

Remote learning was a disaster. Was it? Reflections on a year of remote teaching.



Formação de Gestores - Sthem
16 June 2021

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🔇 CHRISTINA GAMBETTI

🔇 David Turner

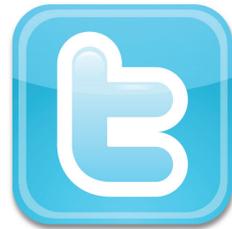
🔇 Aimeah McKeever



Remote learning was a disaster. Was it? Reflections on a year of remote teaching.



Formação de Gestores - Sthem
16 June 2021



@eric_mazur

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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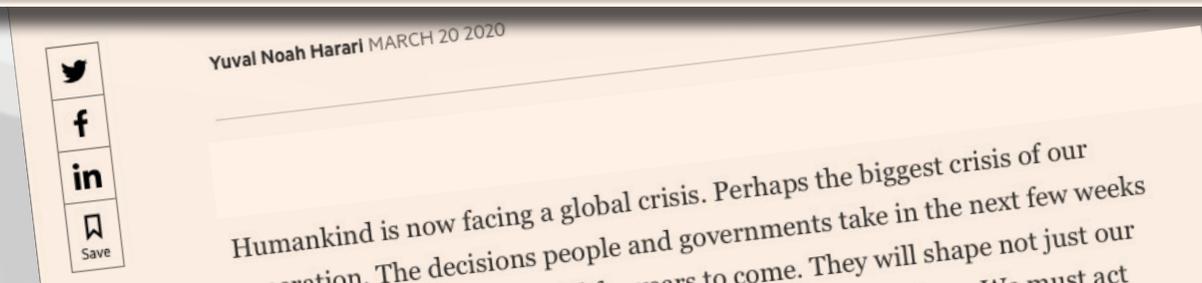


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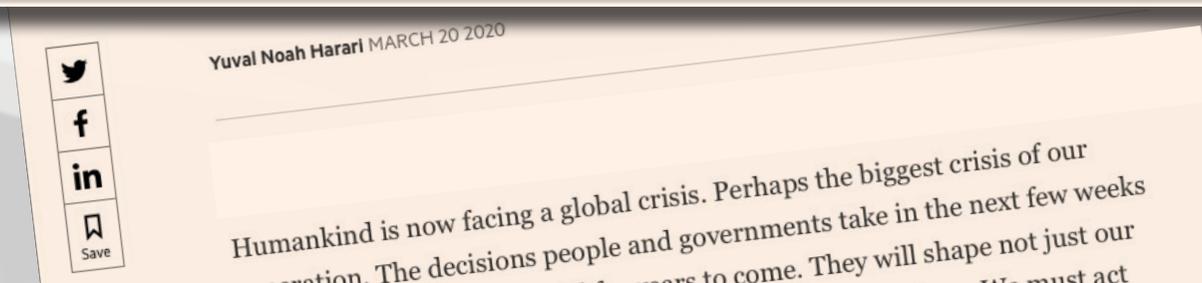


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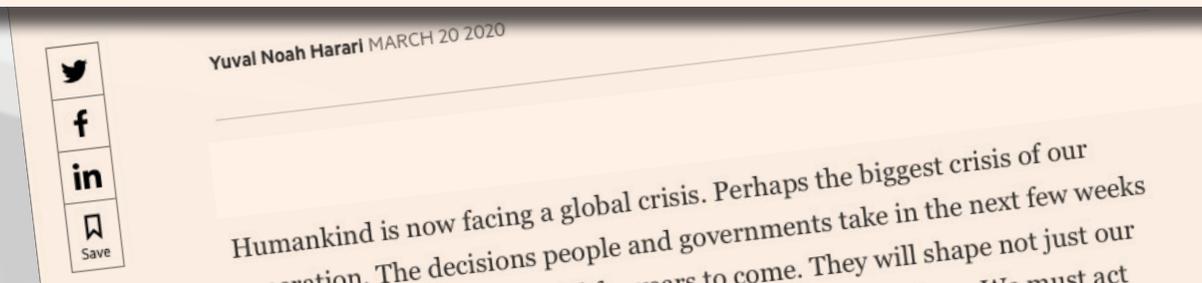




Many short-term emergency measures will become a fixture of life. That is the nature of emergencies. They fast-forward historical processes. Decisions that in normal times could take years of deliberation are passed in a matter of hours. Immature and even dangerous technologies are pressed into use.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

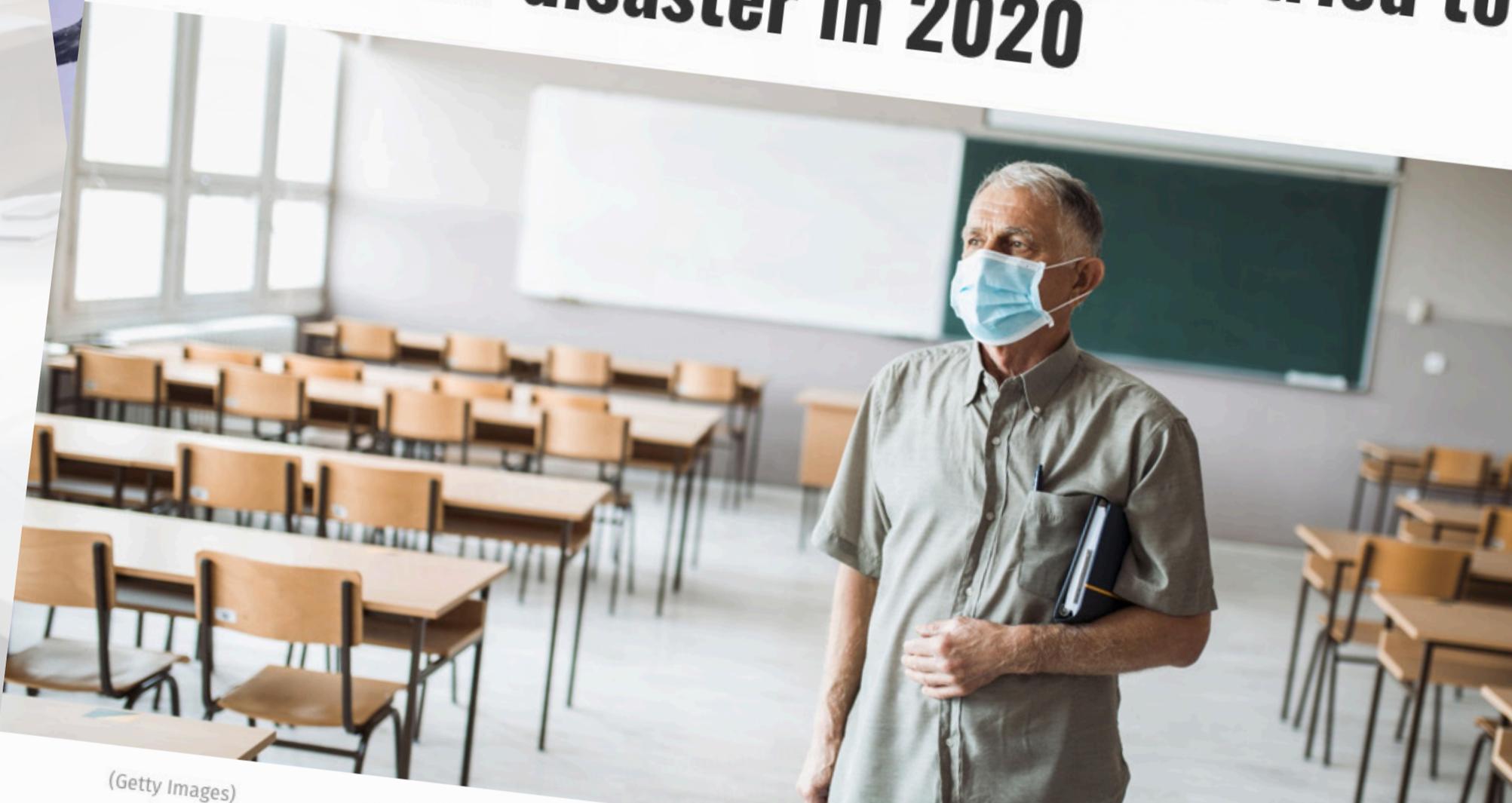


REPUBLISH

...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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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 Frazee

THE NATIONAL INTEREST | OCT. 7, 2020

Remote Learning Is a Catastrophe. Teachers Share the Blame.

By Jonathan Chait

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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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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

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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March 2020

AP50

1 before (and just after) pandemic



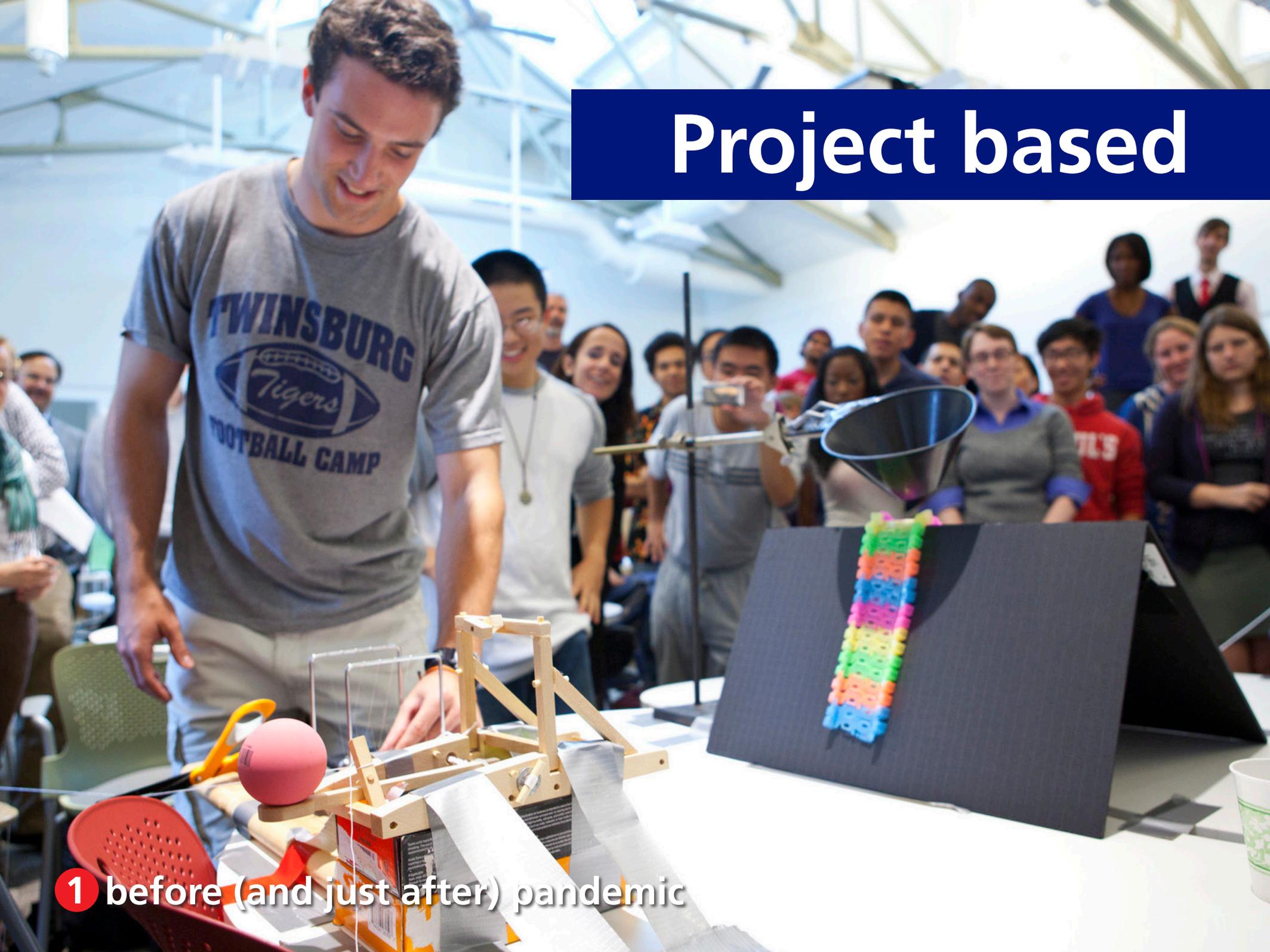


Team based

1 before (and just after) pandemic

Project based

1 before (and just after) pandemic

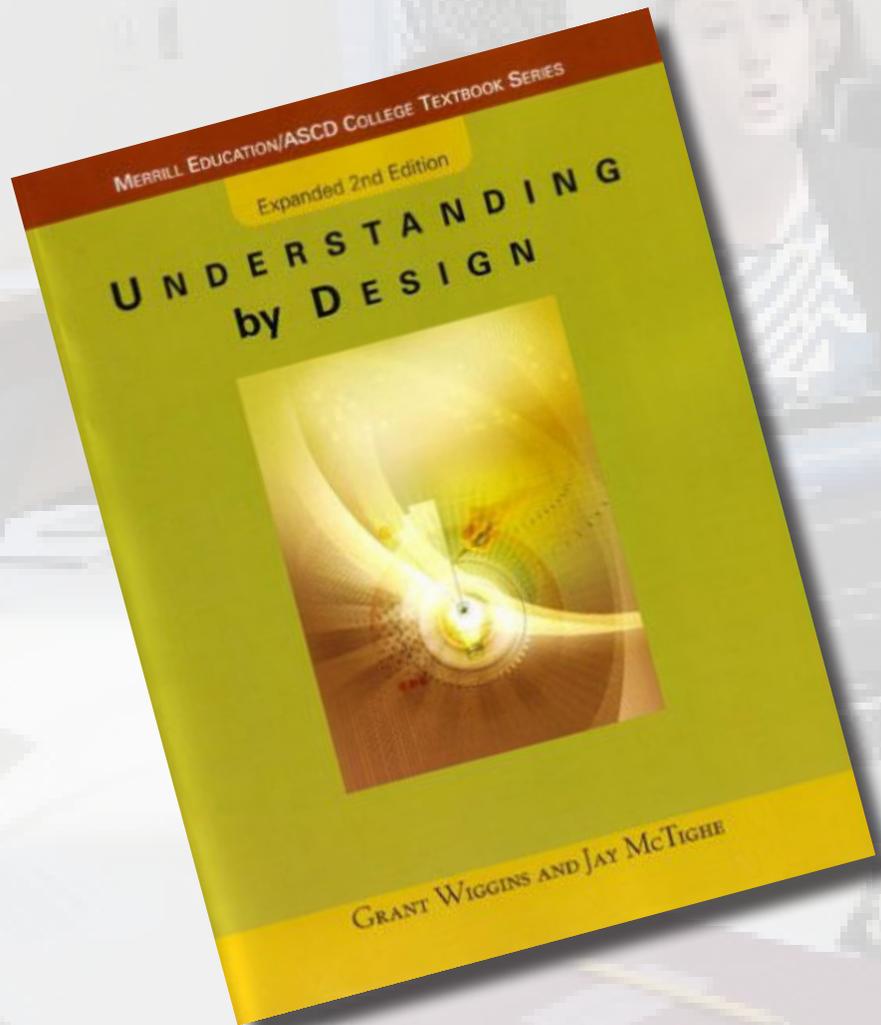




Intrinsic motivation

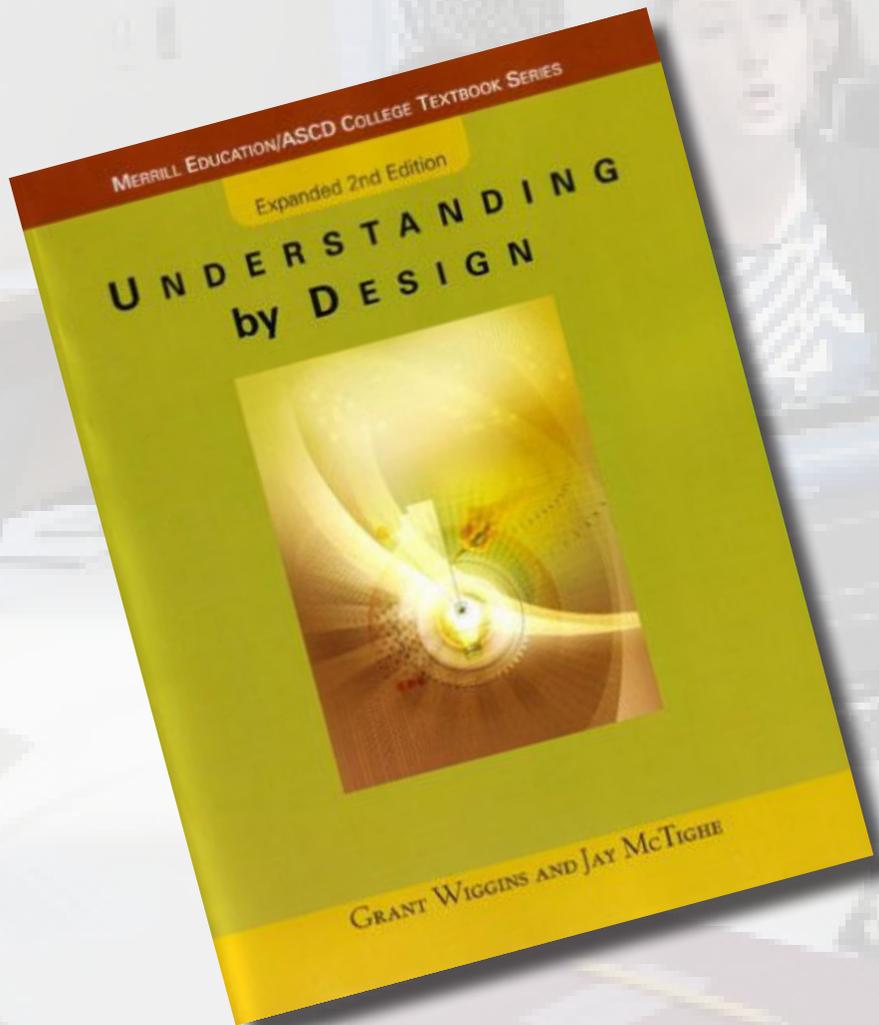
1 before (and just after) pandemic

Setting learning goals



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

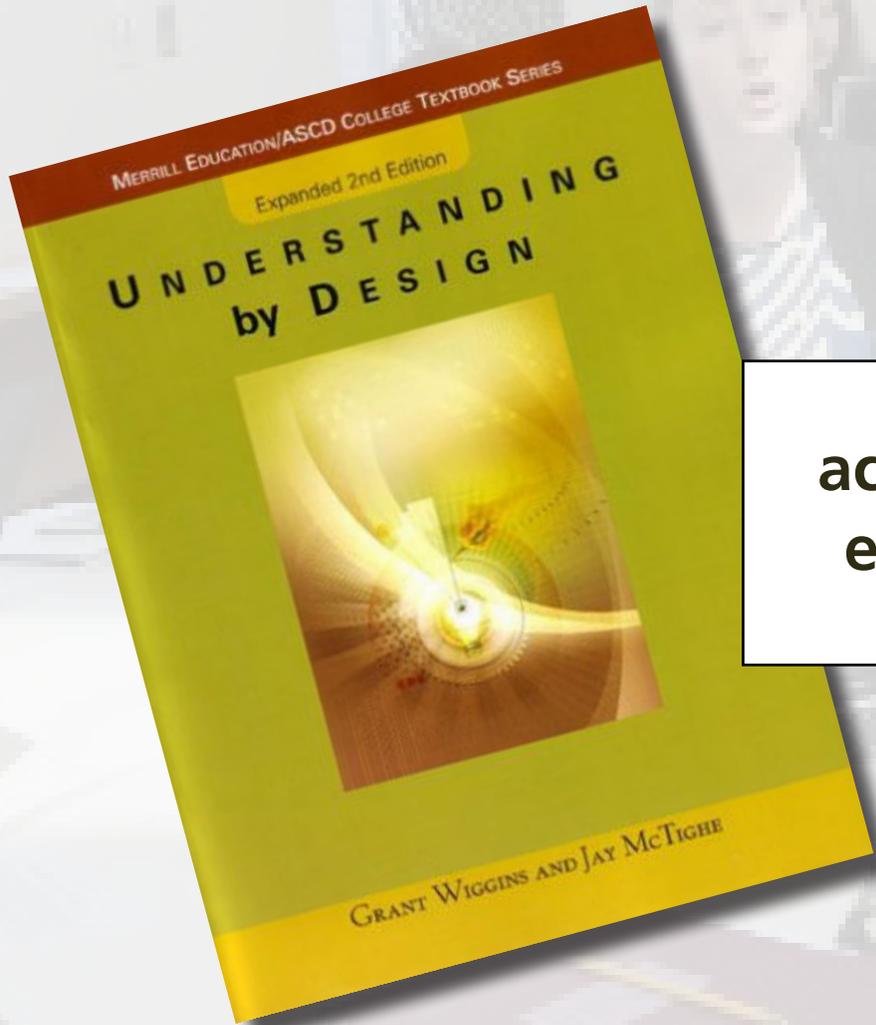
Backward design



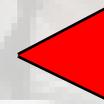
**desired
outcomes**

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

Backward design



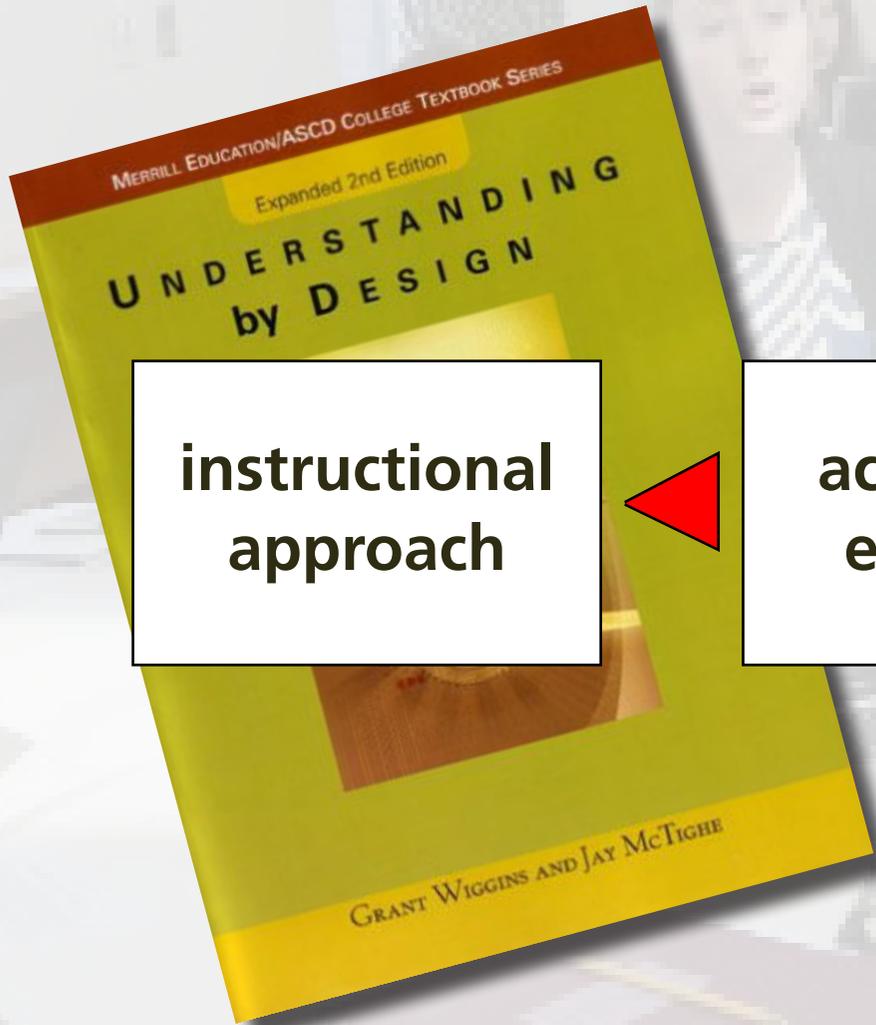
acceptable
evidence



desired
outcomes

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

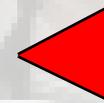
Backward design



**instructional
approach**

**acceptable
evidence**

**desired
outcomes**



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

Course goals

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

1 before (and just after) pandemic



1 before (and just after) pandemic



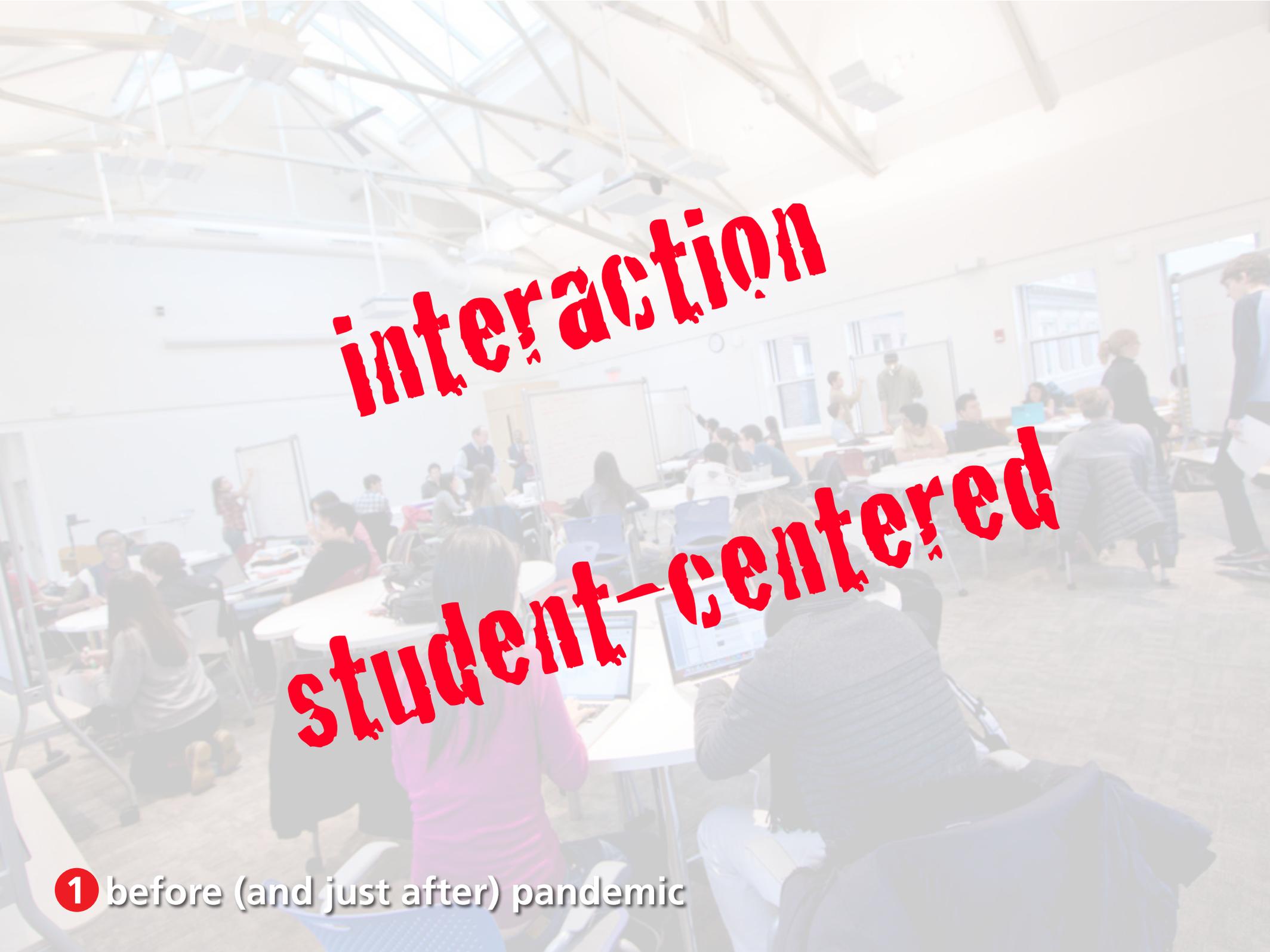
information transfer

faculty-centered

1 before (and just after) pandemic



1 before (and just after) pandemic



interaction

student-centered

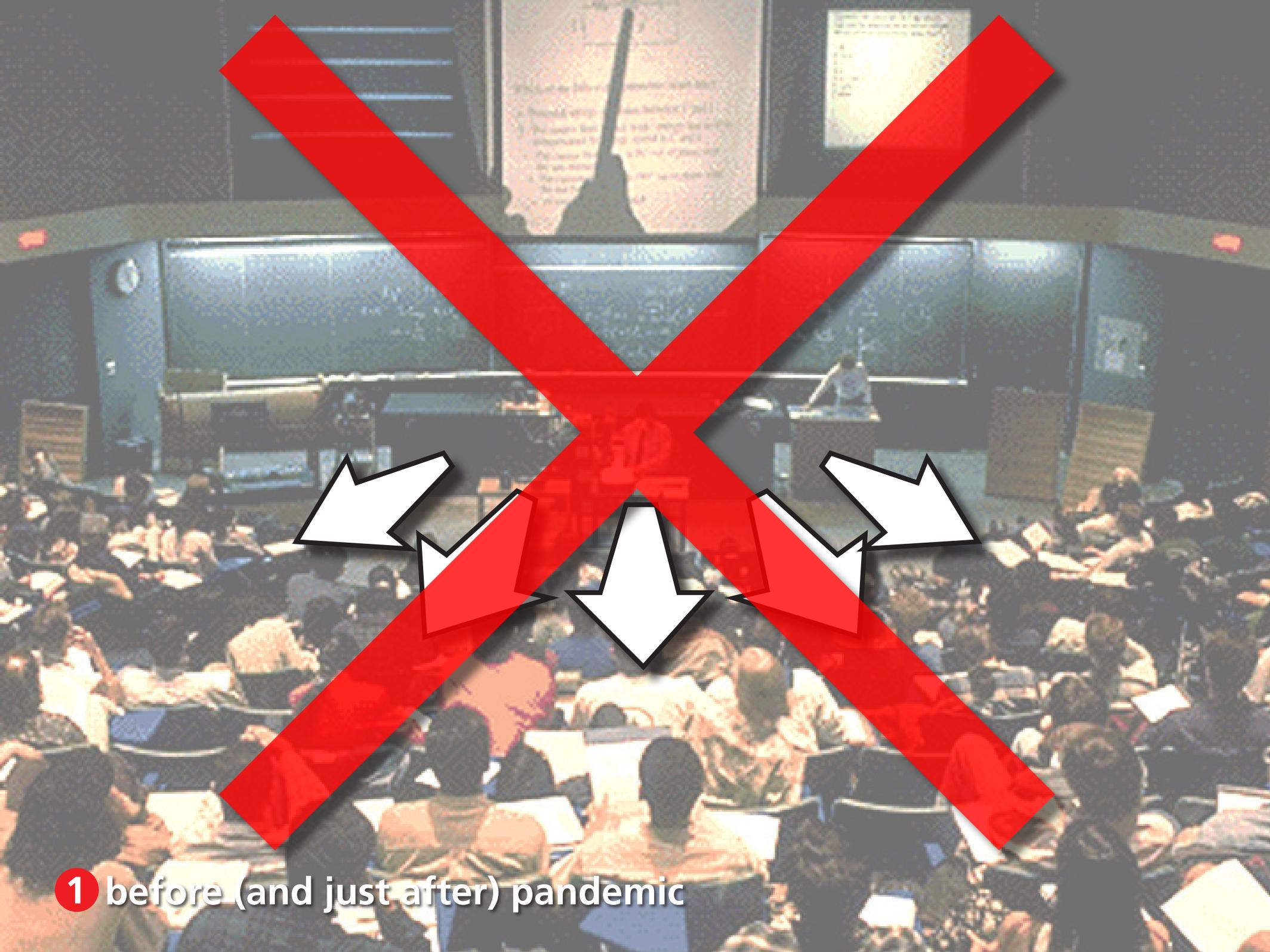
1 before (and just after) pandemic



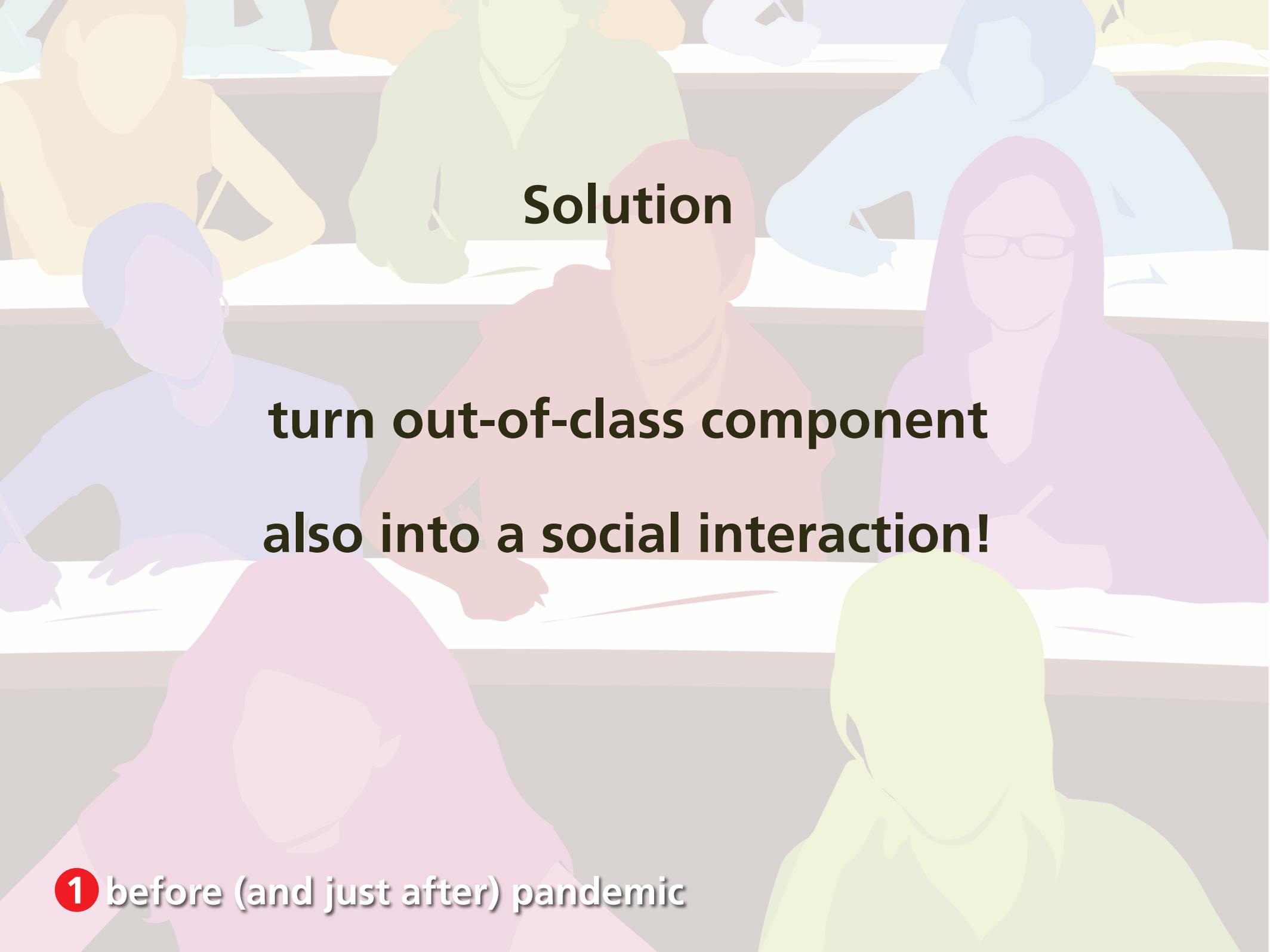
no lectures

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!**

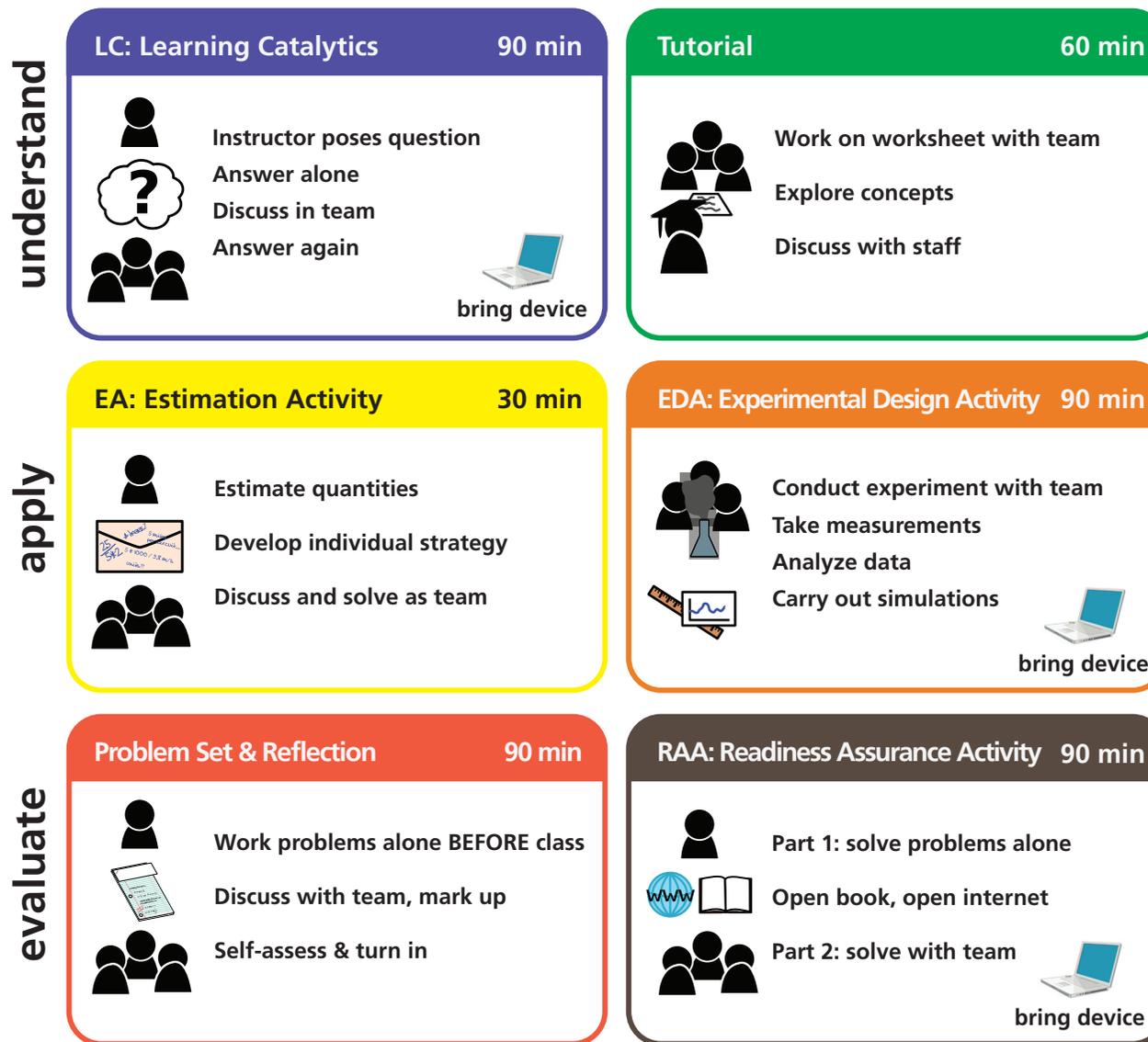
1 before (and just after) pandemic

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 has a white board with colorful dots and lines on it. The background shows a classroom setting with desks and chairs.

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 well-lit room with windows and some equipment.

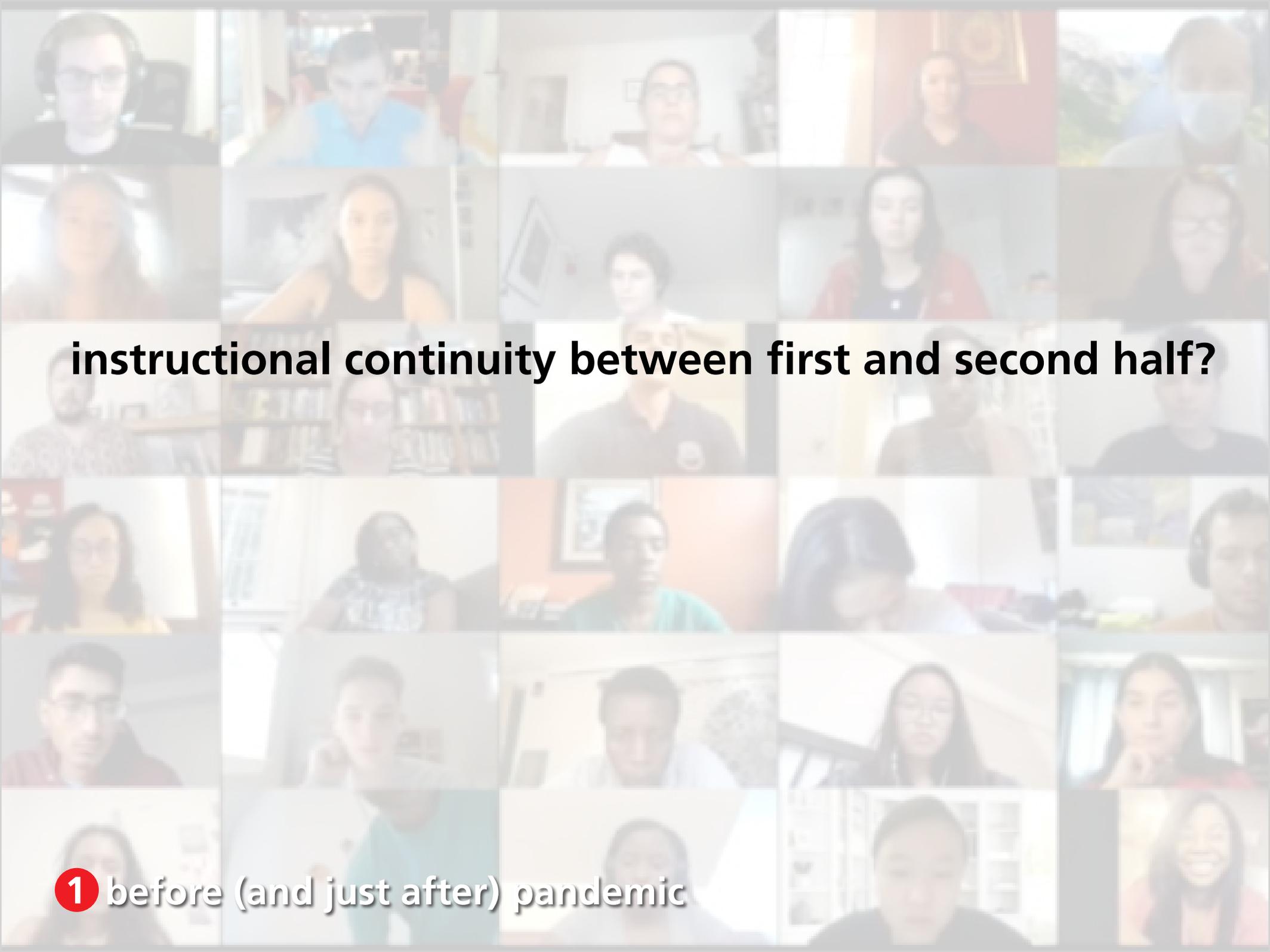
bit.ly/ap50class

1 before (and just after) pandemic



March 13, 2020

1 before (and just after) pandemic



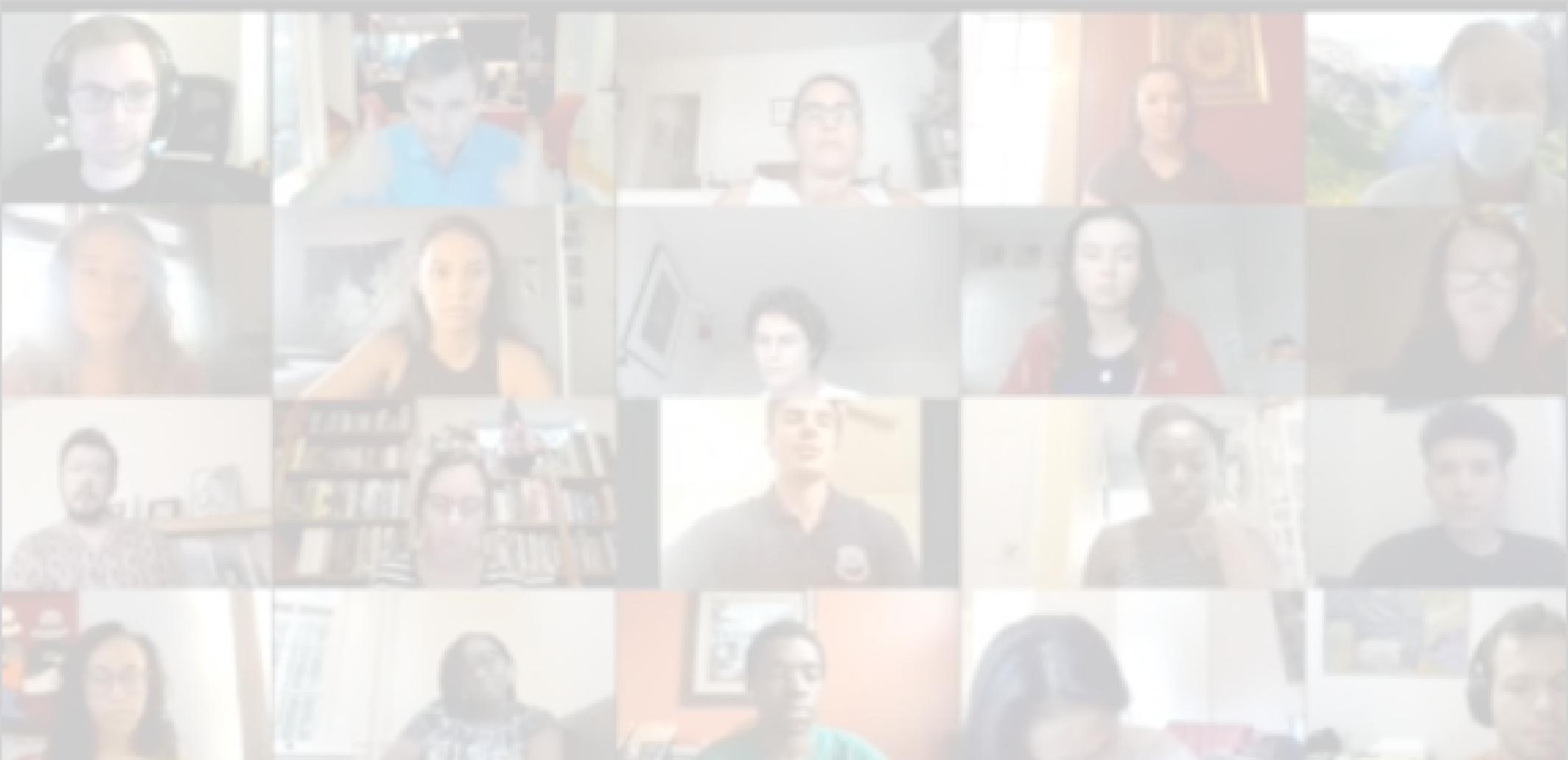
instructional continuity between first and second half?

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**

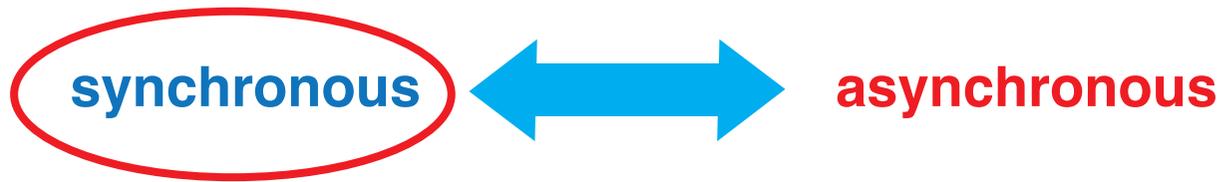
Changes implemented

- **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

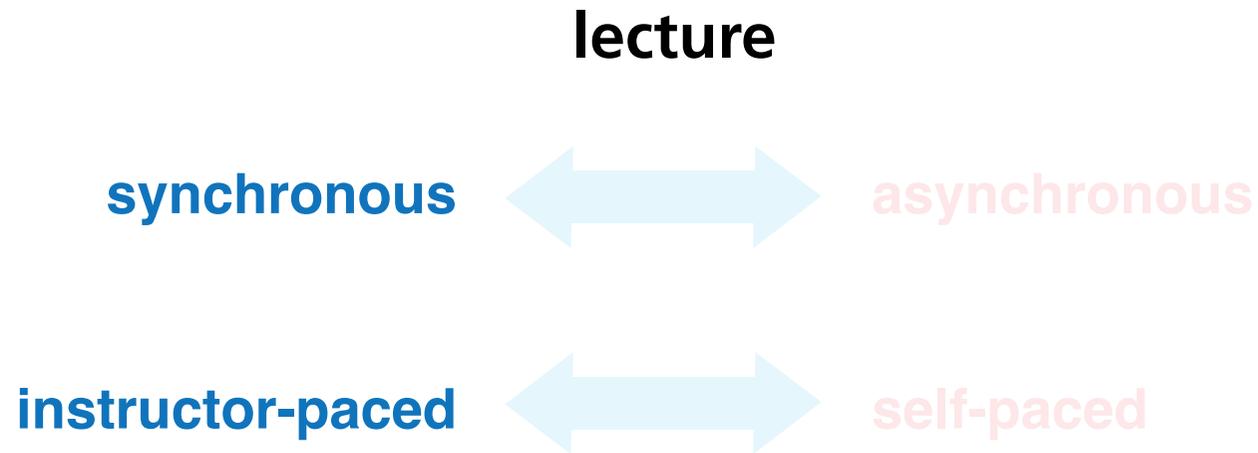
instructor-paced



self-paced

everybody together
at the same *pace*

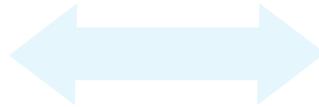
Minimize sync/instructor-paced



Minimize sync/instructor-paced

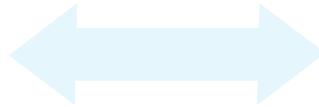
recorded lecture

synchronous



asynchronous

instructor-paced

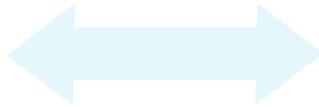


self-paced

Minimize sync/instructor-paced

recorded lecture

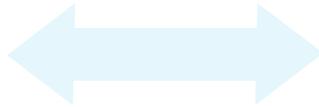
synchronous



asynchronous

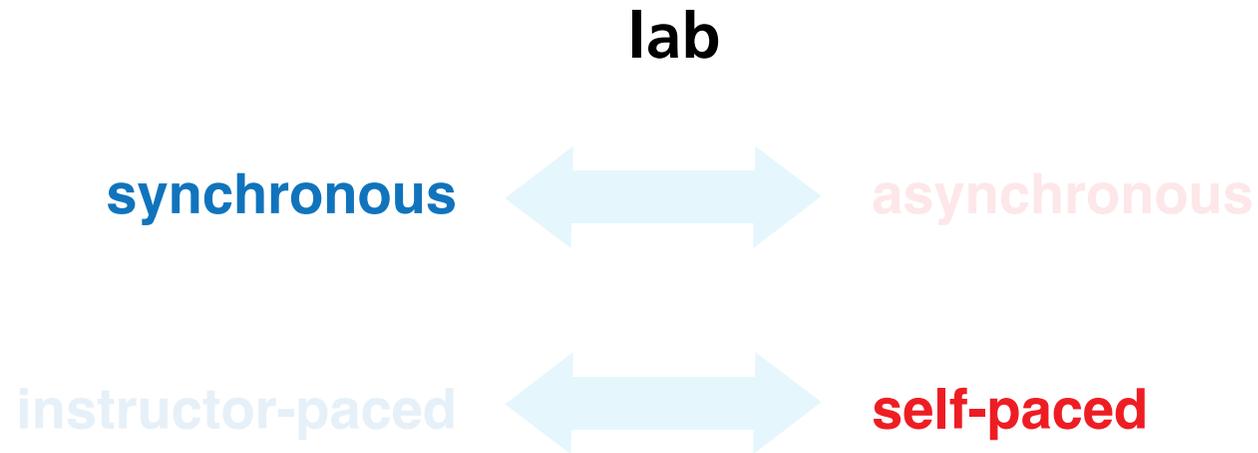
instructor-paced

1.5x!



self-paced

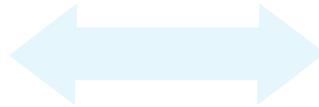
Minimize sync/instructor-paced



Minimize sync/instructor-paced

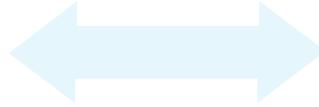
homework/study

synchronous



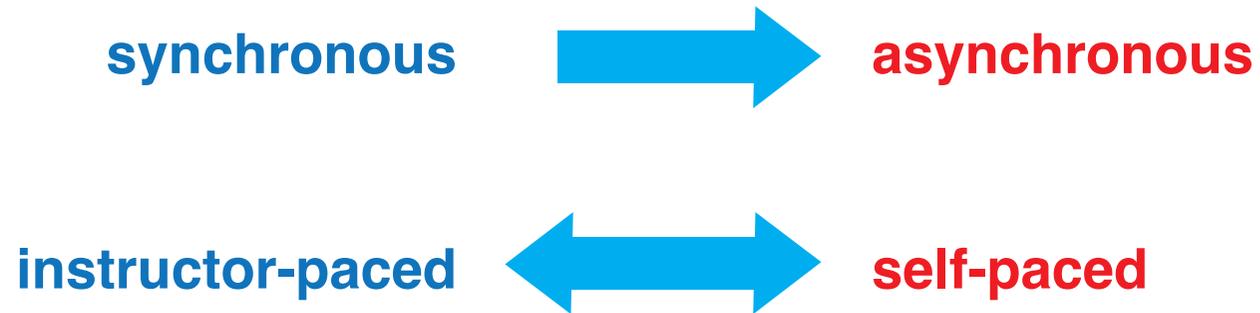
asynchronous

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...

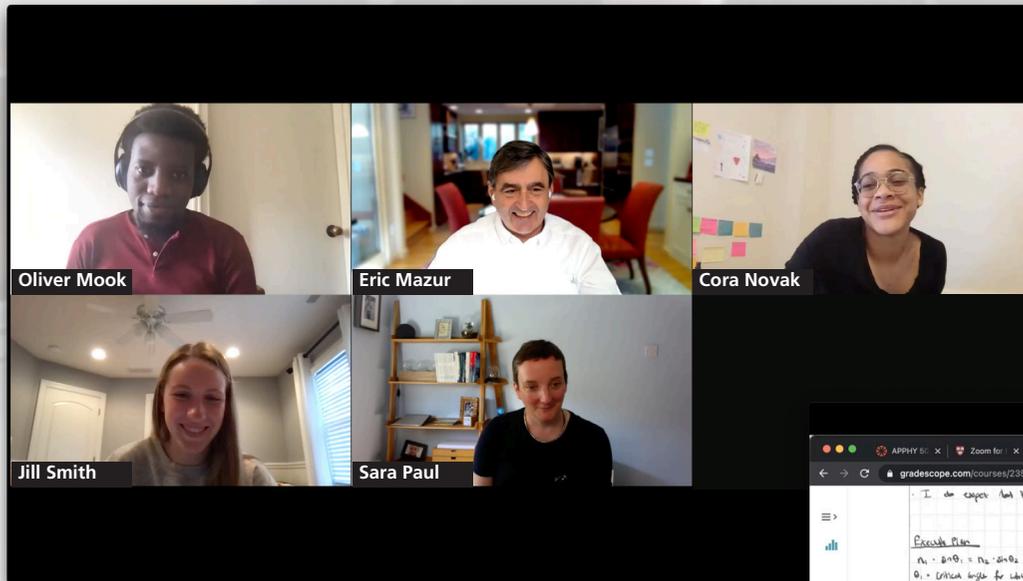
Personalize instruction

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

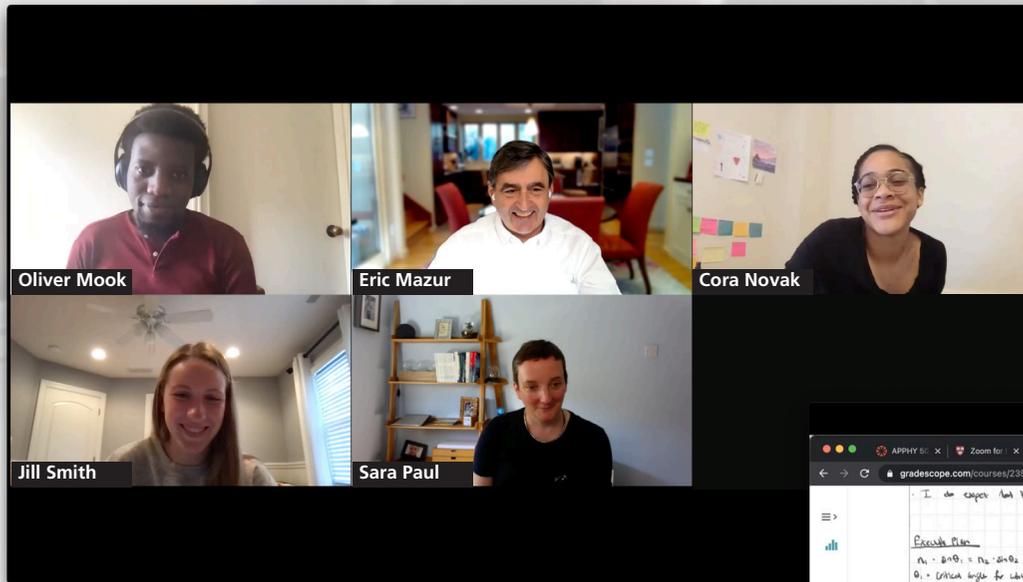
STUDENT: Codi-Ann Reid
TOTAL POINTS: - / 0 pts

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)

Handwritten work on a grid background includes:
- A diagram of a right-angled triangle with vertices A, B, and C. Angle A is at the top-left, angle B is at the top-right, and angle C is at the bottom-left. A dashed horizontal line extends from A to the vertical side BC.
- Text: "I do expect that the angle will flip and that could be verified by trig functions."
- "Example 1.1.1":
 $n_1 \sin \theta_1 = n_2 \sin \theta_2$
 $\theta_1 = \text{critical angle for which total internal reflection occurs}$
 $\theta_1 = 90^\circ, \sin 90^\circ = 1$
 $n_2 \sin \theta_2 = n_1$ ($n_2 > n_1$)
- "Calculate the θ_c for an interface between 2 media with indices of refraction":
 $n_1 \sin \theta_c = n_2 \sin 90^\circ$
 $\sin \theta_c = \frac{n_2}{n_1}$
 $\theta_c = \sin^{-1}(\frac{n_2}{n_1})$
- Trigonometric identities:
 $\cos^2 \theta_c + \sin^2 \theta_c = 1$
 $\cos^2 \theta_c = 1 - \sin^2 \theta_c = 1 - (\frac{n_2}{n_1})^2$
 $\cos \theta_c = \sqrt{1 - (\frac{n_2}{n_1})^2}$
- Snell's Law derivation:
 $n_1 \sin \theta = n_2 \sin \theta'$
 $1 \cdot \sin \theta = n_2 \sin(\theta_c + \theta')$
 $\sin \theta = n_2 \cos \theta_c \sin \theta' + n_2 \sin \theta' \sin \theta_c$
 $\theta = \sin^{-1}[\frac{n_2}{n_1} \cos \theta_c \sin \theta' + \sin \theta' \sin \theta_c]$
 $\theta = \sin^{-1}[\frac{n_2}{n_1} \sqrt{1 - (\frac{n_2}{n_1})^2} \sin \theta' + \sin \theta' \sin \theta_c]$
- Final calculation:
 $\theta_c = \sin^{-1}(\frac{1.491}{1.5})$

Personalize instruction

every student on front row



A screenshot of a Zoom meeting. The main window displays a shared screen with a physics problem. The problem involves calculating the critical angle θ_c for total internal reflection. The diagram shows a light ray incident at point A on a boundary between two media with refractive indices n_1 and n_2 ($n_1 > n_2$). The ray is refracted at point B. The angle of incidence is θ and the angle of refraction is θ' . The critical angle θ_c is the angle of incidence for which the refracted ray travels along the boundary ($\theta' = 90^\circ$).

The problem text includes:

- Example Problem
- $n_1 \sin \theta_c = n_2 \sin 90^\circ$
- $\theta_c = \text{critical angle for which total internal reflection occurs}$
- $\theta_c = 90^\circ$, $\sin 90^\circ = 1$
- $n_1 \sin \theta_c = n_2$ ($n_1 > n_2$)
- Calculate the θ_c for an interface between 2 media with indices refraction
- $n_1 \sin \theta_c = n_2 \sin 90^\circ$
- $\sin \theta_c = \frac{n_2}{n_1} = \frac{1}{1.5}$
- $\theta_c = \sin^{-1}(\frac{1}{1.5})$
- $\cos^2 \theta_c + \sin^2 \theta_c = 1$
- $\cos^2 \theta_c = 1 - \sin^2 \theta_c = 1 - \frac{1}{2.25}$
- $\cos \theta_c = \sqrt{1 - \frac{1}{2.25}}$
- $\theta_c = \sin^{-1}(\frac{1}{1.5})$
- $\theta_c = 41.8^\circ$

The sidebar on the right shows the assignment details for "Assignment Module 25" (UNGRADED) and a list of questions with their respective points.

Personalize instruction

every student on front row & address each by their name

The collage illustrates personalized instruction through a Zoom meeting. Five student video windows are shown, with names circled in yellow: Oliver Mook, Eric Mazur, Cora Novak, Jill Smith, and Sara Paul. Below the video windows is a screenshot of a Zoom meeting window. The main content is a student's work on a physics problem involving Snell's Law and critical angles. The work includes a hand-drawn diagram of a light ray and several equations. The Zoom interface also shows a list of questions on the right side.

Oliver Mook

Eric Mazur

Cora Novak

Jill Smith

Sara Paul

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

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2 reimagining course

Personalize instruction

every student on front row & address each by their name

Oliver Mook

Eric Mazur

Cora Novak

Jill Smith

Sara Paul

Assignment Module 25 • UNGRADED

STUDENT
Codi-Ann Reid

TOTAL POINTS
- / 0 pts

QUESTION 1
Cover Page 0 pts

3: Question 2

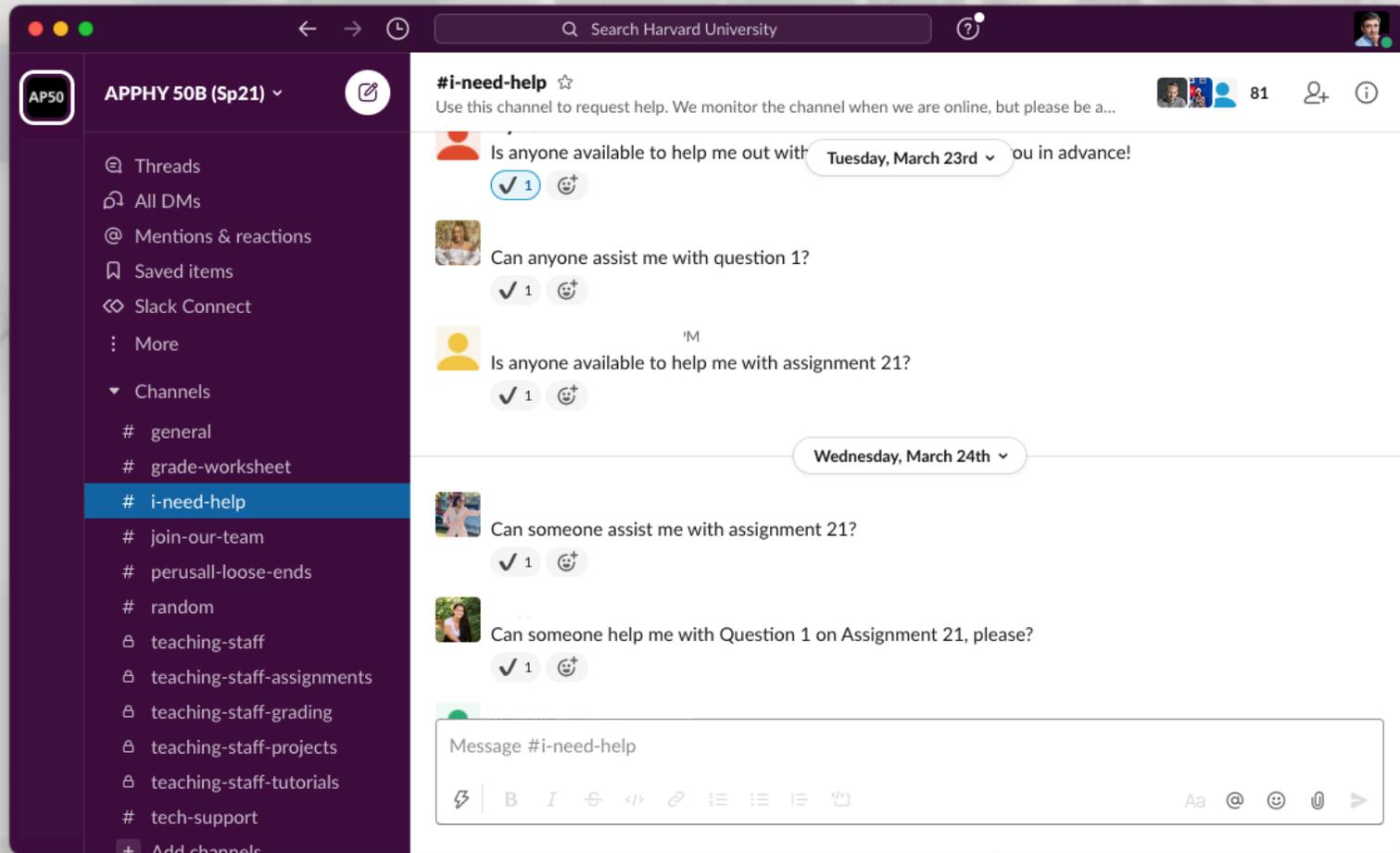
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Shuffle teams

2 reimagining course

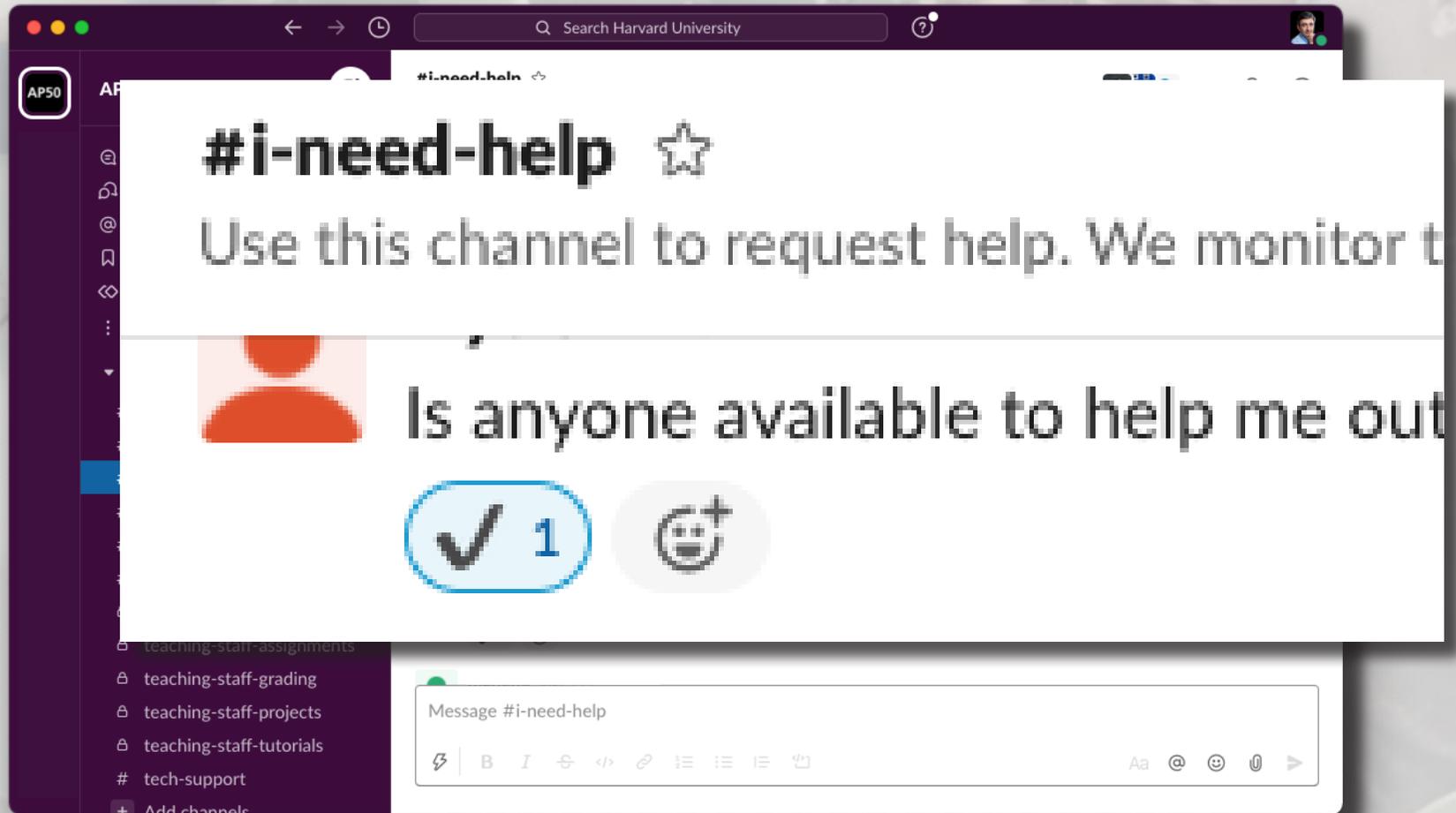
Personalize instruction

Use Slack to provide (nearly) continuous support



Personalize instruction

Use Slack to provide (nearly) continuous support

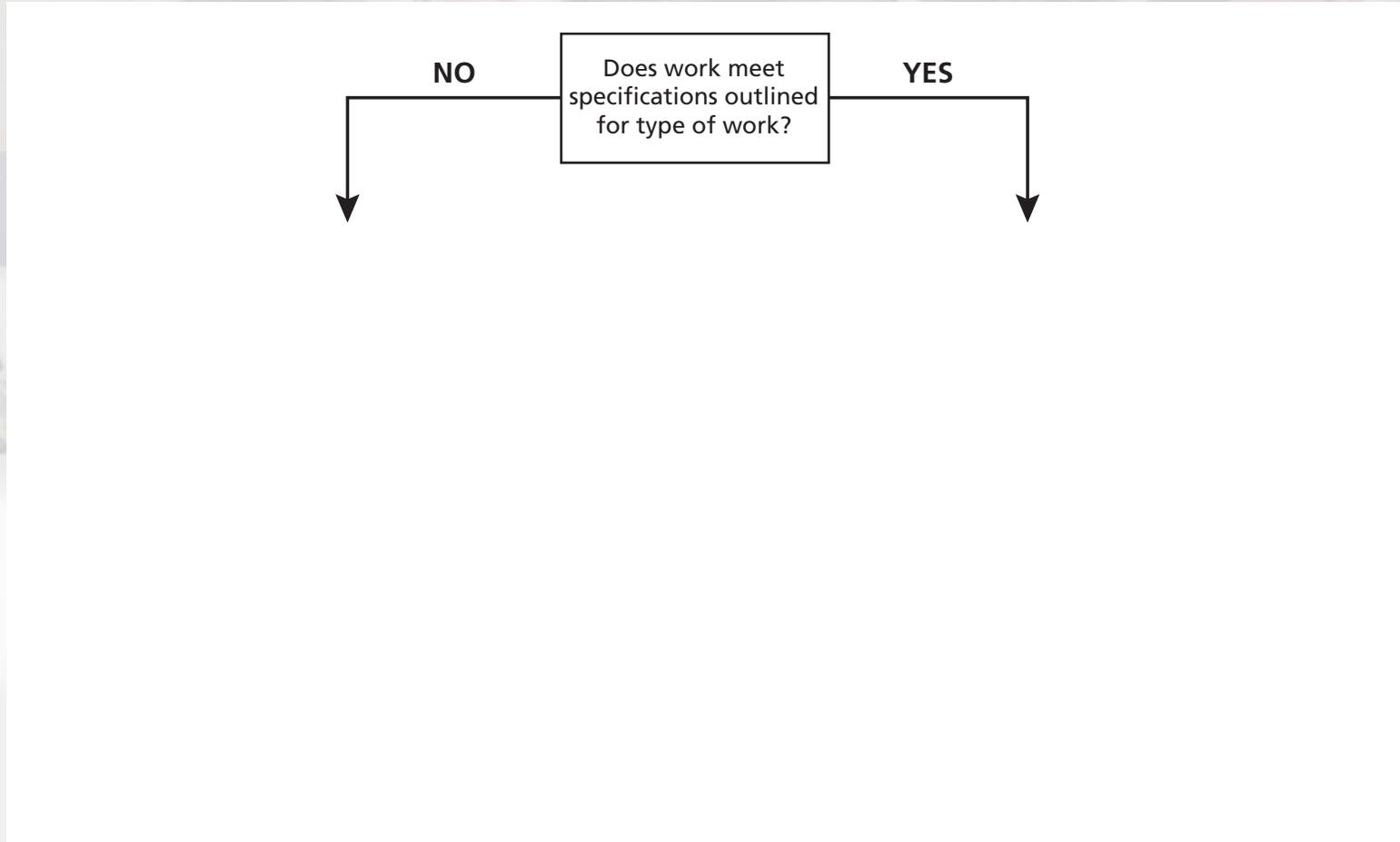


Specifications grading

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

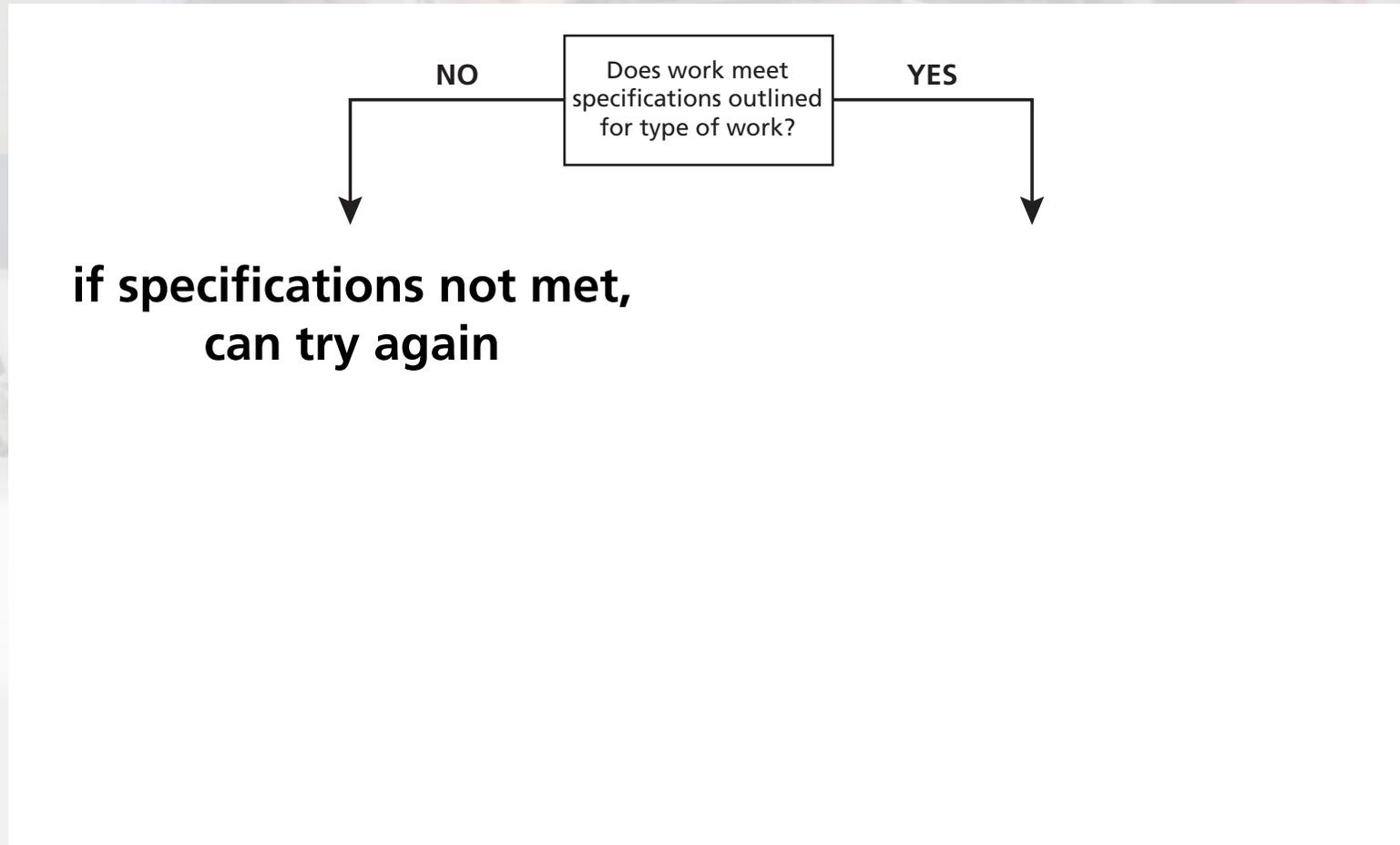
2 reimagining course

Specifications grading



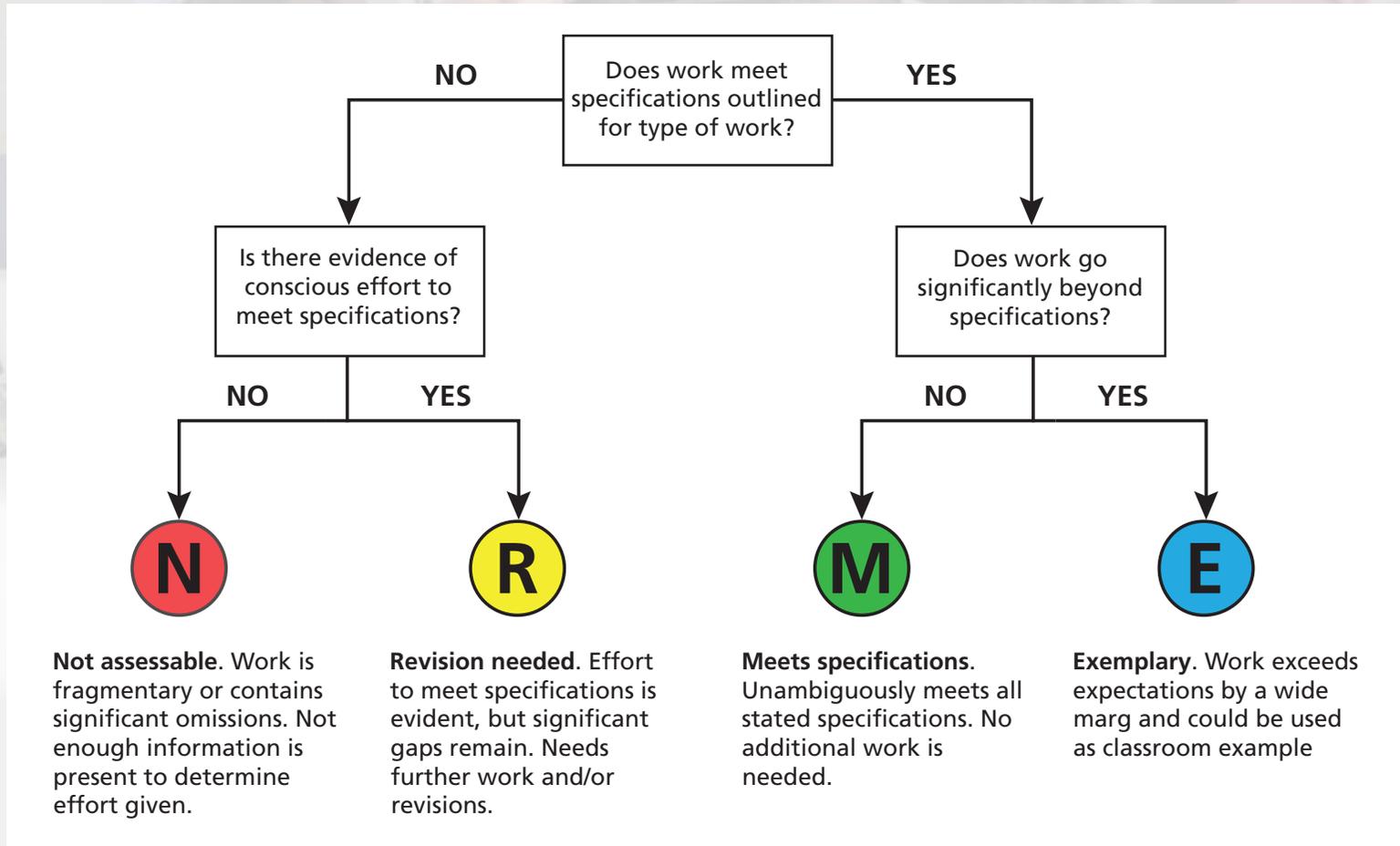
Inside Higher Ed, *Yes, Virginia, there is a better way to grade*

Specifications grading



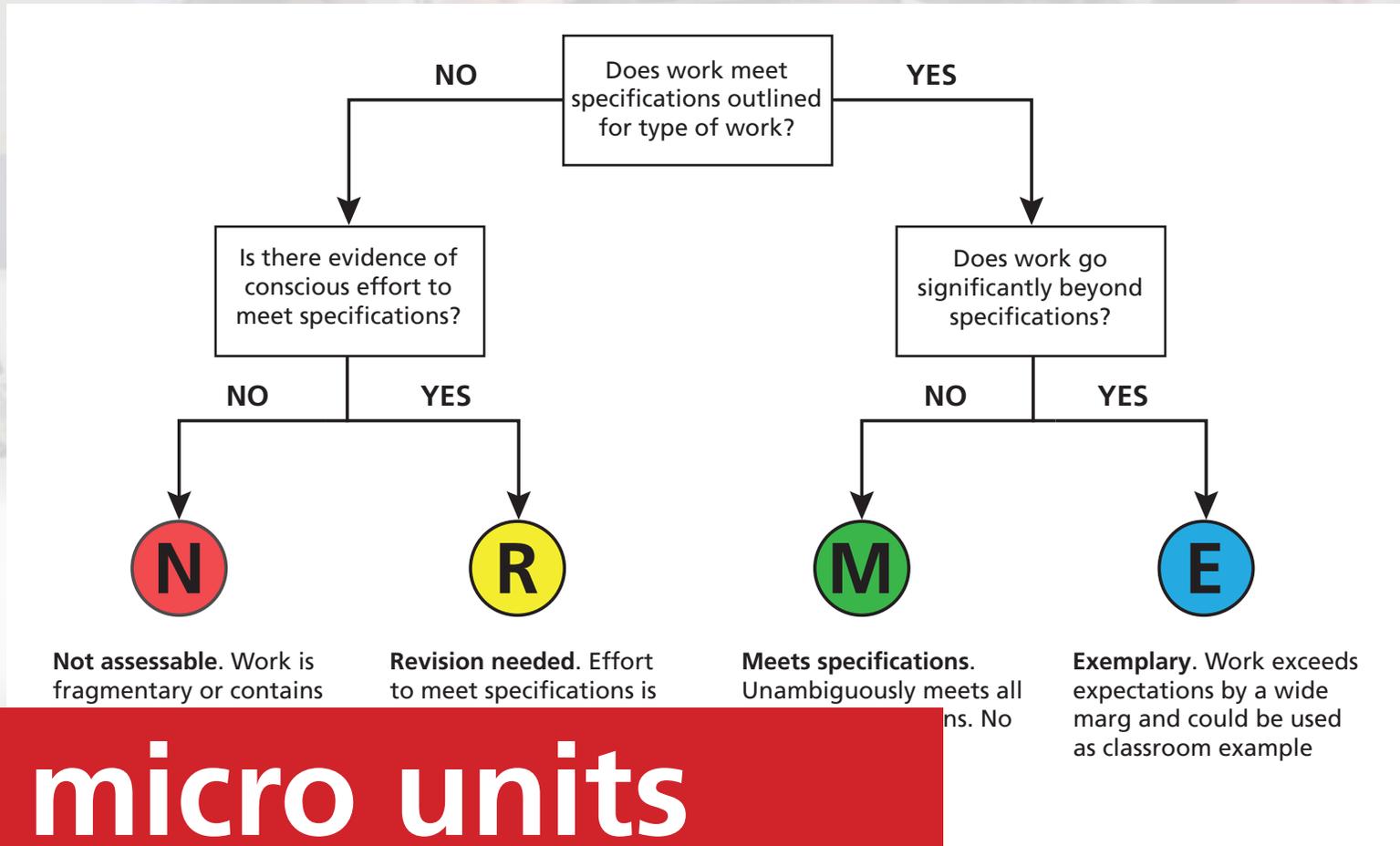
Inside Higher Ed, *Yes, Virginia, there is a better way to grade*

Specifications grading



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

Specifications grading



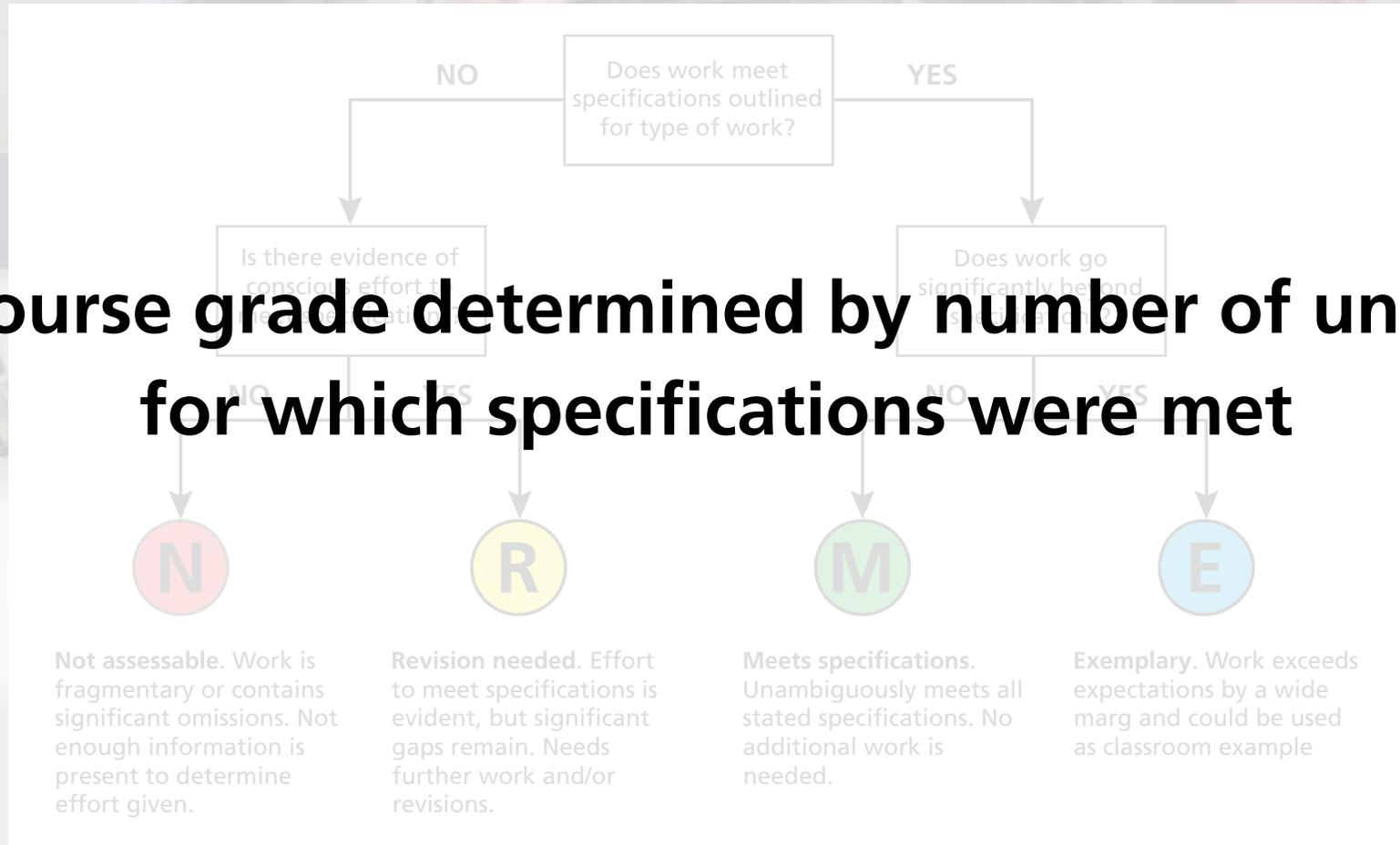
68 micro units

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

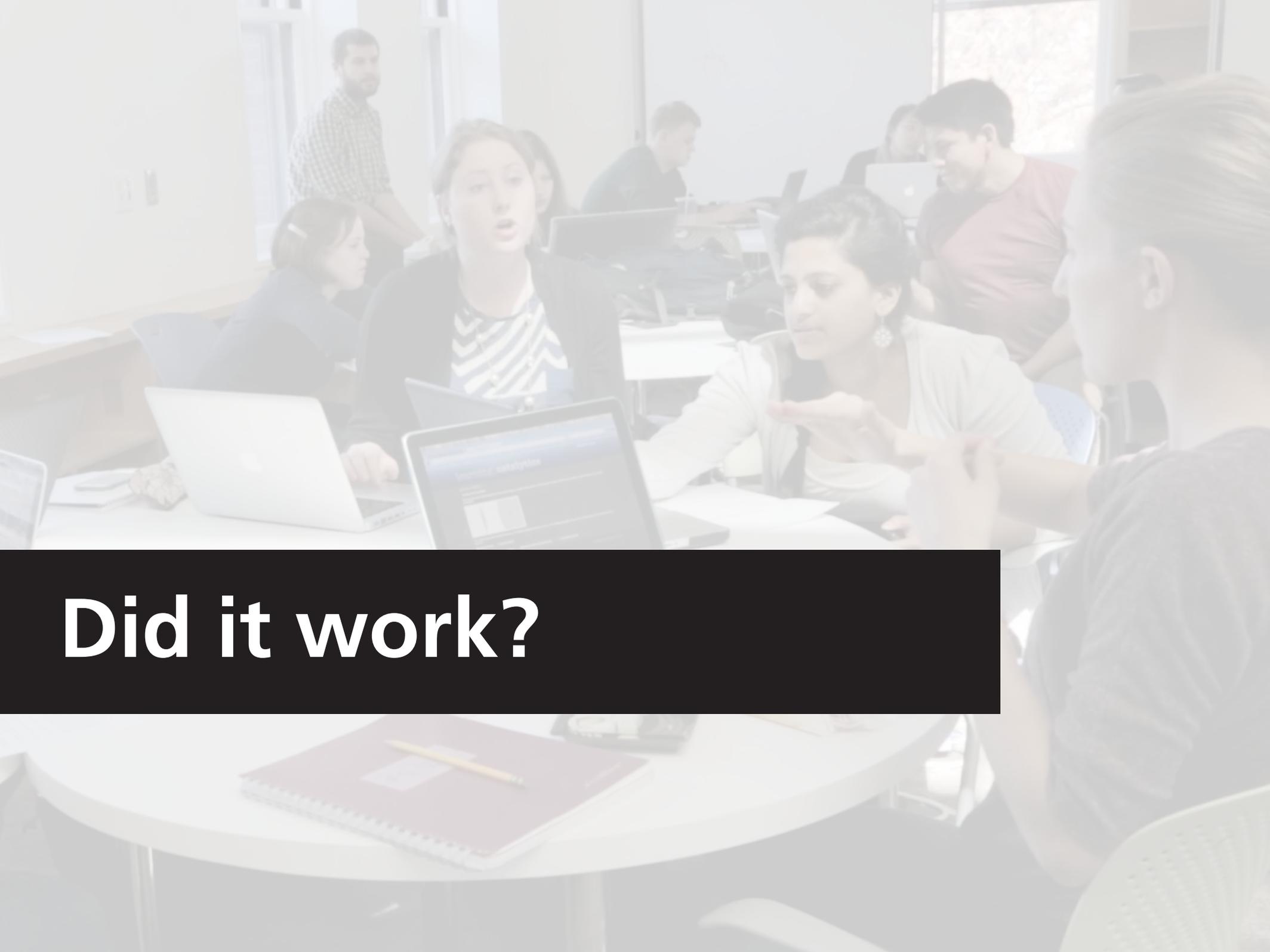
2 reimagining course

Specifications grading

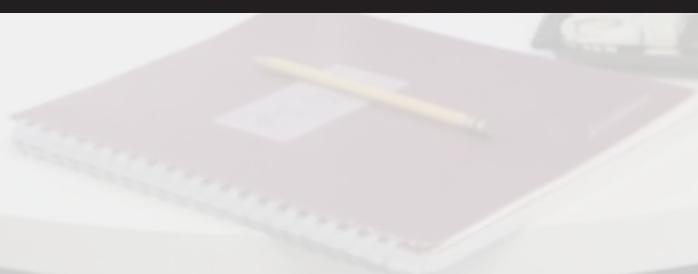
course grade determined by number of units for which specifications were met



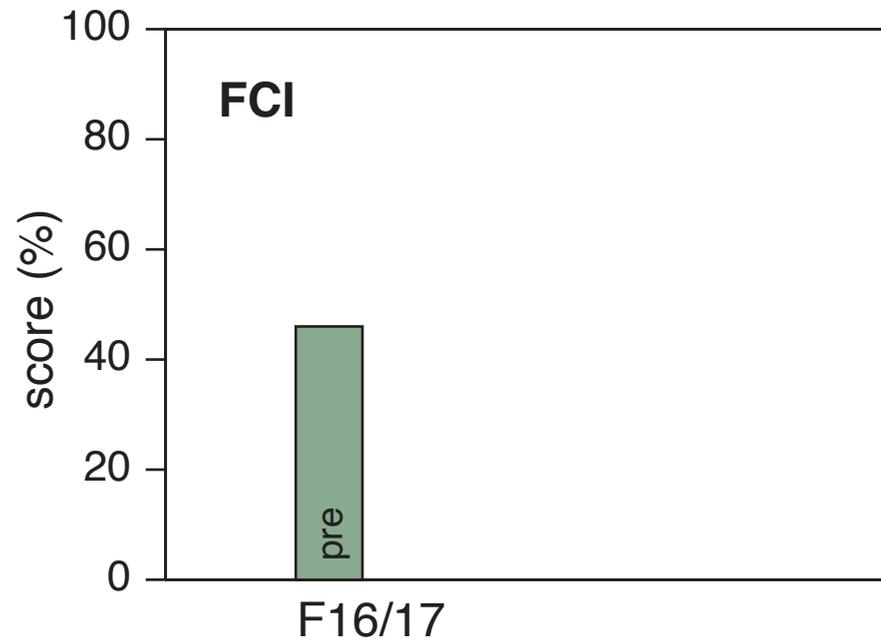
Inside Higher Ed, *Yes, Virginia, there is a better way to grade*



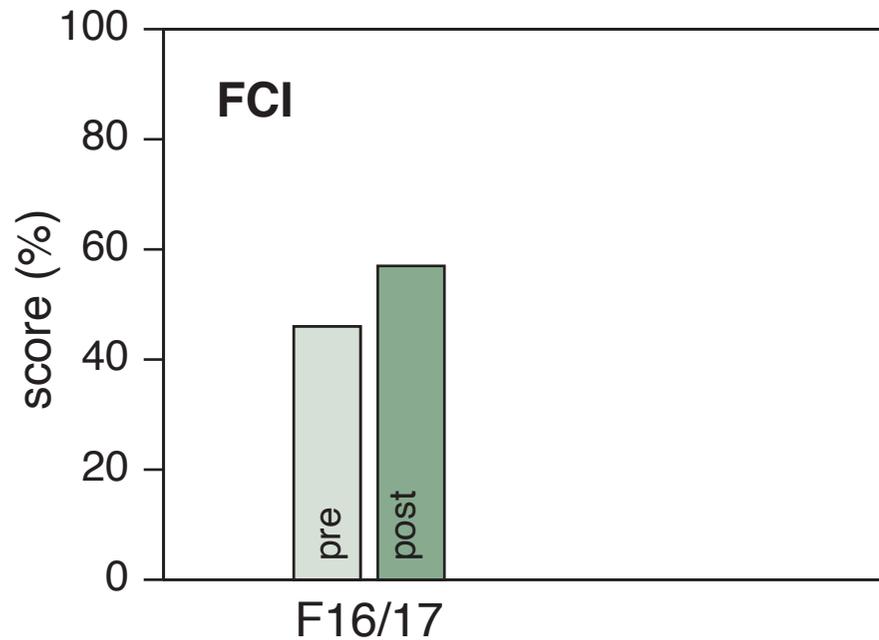
Did it work?



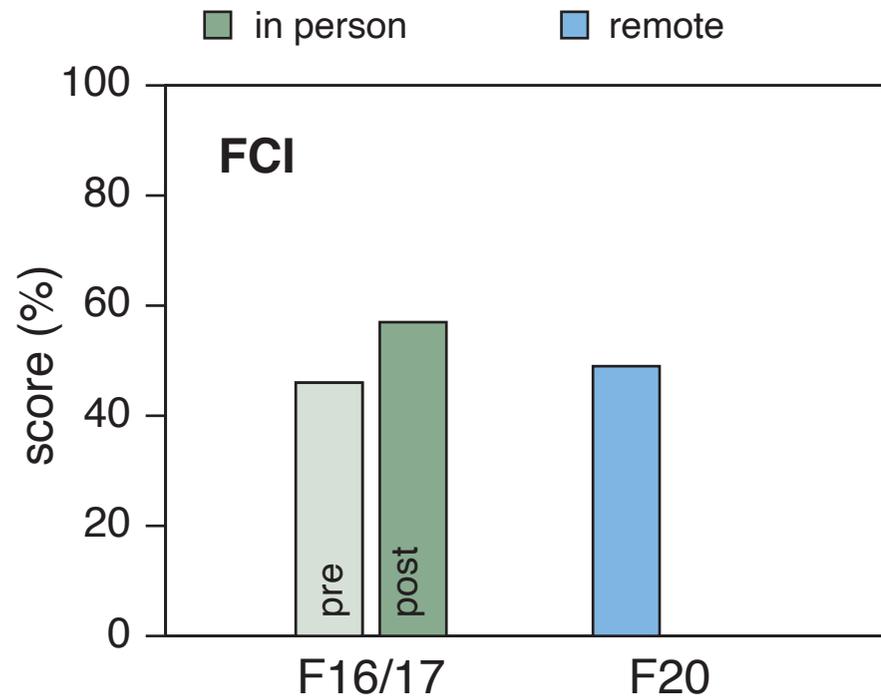
Fall Content Learning Gain



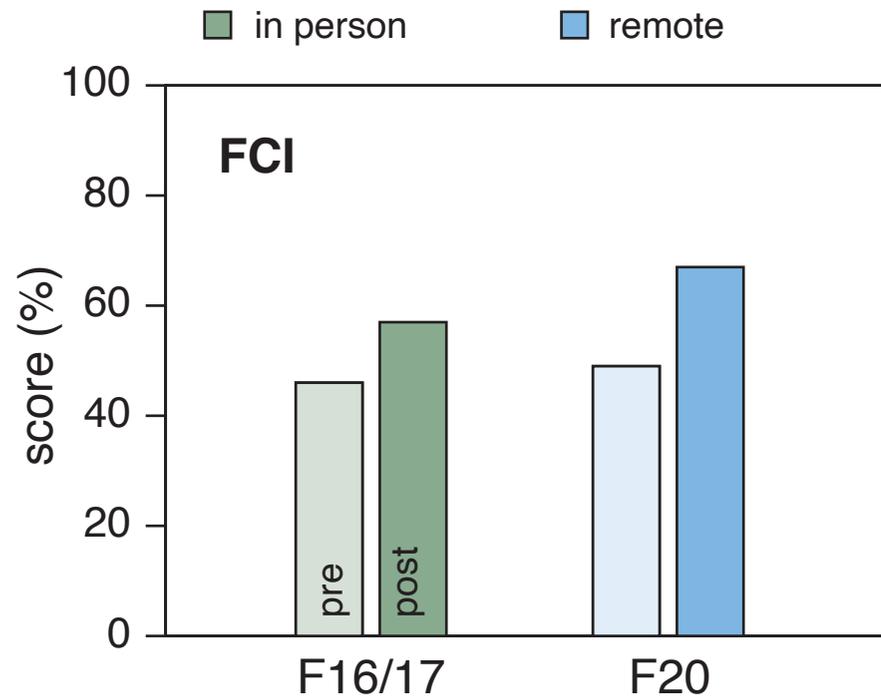
Fall Content Learning Gain



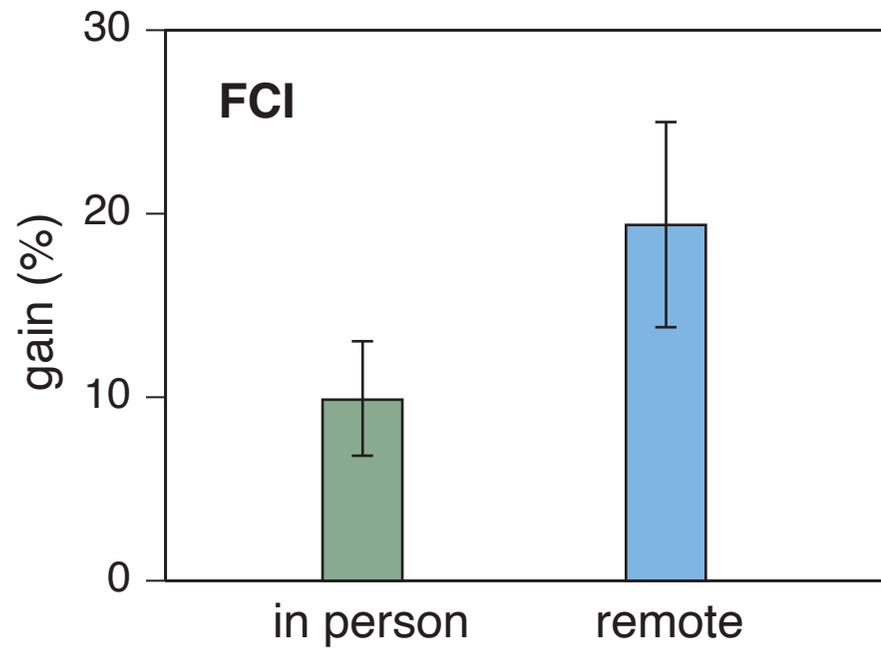
Fall Content Learning Gain



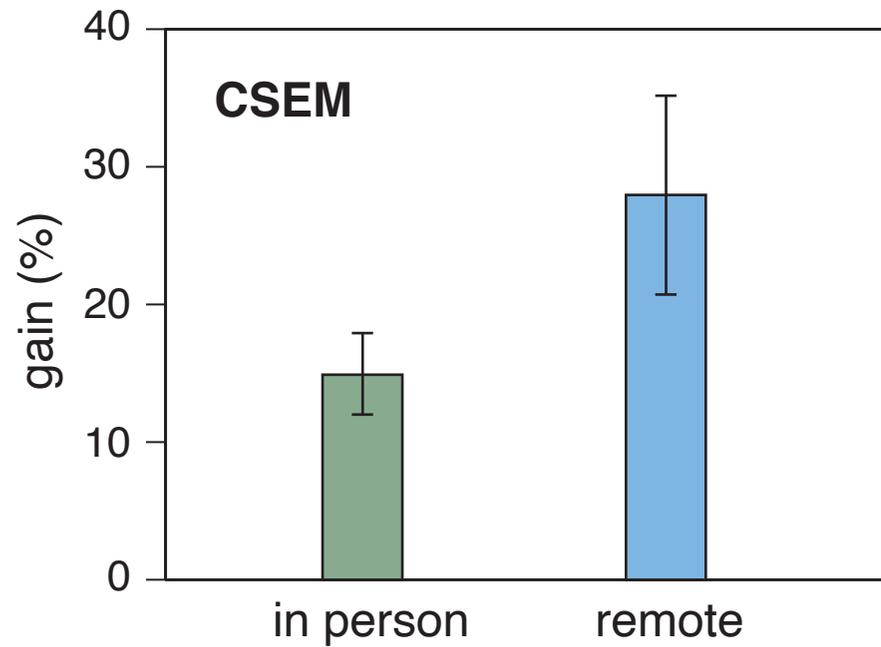
Fall Content Learning Gain



Fall Content Learning Gain



Spring Content Learning Gain



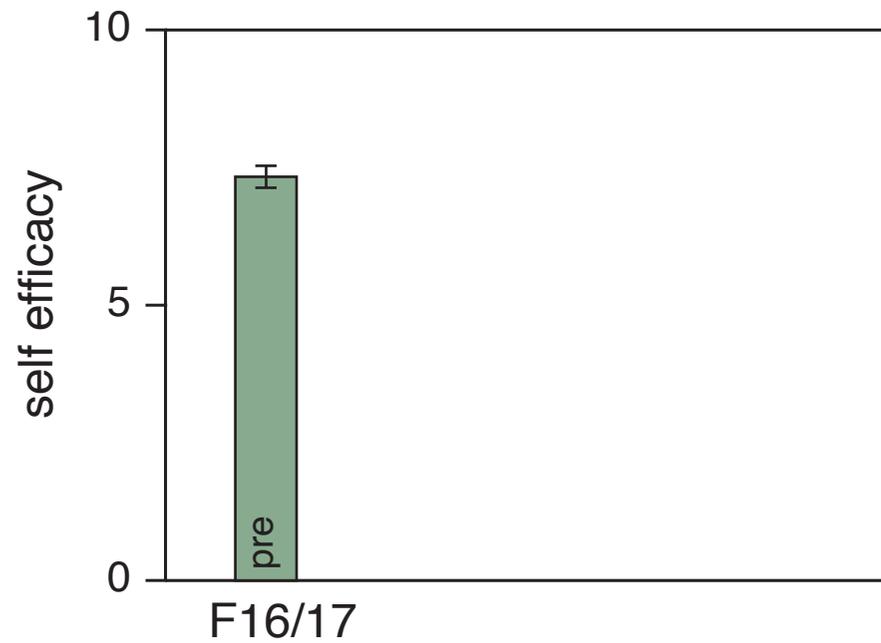
Self Efficacy



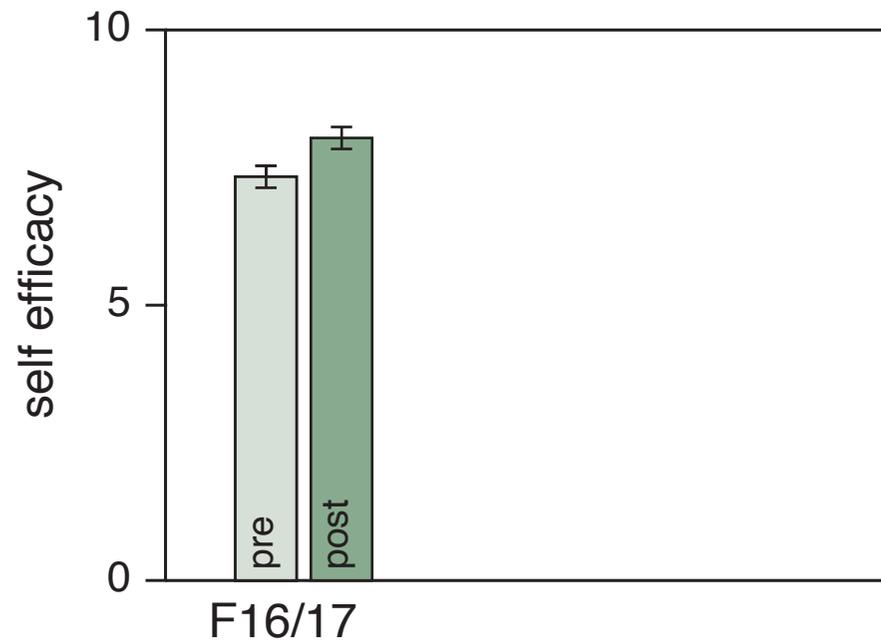
Self Efficacy

belief in ability to succeed in a certain domain

Self Efficacy

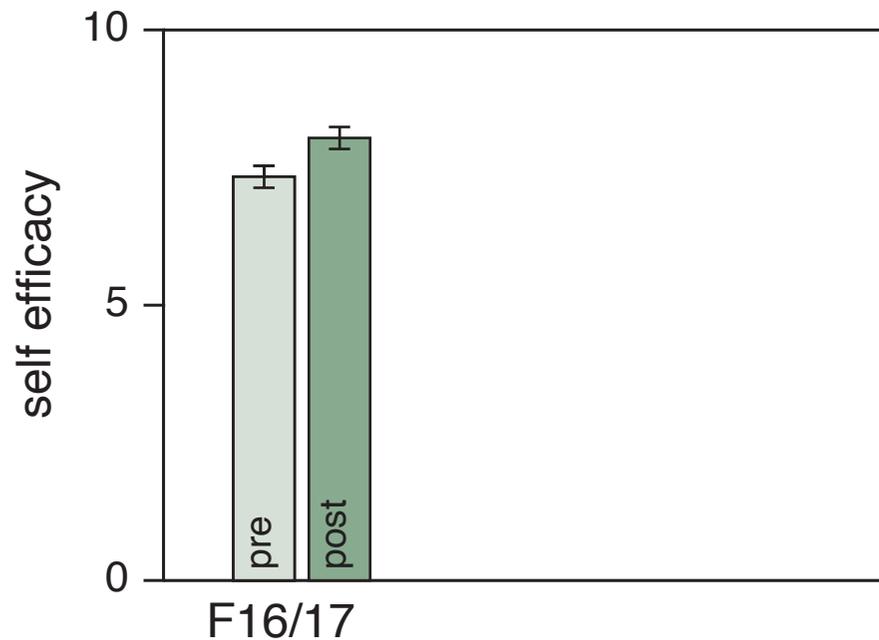


Self Efficacy

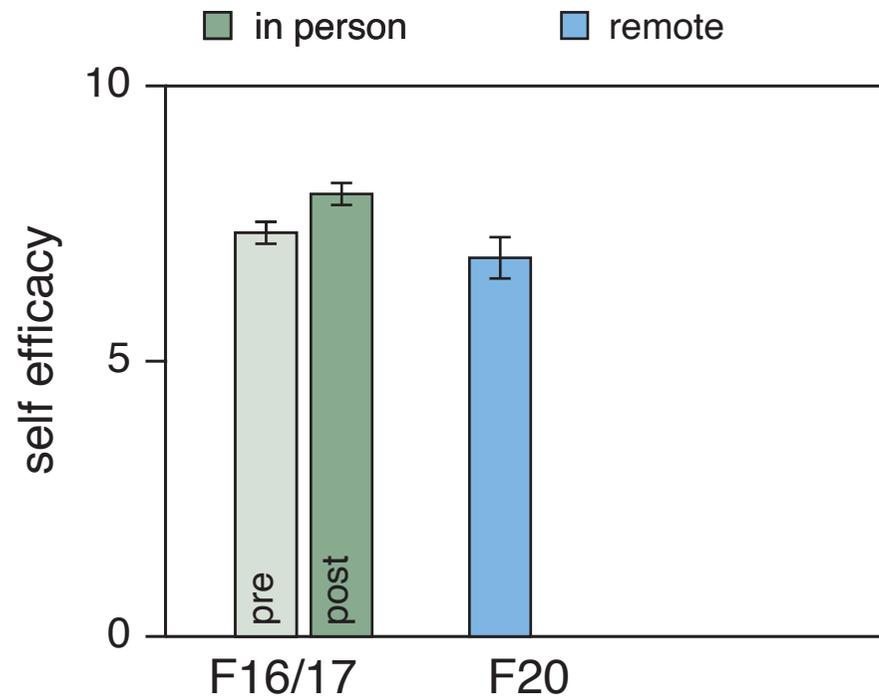


Self Efficacy

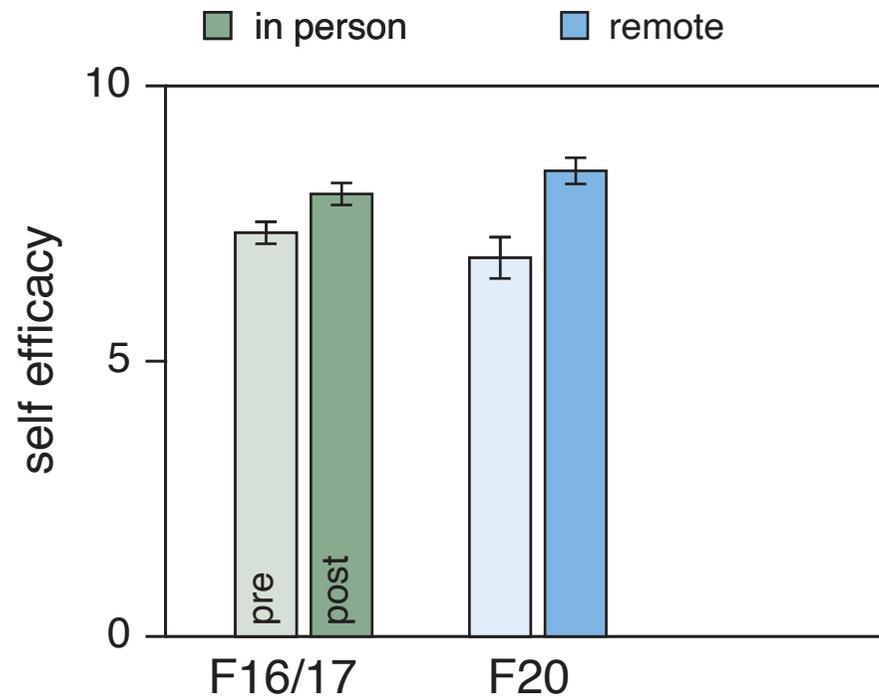
***SE down* in lecture courses!**



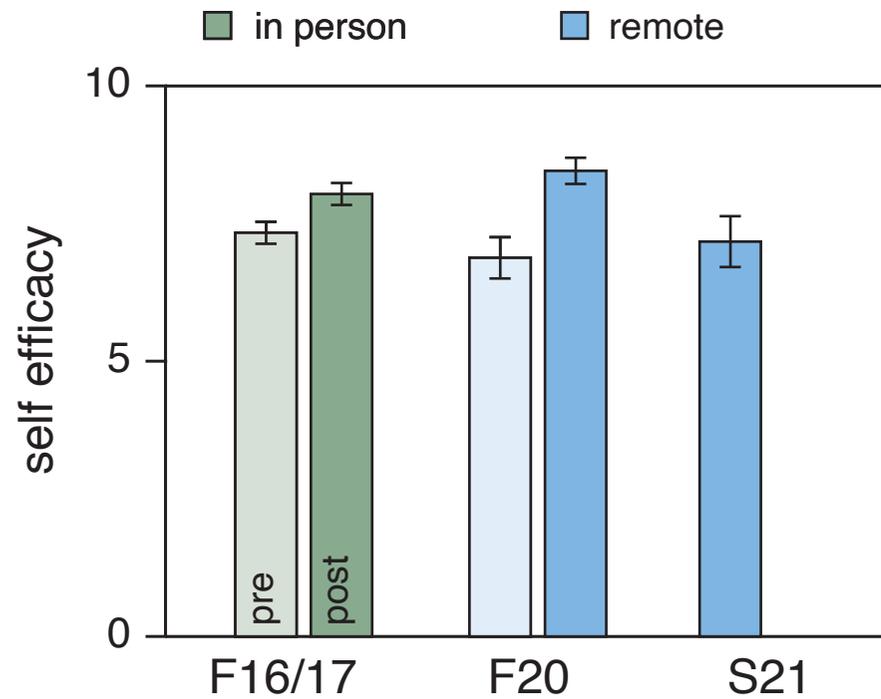
Self Efficacy



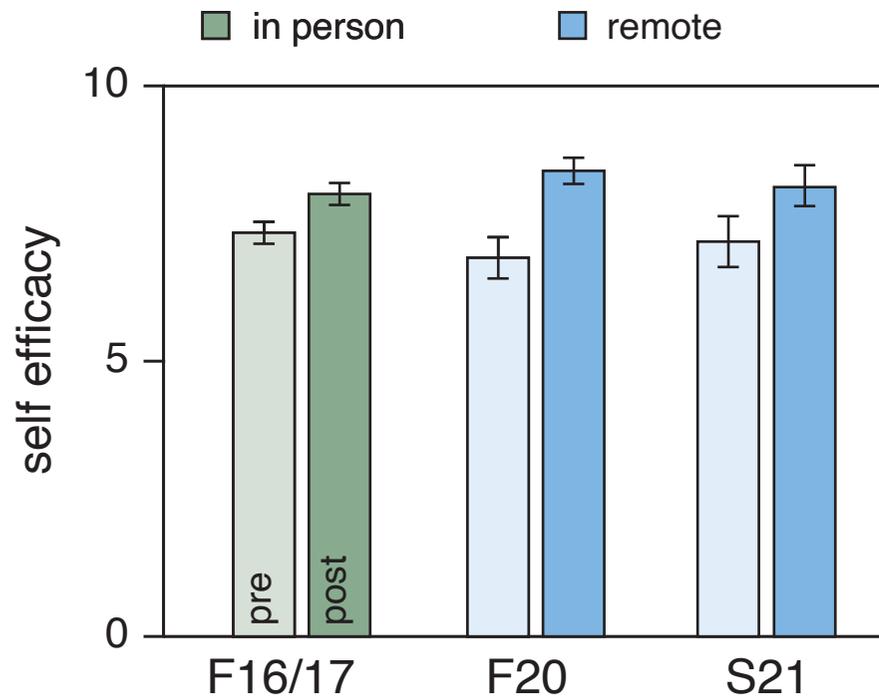
Self Efficacy



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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3 results

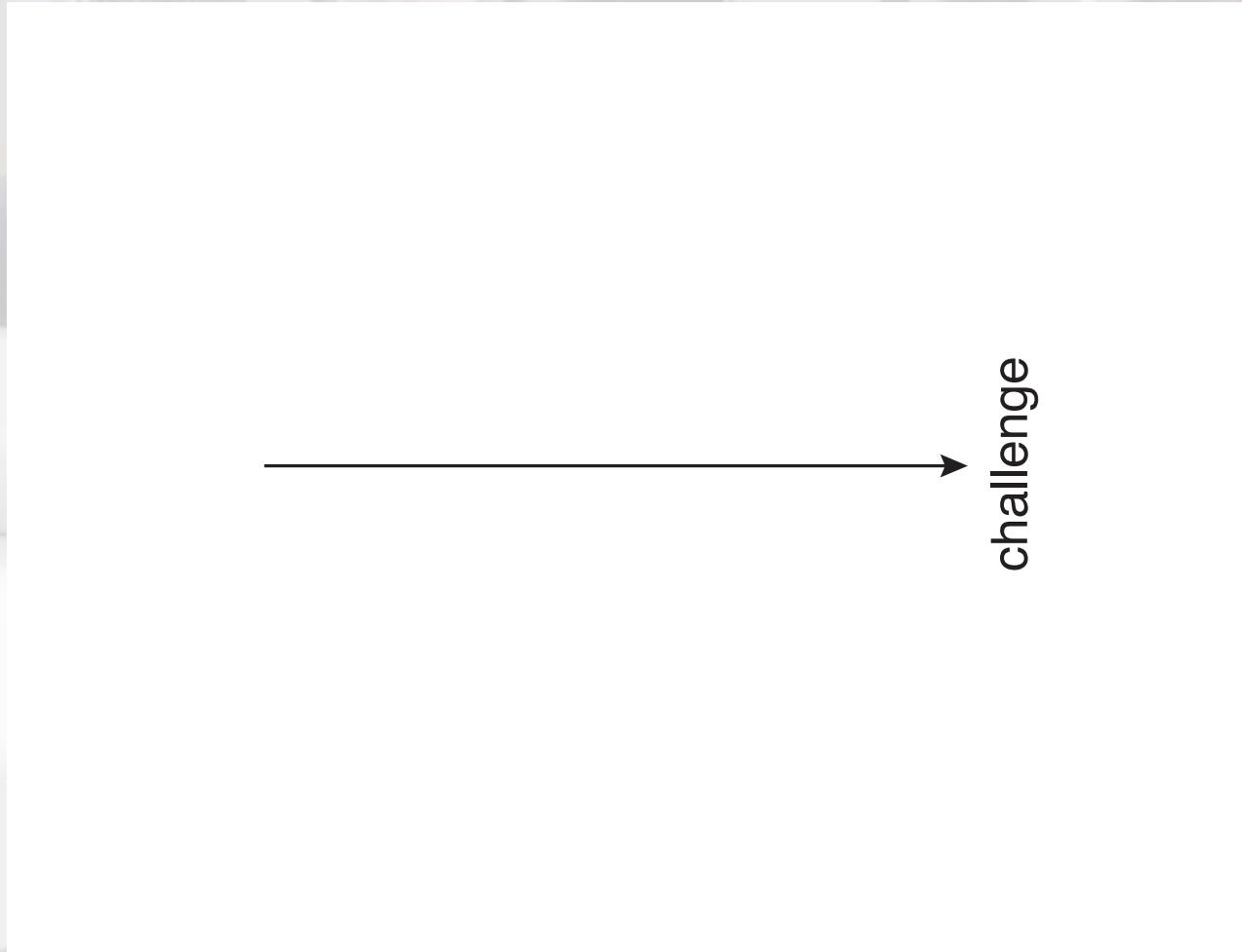
Agile Feedback Survey (Talbert)

- 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**

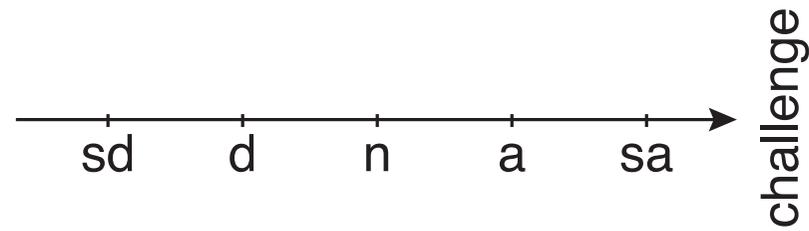
Agile Feedback Survey (Talbert)

- 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

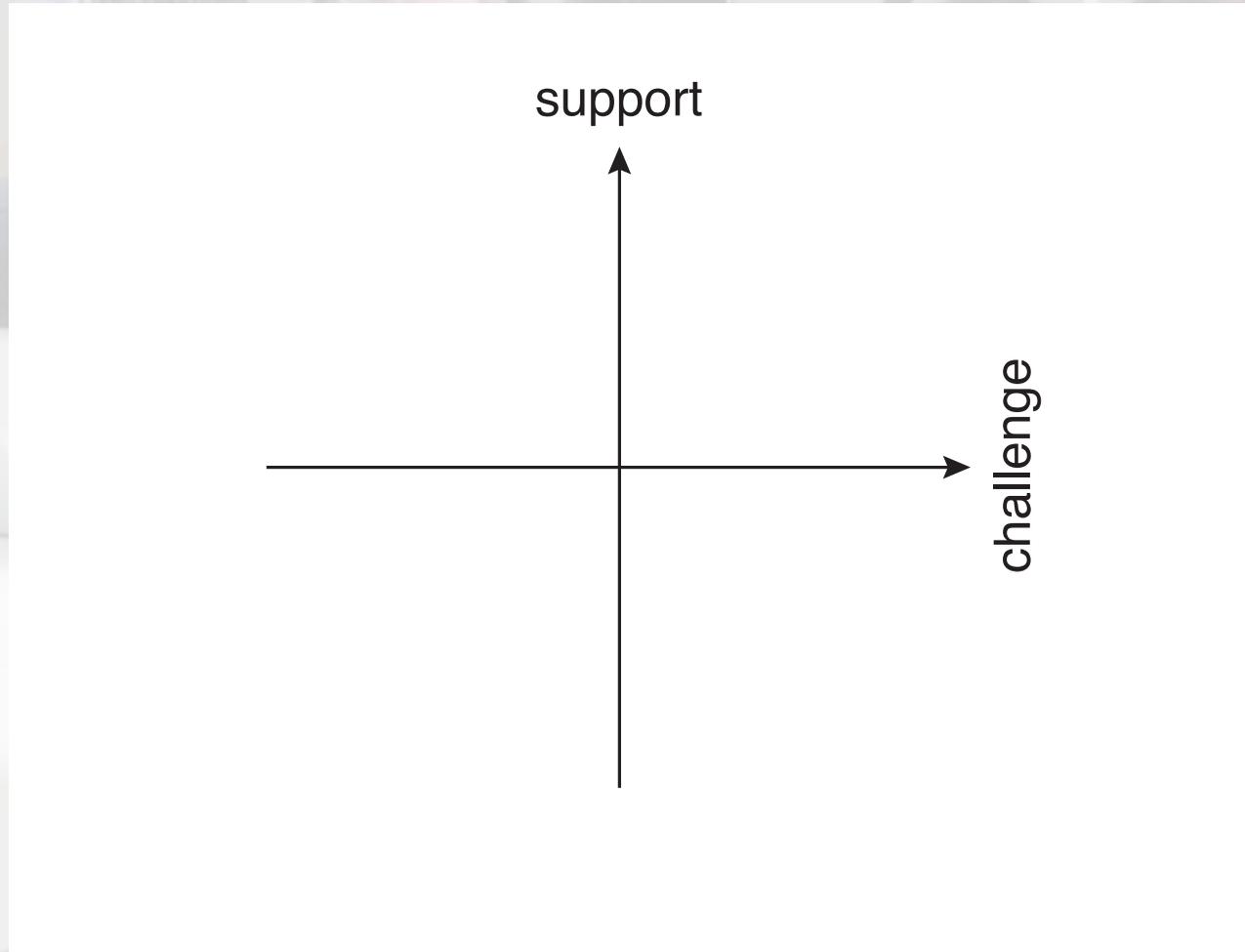
challenge vs. support



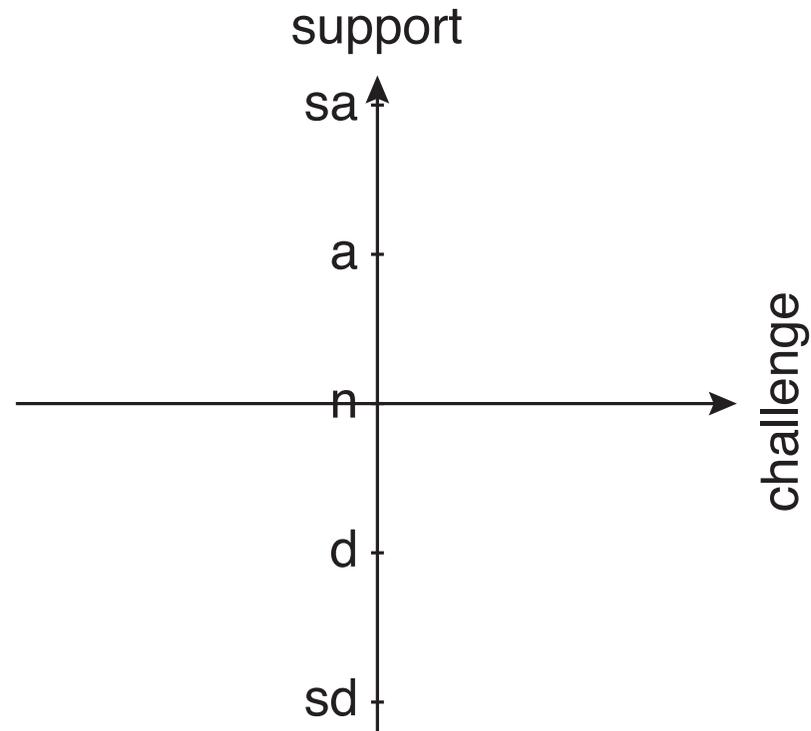
challenge vs. support



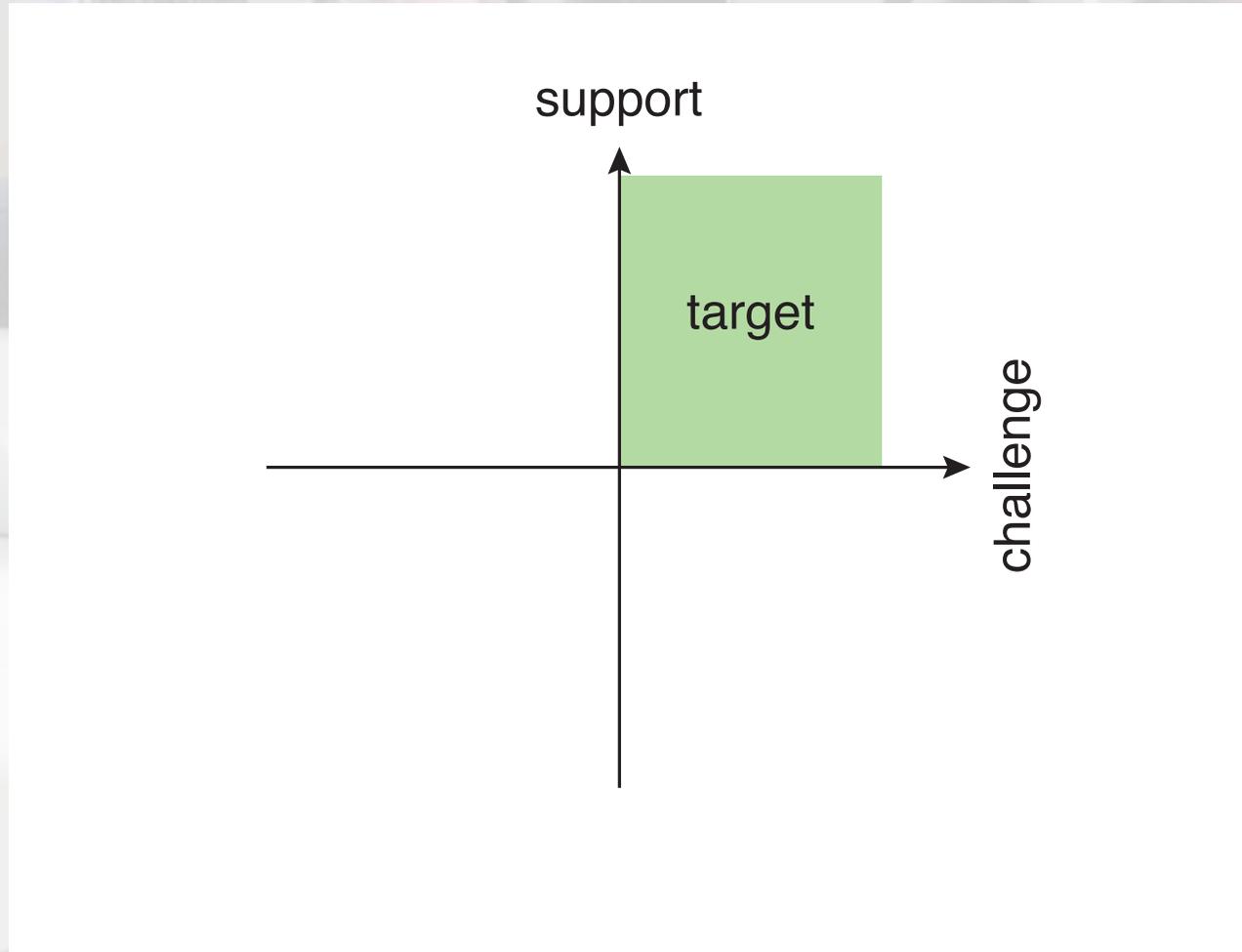
challenge vs. support



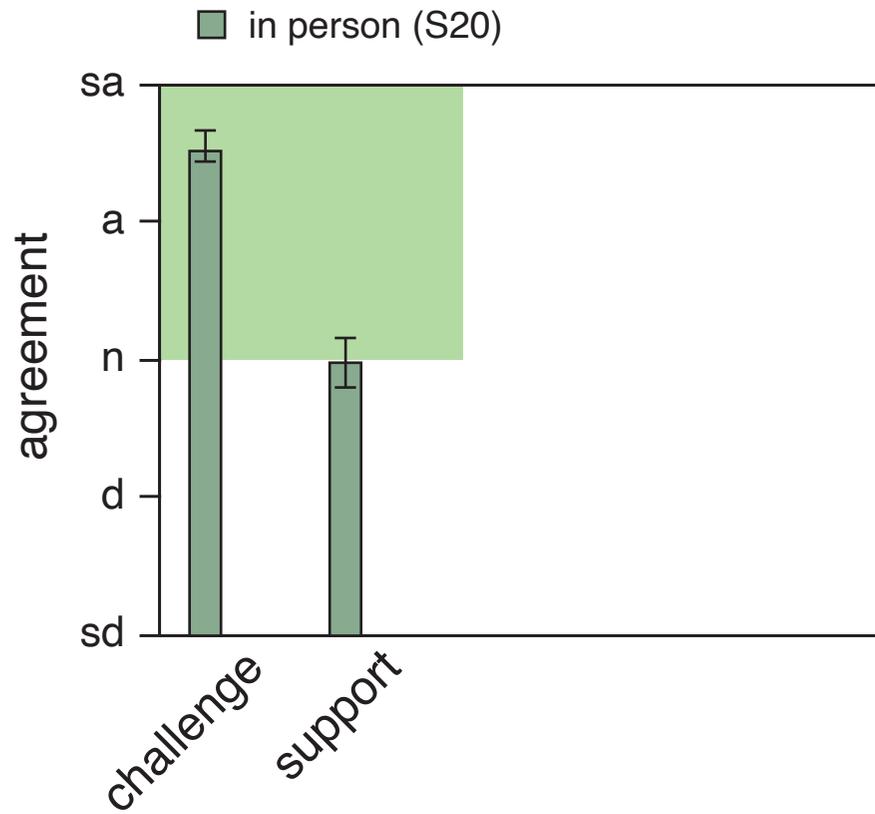
challenge vs. support



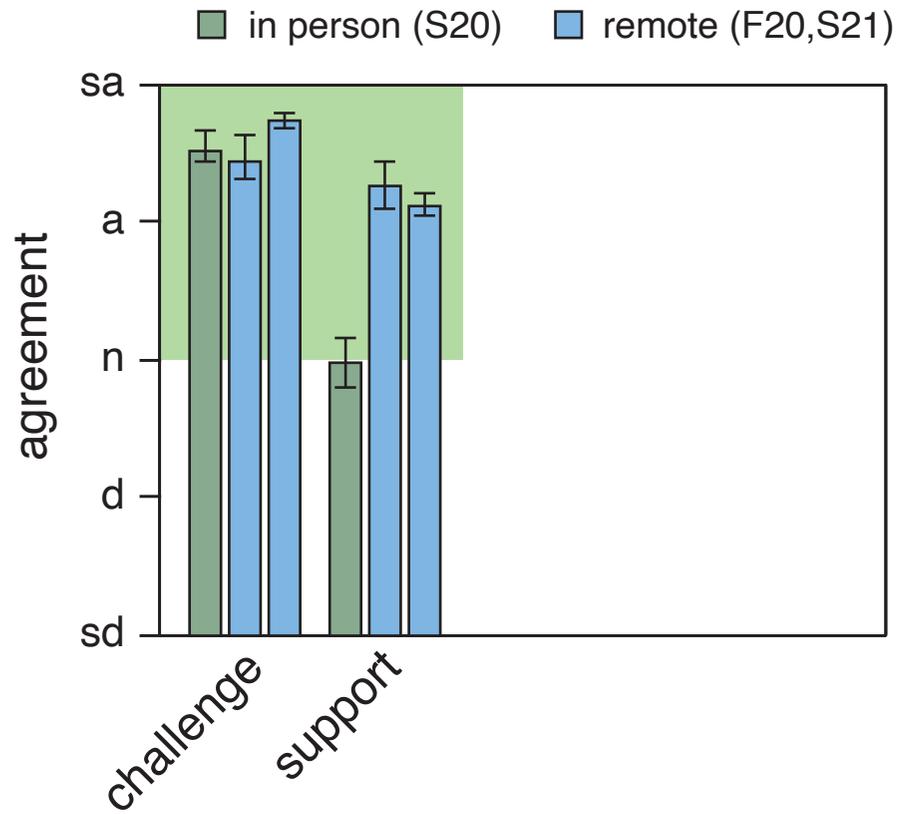
challenge vs. support



challenge vs. support



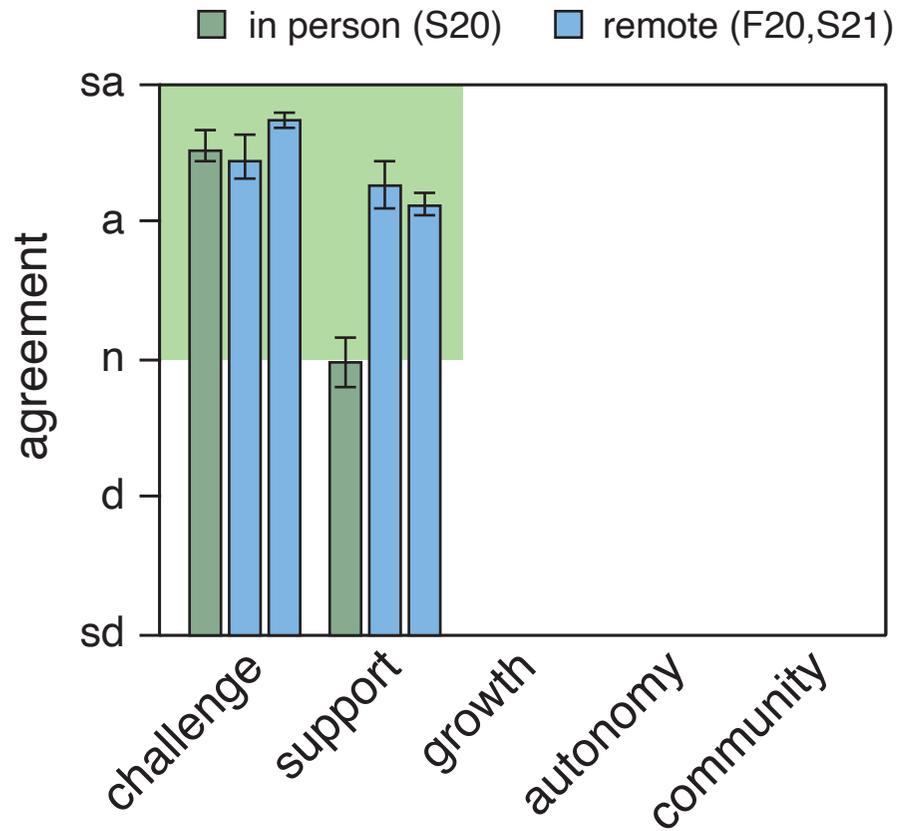
challenge vs. support



self-determination

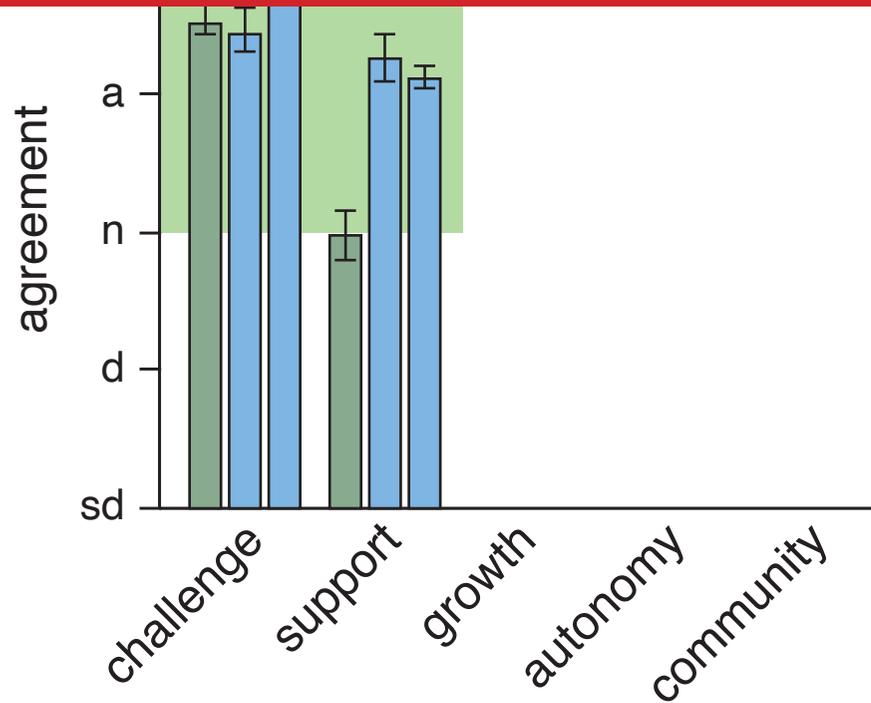
1. I was challenged intellectually (challenge)
2. I had plenty of support (support)
- 3. I am closer to mastering the ideas of the course now (growth)**
- 4. I made progress because of my own efforts and choices (auton.)**
- 5. I felt I was part of a community of learners (relatedness)**

self-determination

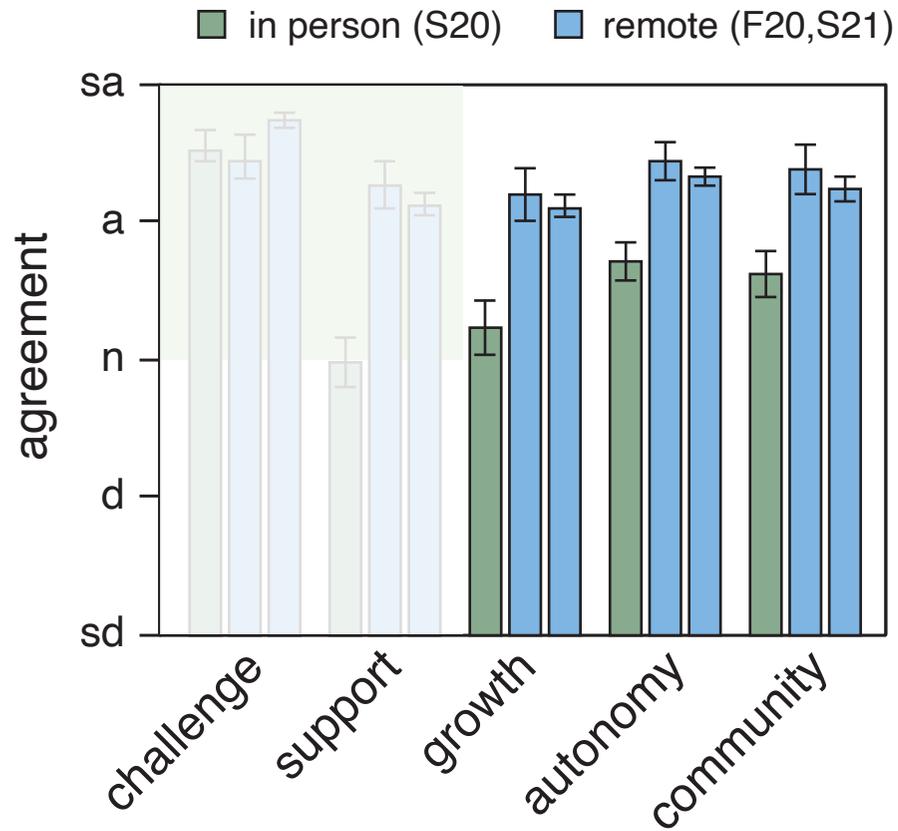


self-determination

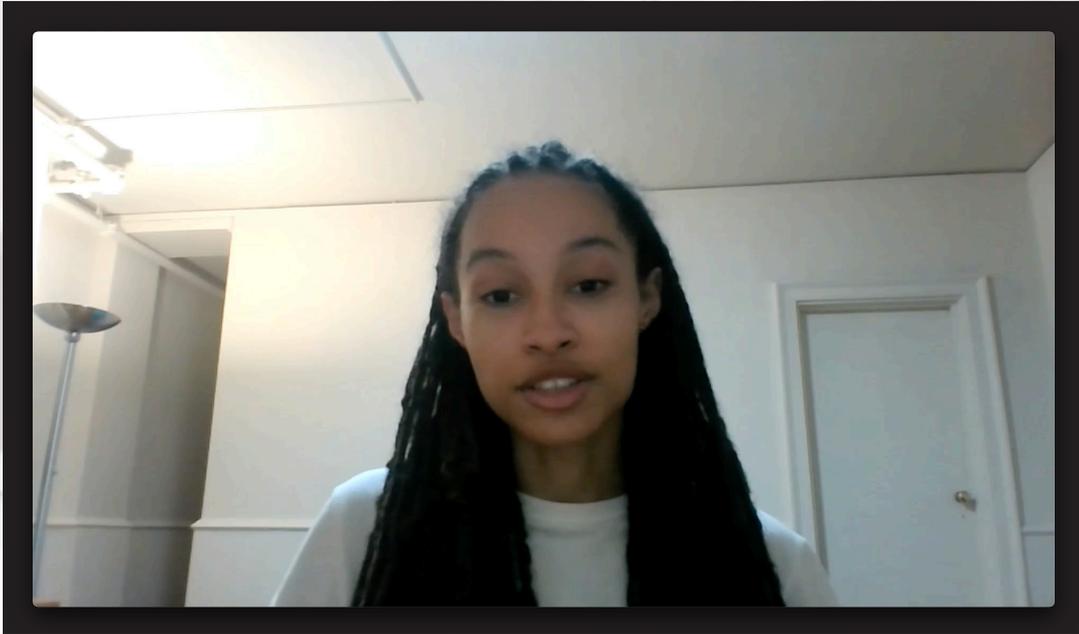
What do you predict?



self-determination



“about you” exercise



“about you” exercise

“...this will be my very first physics class that I will have ever taken in my life,

“about you” exercise

“...this will be my very first physics class that I will have ever taken in my life, so that is both equally exciting

“about you” exercise

“...this will be my very first physics class that I will have ever taken in my life, so that is both equally exciting and also a bit anxiety-inducing

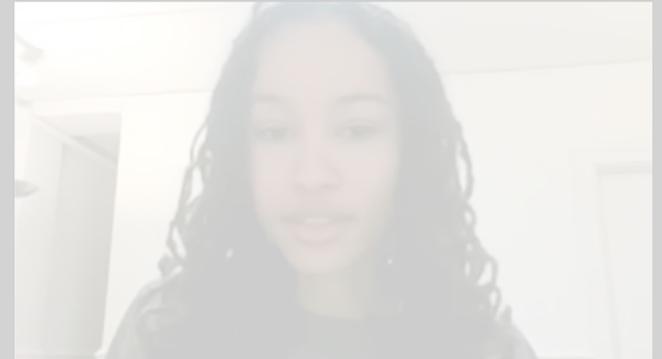
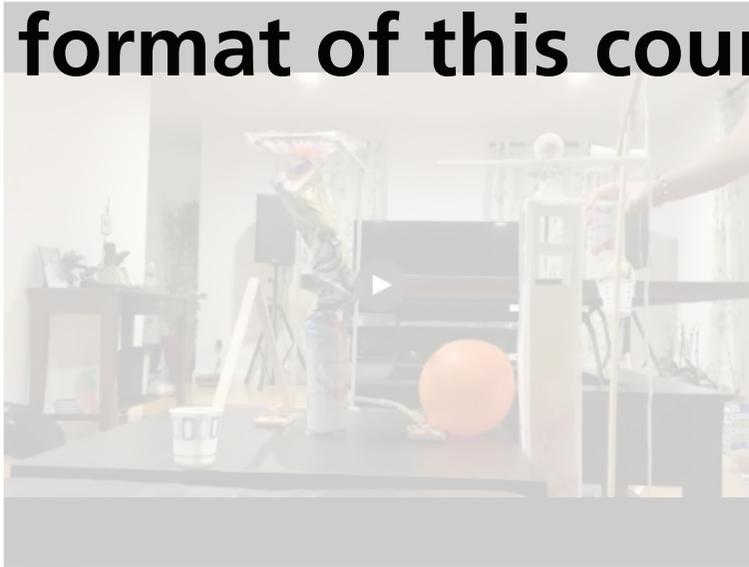
“about you” exercise

“...this will be my very first physics class that I will have ever taken in my life, so that is both equally exciting and also a bit anxiety-inducing, given that I have never felt too confident in my mathematical abilities...”

Our machine....

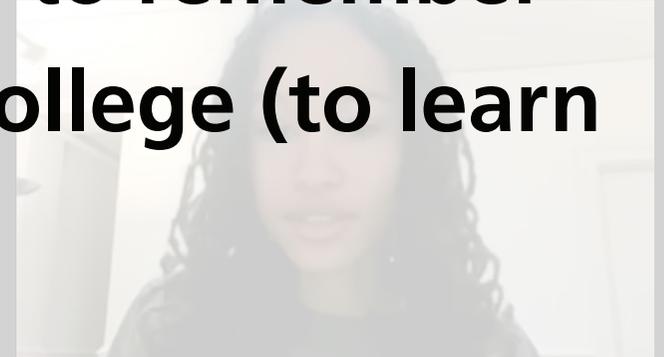
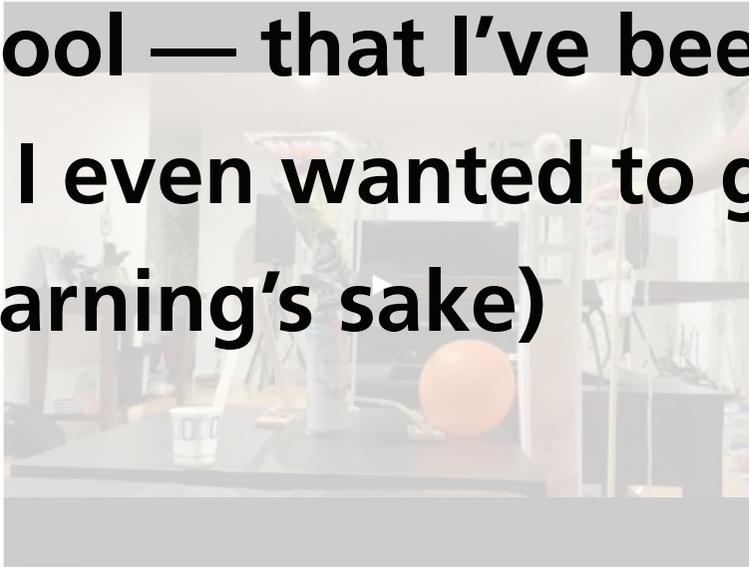


“Physics seems less “scary” to me now, because of the format of this course.



“Physics seems less “scary” to me now, because of the format of this course. I have really severe testing anxiety, but having no ‘sit-down exams’ has allowed me to actually learn physics because I *want* to, not because I need to do well on an exam...”

Our motto: **"...this semester is the first time — since high school — that I've been able to remember why I even wanted to go to college (to learn for learning's sake)**



Our mission **“...this semester is the first time — since high school — that I’ve been able to remember why I even wanted to go to college (to learn for learning’s sake) ... over the past 3 years it’s mostly just been about how to scrape by academically and not let my testing anxiety ruin my GPA.**

Our motto: **"...this semester is the first time — since high school — that I've been able to remember why I even wanted to go to college (to learn for learning's sake) ... over the past 3 years it's mostly just been about how to scrape by academically and not let my testing anxiety ruin my GPA. I love this class."**

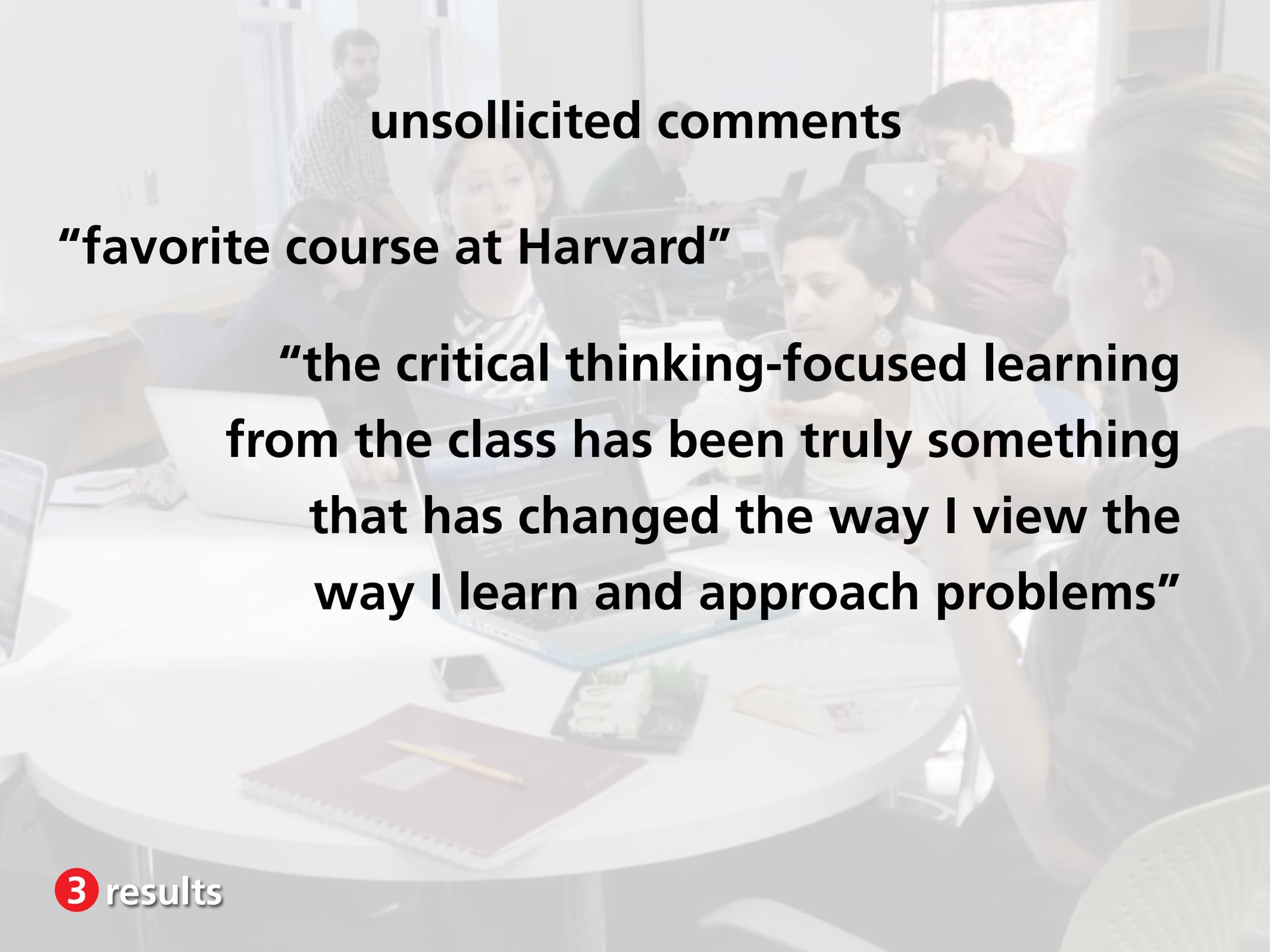
unsolicited comments

unsolicited comments

“this course is amazing because the goal is learning, trying to solve hard problems, and learning from mistakes. I enjoyed the struggle of facing hard problems whether I solved them correctly or not.”

unsolicited comments

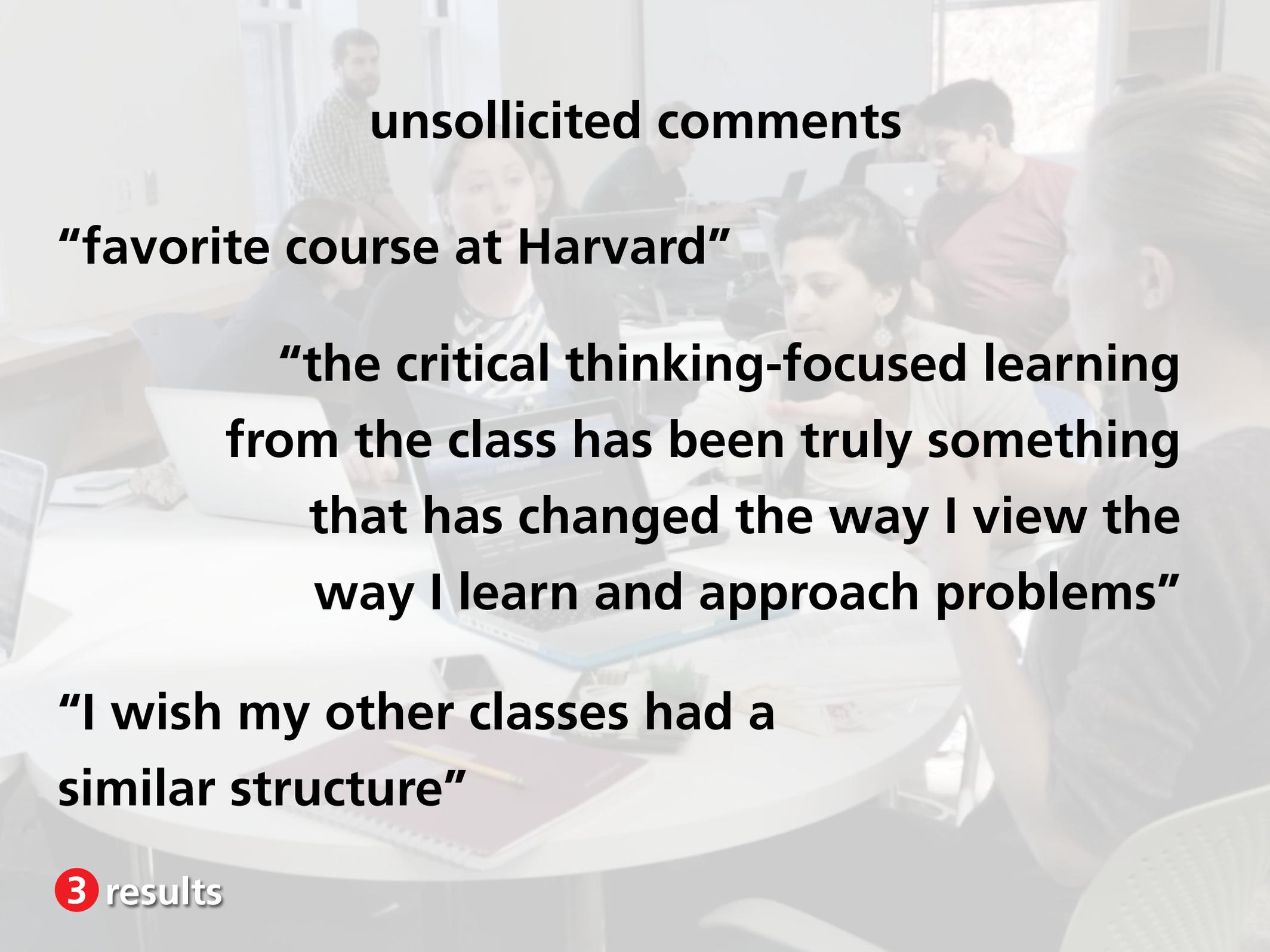
“favorite course at Harvard”



unsolicited comments

“favorite course at Harvard”

“the critical thinking-focused learning from the class has been truly something that has changed the way I view the way I learn and approach problems”



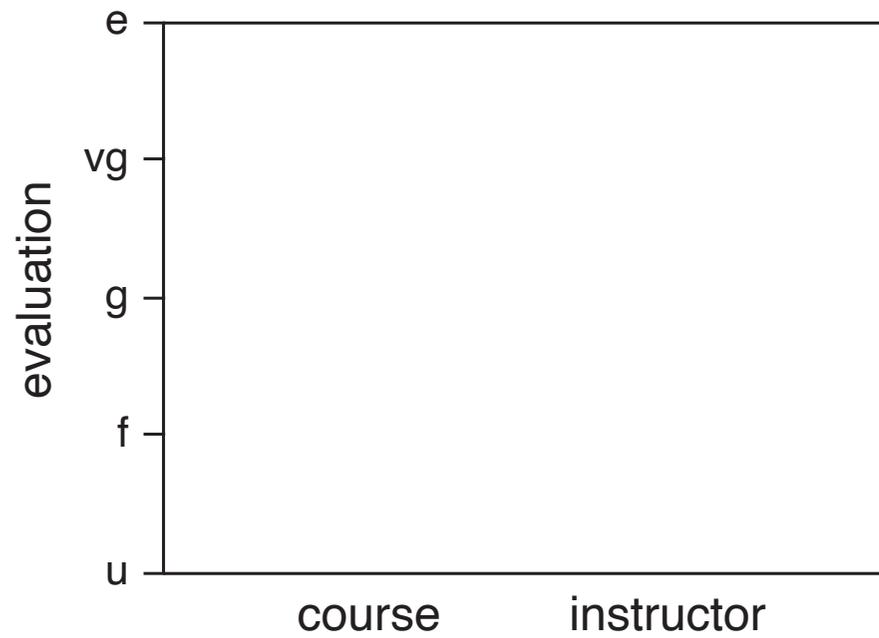
unsolicited comments

“favorite course at Harvard”

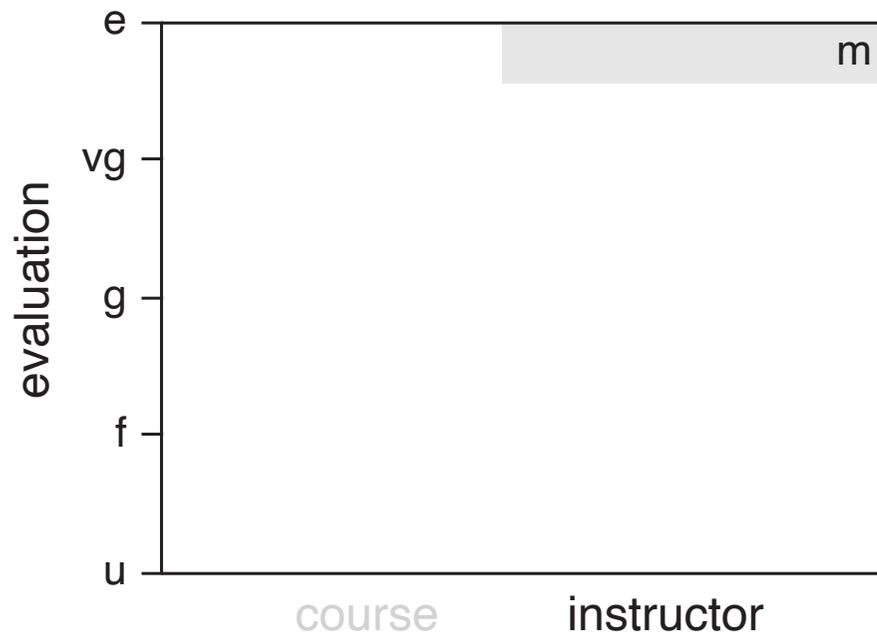
“the critical thinking-focused learning from the class has been truly something that has changed the way I view the way I learn and approach problems”

“I wish my other classes had a similar structure”

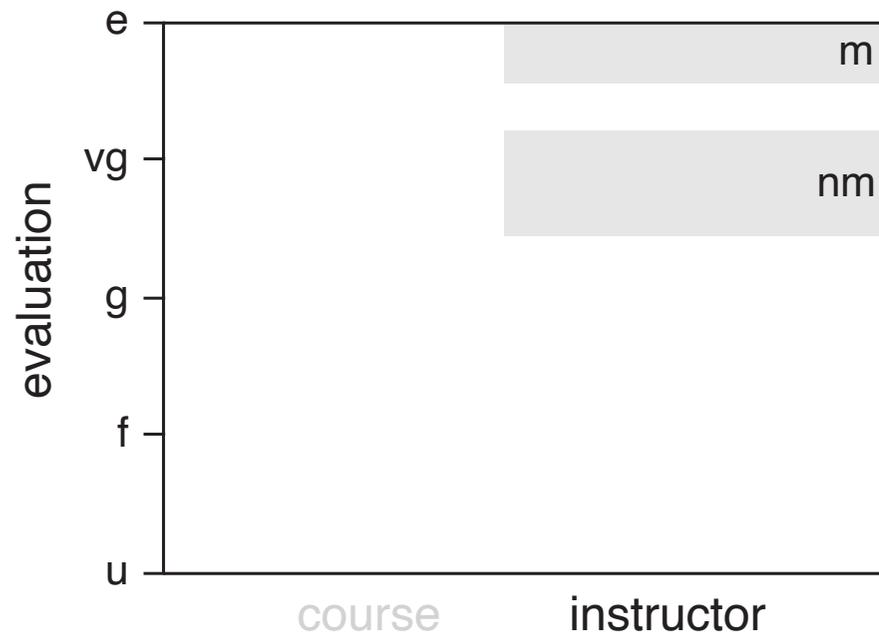
course evaluation



course evaluation



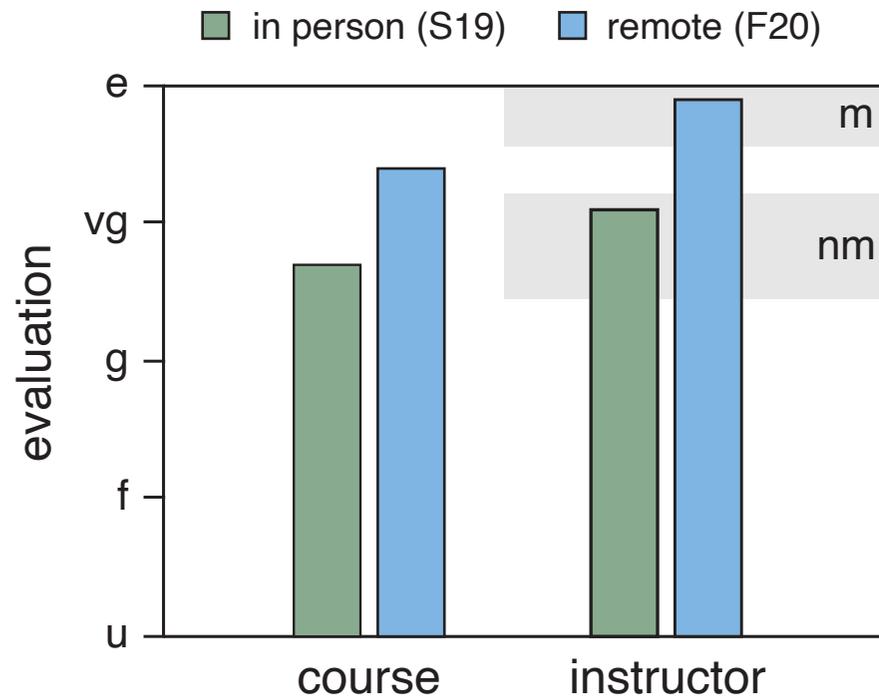
course evaluation



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!*

Research Shows Students Falling Months Behind During Virus Disruptions

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3 results

ikbeat

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I did my best teaching ever remotely!

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3 results

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Second D

I did my best teaching ever remotely!

So, now what?

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.

Building together





Project Fairs



Revert back?

Christina Gamboa

David Turner

Louie Collins

Amanda McKeever

Andrew Brown

Debra Linnick

Matt Jenkins

Justin Cohen

Benjamin Harris



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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course Canvas page: bit.ly/erics_course

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