Unexpected Research Findings from a Pandemic Year

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Digital Promise

Presentation for the Association of Chief Academic Officers panel "Leveraging Digital Technology to Better Serve Minoritized Students, " May 11, 2021.

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Topics for Today

- Data sources
- Satisfaction with courses taught remotely during COVID-19
- Challenges learning at a distance during COVID-19
- Instructional practices associated with greater satisfaction
- Implications for better serving minoritized students going forward

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Student Survey

National survey of 1,008 undergraduates who were taking college courses that began with in-class meetings and transitioned to entirely remote instruction.

62% or 638 survey respondents described STEM courses with a margin of error of 4.6 points.

- Student sample obtained from the Ipsos Knowledge Panel with 65,000 registrants
- Panel construction and sampling provide nationally representative data and support valid statistical comparisons
- Survey conducted May 13 – June 1, 2020
- Survey respondents about 30% from 2-year institutions and 70% from 4-year

Methodology details available in Appendix A of *Suddenly Online*

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Student Focus Groups and Instructor Interviews

- 22 case study courses at 10 broad-access higher education institutions
- Subject areas included biology, chemistry, economics, geology, and statistics
- Most of the courses had been using digital learning systems as part of the course prior to COVID
- 92 students, roughly half from minoritized race/ethnicity groups and a third on Pell grants
- 29 instructors from the same courses

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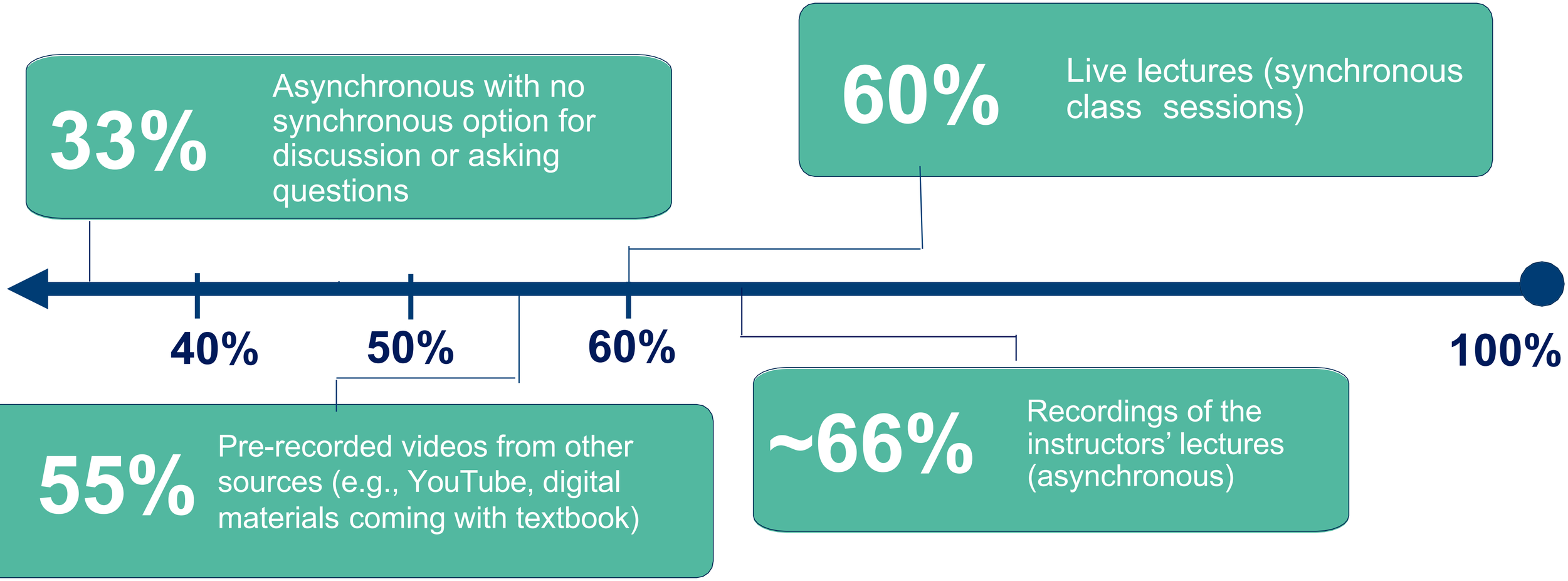
Instructional modalities after COVID



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Asynchronous instruction was thought to be more equitable

The first thing I did [after COVID-19] was record my lectures and deliver them asynchronously, and that was per our department mandate. . . After hearing from some of the students who might've struggled with the technology, I do think that at least recording them was a good idea, but I also heard from some students who said it was really hard for them to switch to online.

— Instructor interview

The biggest challenge after COVID was just keeping up because when it was in-person, we would meet twice a week. But once the videos were posted online, then we could access them whenever we wanted, so it was really easy to push it off and say, "I'll do that the next day," and that was just kind of a cycle.

— Focus group student

At first, I thought I'd just use the videos that Wiley created. Then my students begged me to hold WebEx sessions, so I held a WebEx session every day during class time because they still wanted the interaction.

— Instructor interview

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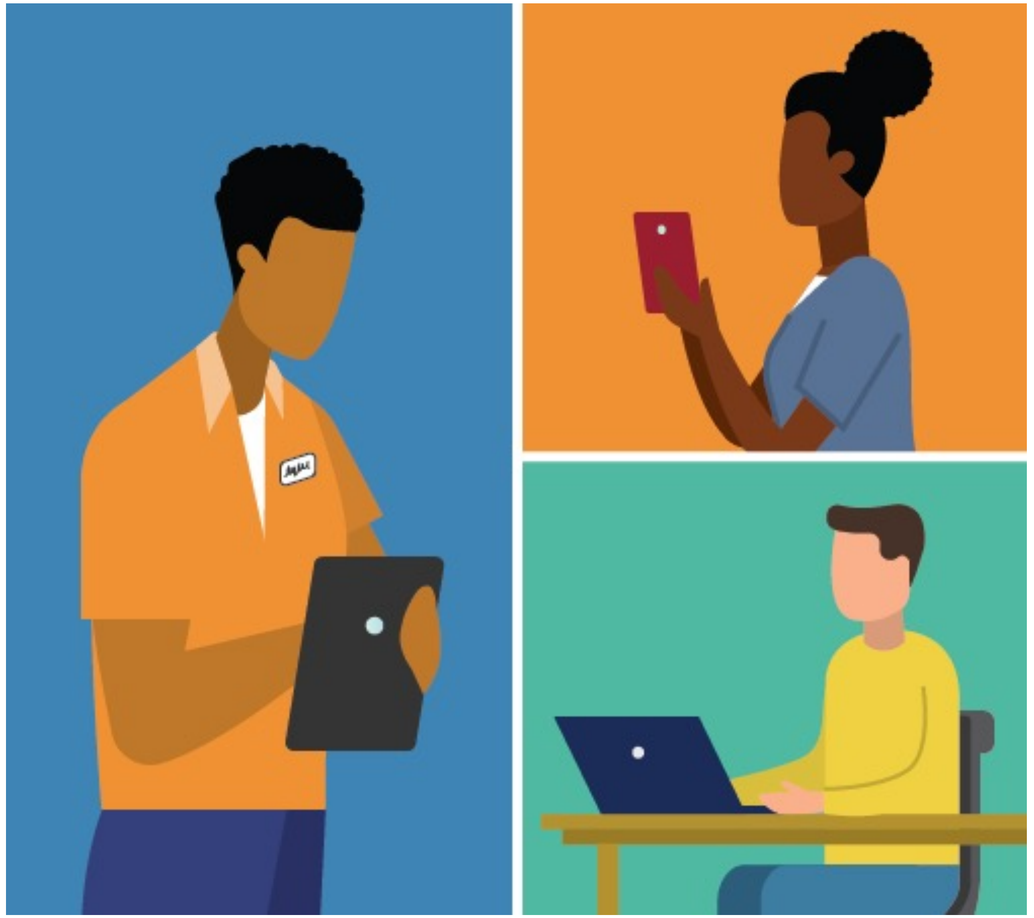
Student satisfaction with courses taught remotely



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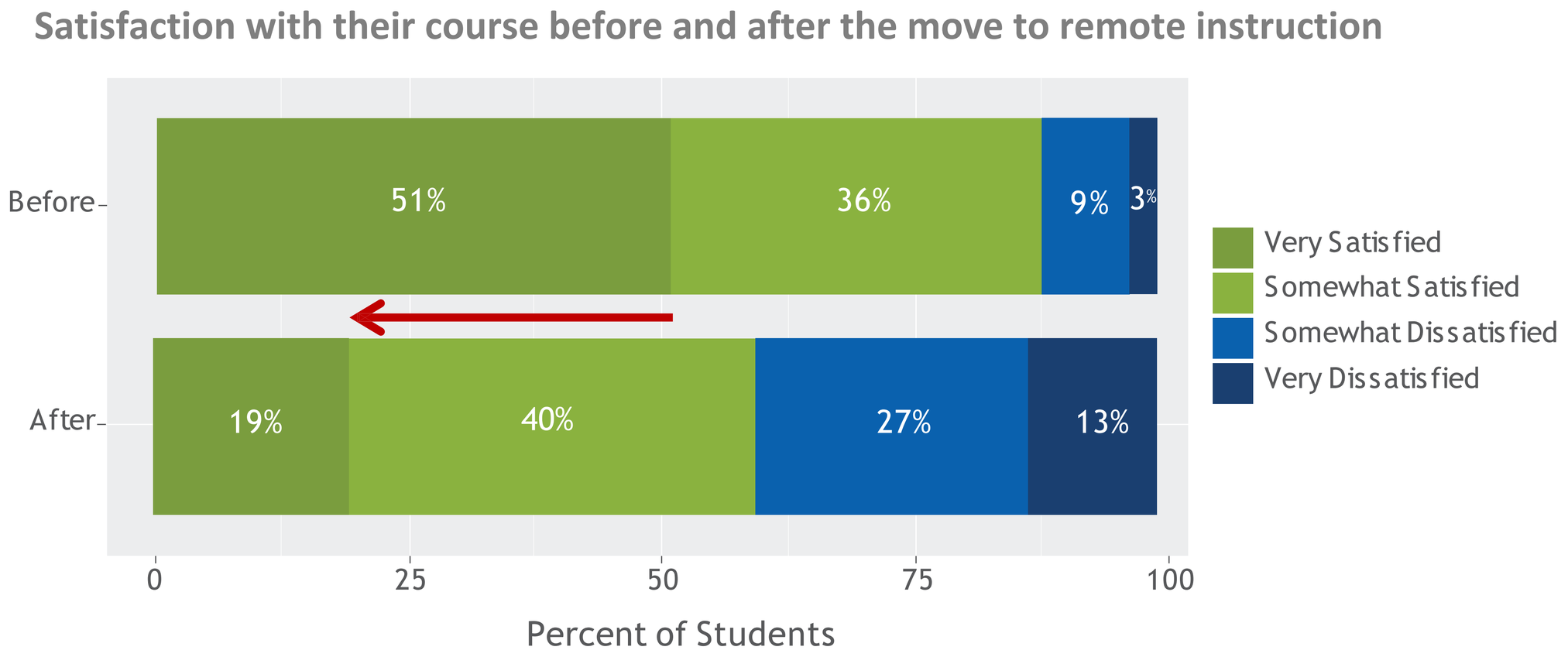
Course satisfaction dropped dramatically



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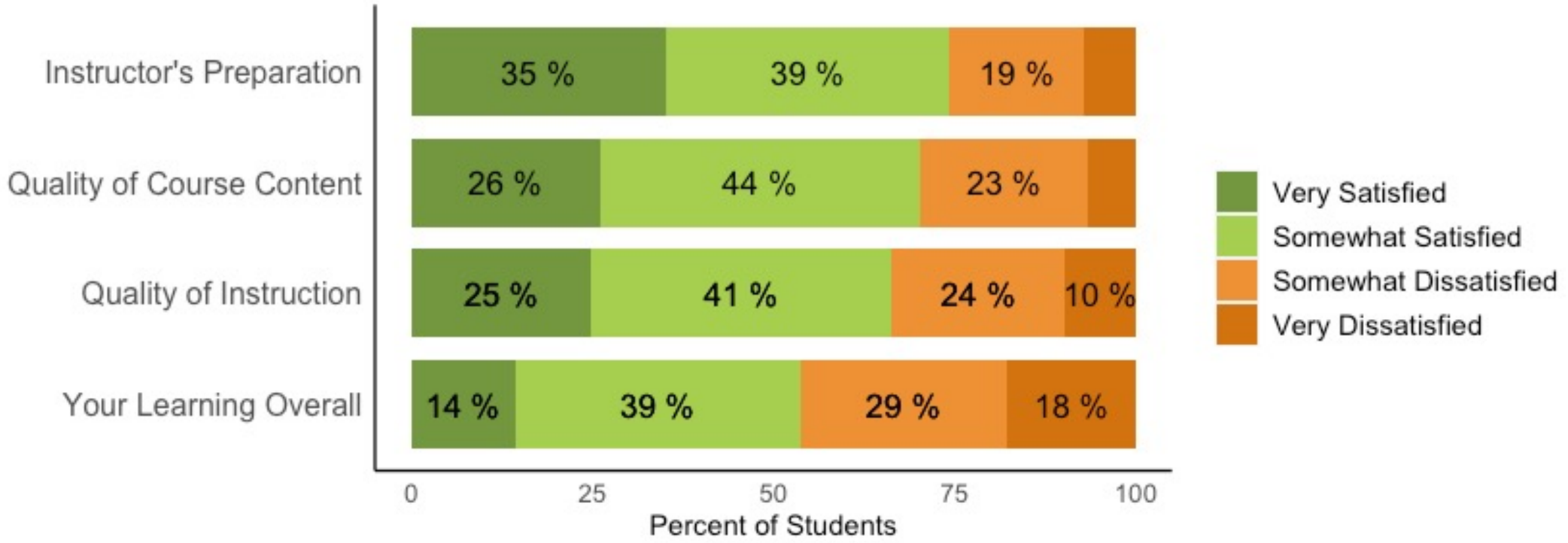
Most students did not blame their instructors

Satisfaction with four dimensions of their course before and after the move to remote instruction



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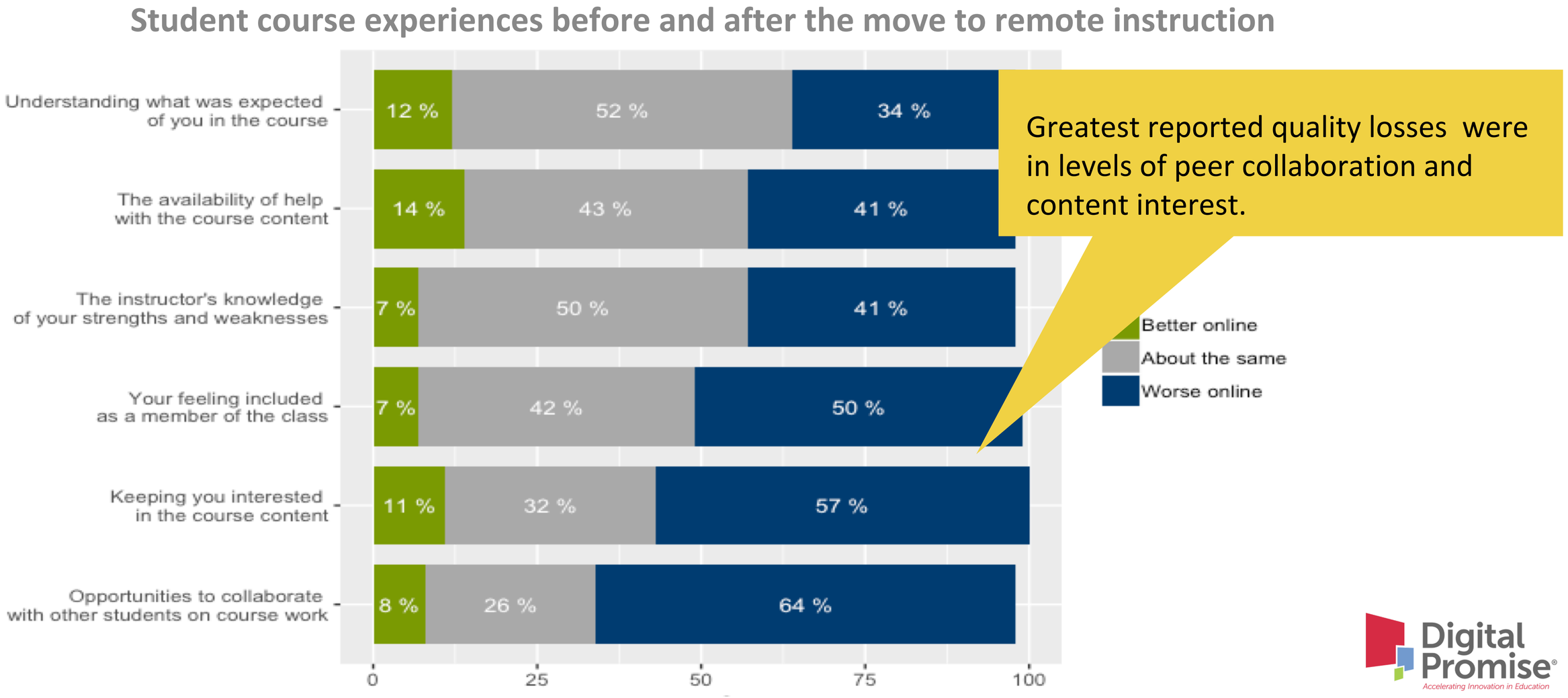
Areas where remote learning fell short



Greatest reported quality losses were in levels of peer collaboration and content interest.

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Students missed interacting with peers and instructors

During in person lectures I was able to ask my peers and my teacher for help with something I was struggling with and they would be able to show me how to do it. When class went online I was no longer able to ask for help the same way I could before, and it was harder to teach myself the class.

— Student survey respondent

It was more difficult to participate in discussions with the class because it was not the same as when we were in person. In person, we can raise our hands to ask to say something, and we can physically break into groups. Online, we were more shy in sharing our opinions because we did not want to interrupt another person. We took turns, making the discussion slower.
[Translated from textbox response in Spanish]

— Student survey respondent

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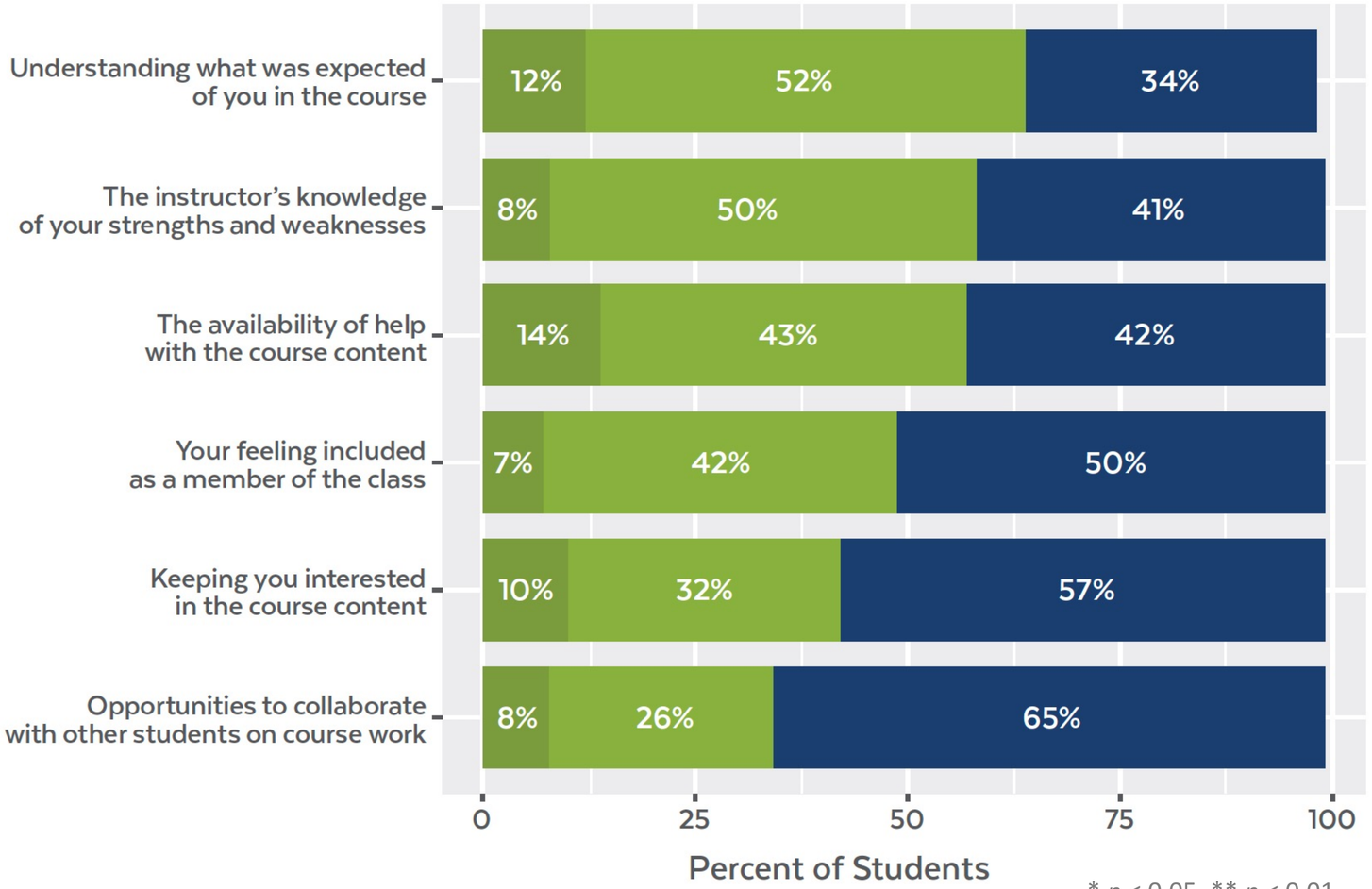
Comparing aspects of the course experience before and after shifting to remote learning

Quality of the course experience before and after shifting to remote instruction



* $p < 0.05$, ** $p < 0.01$

Most students thought remote instruction was poorer in terms of opportunities to collaborate with peers, level of interest, and sense of inclusion.

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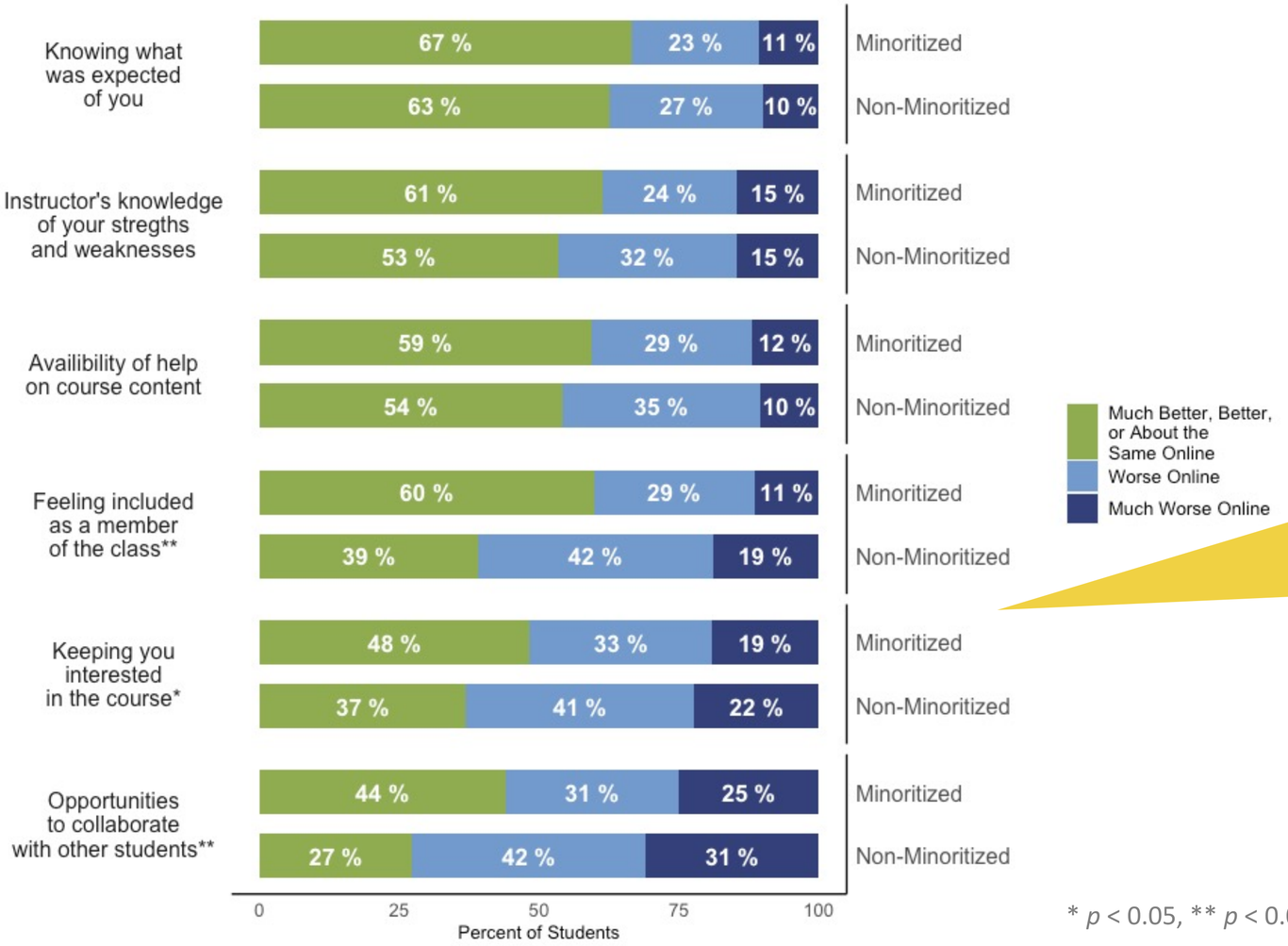
Aspects of the course experience by student minoritization status

Quality of the course experience before and after shifting to remote instruction



But students from minoritized groups were less likely to report that these aspects of their course experience lessened after COVID

* $p < 0.05$, ** $p < 0.01$

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The puzzle in this data

- Most students thought their course experience was better before the shift to remote learning
- But students from minoritized groups were more likely to think the remote experience was as good or better than the experience that included in-person meetings in terms of
  - feeling included in the class
  - opportunities to collaborate
  - level of interest
- This was true even though students from minoritized groups experienced more technology and other challenges with remote learning
- Why? What does this suggest about the course experiences of students from minoritized groups before COVID?

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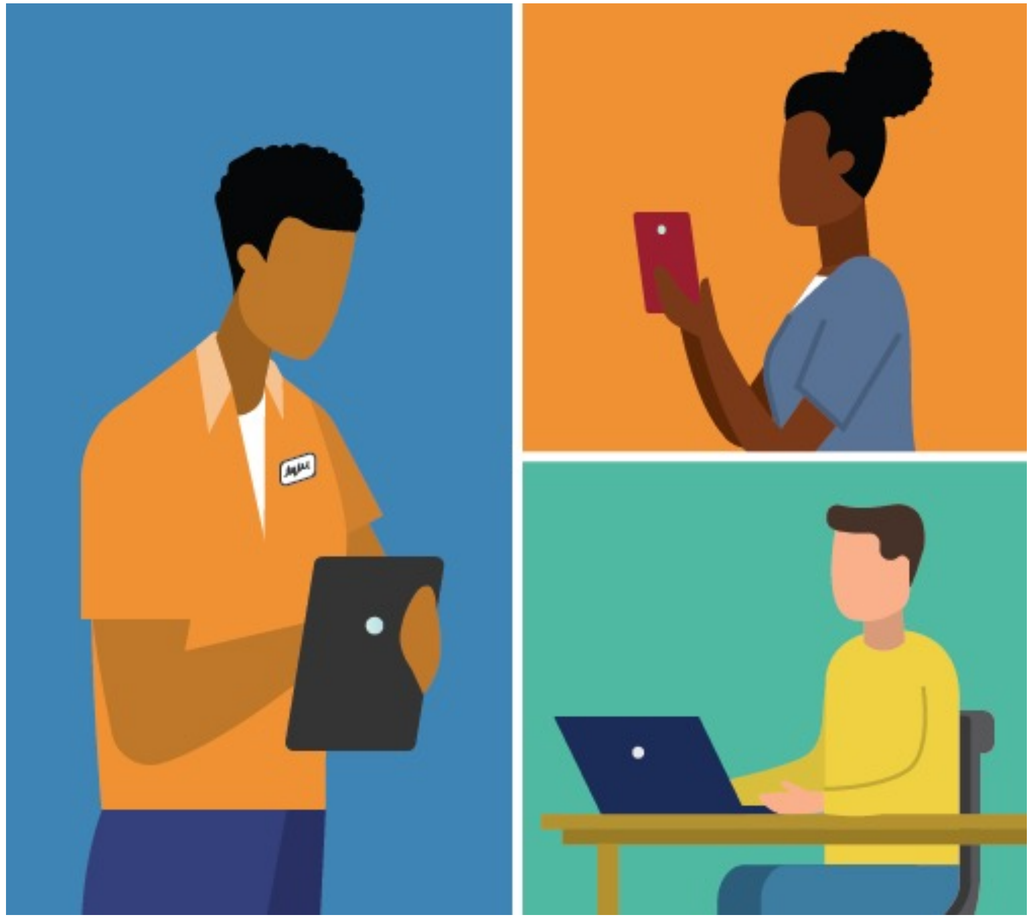
Challenges continuing courses remotely



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The technology access gap

- Overall about **1** in **6** students experienced internet connectivity and/or hardware/software problems often or very often.
- Technology access issues were more prominent among students of color and those from lower-income households.
  - **20%** of students from minoritized racial/ethnic groups experienced internet connectivity problems often or very often compared to 12% of students from non-minoritized groups.
  - **22%** of students from lower-income households experienced internet connectivity problems often or very often compared to 11% from higher-income households.
  - Major hardware and software problems were less common than internet issues, but exhibited the same pattern of race/ethnicity and income level differences.

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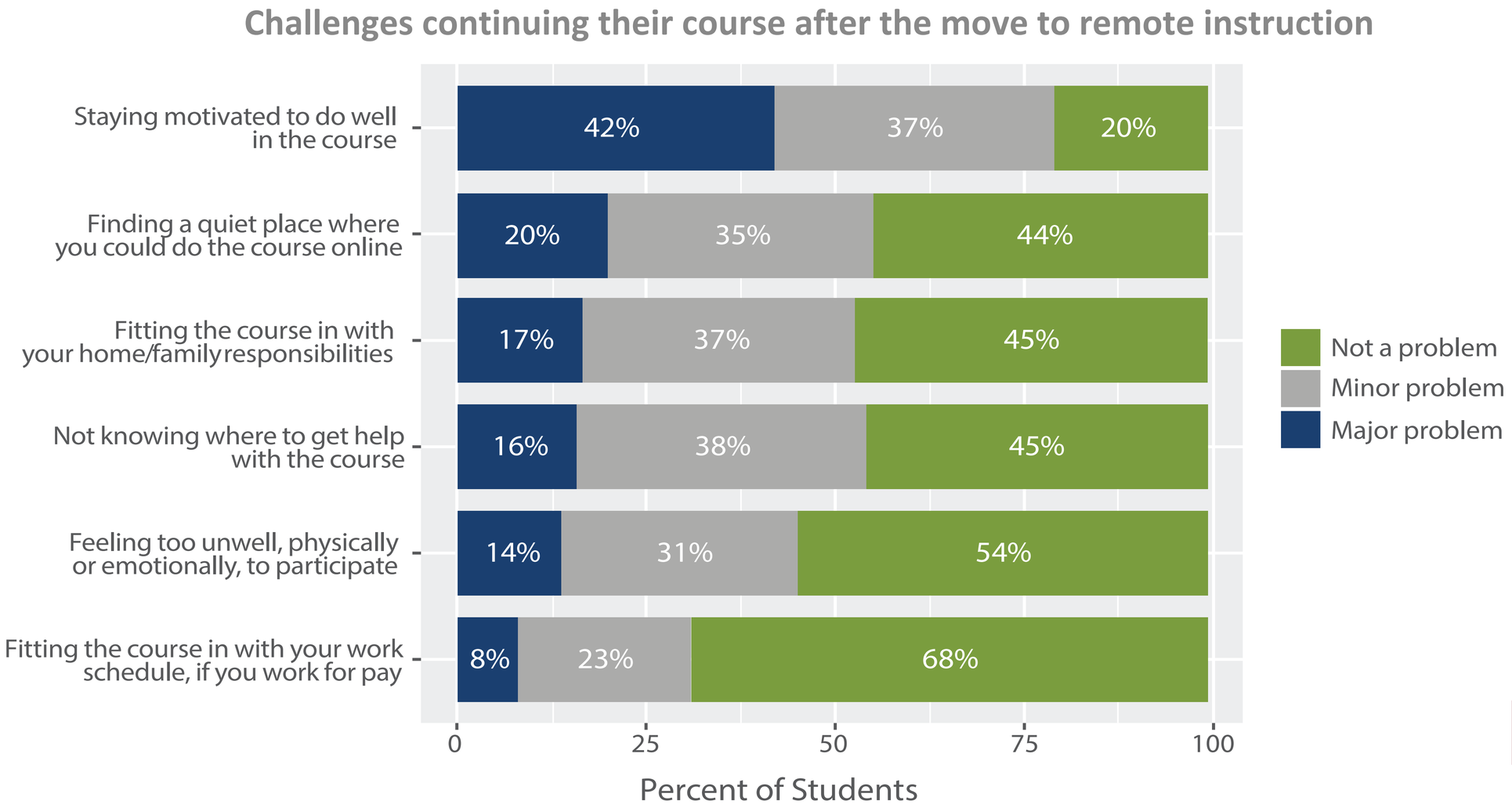
Non-tech-related challenges to learning remotely



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Staying motivated was the most frequently cited challenge

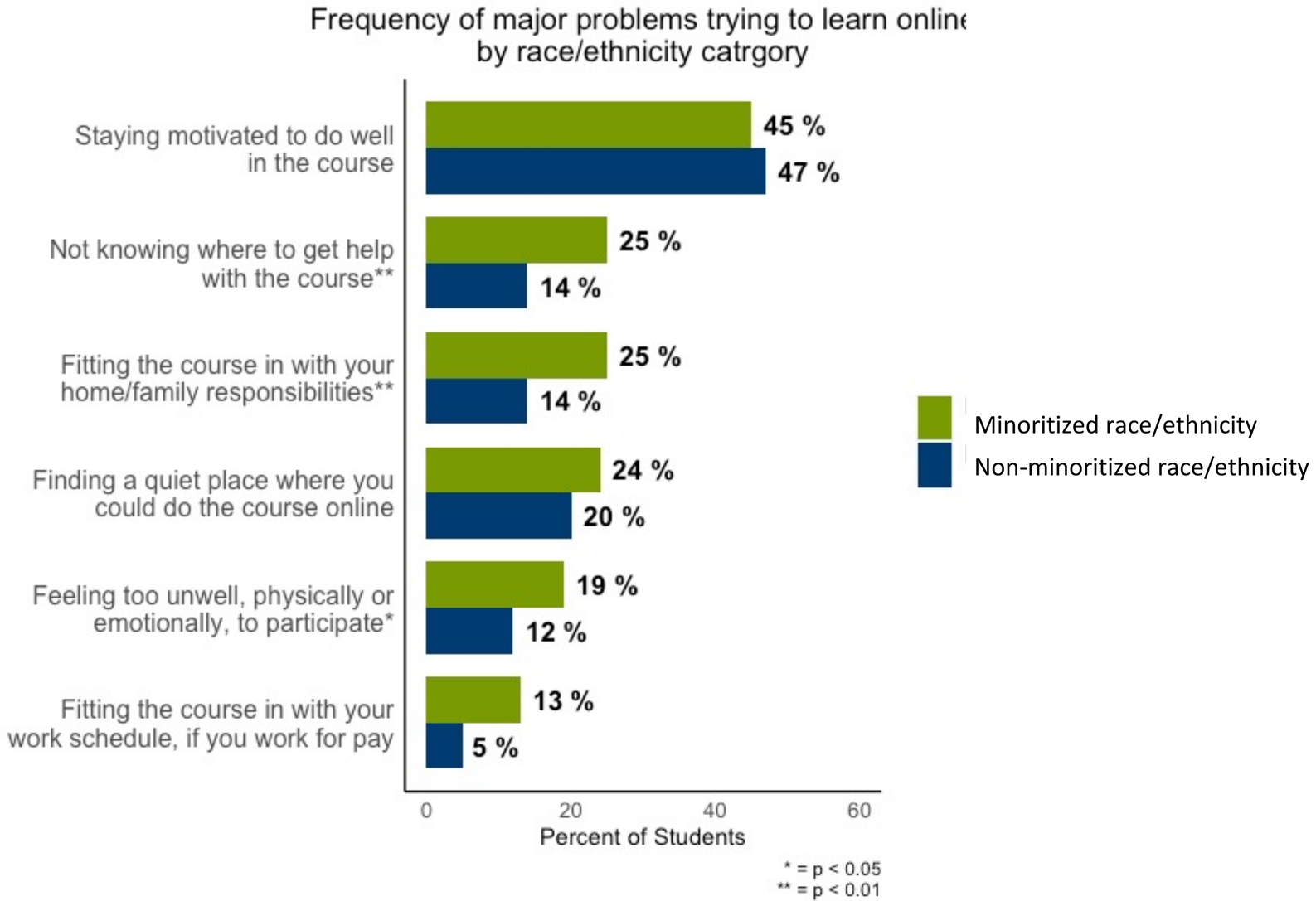
Trying to stay focused and on top of things without having the same daily schedule and regular in-person chats. It was a lot easier to get left behind and for once in my academic career, I actually got behind on a lot on work.

— Student survey respondent

Mustering the motivation to watch recorded lectures. Often my professors would assign lectures that were longer than the assigned duration of the class, and lectures were not made available at the proper times. Online classes felt much more like work than they ever did on campus.

— Student survey respondent

Students from minoritized race/ethnic groups experienced most challenges more frequently



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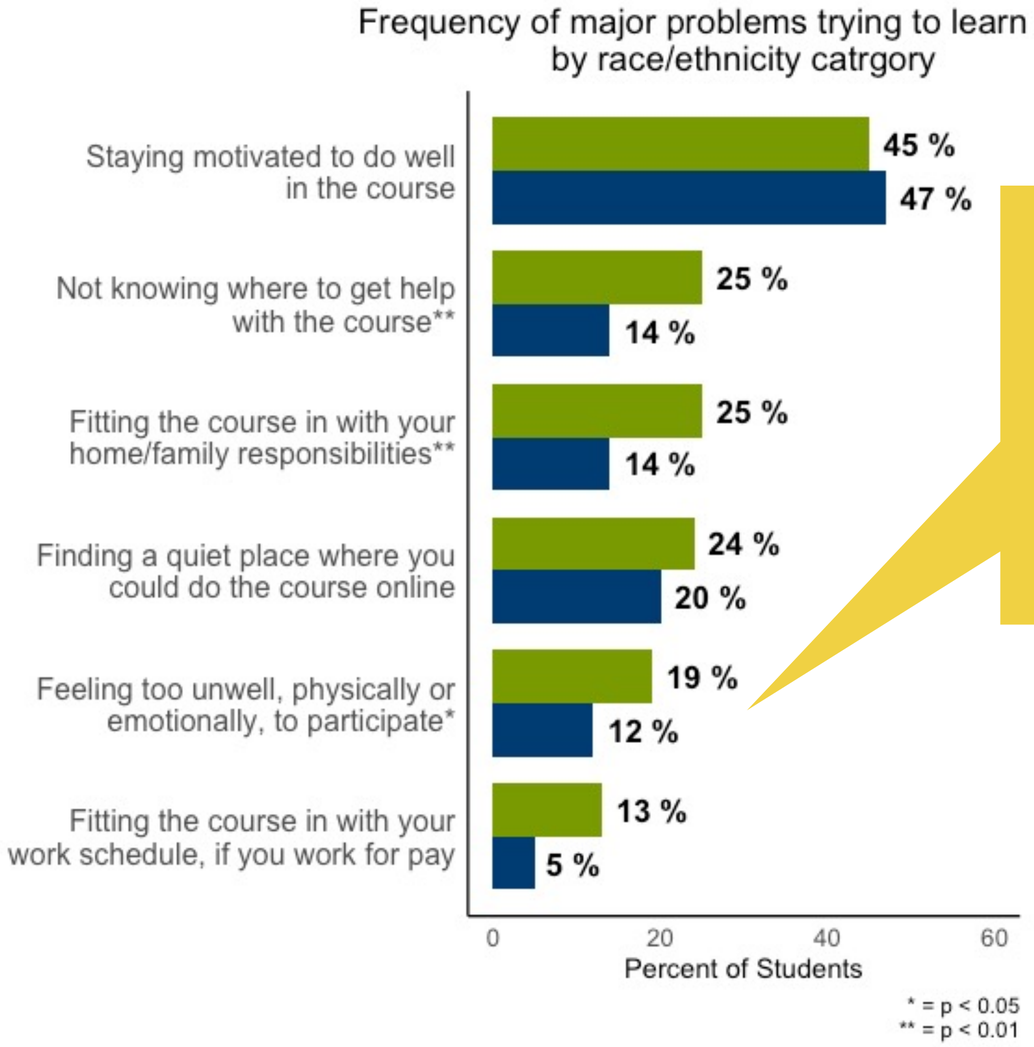

Similarly, women, those responsible for childcare, and students from low-income households reported more challenges.

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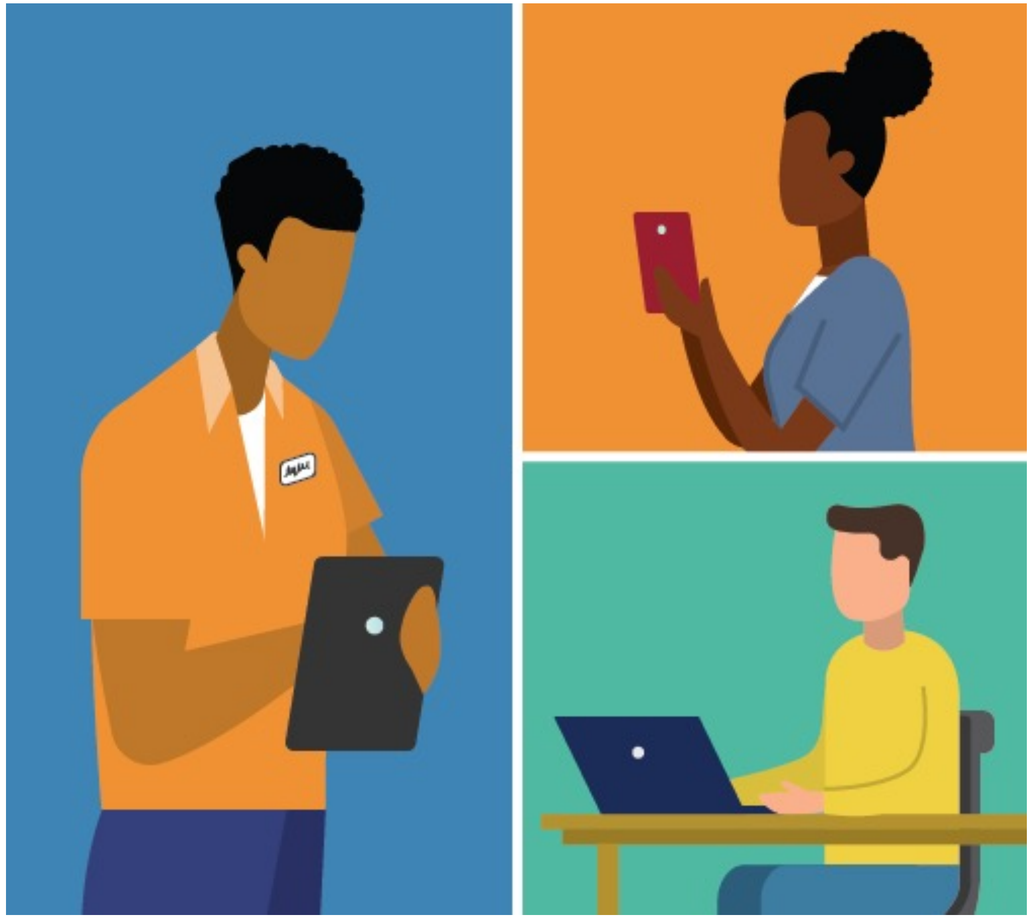
Instructional practices associated with enhanced course satisfaction



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Student focus group responses revealed fewer motivational issues for students in courses . . .

- that were using courseware before the pandemic
- that held synchronous online sessions after instruction switched to remote delivery

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Recommended practices for online instruction

Interaction

Live sessions in which students can ask questions and participate in discussions

“Breakout groups” during a live class

Personal messages to individual students about how they are doing in the course or to make sure they can access course materials

Content & Activities

Breaking up class activities into shorter pieces than in an in-person course

Using examples from the real world to illustrate course content

Assignments to work on group projects separately from the course meeting

Assessment Practices

Frequent quizzes or other assessments

Assignments having students express what they have learned and what they still need to learn

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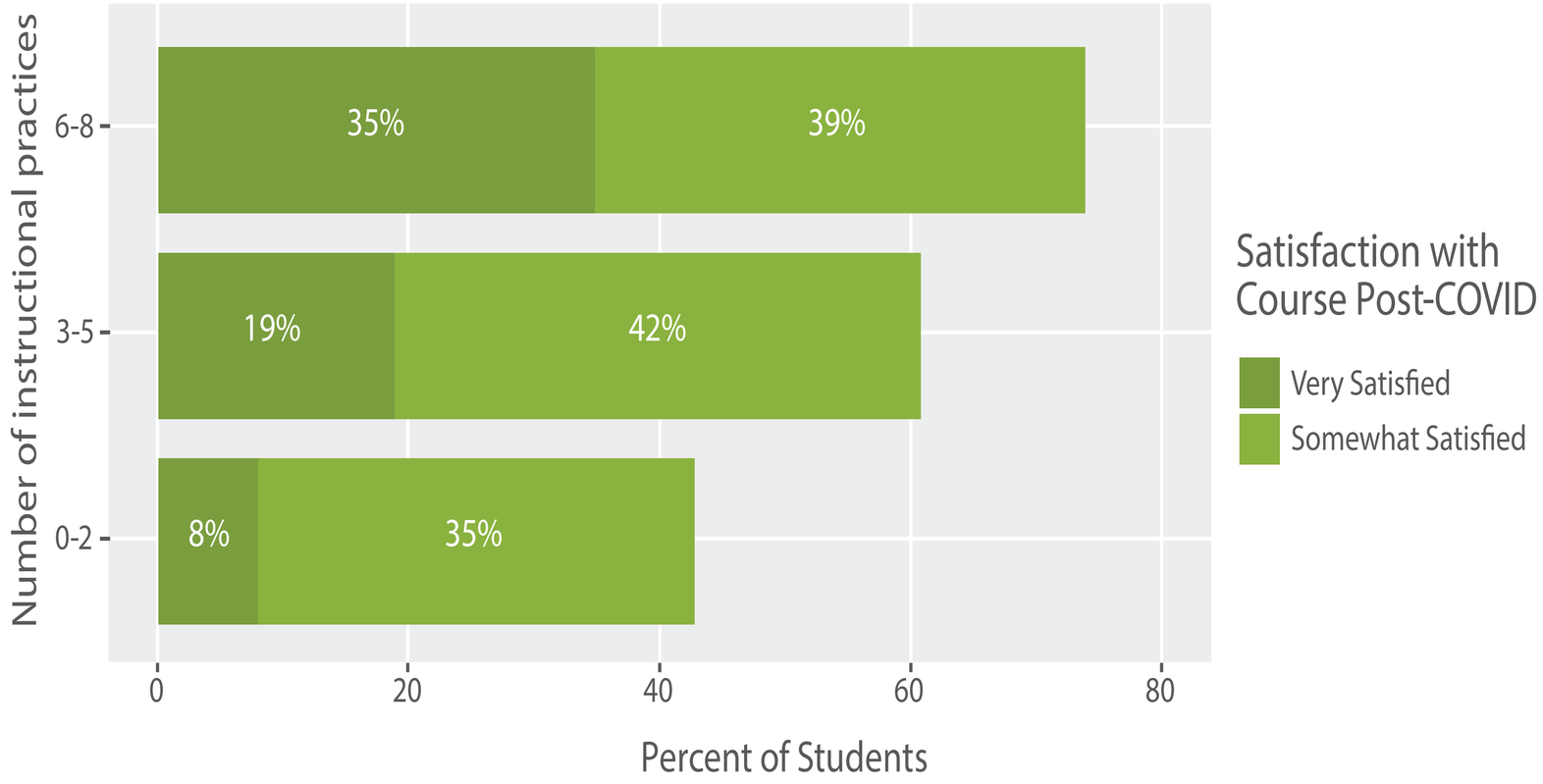
Use of recommended practices and student course satisfaction

Courses using more of the recommended practices had higher satisfaction ratings.



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The relationship between number of practices used and satisfaction held for all key student groups

Student Characteristic	*F*	*p*	df	R^2	Increase in Satisfaction with +1 IP
Female	74.03	< 0.001	643	0.10	0.17
Hispanic	13.83	< 0.001	227	0.05	0.12
Black, non-Hispanic	27.49	< 0.001	96	0.22	0.20
Lower-income households [a]	33.75	< 0.001	366	0.08	0.14
Responsible for childcare	6.577	< 0.05	114	0.05	0.11
Working 21+ hours a week	7.839	< 0.01	226	0.03	0.09
All students	110.1	< 0.001	1006	0.10	0.17

IP = Instructional Practice

[a] Family Income < $50,000 annual

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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But the practices that promoted varied somewhat across groups

Student Characteristic	Personal messages	Using real-world examples	Reflections regarding learning	Breaking up class activities	Group projects	Live discussion sessions
Female	0.23***	0.23***	0.10*			
Hispanic		0.27***	0.14*			
Black, non-Hispanic	0.35**		0.26*			
Lower-income households [a]	0.25***		0.15**	0.11*		-0.14**
Responsible for childcare	0.27**	0.22*			-0.22*	
Working 21+ hours a week	0.17*	0.18**				
All students	0.22***	0.18***	0.12***			0.11***

[a] Family Income < $50,000 annual

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Black, non-Hispanic	0.35**		0.26*			
Lower-income households [a]	0.25***		0.15**	0.11*		-0.14**
Responsible for childcare	0.27**	0.22*			-0.22*	
Working 21+ hours a week	0.17*	0.18**				
All students	0.22***	0.18***	0.12***			0.11***

We conjecture that low-income and care-giving students may have difficulty participating in scheduled group work or discussions.

[a] Family Income < $50,000 annual

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Some implications for teaching going forward

- Ensure every student has a computer and internet access adequate for videoconferencing and the digital learning applications used in your courses
- Develop plans for dealing with broader-than-usual ranges in student preparation for key courses; consider implementing adaptive learning systems *plus* techniques for maintaining a strong sense of belonging and classroom culture
- Consider incorporating independent digital learning resources and activities into courses even if face-to-face instruction resumes
- Provide opportunities for faculty to learn how to implement evidence-based teaching practices, including those related to fostering a sense of belonging for students from different backgrounds and contexts

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Project Publications

- Means, B., & Neisler, J., with Langer Research Associates. (2020). *Suddenly Online: A National Survey of Undergraduates During the COVID-19 Pandemic.* San Mateo, CA: Digital Promise. https://www.everylearnersolve.org/asset/h22tgaXzW18yQImzAsdR
- Means, B., Peters, V., Neisler, J., & Griffiths, R. (December 2020). *STEM Courses During the COVID Pandemic.* https://digitalpromise.dspacedirect.org/handle/20.500.12265/109
- Means, B., & Neisler, J. (2021). Teaching and learning in the time of COVID: The student perspective. *Online Learning, 25*(1), 8-27. https://doi.org/10.24059/olj.v25i1.2496