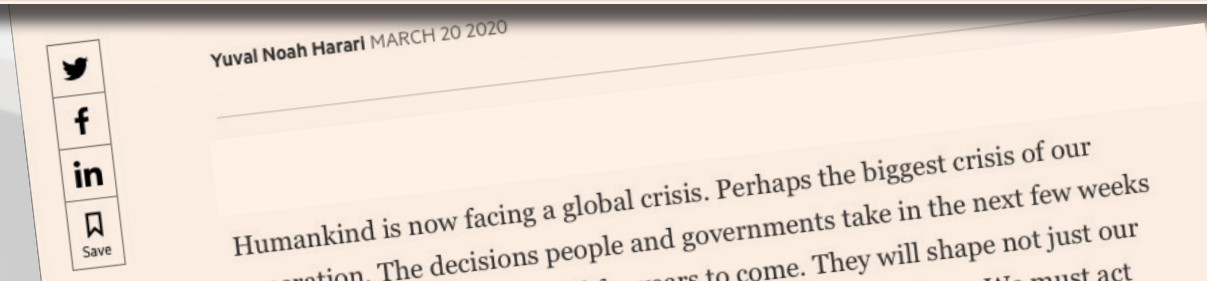


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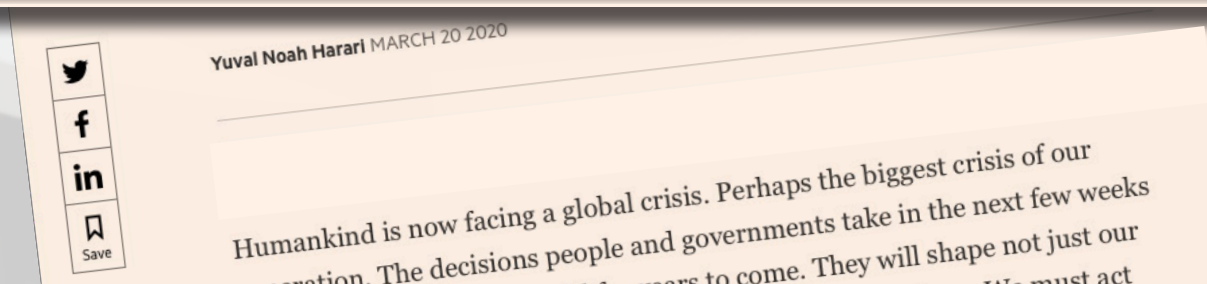


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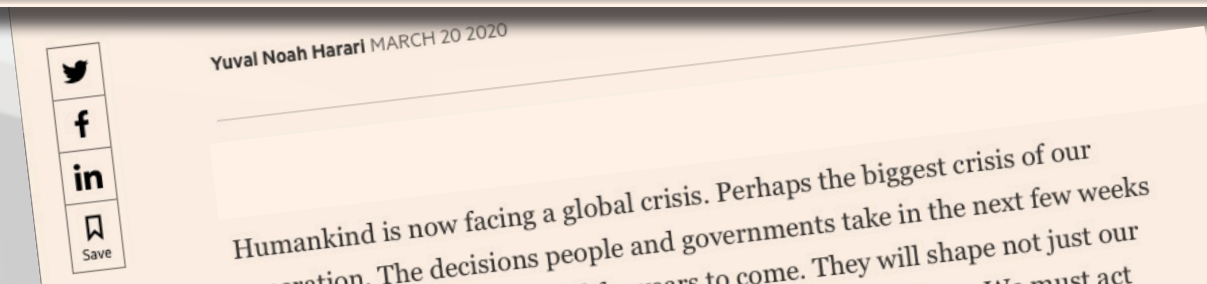


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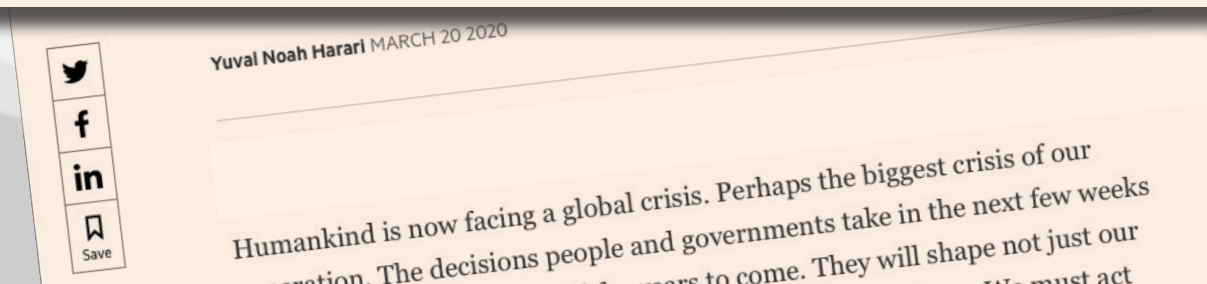




Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are pressed into use.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





ng Wing School P.S. 124 who wished not be identified remote teaches on her laptop from her roof on March 24, 2020 in New York City. | Photo by Michael Loccisano/Getty Images

TEACHING & CLASSROOM

America's great remote-learning experiment: What surveys of teachers and parents tell us about how it went

By Matt Barnum and Claire Bryan | Jun 26, 2020, 12:18pm EDT

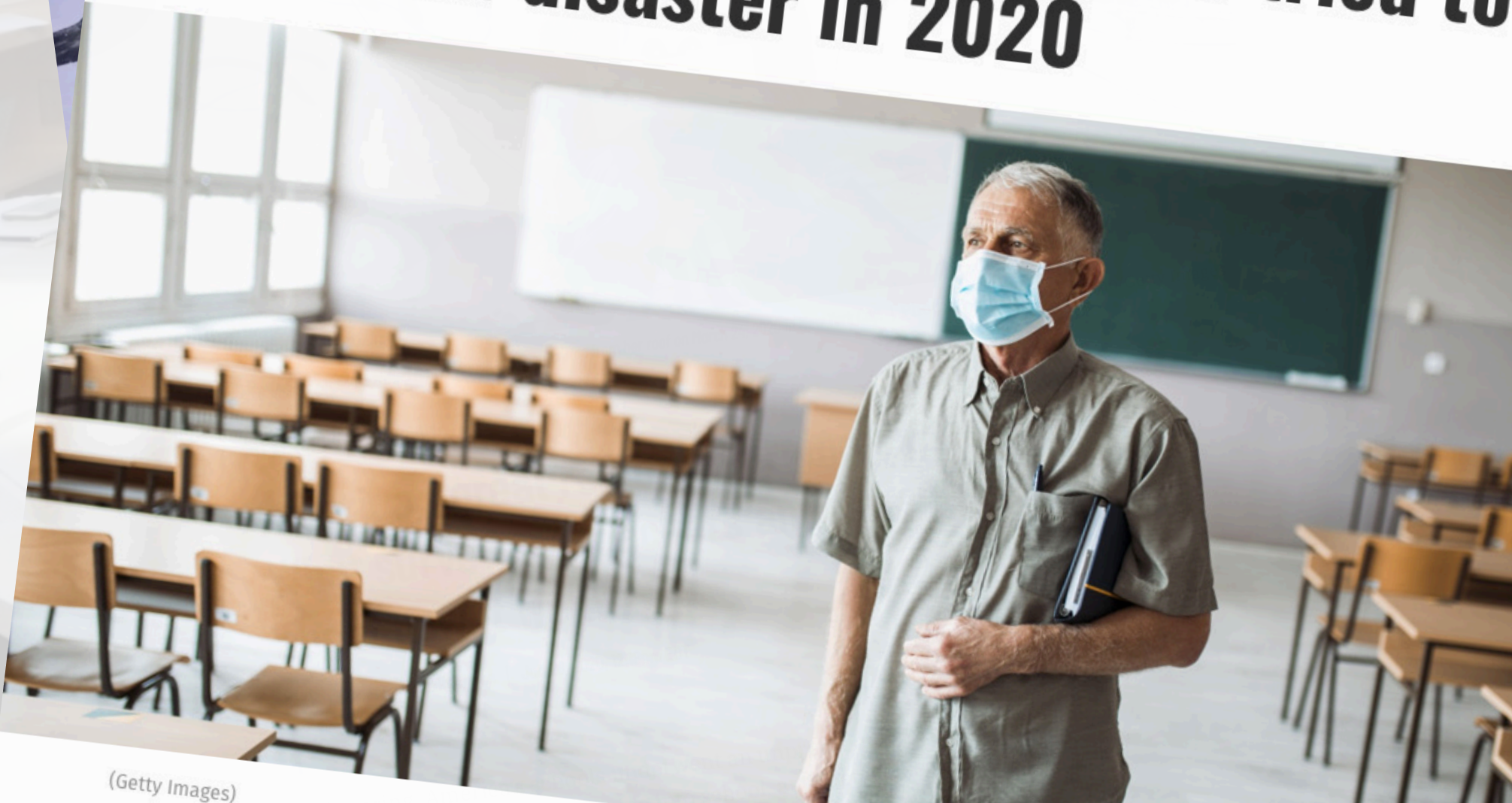


REPUBLISH

...ring America's schools underwent an unprecedented experiment: tens of
...ing into school, and instead began receiving

HIGHER EDUCATION

How higher education leaders tried to stave off disaster in 2020



(Getty Images)



The Results Are In for Remote Learning: It Didn't Work

The pandemic forced schools into a crash course in online education. Problems piled up quickly. 'I find it hectic and stressful'

Lucia Curatolo-Boylan supervises the online schooling of her four children, ages 4 to 10, in Staten Island, N.Y. KEVIN HAGEN FOR THE WALL STREET JOURNAL

lkbeat

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☰ 🔍 Popular Latest

The Atlantic

IDEAS

Remote Learning Is a Bad Joke

My kid can't handle a virtual education, and neither can I.

AUGUST 18, 2020

Emily Gould

Author and essayist



RECOMMENDED READING

Put Anthony Fauci in Dunk Tank

CONOR FRIEDERSDORF

Why Millennials Can't Get Up



Remote learning has been a disaster and it can't continue

Randy Feldman

Published 5:30 a.m. ET Jun. 9, 2020

[View Comments](#)



Perspective. Few public policy issues are about one's own personal predisposition to live with risk and uncertainty than how we approach the coronavirus pandemic in the coming months. Scientific facts notwithstanding, how each of us evaluates the probability of contracting or spreading coronavirus



lkbeat

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Intelligencer



Remote learning has been a disaster
and it can't continue

Randy Feltman

THE NATIONAL INTEREST | OCT. 7, 2020

Remote Learning Is a Catastrophe. Teachers Share the Blame.

By Jonathan Chait

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Intelligencer



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COLUMN | HIGHER EDUCATION

Why Emergency Online Learning Got Low Grades From Many College Students

By Robert Ubell (Columnist) Mar 8, 2021



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the Coronavirus Outbreak >

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Second D

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.

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Second D

Online distance learning for schools and colleges has been a great disaster.

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.

Was it really *that* bad?

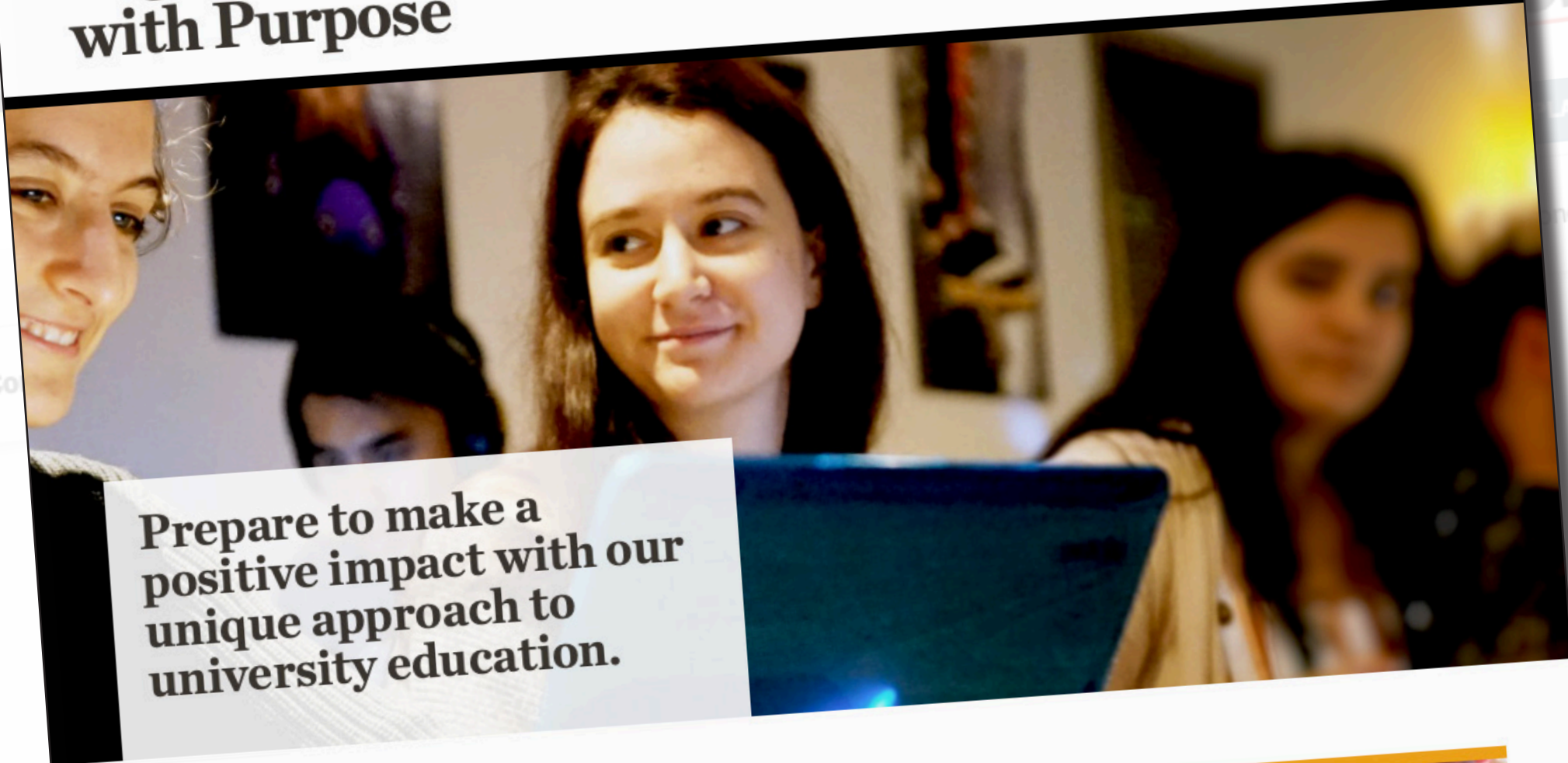
Research Shows Students Falling Months Behind During Virus Disruptions

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March 2020

AP50

1 before (and just after) pandemic



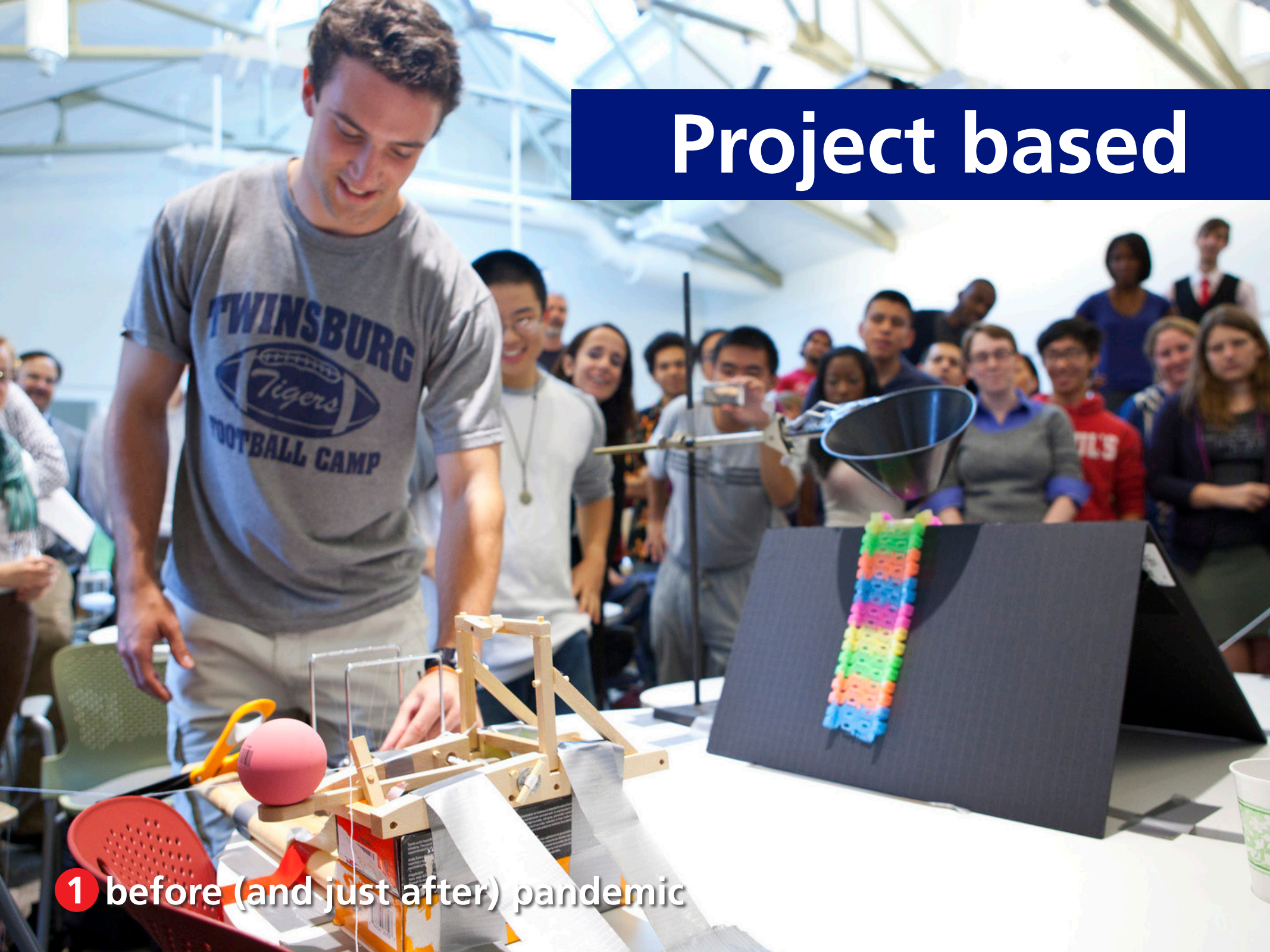


Team based

1 before (and just after) pandemic

Project based

1 before (and just after) pandemic

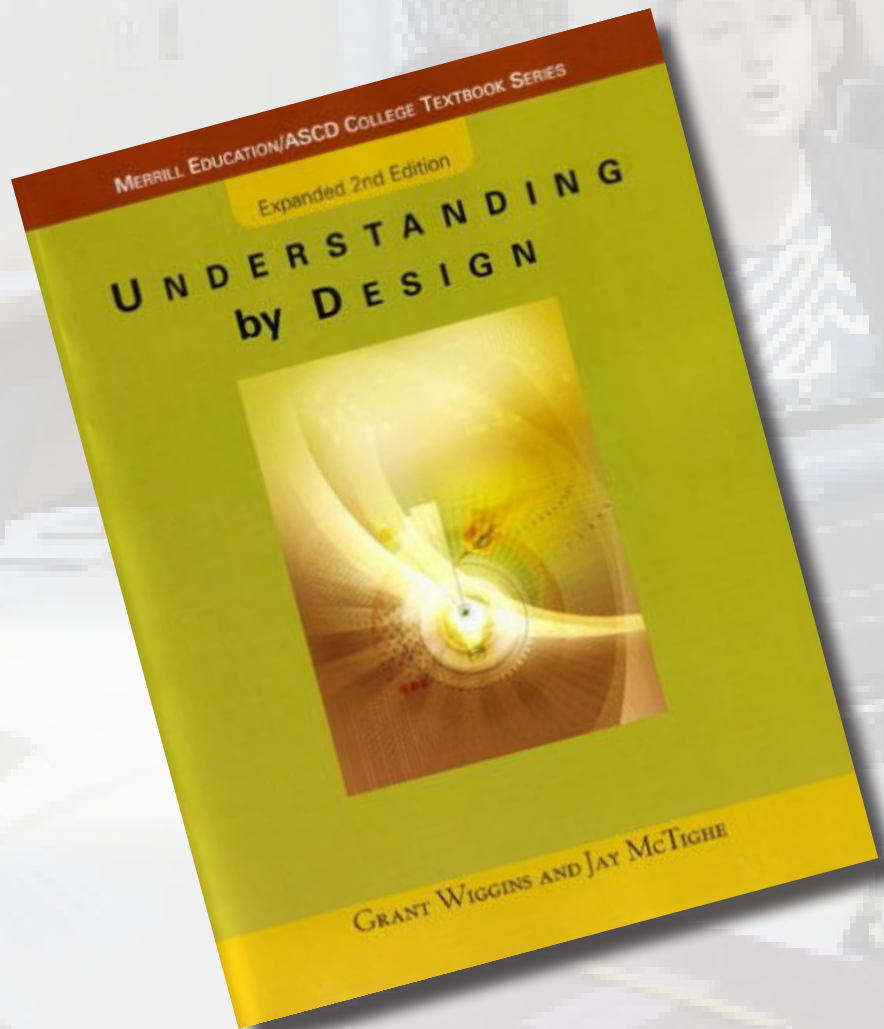




Intrinsic motivation

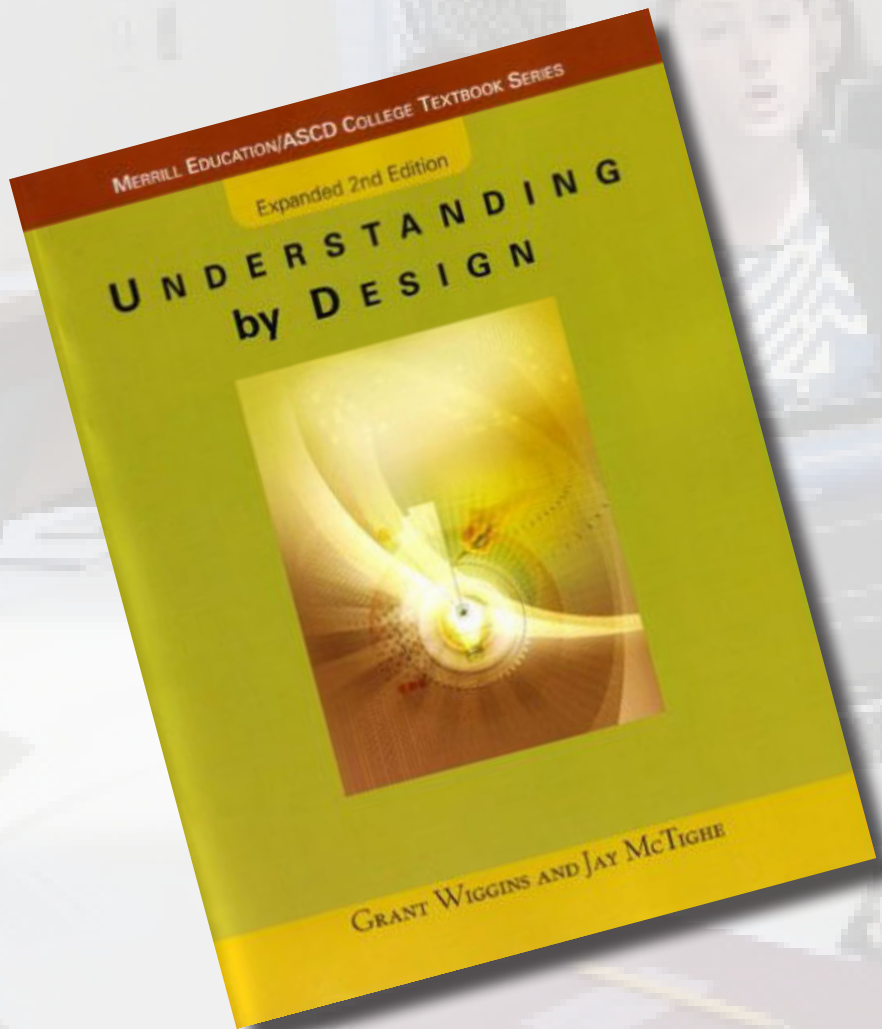
1 before (and just after) pandemic

Setting learning goals



Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

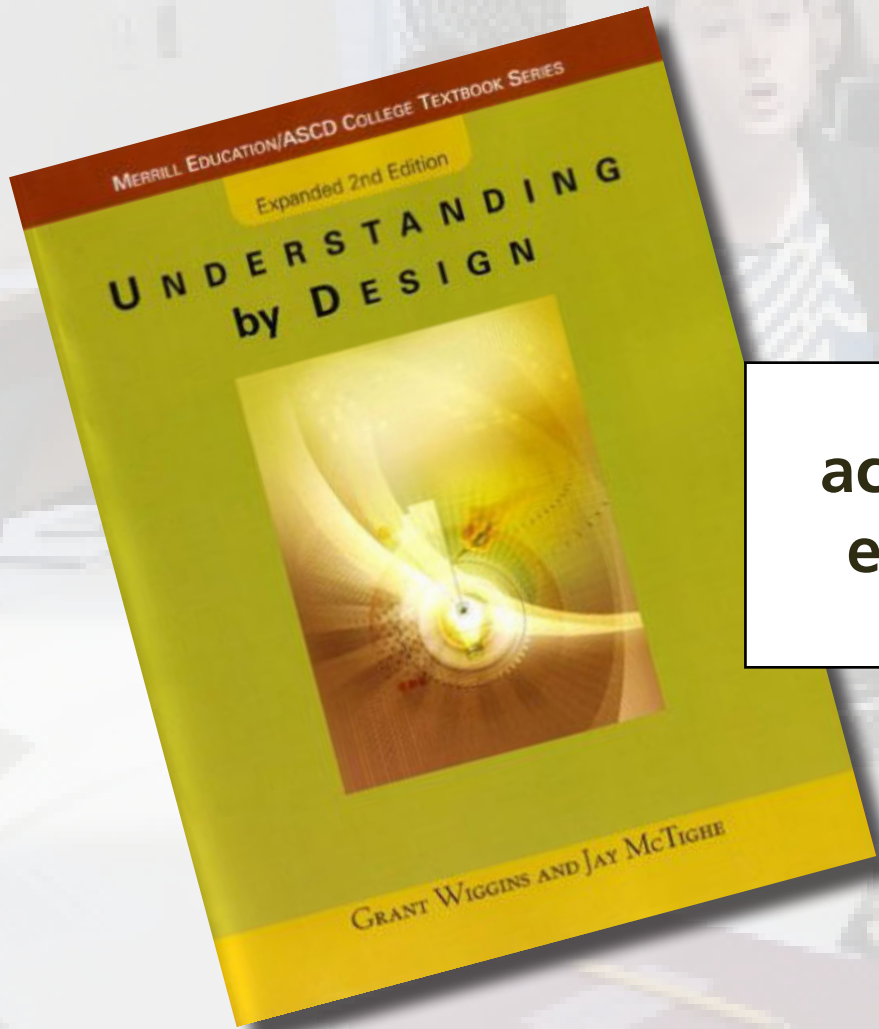
Backward design



**desired
outcomes**

Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

Backward design



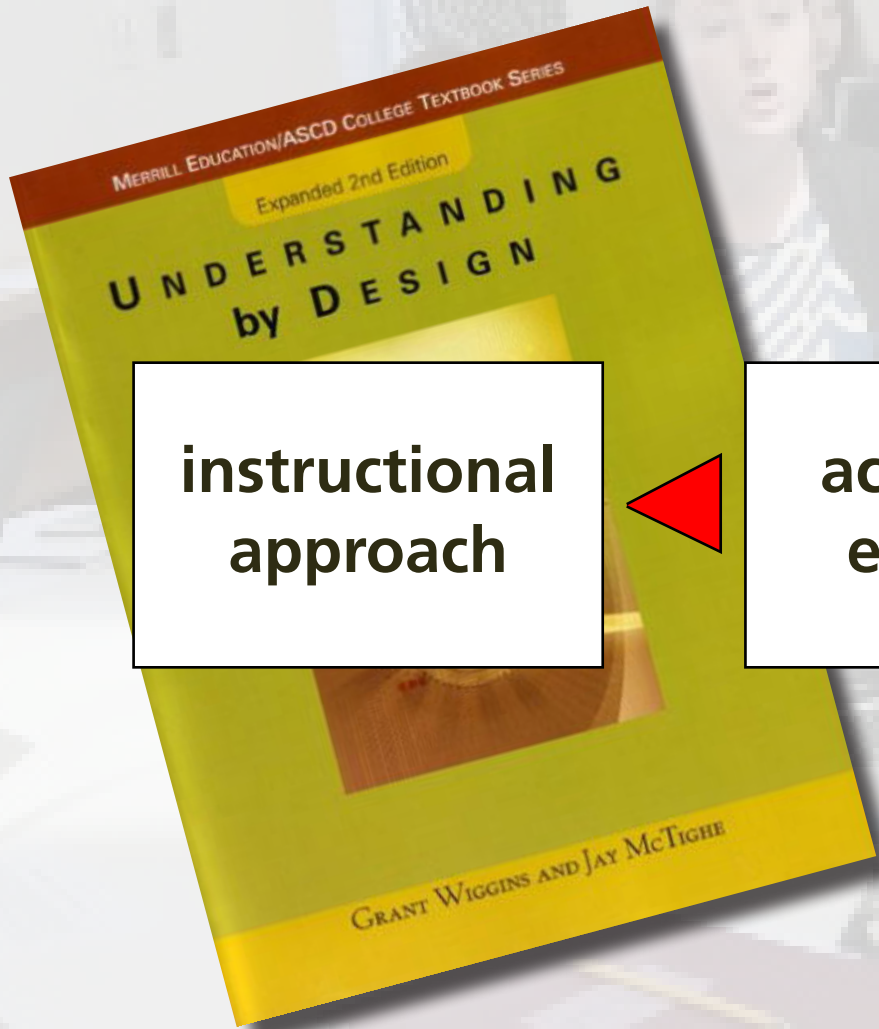
acceptable
evidence



desired
outcomes

Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

Backward design



**instructional
approach**

**acceptable
evidence**

**desired
outcomes**



Course goals

- self-directed learning
- content mastery
- team work
- professionalism

1 before (and just after) pandemic



1 before (and just after) pandemic



information transfer

faculty-centered

1 before (and just after) pandemic




1 before (and just after) pandemic



interaction

student-centered

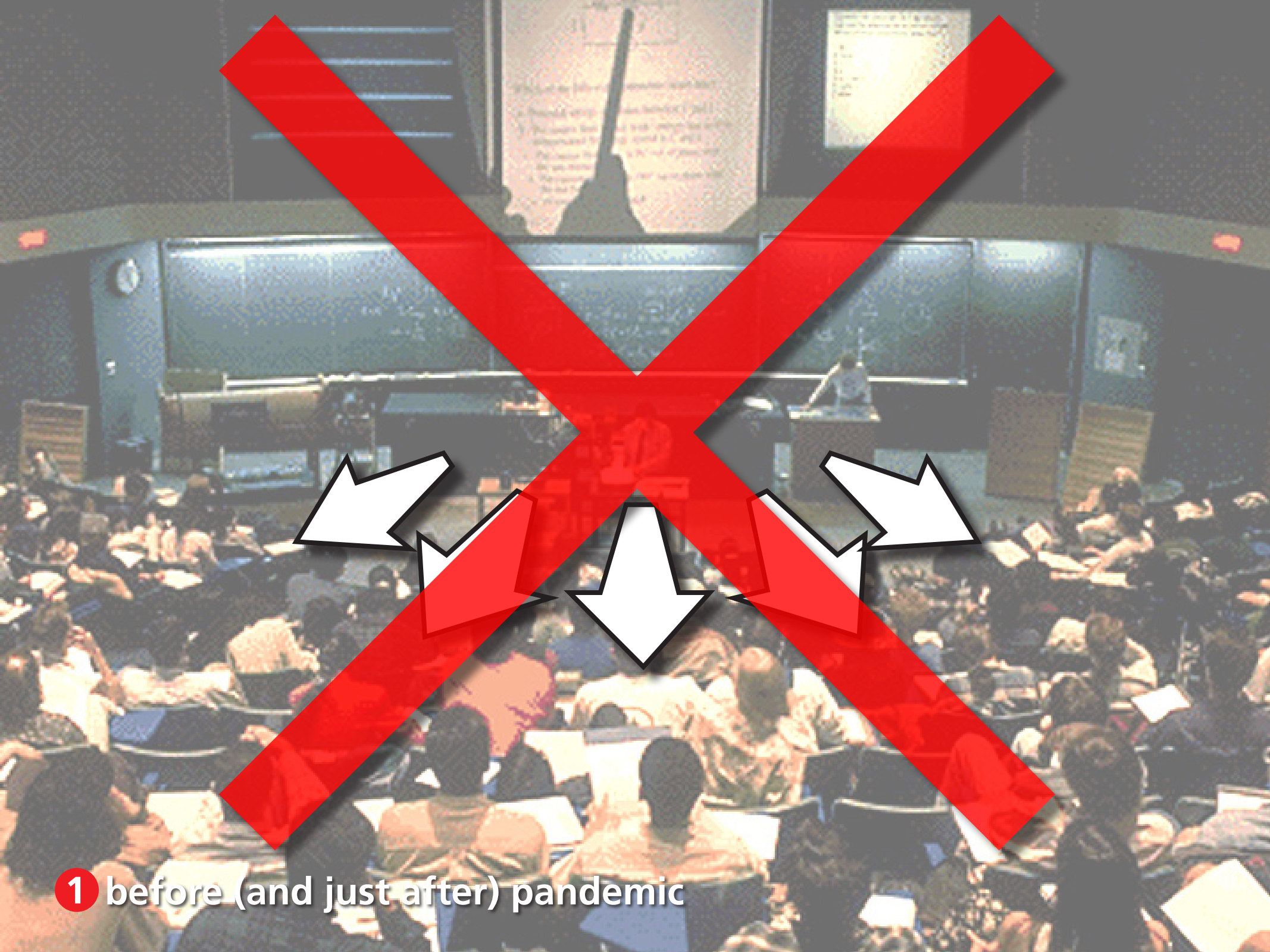
1 before (and just after) pandemic



no lectures

no exams

1 before (and just after) pandemic



1 before (and just after) pandemic



Solution

**turn out-of-class component
also into a social interaction!**

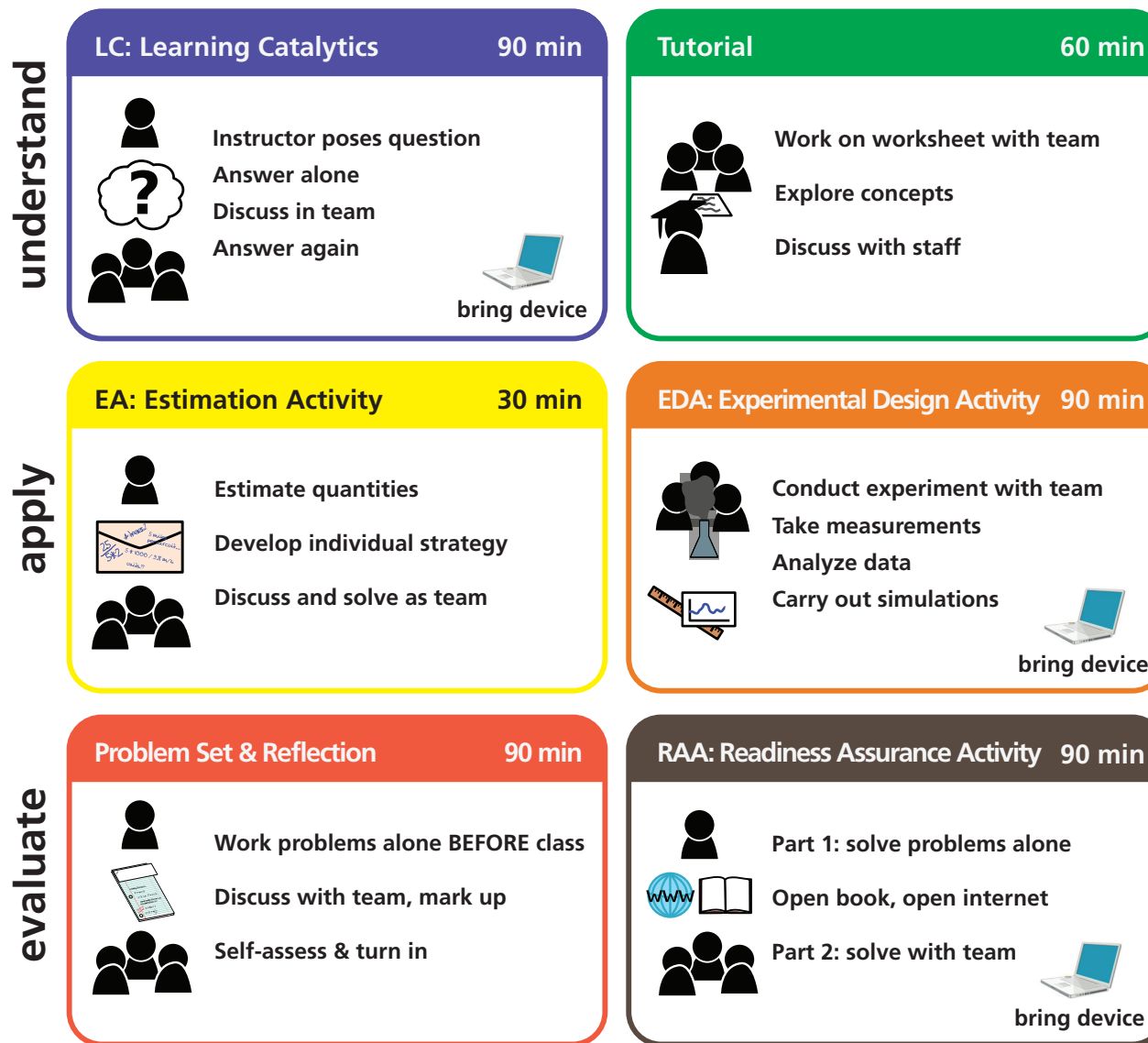
1 before (and just after) pandemic

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 contains various components, including a blue bowl, a white cup, and a board with colorful lights and wires. The background shows a classroom setting with other students and equipment.

what about class activities?

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 classroom setting with a window and a door.

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

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

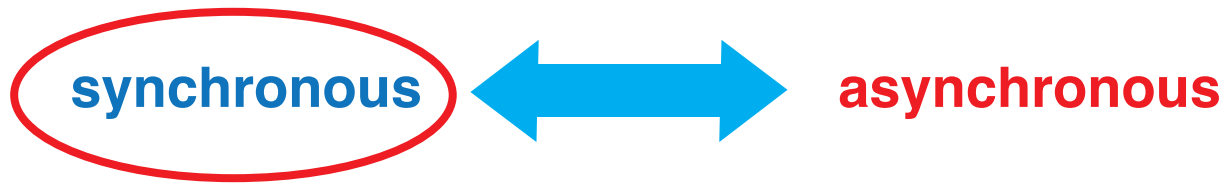
Changes implemented

- **Minimize sync/instructor-paced**
- **Personalize instruction**
- **Specifications Grading**

Minimize sync/instructor-paced

synchronous ↔ asynchronous

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

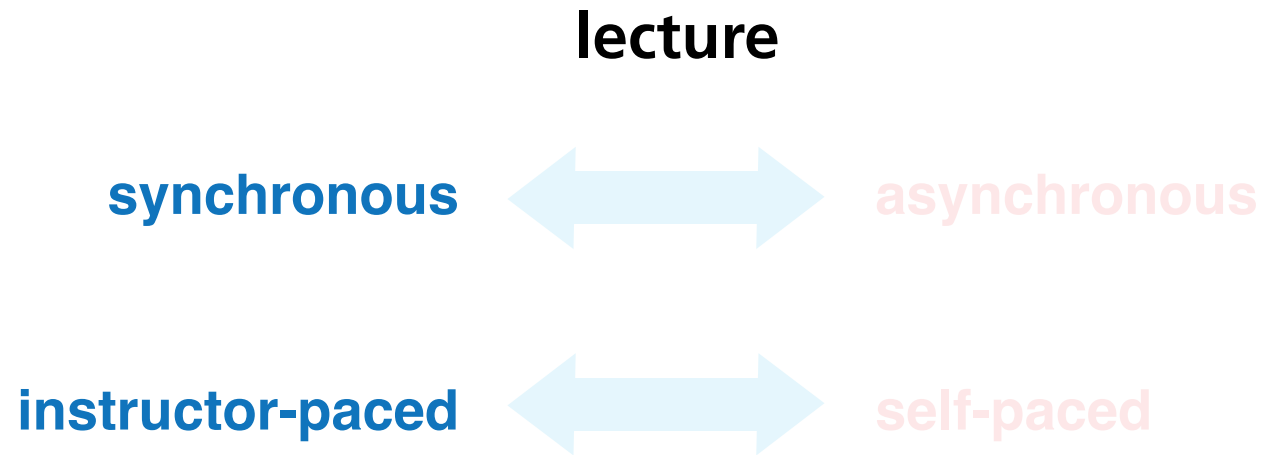
instructor-paced



self-paced

everybody together
at the same *pace*

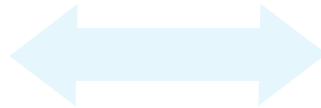
Minimize sync/instructor-paced



Minimize sync/instructor-paced

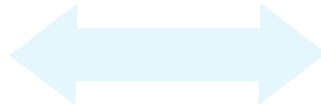
recorded lecture

synchronous



asynchronous

instructor-paced

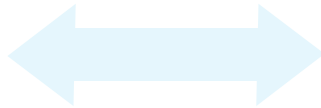


self-paced

Minimize sync/instructor-paced

recorded lecture

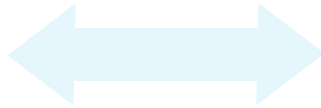
synchronous



asynchronous

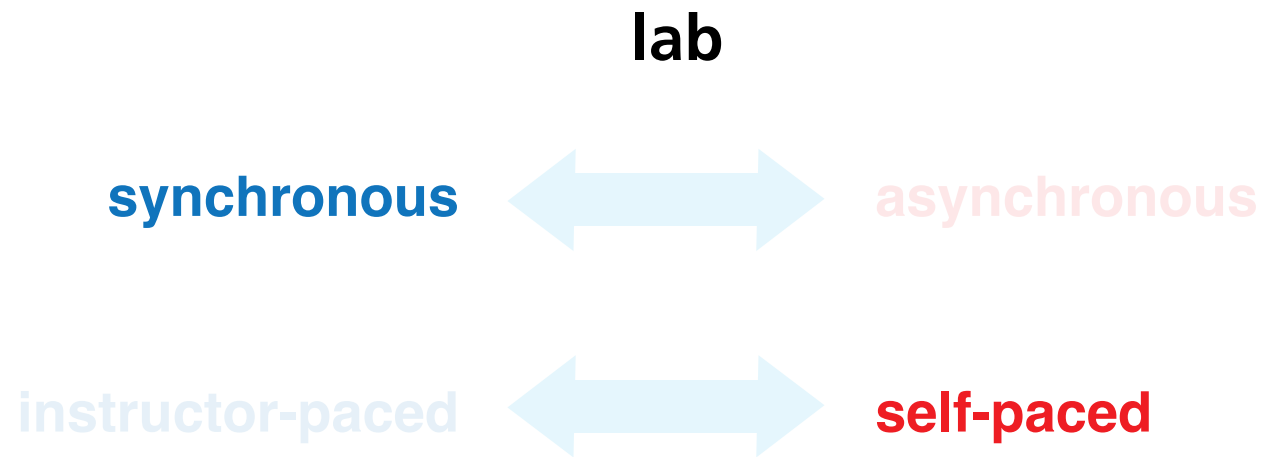
instructor-paced

1.5x!



self-paced

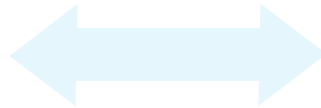
Minimize sync/instructor-paced



Minimize sync/instructor-paced

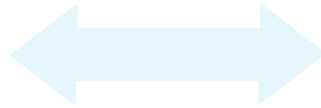
homework/study

synchronous



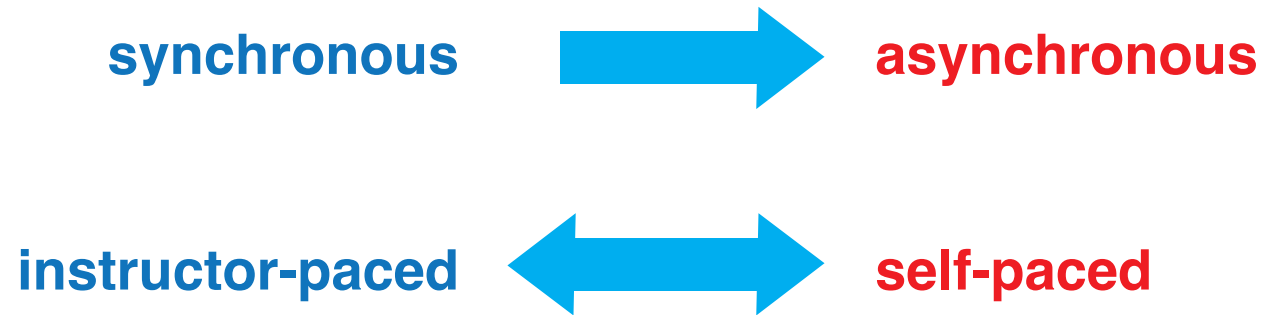
asynchronous

instructor-paced



self-paced

Minimize sync/instructor-paced



Minimize sync/instructor-paced

synchronous



asynchronous

instructor-paced



self-paced

Minimize sync/instructor-paced

synchronous



asynchronous

instructor-paced



self-paced

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

Personalize instruction

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

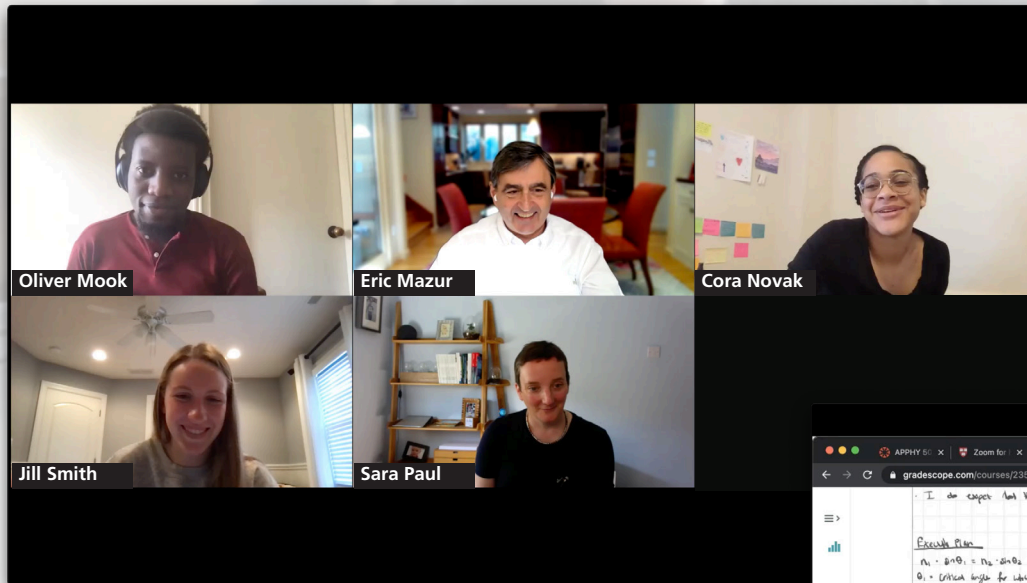
Personalize instruction

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



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)

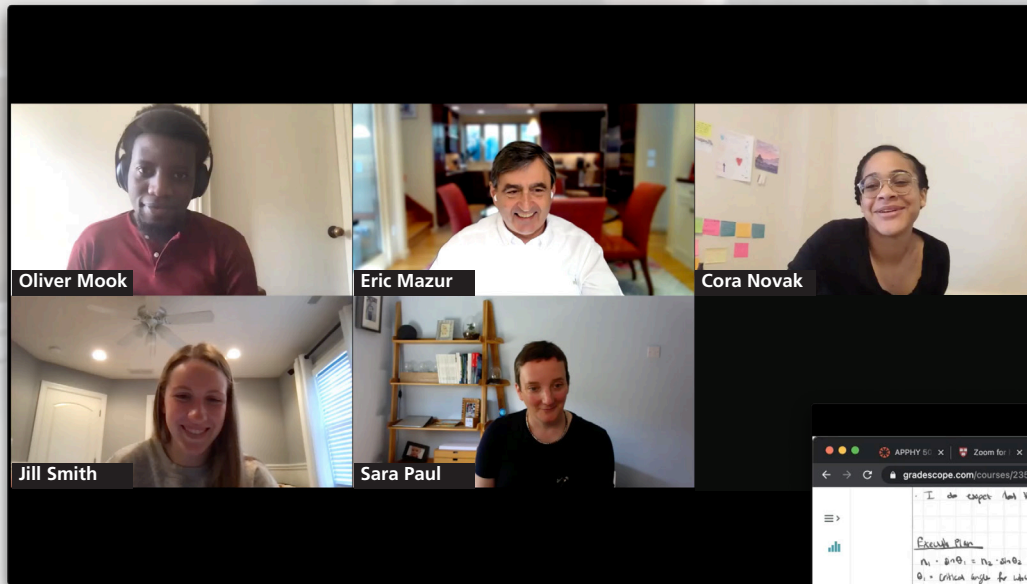
3: Question 2

Reselect Pages | Download Original | Submission History | Resubmit

The screenshot shows a physics problem about a car on a hill. The student's solution includes a diagram of a car on a hill with forces n_1 and n_2 acting on it. The solution uses trigonometry to find the angle θ where the car is in equilibrium. The final answer is $\theta = \arcsin\left(\frac{1}{\sqrt{2}}\right) = 45^\circ$.

Personalize instruction

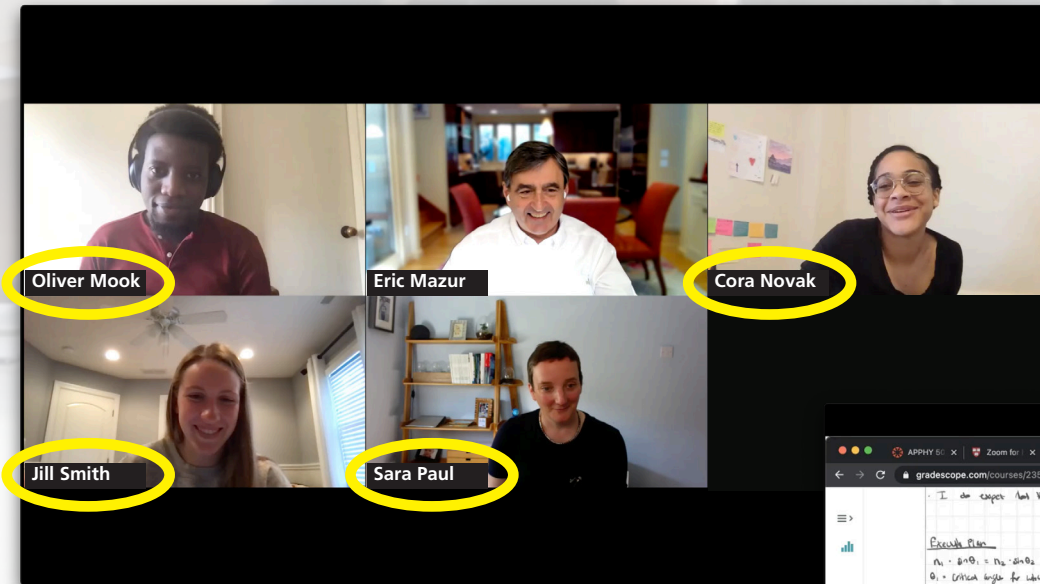
every student on front row



The screenshot shows a Zoom meeting interface. The main window displays a shared screen with a physics problem and its solution. The problem involves calculating the critical angle θ_c for total internal reflection at the interface between two media with refractive indices n_1 and n_2 . The solution includes a diagram of a right-angled triangle with vertices A, B, and C, and various trigonometric derivations. The sidebar on the right shows a list of questions for "Assignment Module 25" (UNGRADED) with a total score of 0 points. The bottom of the screen shows the Zoom control bar with options like "Reselect Pages", "Download Original", "Submission History", and "Resubmit".

Personalize instruction

every student on front row & address each by their name



gradescope.com/courses/235715/assignments/1081570/submissions/76218040#Question_3

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

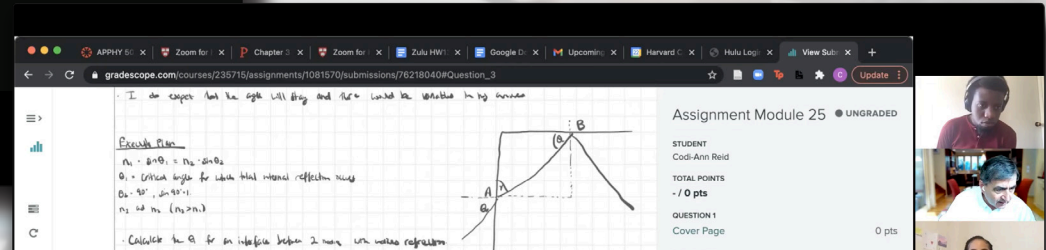
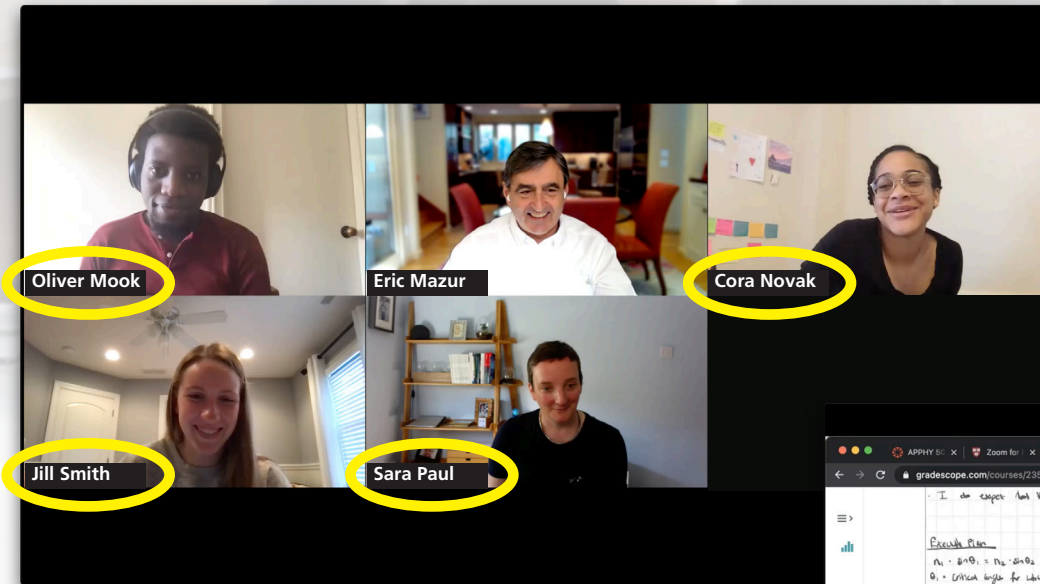
QUESTION 5
Reflection 0 pts

3: Question 2

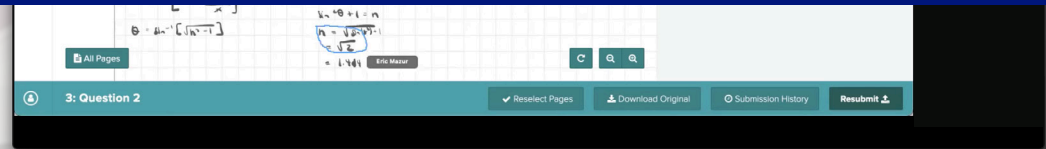
Reselect Pages Download Original Submission History Resubmit

Personalize instruction

every student on front row & address each by their name



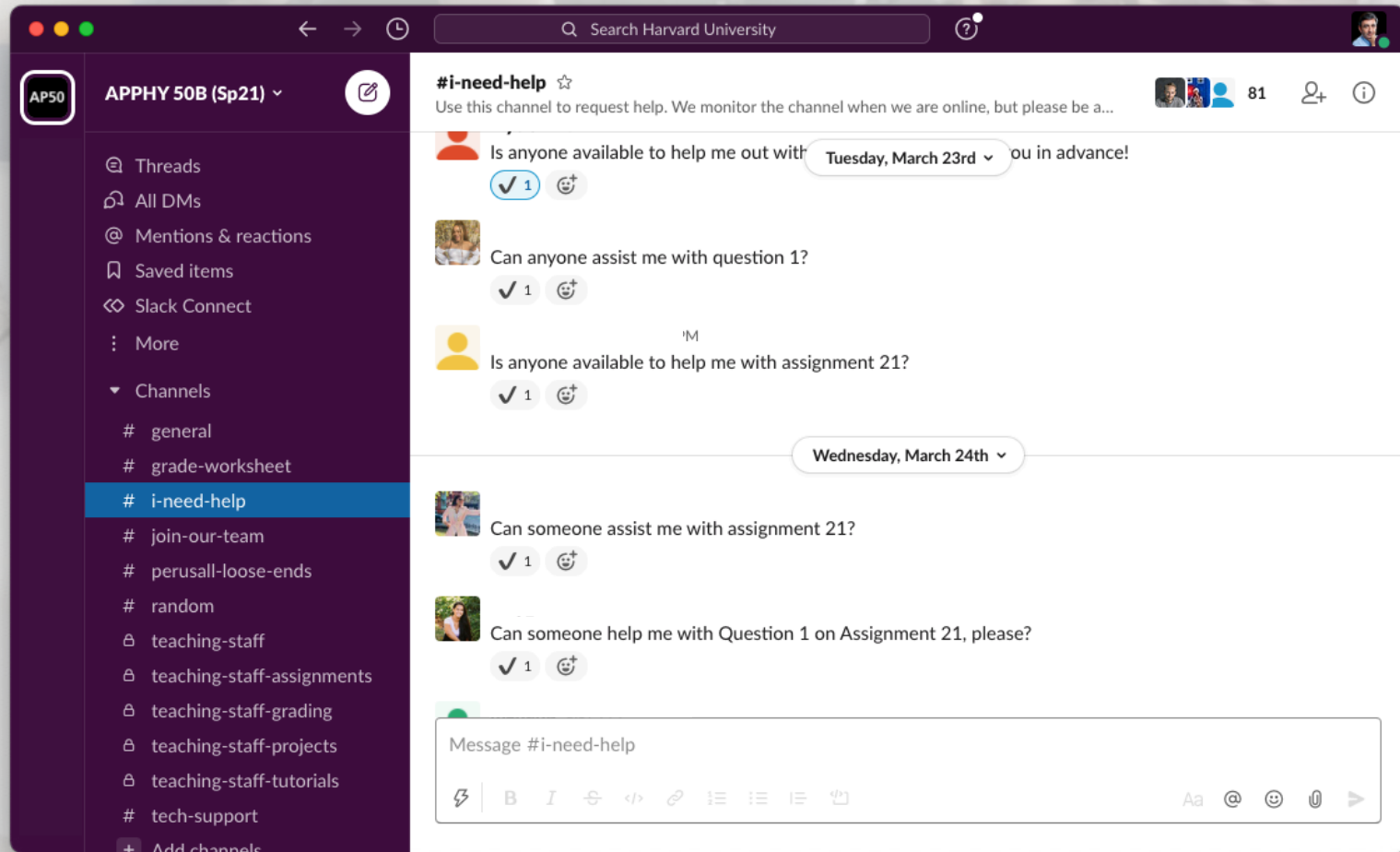
Shuffle teams



2 reimagining course

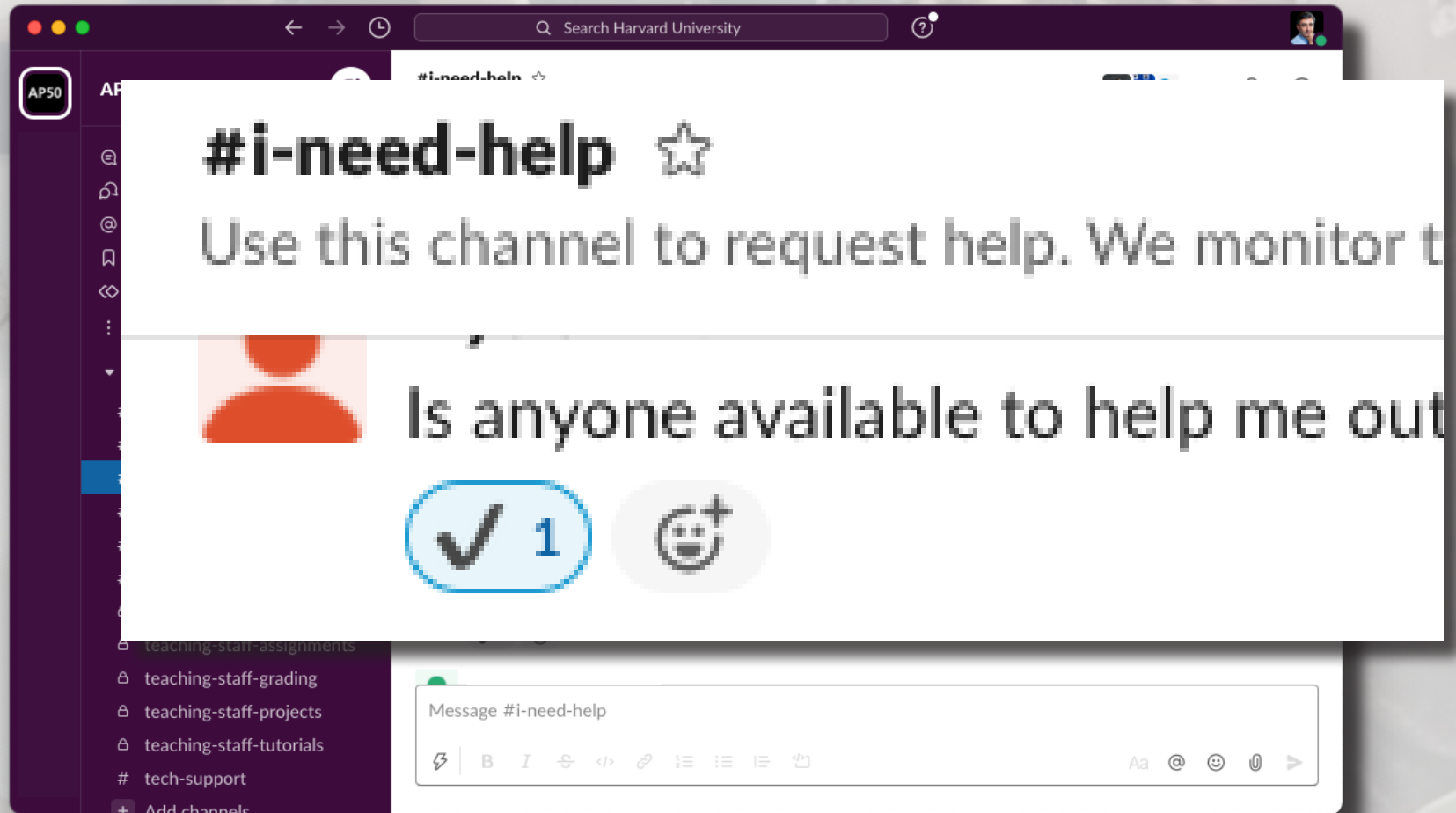
Personalize instruction

Use Slack to provide (nearly) continuous support



Personalize instruction

Use Slack to provide (nearly) continuous support

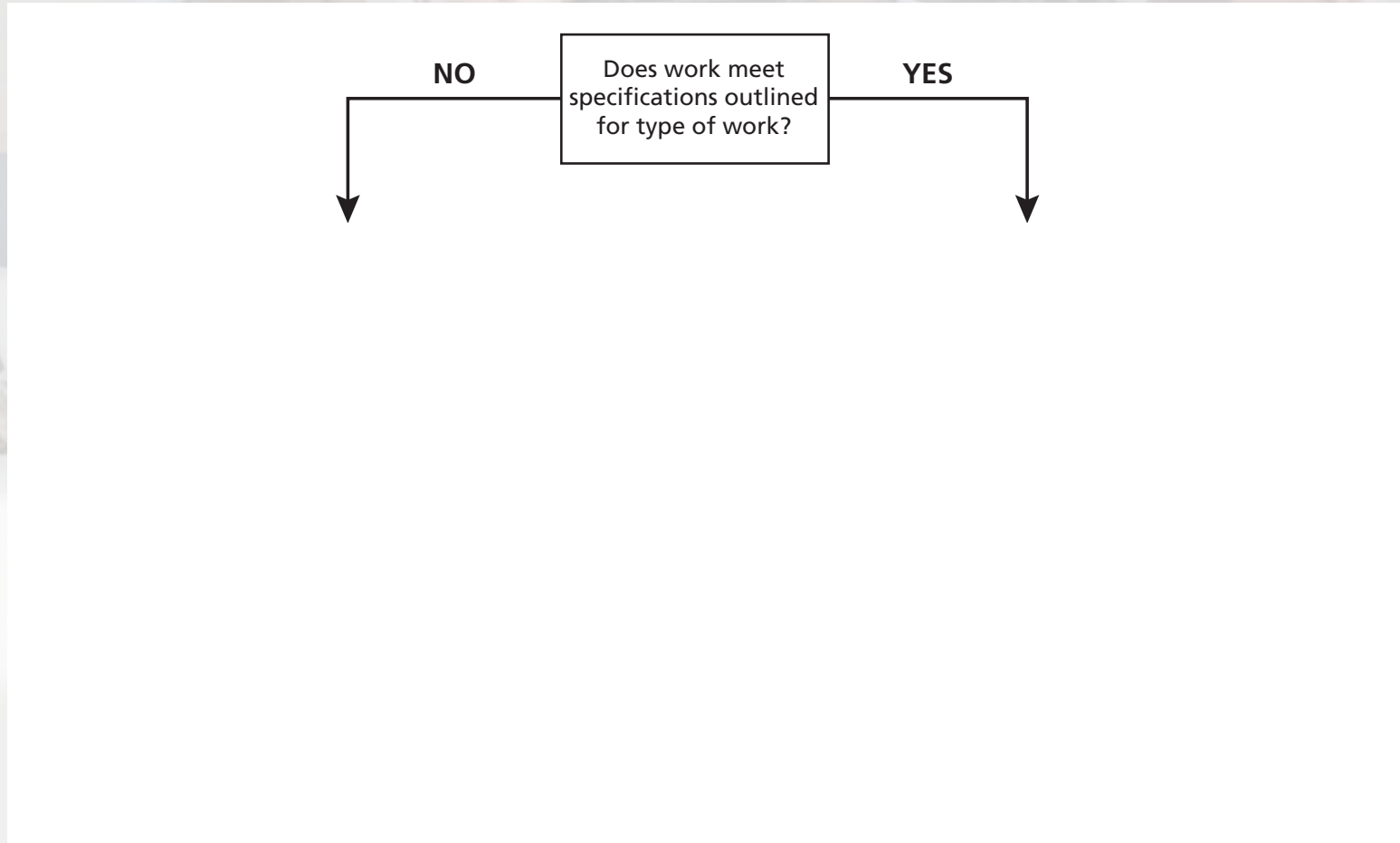


Specifications grading

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

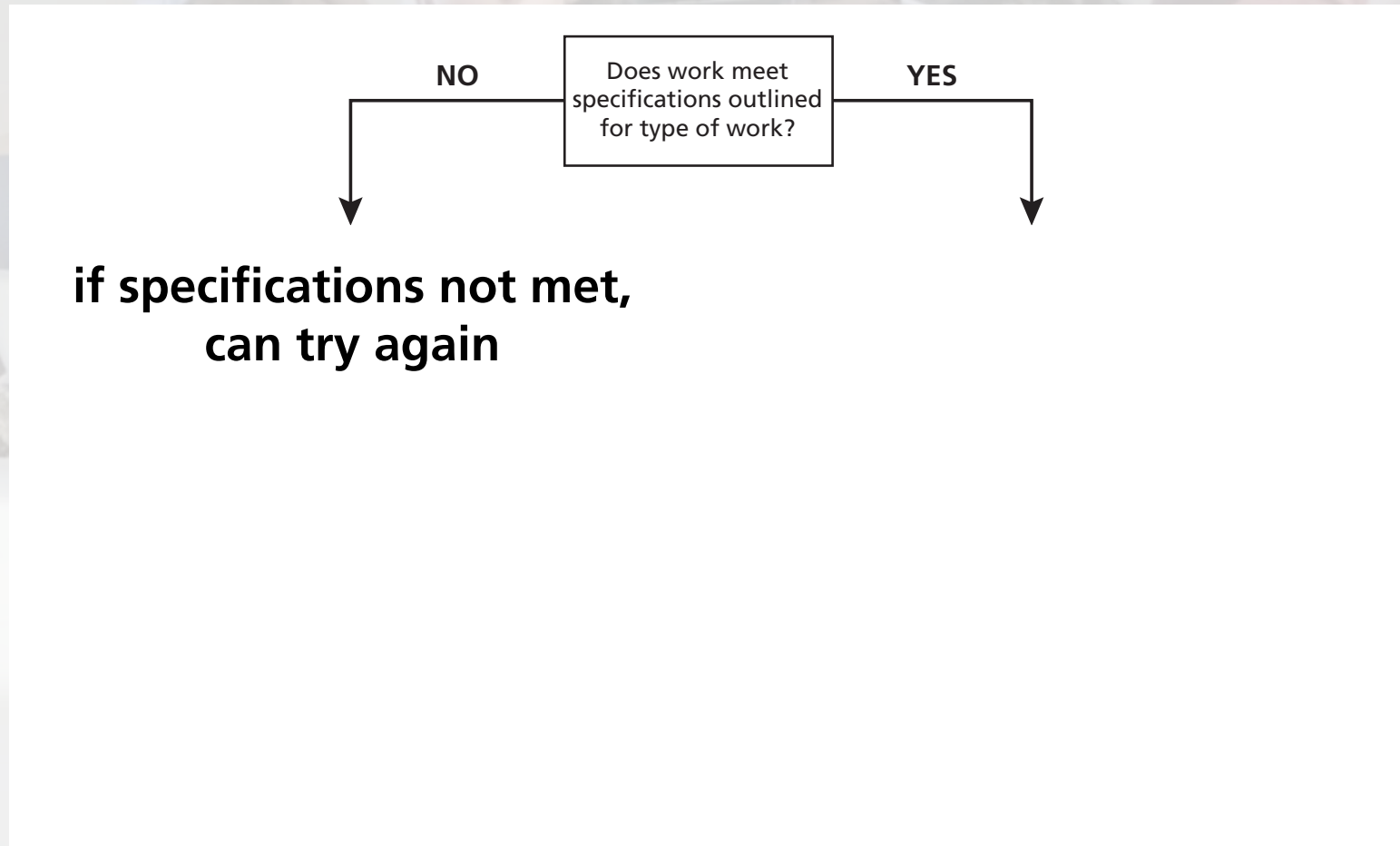
2 reimagining course

Specifications grading



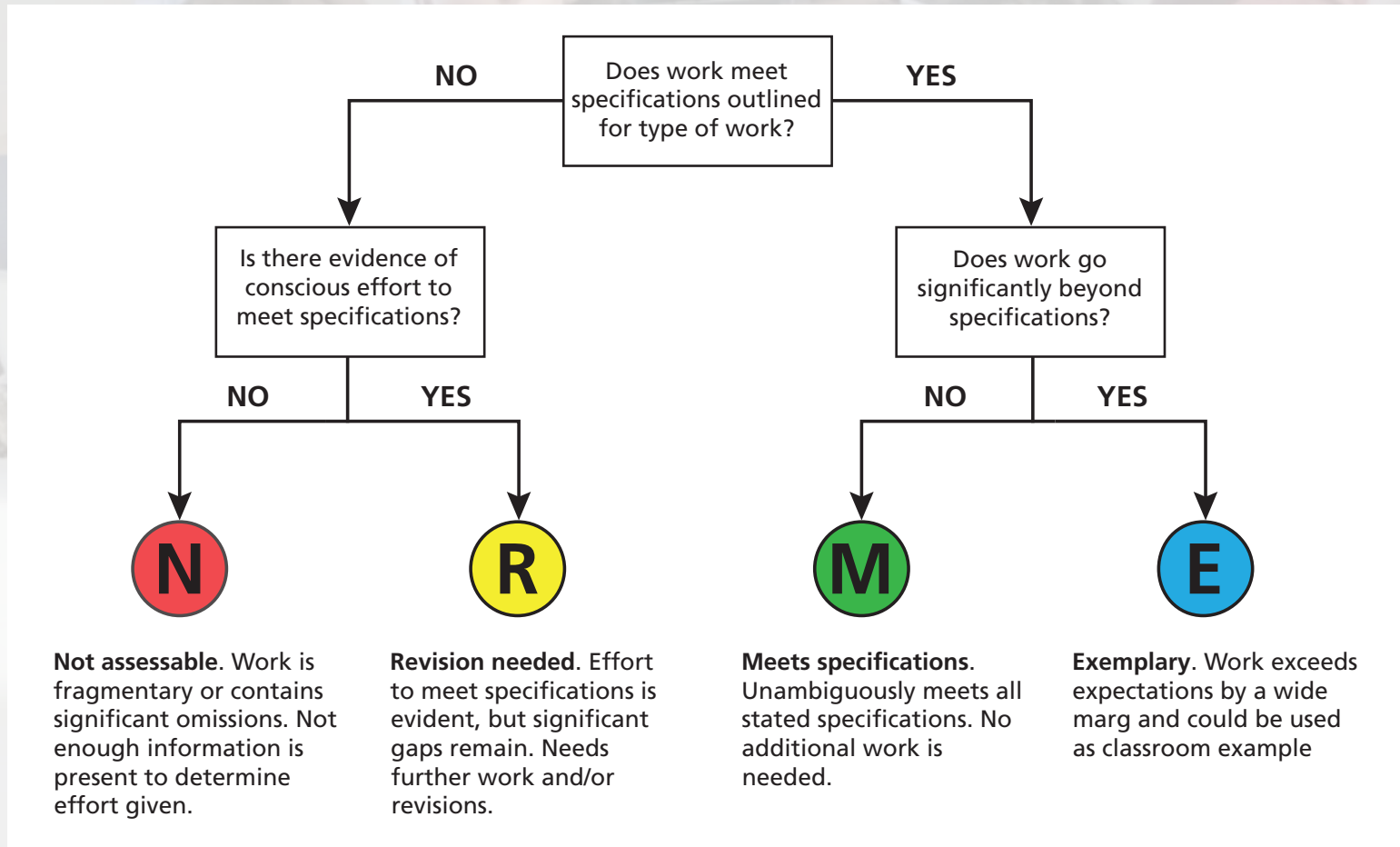
Inside Higher Ed, *Yes, Virginia, there is a better way to grade*

Specifications grading



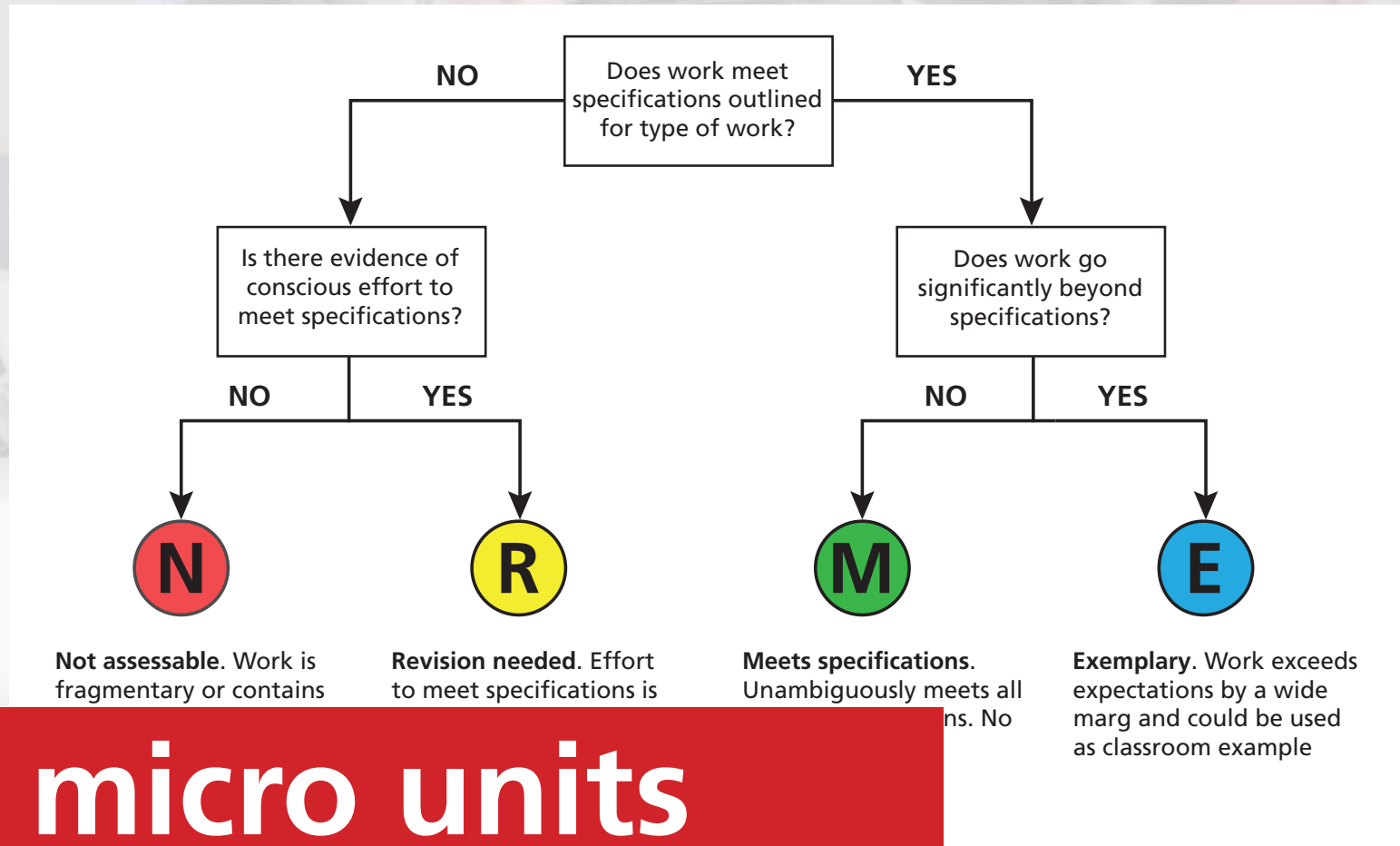
Inside Higher Ed, *Yes, Virginia, there is a better way to grade*

Specifications grading



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

Specifications grading



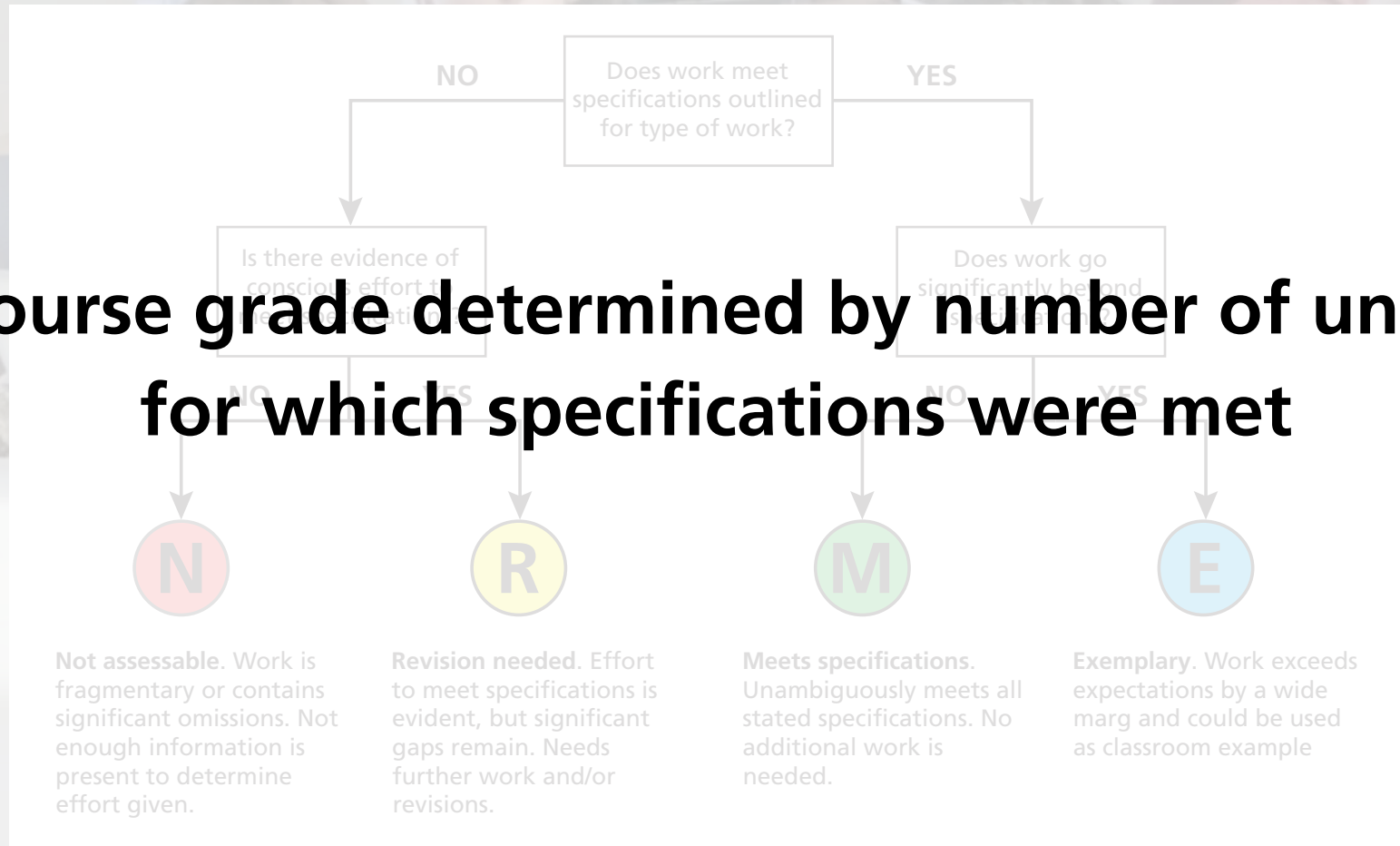
68 micro units

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

2 reimagining course

Specifications grading

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

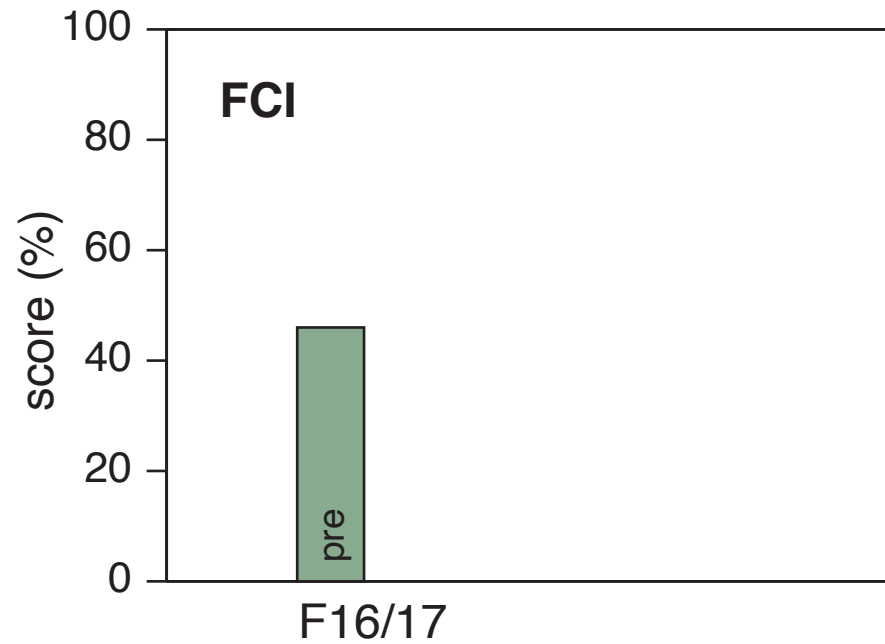


Inside Higher Ed, *Yes, Virginia, there is a better way to grade*

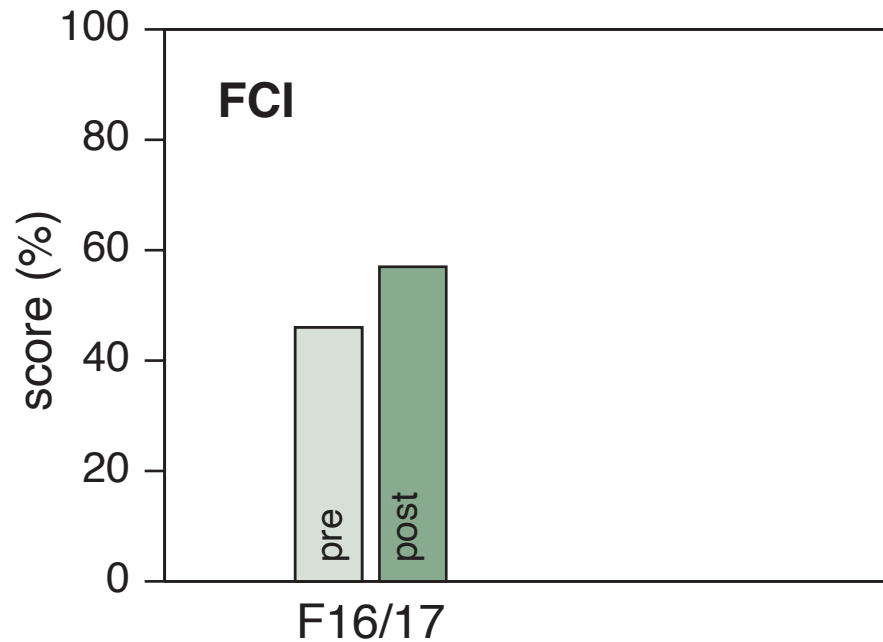


Did it work?

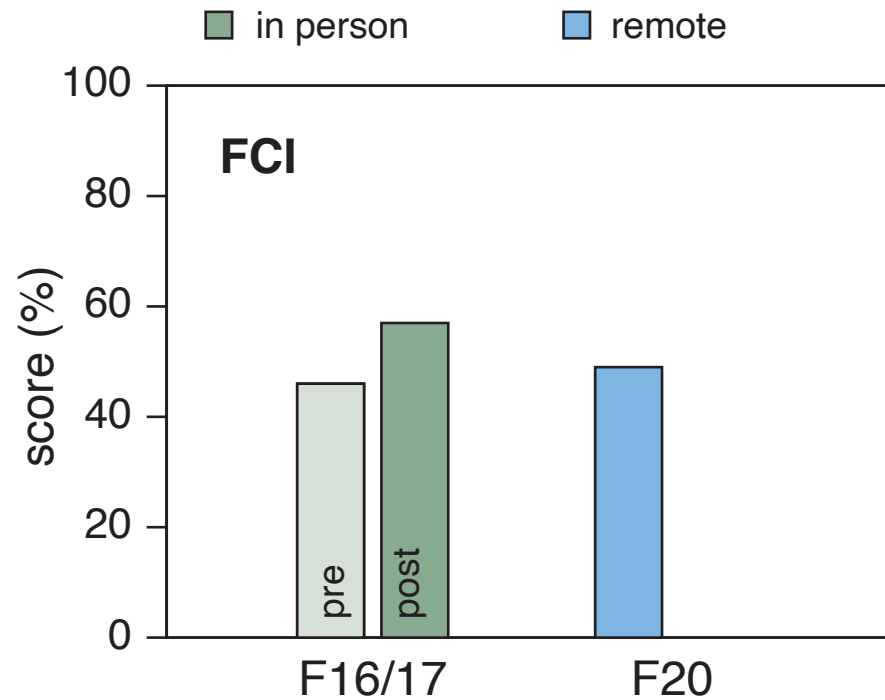
Fall Content Learning Gain



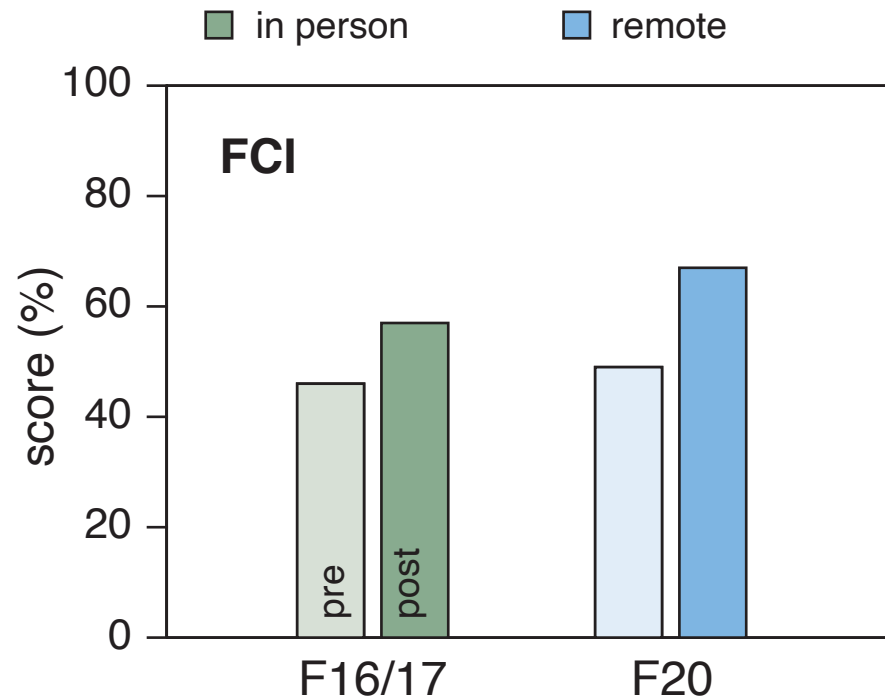
Fall Content Learning Gain



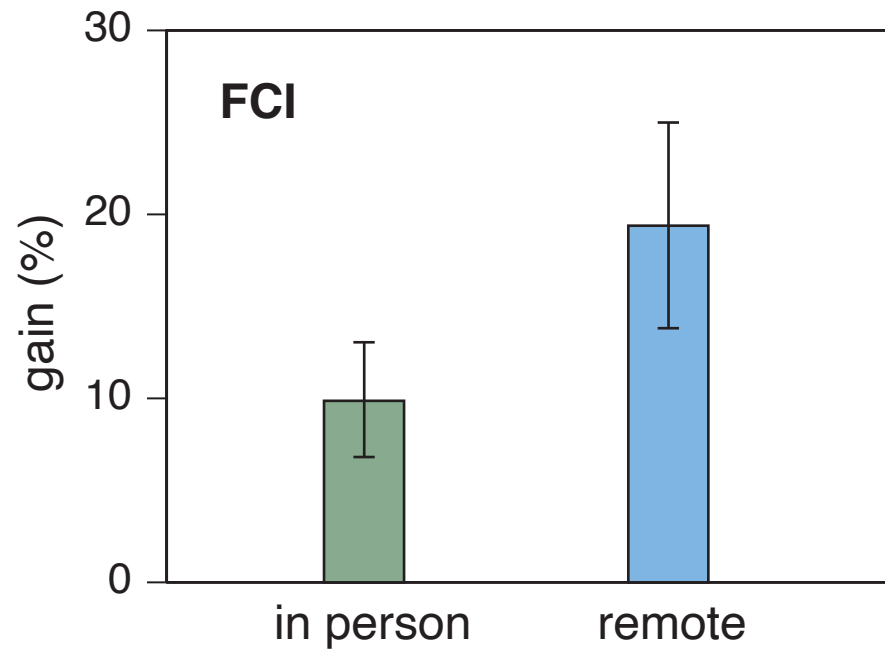
Fall Content Learning Gain



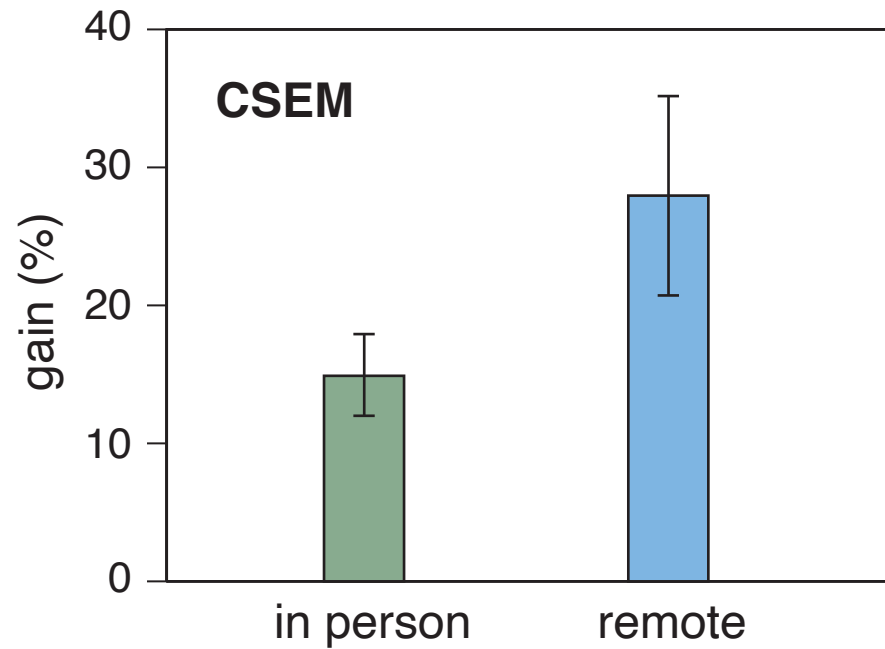
Fall Content Learning Gain



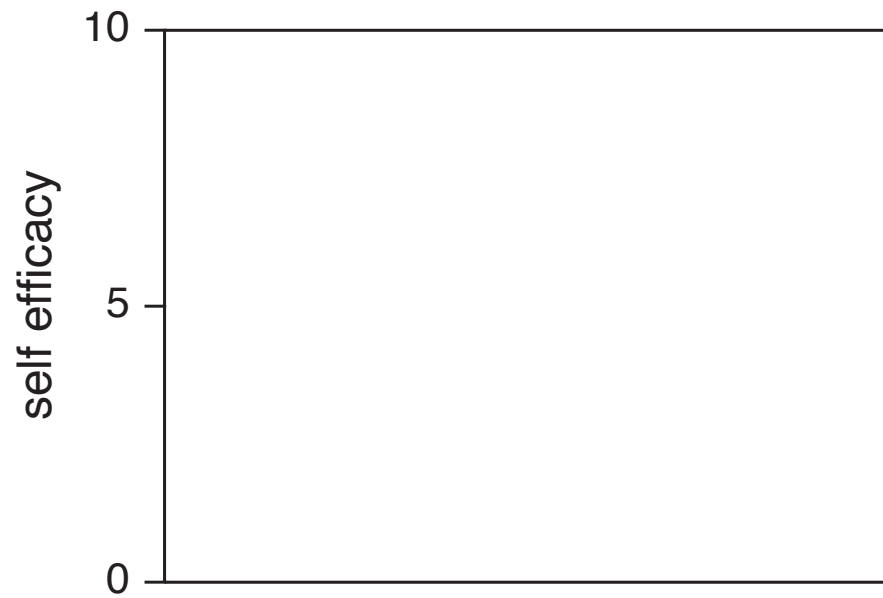
Fall Content Learning Gain



Spring Content Learning Gain



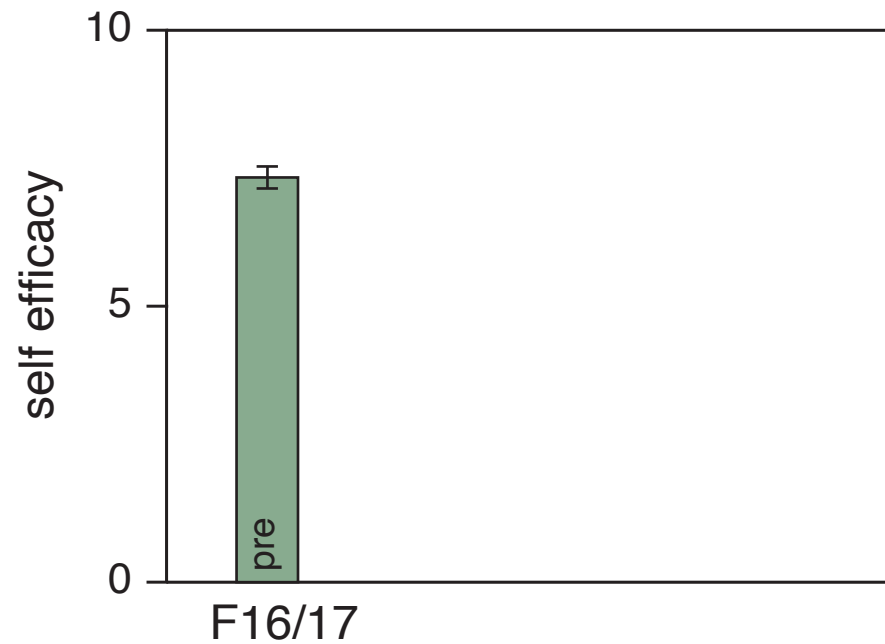
Self Efficacy



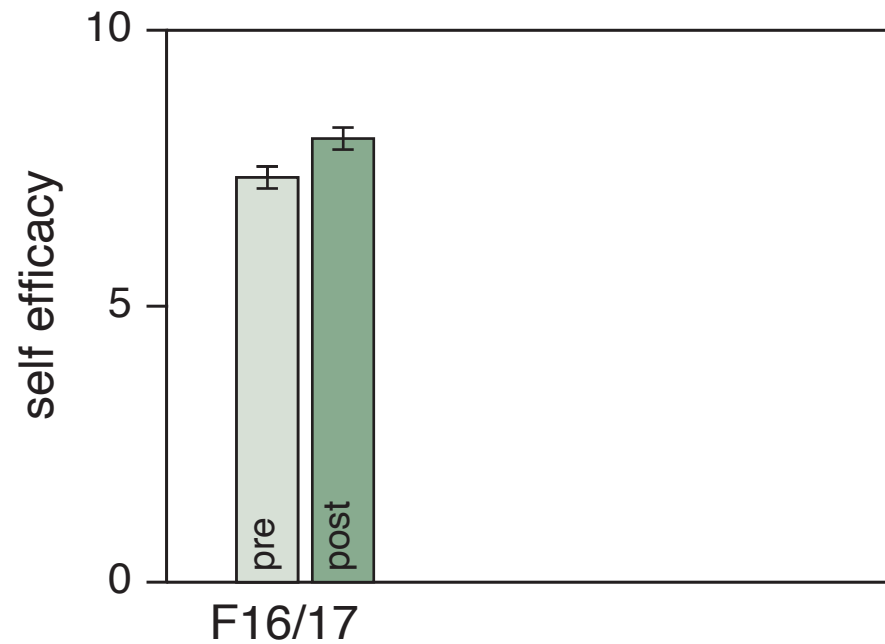
Self Efficacy

belief in ability to succeed in a certain domain

Self Efficacy

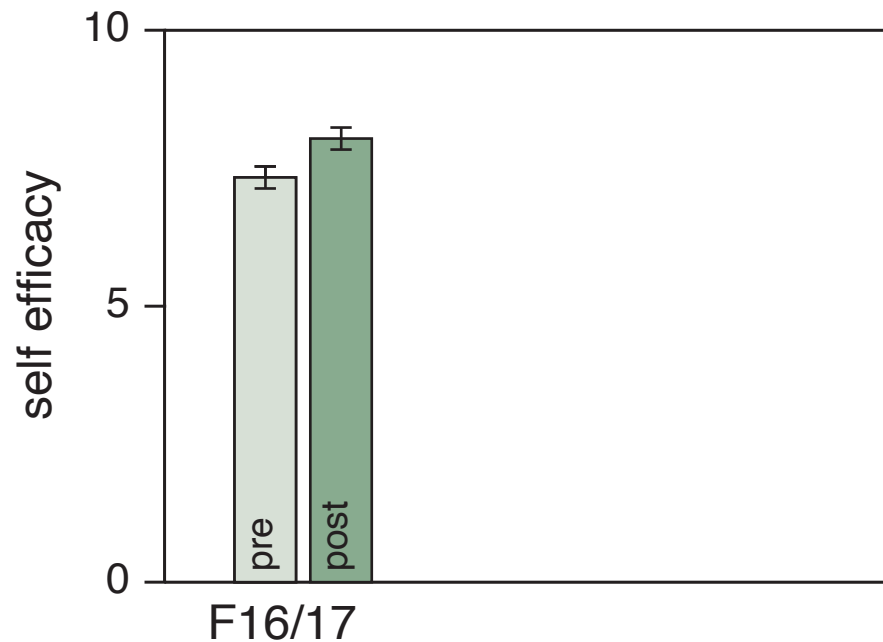


Self Efficacy

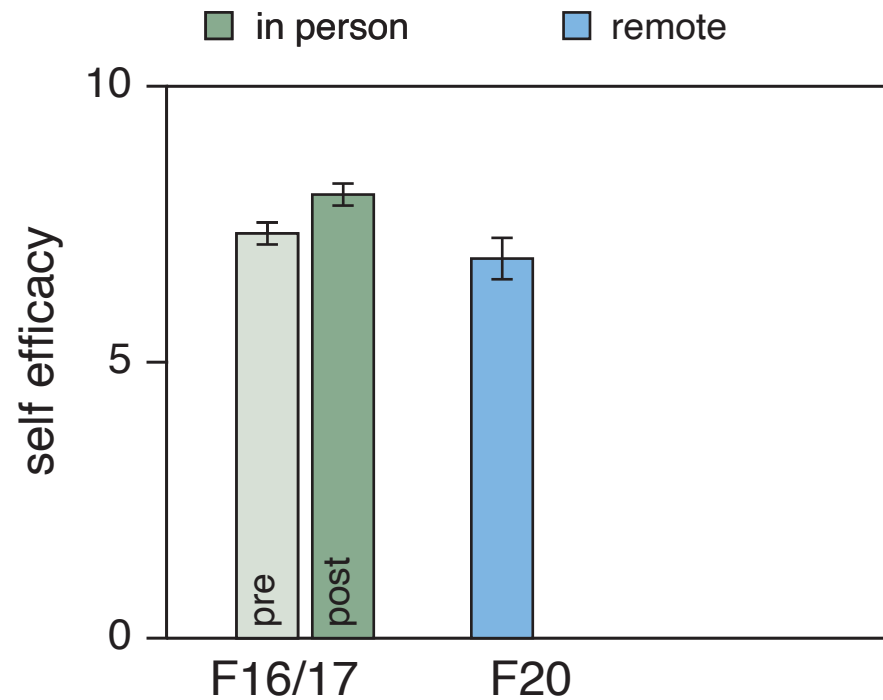


Self Efficacy

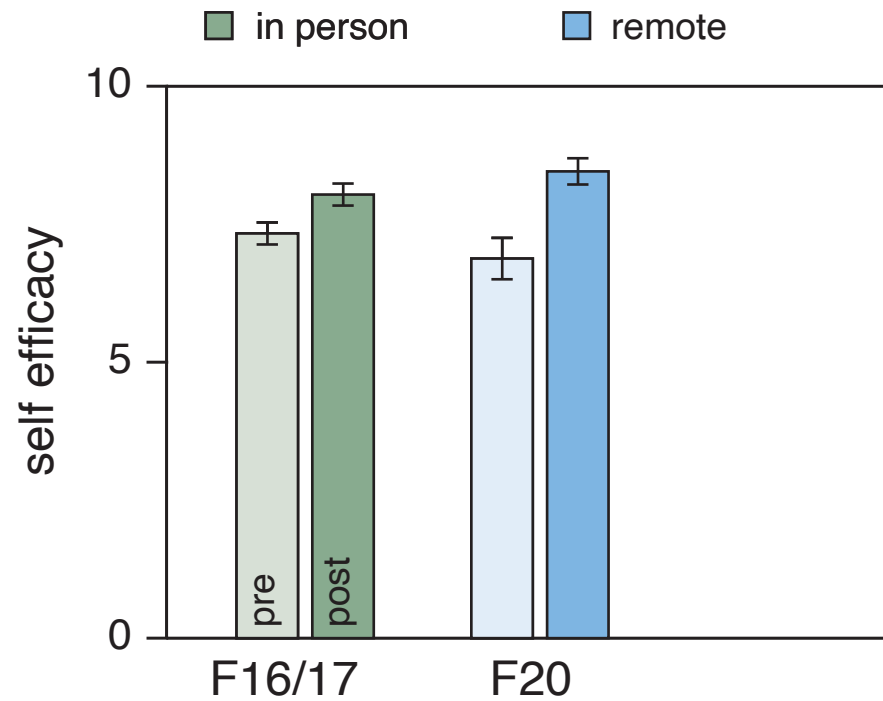
***SE down* in lecture courses!**



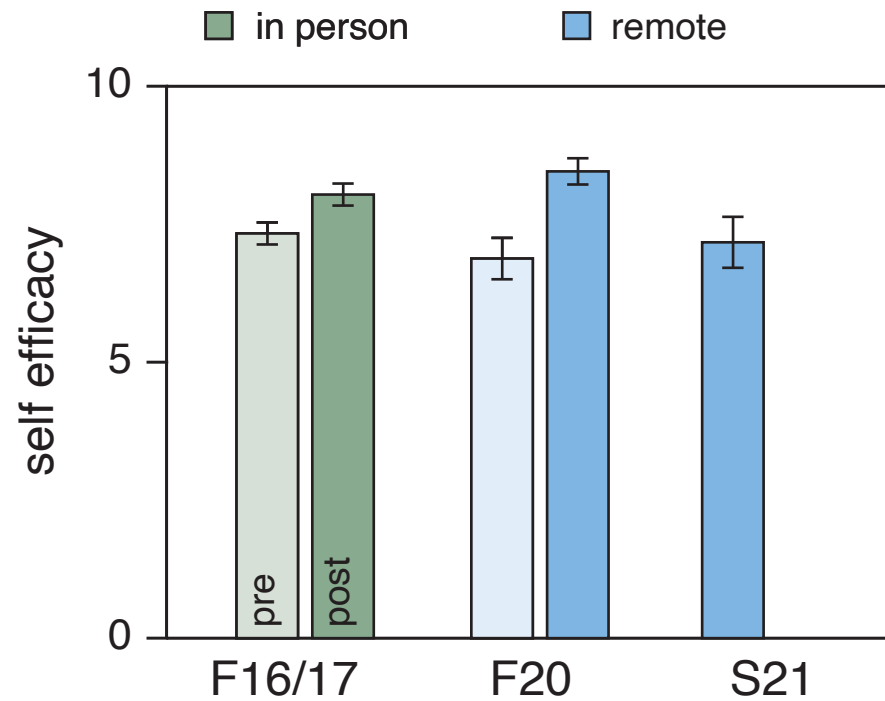
Self Efficacy



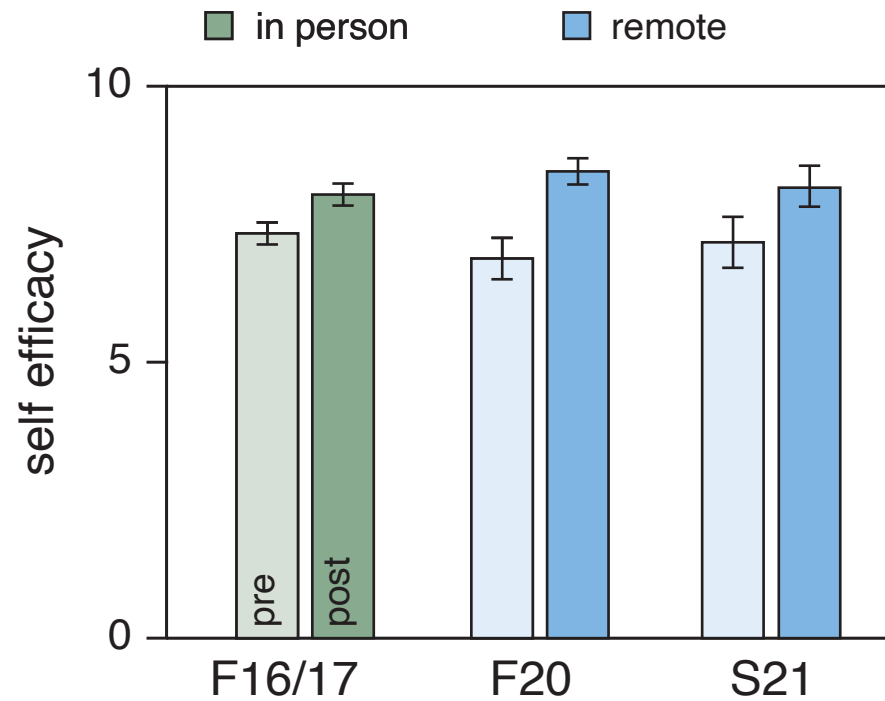
Self Efficacy



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.

3 results



What do students say?

Research Shows Students Falling Months Behind During Virus Disruptions

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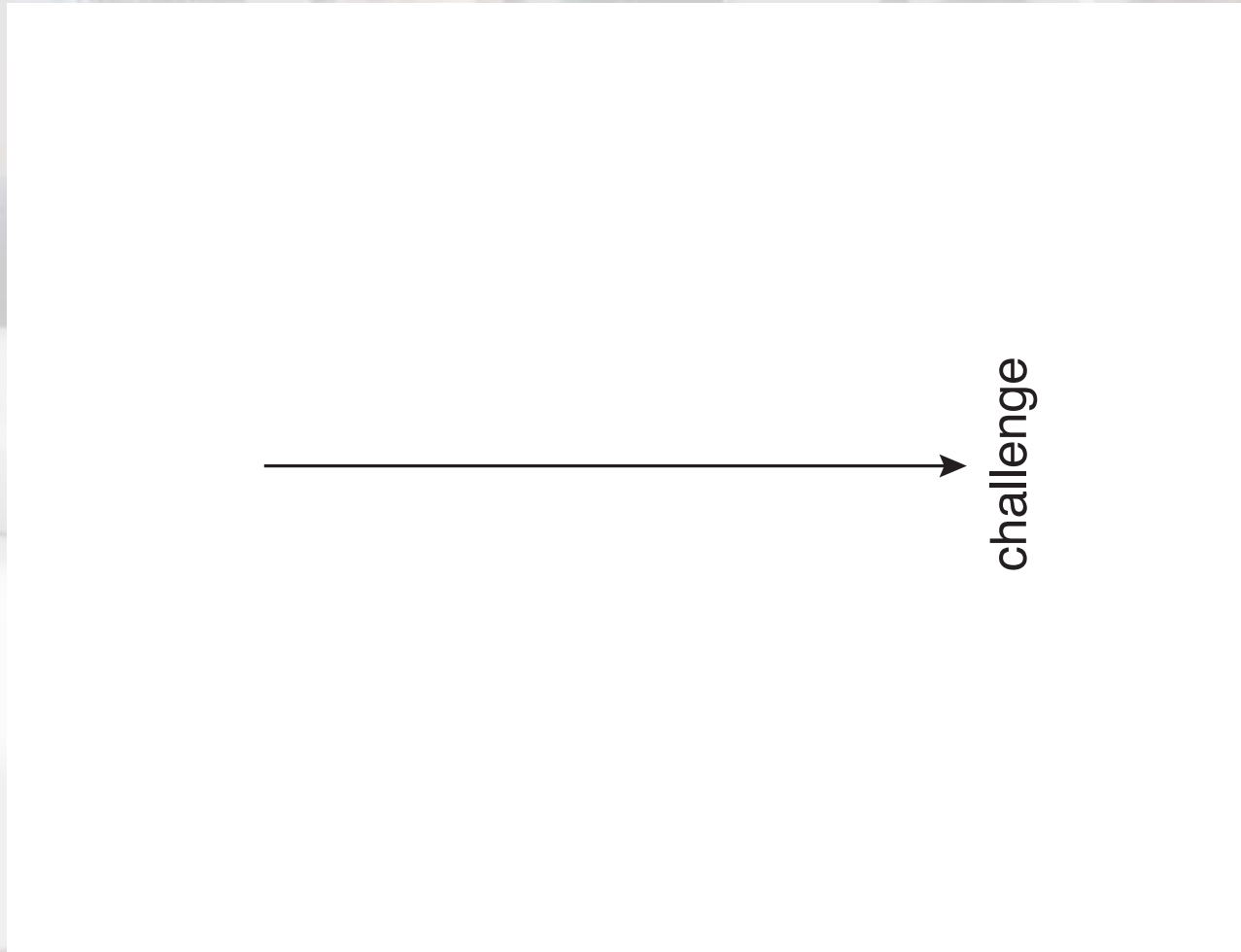
Agile Feedback Survey (Talbert)

- 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**

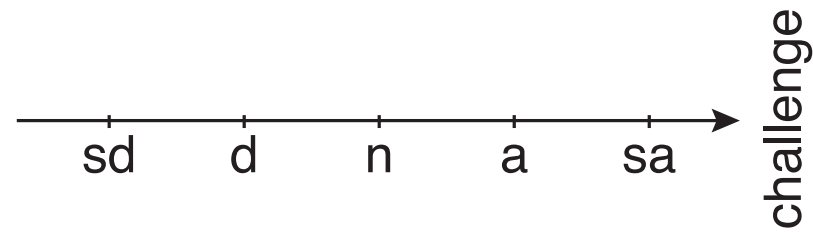
Agile Feedback Survey (Talbert)

- 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

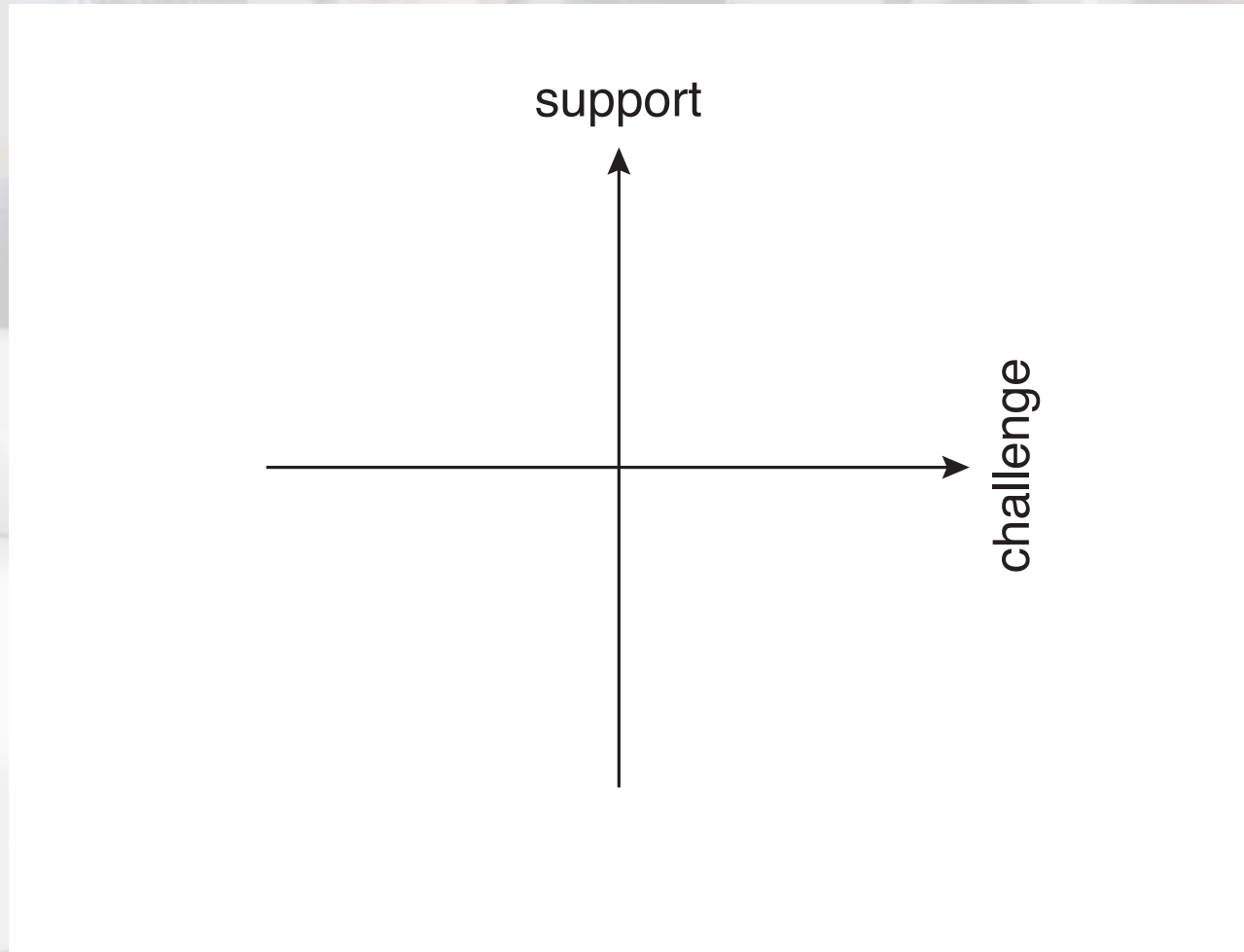
challenge vs. support



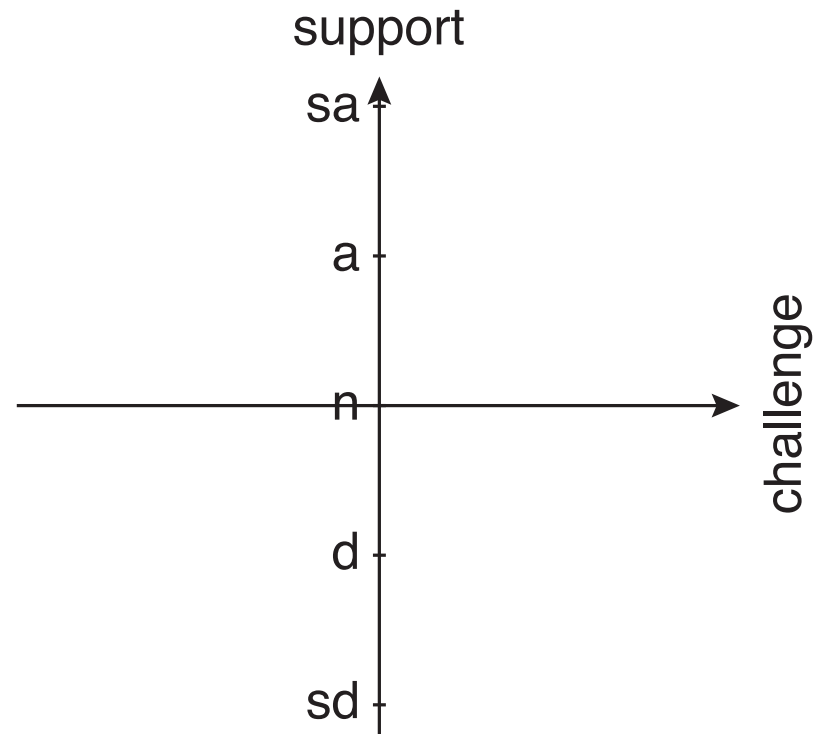
challenge vs. support



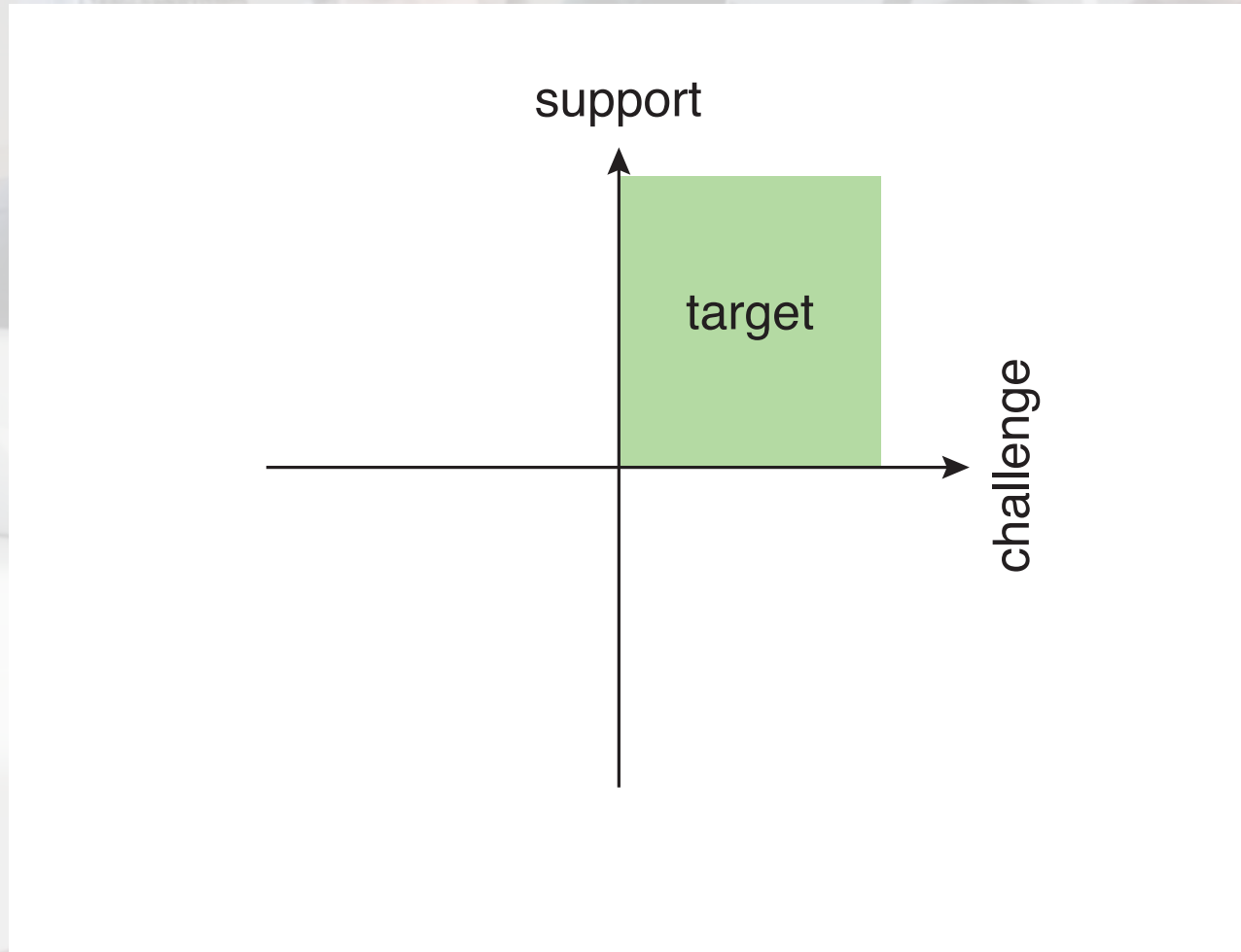
challenge vs. support



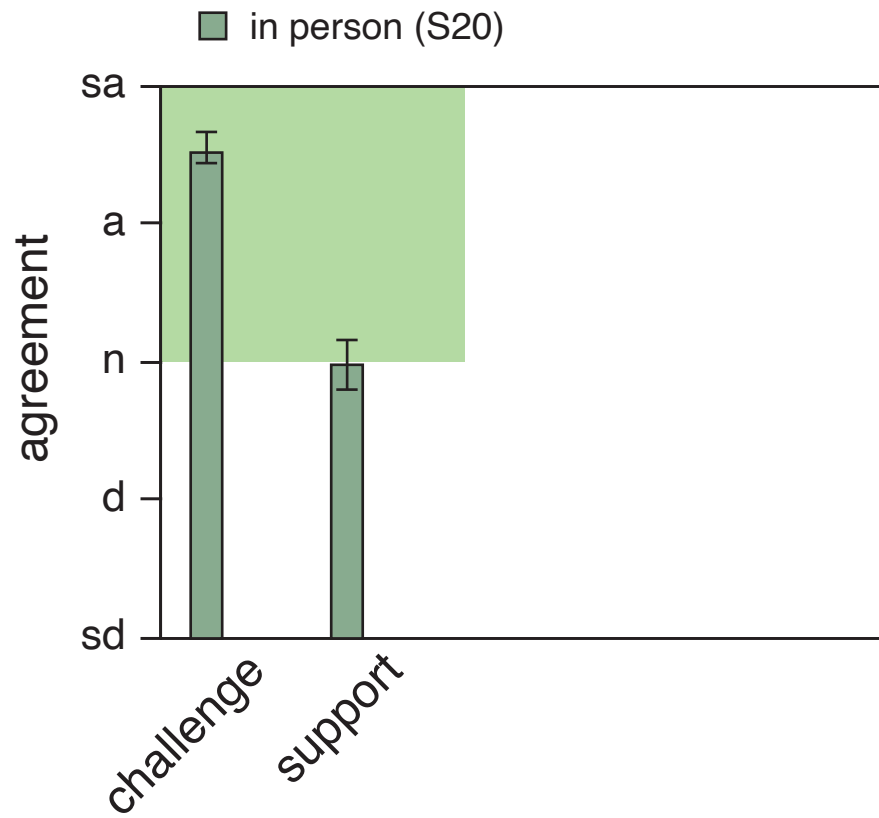
challenge vs. support



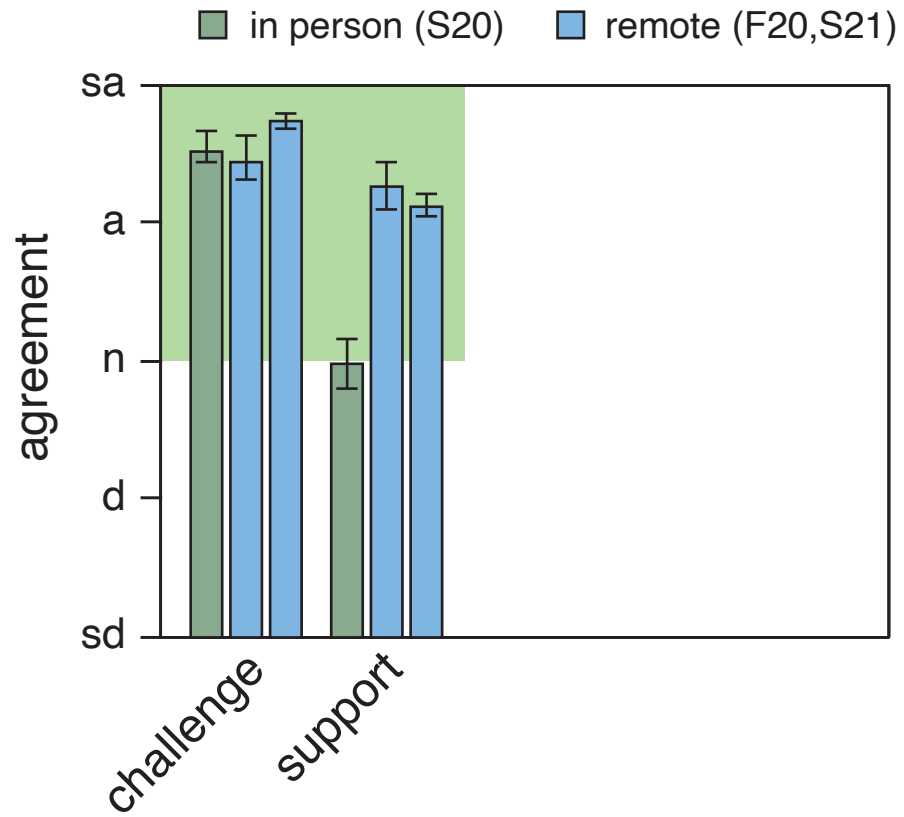
challenge vs. support



challenge vs. support



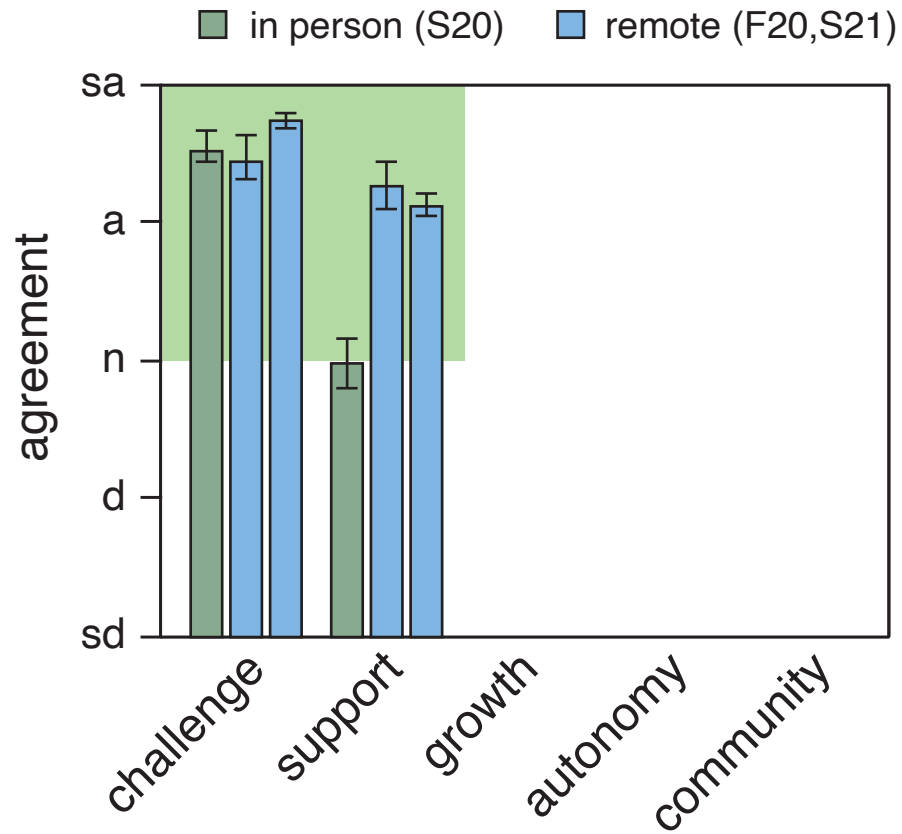
challenge vs. support



self-determination

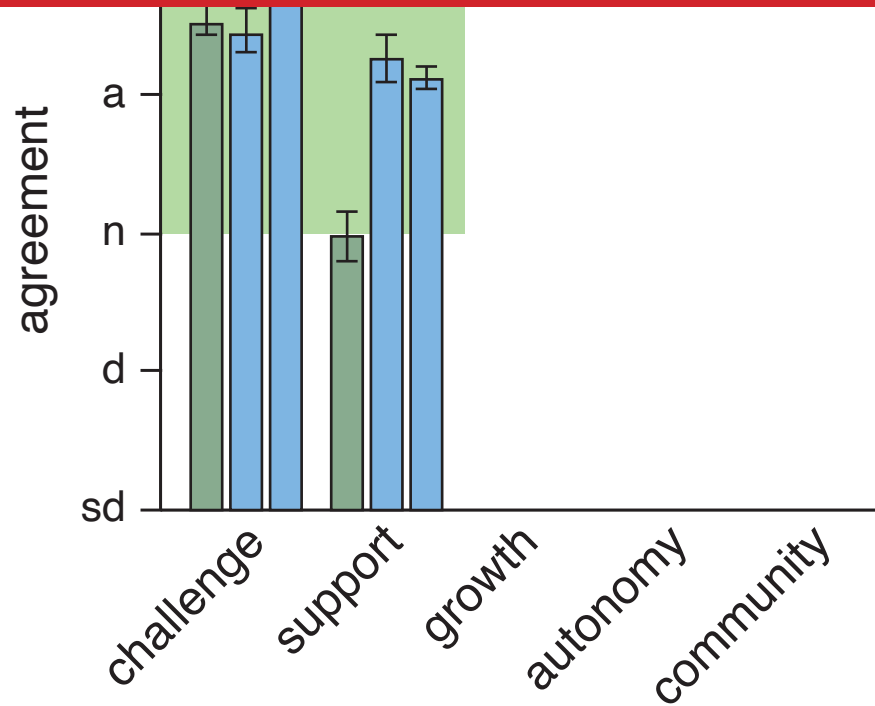
1. I was challenged intellectually (challenge)
2. I had plenty of support (support)
- 3. I am closer to mastering the ideas of the course now (growth)**
- 4. I made progress because of my own efforts and choices (auton.)**
- 5. I felt I was part of a community of learners (relatedness)**

self-determination

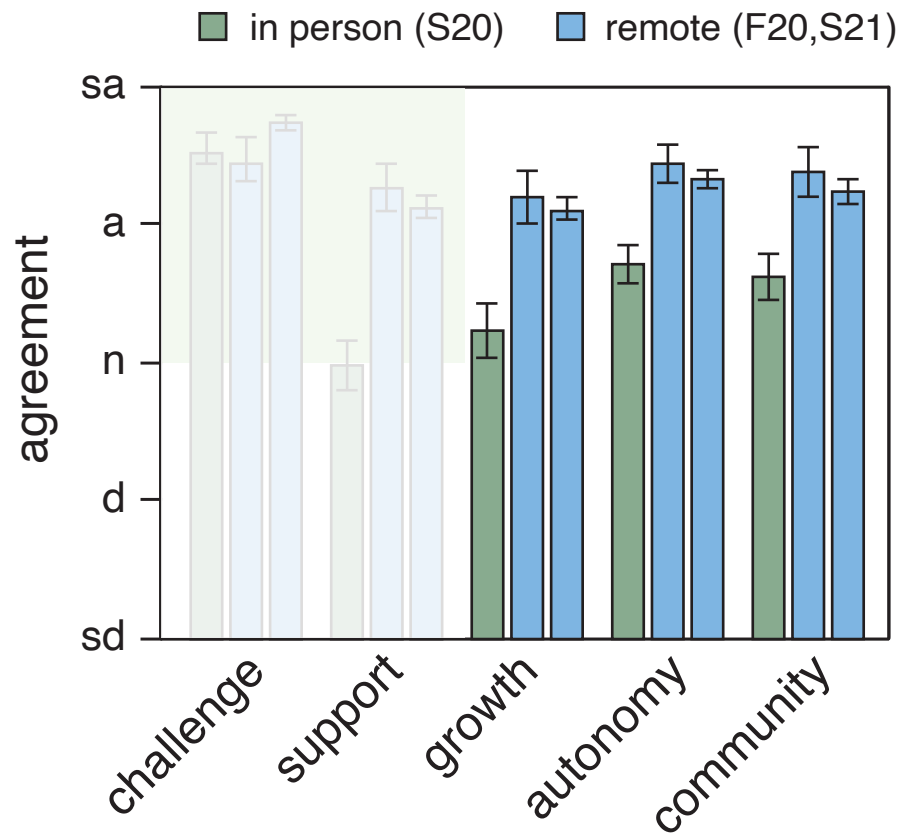


self-determination

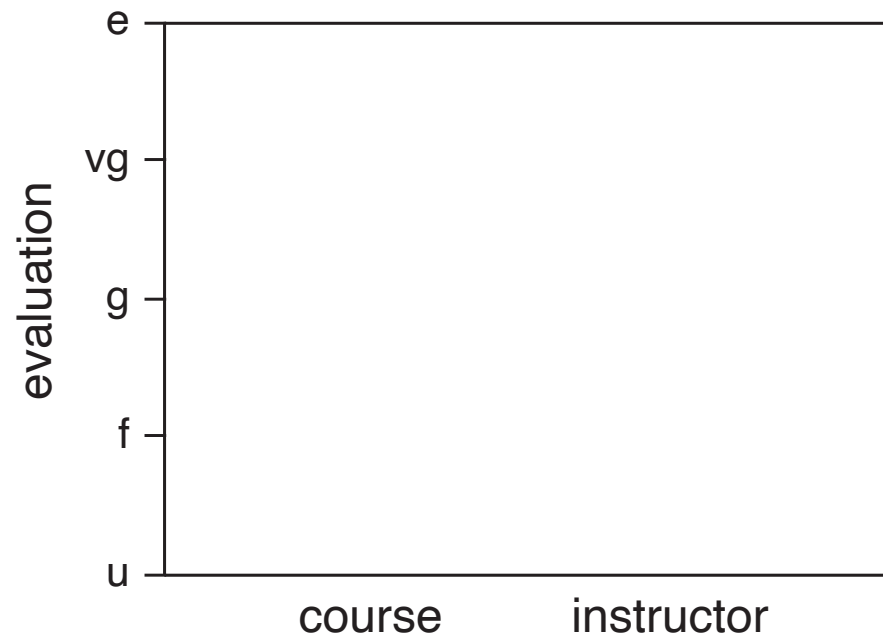
What do you predict?



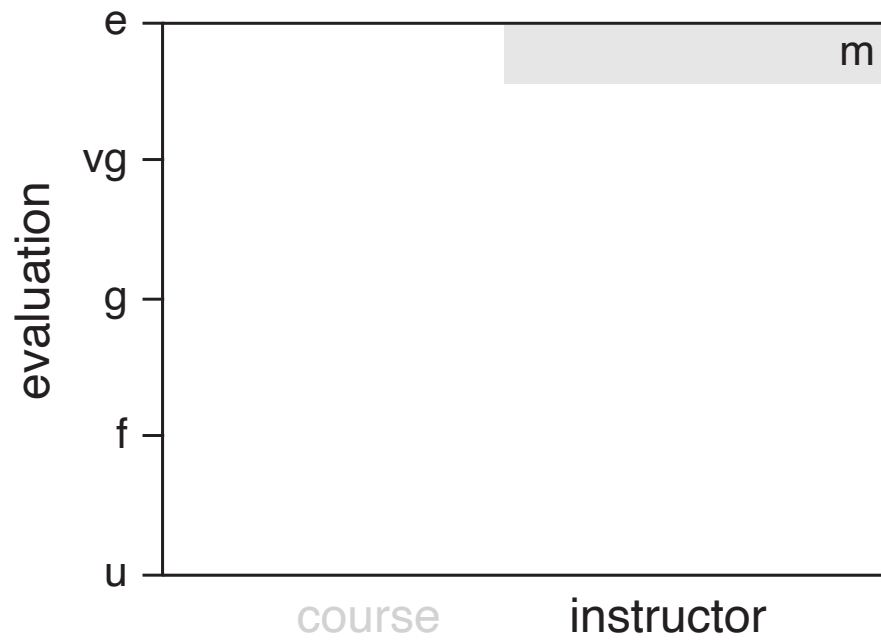
self-determination



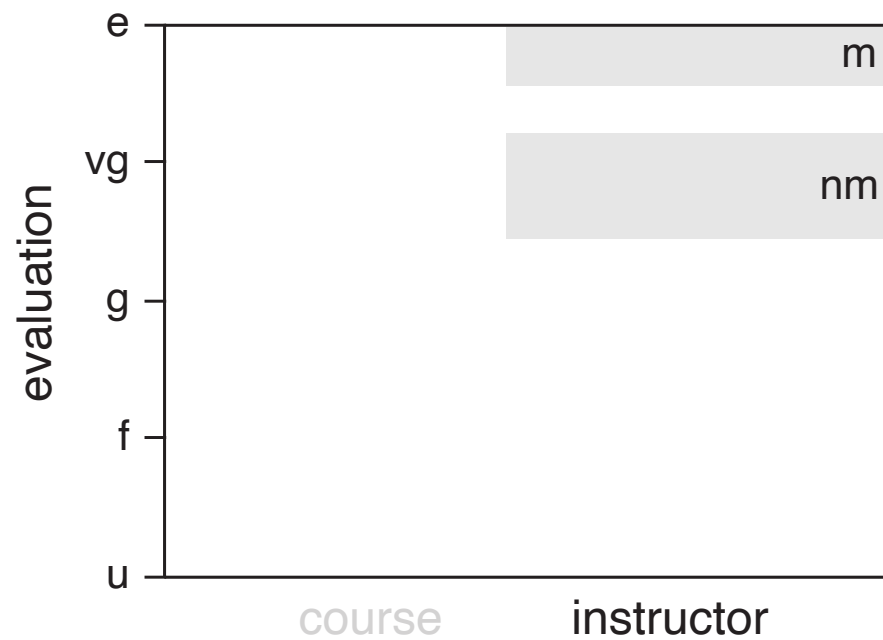
course evaluation



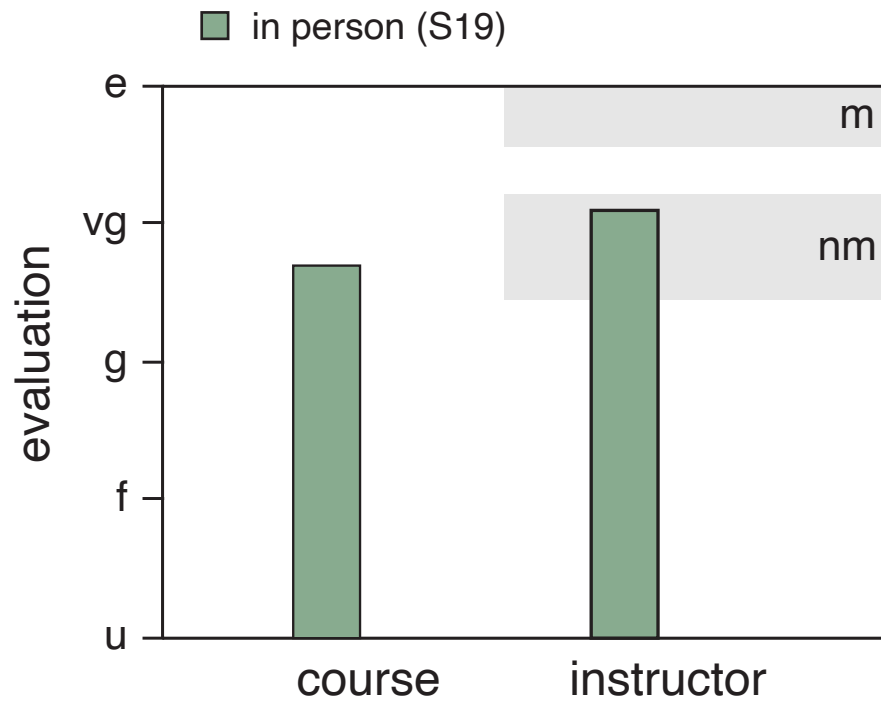
course evaluation



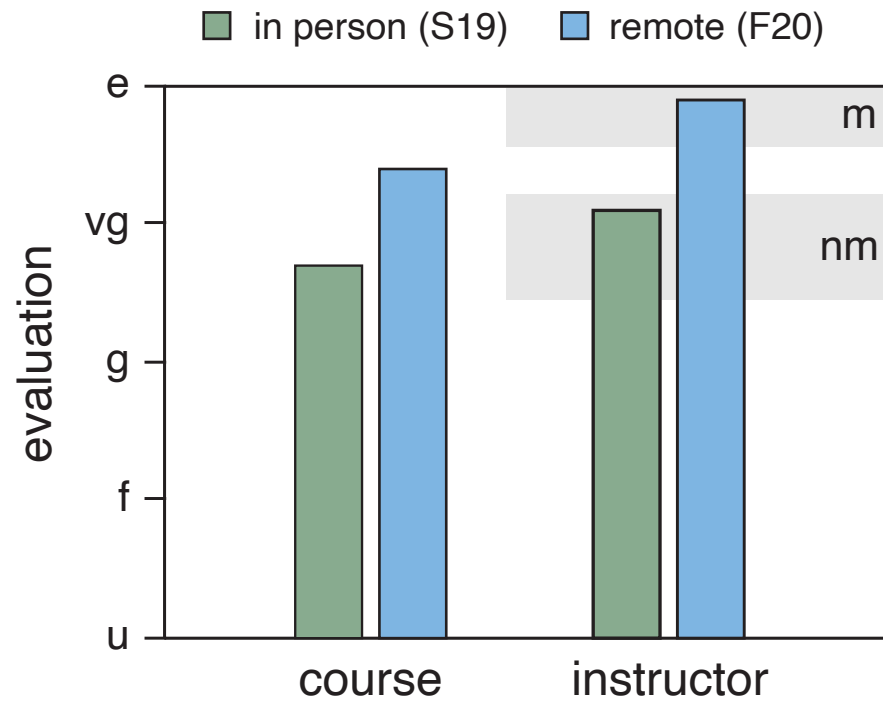
course evaluation



course evaluation



course evaluation



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

Remote/online can be *better!*

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3 results

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Second D

I did my best teaching ever remotely!

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Second D

I did my best teaching ever remotely!

Research Shows Students Falling Months Behind During Virtual Learning

So, now what?

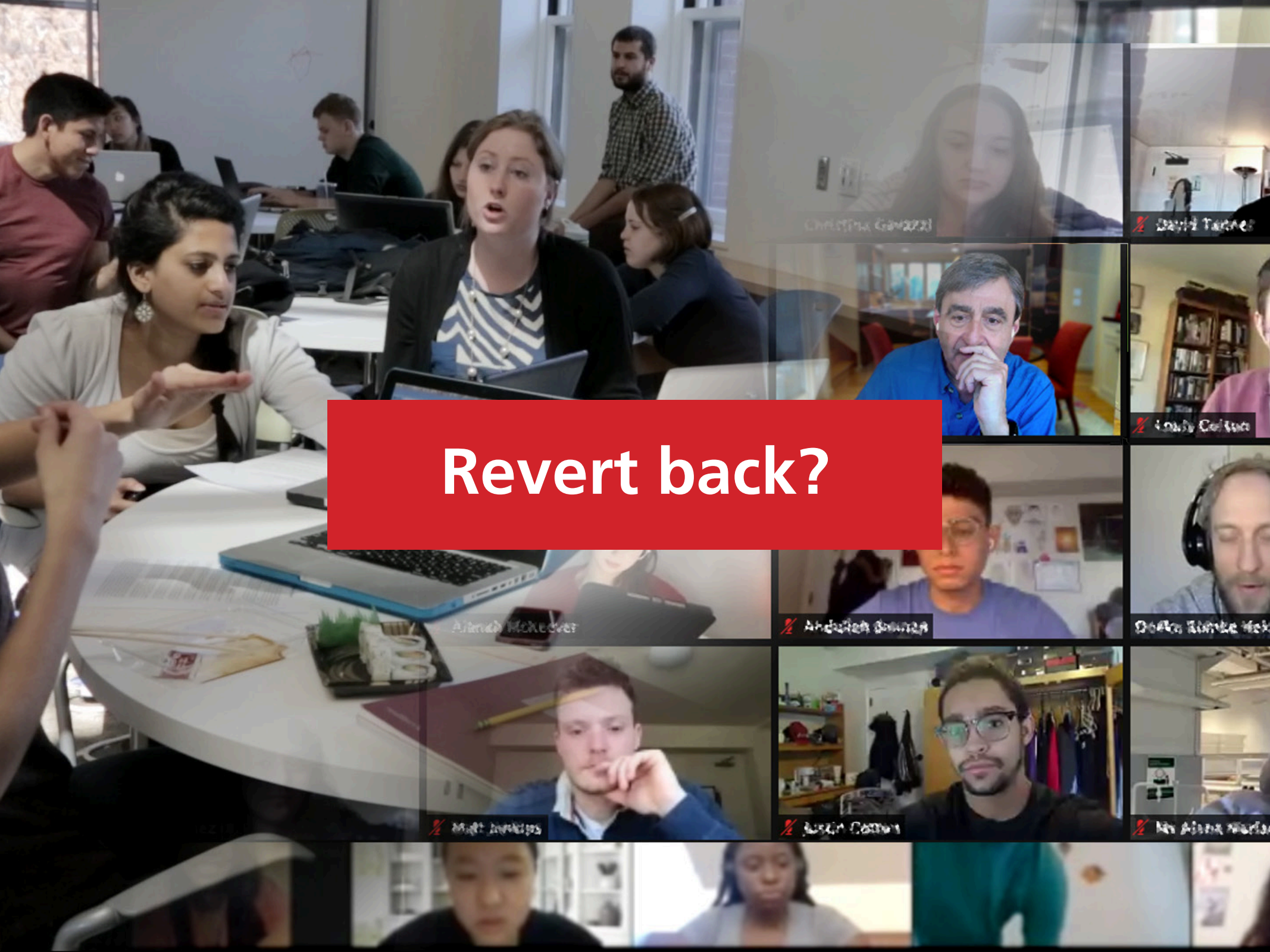
The abrupt switch to remote learning wiped out academic gains for many students in America, and widened racial and economic gaps. Catching up in the fall won't be easy.

Building together





Project Fairs



Revert back?

Christina Gamozo

David Turner



Louise Collins

Amanda McKeever

Andrew Brown

Debbie Smith

Matt Jenkins

Justin Cohen

Ben Adams



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.



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