# Insights from Spring 2020 Remote Instruction:
## Results from surveys on remote learning and teaching

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UCDAVIS
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*We know you are doing your absolute best…. So are we.*
*Be patient with us, with yourselves, with the process.*

*We will look back on this time in 5 years and not remember if we got through 9 units or 10, but instead remember how we treated each other, how we reached out to each other, and how we got through this together.*

*Thank you for your efforts.  We see you, we see all you are doing.*

-Student Survey Response

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# Executive Summary

The Center for Educational Effectiveness surveyed 2196 students, 418 instructors of record, and 264 teaching assistants (TAs) at the end of the spring 2020 quarter – the first full quarter of remote instruction at UC Davis. Instructors and TAs answered questions about course delivery, instructional activities, student learning and connectedness, challenges, software, resources, and concerns for fall quarter. Students were asked about their experiences with instructional activities, courses that worked well or poorly in the remote environment, and their advice for students and instructors. Selected findings follow.

**Instructional activities**
Most students were able to participate in most class activities. For the exceptions, technology or WiFi presented the most challenges followed by finding quiet space. Additionally, about 25% of students who reported having a disability said that remote learning sometimes prevented them from accessing needed accommodations, in particular extra time on exams.

Students and instructors agreed that homework and/or problem sets helped the most with learning, followed by lectures - recorded and live lectures both ranked high. Students also reported learning from office hours, while instructors observed learning in live discussions, reading responses, and student presentations. Low-stakes assessments, such as quizzes and polls, and office hours were the activities that most helped students stay motivated.

Students reported generally similar activities in classes they felt worked well and those that did not, but with a wider variety of activities in the classes that worked well. Recorded lectures or demonstrations designed to be watched online, rather than simply recorded from live lectures, online message boards, low-stakes quizzes, and short reading responses were more common in classes they felt worked well, while proctored exams were used more in classes they felt worked poorly. In open comments, students described both instructor flexibility and the nature of the course material as fundamental in determining whether a course worked well remotely.

Open-ended comments from instructors and TAs noted that alternative assessment methods beyond the midterm-and-final-exam model worked well, as did class discussions and using a combination of synchronous and asynchronous activities. Office hours were vital. Finally, instructors, like students, said flexibility was key.

**Challenges of remote teaching**
The greatest challenge reported by most instructors was keeping students engaged. Instructors and TAs also found that facilitating participation during live meetings, achieving the course learning goals, answering questions, and administering exams were more difficult in remote learning. They further reported spending more time on some aspects of instruction such as preparing class lectures and activities.

Recommended solutions to the problem of keeping students engaged included interactive tools such as Zoom polls and active classroom activities such as collaborative projects, quizzes, and presentations. Instructors and TAs also suggested better ways to administer exams, including using alternative assessment methods such as take-home exams and online tools such as Canvas quizzes. To better connect with students, instructors and TAs described holding one-on-

one meetings and office hours, including live components in their classes, and encouraging students to ask questions online using platforms such as Piazza.

In students' advice to instructors, they recommended taking the time to ensure that expectations and deadlines were clear – these efforts helped students feel that the instructor cared about their success. They emphasized the importance of patience and understanding given the extraordinary circumstances of the pandemic and political upheaval. Finally, students asked instructors for opportunities to engage individually, through office hours, individual meetings, breakout rooms, and group projects.

### Software

Unsurprisingly, Zoom was the most used software during spring 2020, with 98% of instructors indicating its use. Other tools that were frequently used included Canvas Speedgrader (65%), Canvas Discussion (61%), YouTube (36%), and Google Docs (35%). Instructors and TAs were generally very positive about most of the tools they used except for Examity; its users expressed dissatisfaction with the non-user-friendly functions and its negative impact on students.

### Institutional and Department Support

Instructors and TAs' most-appreciated supports included access to software, workshops and webinars, the Keep Teaching website, IT support, and department- or campus-level guidelines. They requested further access to online tools and instruction on how to use them, guidelines for teaching such as how to change expectations for remote teaching and concrete best practices, and hardware support.

Many instructors or TAs appreciated department-level supports, most commonly formal and/or semi- formal training sessions or meetings about instruction in the remote context. Other helpful department-level supports included shared resources among colleagues, infrastructure, and human resources. About 28% of respondents ($N$ = 94) indicated receiving no support from their departments. TAs were less likely than instructors to report department support, and more likely to request software and other training.

*I know staff and faculty are very unsure of what they can and should do, now and in the future, but I'm sure they are all trying their best to figure out the best solutions. Thank you for striving to help us, and I believe that asking the students what is best for them will be the most effective way of problem-solving.*
*-Student Survey Response*

# 1. Introduction

On March 14, 2020, 9 days before the start of the spring quarter, UC Davis announced that due to the COVID-19 pandemic, all instruction for spring would be online. Students and instructors scrambled to prepare, resulting in an astonishing process of collective learning and a very rapid transition to remote education. Most of the community now faces at least one more quarter online before we can return to in-person classes. This report is intended to consolidate what we learned about teaching and learning remotely, to inform decisions for this fall and subsequent times in which we find it prudent to move classes to the remote context.

We report results from parallel surveys of students, instructors, and TAs conducted at the end of the spring quarter. The goal was to find what practices, resources, and tools were most helpful for successful emergency remote instruction. We begin by describing the methodology and survey samples. The subsequent sections address pedagogical activities, challenges of remote teaching, software, equity, and resources for instructors. We end with instructors' and TAs' greatest concerns for the fall quarter and general comments from both instructors and students. Finally, we include results from a survey of academic advisors administered separately by Academic Advising Enrichment.

## 1.1 Methodology

The student survey was released on May 29 and closed on June 25, running one week prior to, and two weeks after, the final exams period. It was disseminated to all undergraduate students who enrolled in spring courses via an email directly from CEE, with supporting emails from college-level advisors and Student Affairs units as well as announcements in the learning management system (Canvas), campus social media accounts, and a Chancellor's Message. The survey was incentivized with a gift card drawing. Many of these communications were delayed or downplayed to give appropriate prominence to messages regarding George Floyd's murder and the Black Lives Matter movement, as the survey release coincided with these events. As a result, and as with other surveys conducted around the same time, the response rate was low - 2196 undergraduate students responded, representing 7.7% of those enrolled in the spring quarter. The basis for the nearly all the results for this report was a module shown to 1056 of those respondents, selected at random from the full sample. Advice to instructors and general comments come from the full sample.

The instructor and teaching assistant (TA) survey was released shortly after grades were due for spring quarter (open June 28 through July 16). It was emailed to spring instructors with supporting messages sent through the Faculty Senate and Federation list-serves, the CEE Teaching Assistant Consultant program, and on the Know Your Students instructor tool. 418 instructors of record and 264 teaching assistants responded, representing 26.3% of instructors of record and 15.2% of teaching assistants who taught in the spring.

Both surveys included a mix of closed- and open-ended questions. For the student survey, responses were linked with administrative data on demographic background and college affiliation. A methodological error and limited data access prevented us from matching instructors and TAs to detailed administrative data, but we were able to match about half the instructors of record to information about job title and college affiliation. For both surveys, we used a simple inductive thematic coding process with single readers for the open responses. The full available

sample, excluding duplicate responses, was used for each question – respondents who partially completed the surveys were included in results for the questions they answered. The survey instruments can be found in Appendixes A and B.

## 1.2 Data

**Student Survey**

2196 undergraduate students responded to the student survey. Ethnically, the respondent sample was very similar to the UC Davis undergraduate population, although international students responded less frequently than domestic students. 75% of respondents were women – 14 points more than the population share. First-generation college students made up 39% of respondents, while 24% reported a family income that put them at 250% or less of the poverty line.
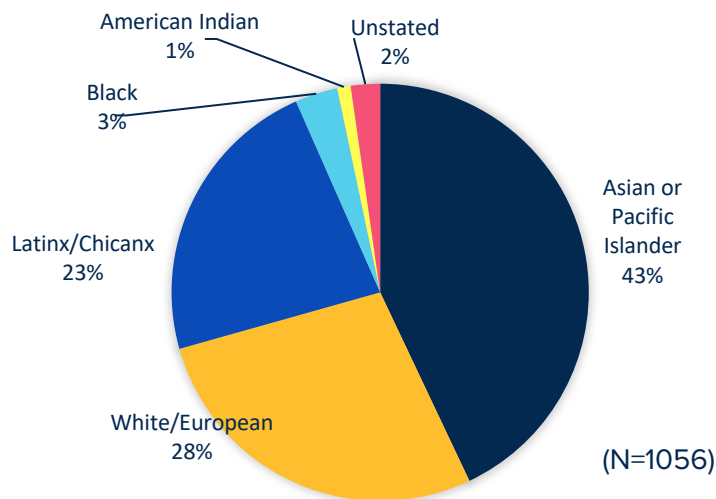
Figure 1. Ethnicity of student respondents
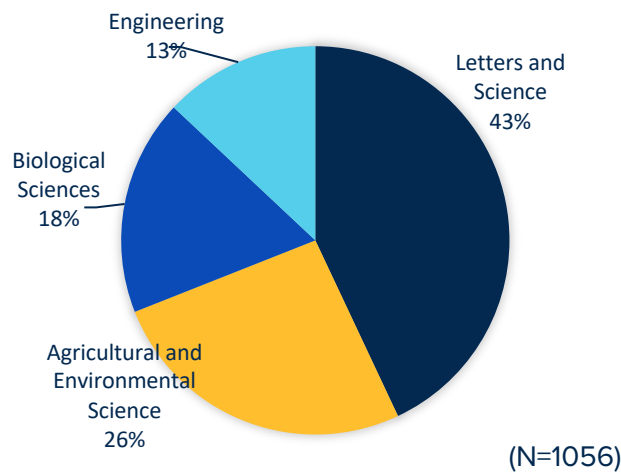
Figure 2. College of student respondents

Academically, 79% of respondents were admitted as first-year students while 21% were transfer students. Representation by college was very similar to the student population as a whole. In terms of academic standing, 16% of respondents were first-years in the 2019-2020 academic year, while 22% were second-, 31% third-, and 31% fourth-years or higher.

**Instructor Survey**

418 instructors of record and 264 teaching assistants (TAs) responded to the instructor survey. A little over half of the instructors of record logged in to the survey using a university account such that they could be identified in administrative data (the rest could not be identified due to a survey setup error). 66% of the instructors of record who logged in were tenure-track research faculty. Smaller proportions were teaching professors or lecturers, and about 25% did not fit any of these categories. We were unable to identify descriptive statistics for TAs due to data limitations.
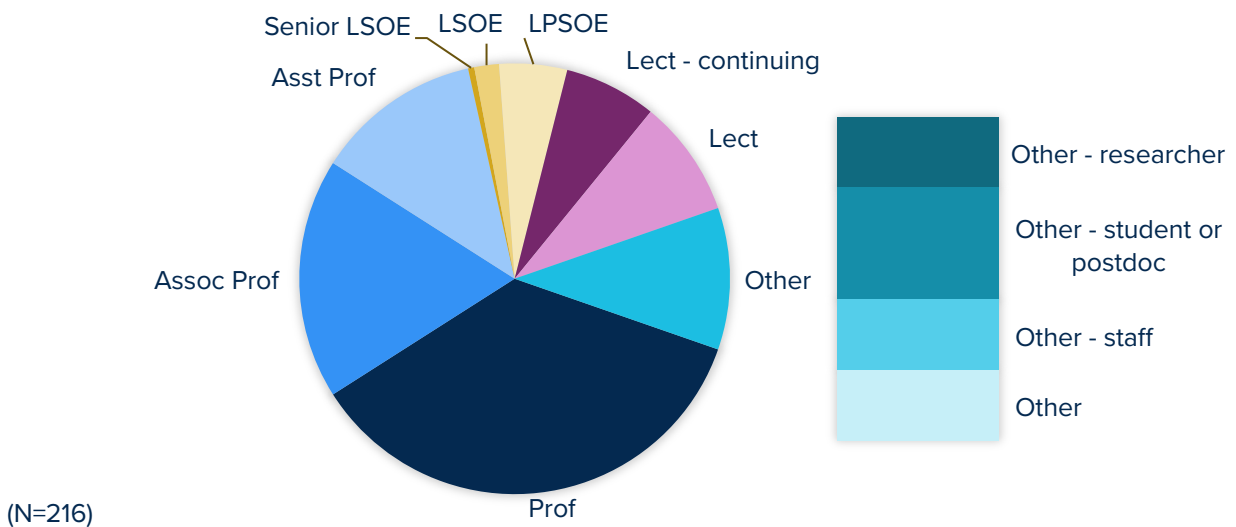


*Figure 3. Title of instructors of record*
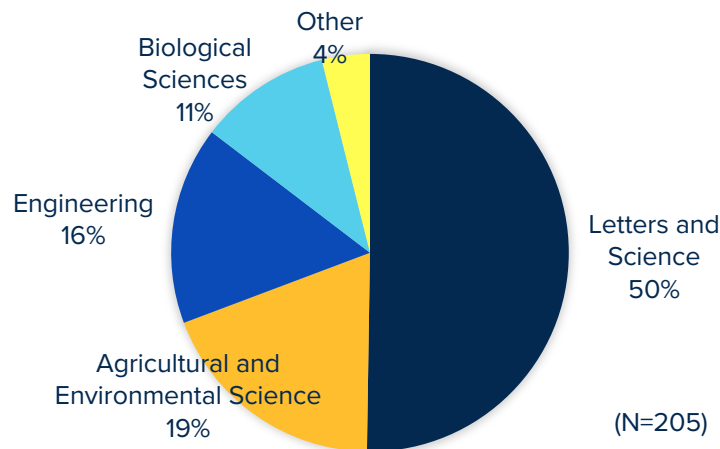


*Figure 4. College of instructors of record*

# 2. Instructional Activities

During the Spring 2020 quarter, most instructors and TAs (*N* = 340, 49%) indicated teaching at least one course with required synchronous meetings. The second most popular method was having an optional synchronous meeting, with 297 or 43% of instructors choosing this option.
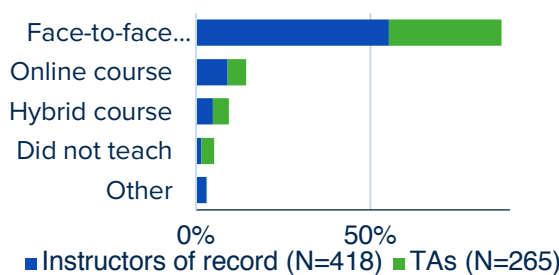


*Figure 5. Types of courses taught prior spring 2020*
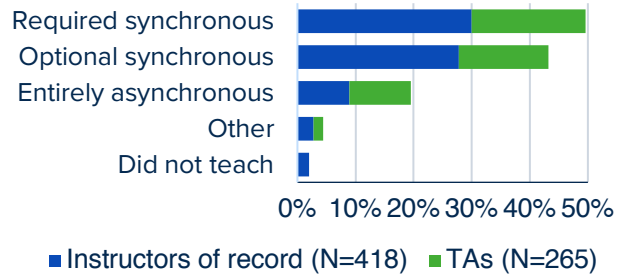


*Figure 6. Delivery method of courses taught to in spring 2020*

*"Providing instruction both in live Zoom sessions and posting recordings later has been the best. Having live Zoom sessions makes me feel more connected to the class, especially when I can ask questions via chat. The recording ensures that if my internet doesn't work I can still learn."*
*-Student Survey Response*

Likewise, most TAs reported using required synchronous meetings for their discussion sections and laboratories (N = 106 or 40% for discussion sections and N = 50 or 19% for laboratories).
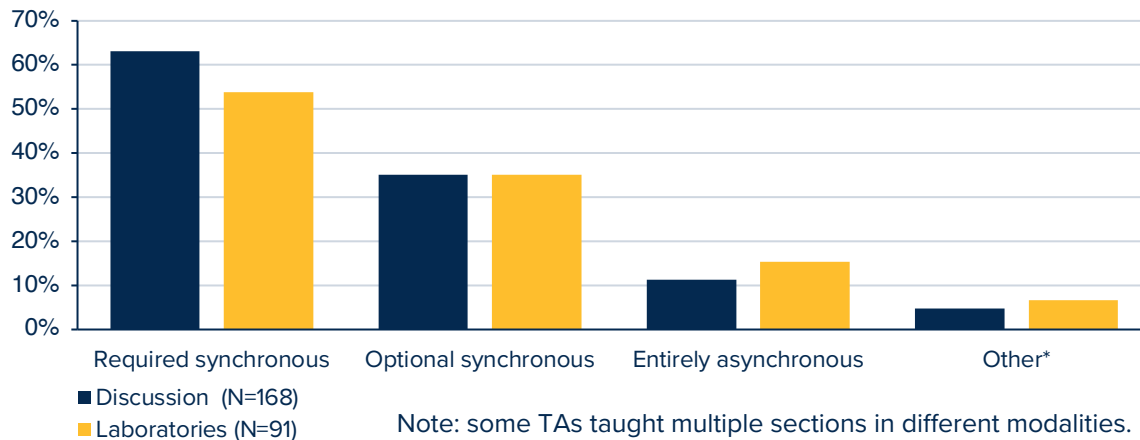


*Figure 7. Delivery method of discussion and laboratory sections*

Instructors were asked to identify from a list the activities they used in their classes. The six most frequently used class activities during the spring quarter were office hours, live lectures, live discussions, homework, non-proctored exams, and recorded lectures designed to be watched online. Overall, instructors and TAs agreed on the rankings of the most frequently used class activities, with the exception of non-proctored exams which instructors reported using more frequently than TAs, and breakout groups, which TAs used more frequently than instructors.
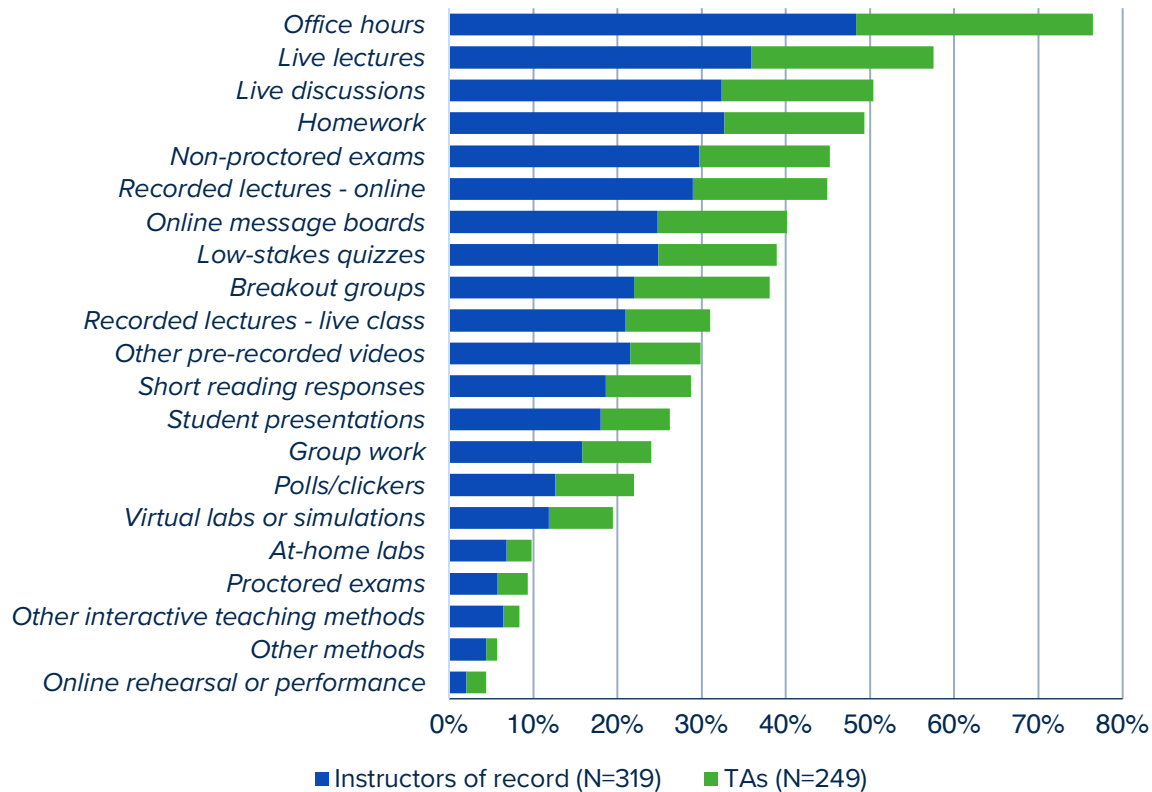


*Figure 8. Class activities used by instructor respondents*

*[Things that worked well included] short, live lectures that were recorded and made available to all students; using breakout rooms to do think/pair/share activities during lecture; staying late after the short lectures to keep talking and answering questions for students (in addition to regular office hours); strongly encouraging students to come to office hours \*and sending reminders right before office hours started\*; speaking openly and honestly to students about the difficult situation we were in.*
*- Instructor Survey Response*

## 2.1 Effectiveness in the remote learning environment

Instructors and students responded to several questions about their experiences with a randomly selected subset of the activities used in their classes. Students selected activities from a list similar to the one above for both a class that worked well remotely and a class that did not, and rated the activities for each class. In order to avoid small-sample effects on the statistics presented, only those activities rated by 100 or more respondents are included in the analysis below (except where noted otherwise). Students were asked whether they experienced barriers to participation, whether the activities helped them learn, the impact on their motivation, and how the activities influenced their feeling of connectedness to instructors and to other students. Instructors were asked about effectiveness for student learning and feeling connected to their students as well as about time-efficiency.

### 2.11 Barriers to access and participation

In order to gauge the extent to which students experienced barriers to accessing instruction, for each activity they were asked to indicate whether they were almost always able to participate, or whether technology/WiFi, finding quiet space, or other barriers prevented them from participating more than once.
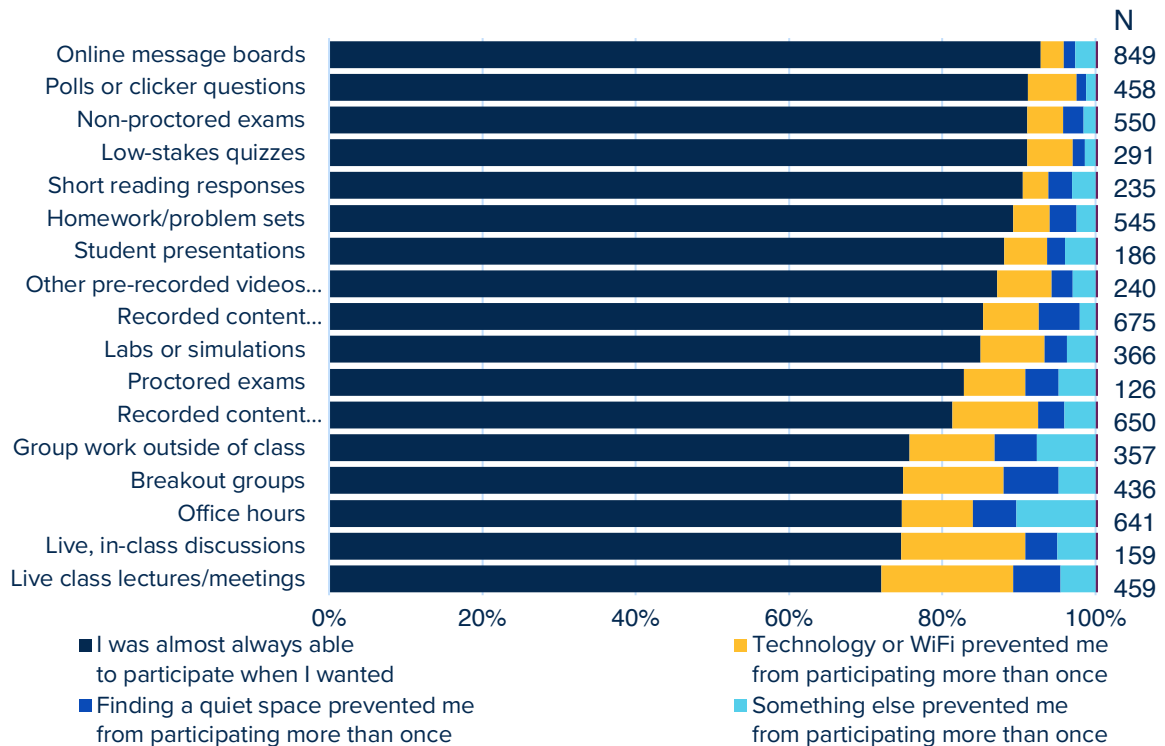


*Figure 9. Participation barriers for students*

Students overwhelmingly reported that they were able to participate to the extent that they wanted in most activities, with technology/WiFi presenting the most challenges followed by finding quiet space.[1] These barriers affected live class meetings most often, followed by recorded lectures, breakout groups, discussions, labs, and short reading responses.

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[1] The wording of the choices may have caused some confusion for, and subsequent under-reporting by, respondents as they could have been interpreted in two ways: 1) tech/WiFi/quiet space/other prevented them from participating more than one time over the span of the quarter, or; 2) there was more than one instance when Tech/WiFi/quiet space/other prevented them from participating.

## 2.12 Student Learning

Students and instructors both responded to questions about learning, although the questions were not identical. Instructors marked whether each activity helped students learn, did not help students learn, or "I don't know." Students rated whether each activity helped them learn a lot, a little, or not at all. Figure 10 shows the number of students who responded "helped me learn a lot" and instructors who responded "helped students learn" for each activity.

| Activity | Students N | Instruct. N |
|---|---|---|
| Recorded lectures - online | 659 | 165 |
| Homework | 628 | 159 |
| Recorded lectures - live… | 528 | 129 |
| Live lectures | 817 | 222 |
| Office hours | 527 | 291 |
| Low-stakes quizzes | 429 | 120 |
| Other pre-recorded videos | 353 | 112 |
| Live discussions | 448 | 193 |
| Short reading responses | 357 | 104 |
| Non-proctored exams | 616 | 171 |
| Polls/clickers | 155 | 71 |
| Online message boards | 444 | 143 |
| Student presentations | 126 | 93 |
| Group work | 227 | 89 |
| Breakout groups | 287 | 138 |
| Proctored exams | 179 | 34 |

■ signifies <100 instructor responses

■ Instructors: Helped students learn  ■ Students: Helped me learn a lot

*Figure 10. Activities and student learning*

Both groups agreed that homework or problem sets helped the most with learning - one instructor described homework assignments as "the main driver for learning." Live lectures and recorded lectures designed to be watched online were also high on both lists. Instructors were more likely to say that live discussions and reading responses were helpful, while students rated recordings of live lectures and office hours higher. Those instructors who used student presentations responses found them helpful for learning as well.

> *The professor would engage in conversation with us and check up on us. They would also take attendance as if we were actually there, getting to know our names and personally connecting with us. They also would encourage discussion among students through breakout rooms and discussions during lecture.*
> -Student Survey Response

## 2.13 Motivation

Students were asked to indicate whether each activity increased their motivation, did not affect their motivation, or decreased their motivation. The activities that helped student motivation most were low-stakes quizzes (e.g., reading quizzes, lecture quizzes, quizzes worth less than 10% of total grade), office hours, live class meetings, live discussions, and homework or problem sets. Some students also rated activities as making them less motivated, notably proctored exams.



| Activity | N |
|---|---|
| Low-stakes quizzes | 426 |
| Office hours | 530 |
| Live class lectures/meetings | 819 |
| Live, in-class discussions | 449 |
| Homework/problem sets | 628 |
| Polls or clicker questions | 153 |
| Non-proctored exams | 613 |
| Group work outside of class | 227 |
| Recorded - as if for a live class | 524 |
| Student presentations | 124 |
| Online message boards | 445 |
| Short reading responses | 357 |
| Recorded - designed for online | 656 |
| Other videos (e.g., YouTube) | 351 |
| Labs or simulations | 235 |
| Breakout groups | 286 |
| Proctored exams | 179 |

■ This activity made me more motivated  ■ This activity did not affect my level of motivation
■ This activity made me less motivated

*Figure 11. Activities and student motivation*

*"Frequently be in touch with students about what is working and what isn't. People learn and respond to things in different ways and what works for some students can be complicated by remote instruction, so keeping up to date with students and learning more about their preferences can really help transform their learning environment and maintain a sense of motivation that can be difficult to find remotely."*
-Student Survey Response

## 2.14 Connectedness

Students and instructors both rated whether each activity helped them feel connected to the other group. In this case, the scale was the same for both groups. Both reported that office hours, live discussions, and live lectures helped the most to strengthen the feeling of connection between student and instructor. Students rated office hours higher than live discussions, while instructors rated live discussions highest. Other popular activities for students included polls or clicker questions and recordings of live lectures, while instructors felt short reading responses and breakout groups helped them feel connected.
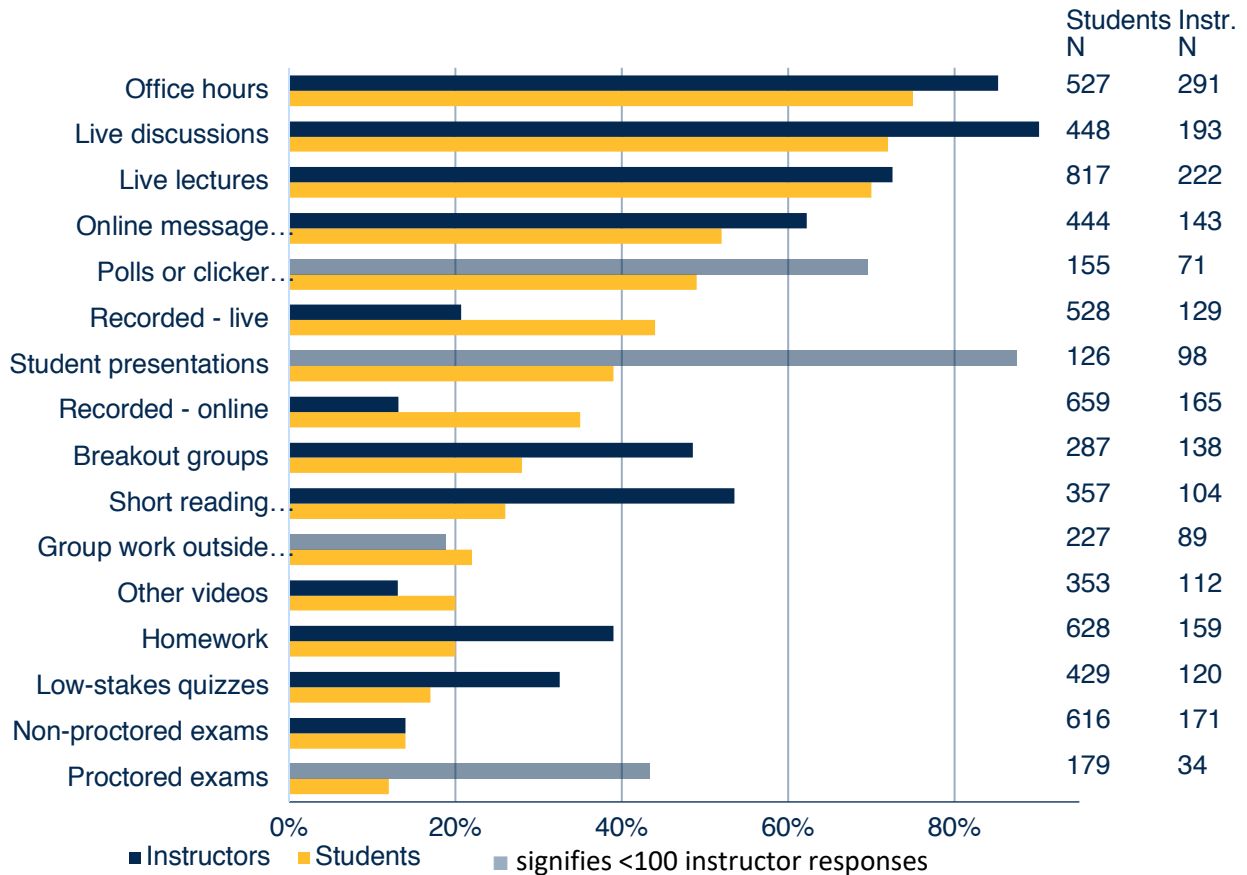
| Activity | Students N | Instr. N |
|---|---|---|
| Office hours | 527 | 291 |
| Live discussions | 448 | 193 |
| Live lectures | 817 | 222 |
| Online message... | 444 | 143 |
| Polls or clicker... | 155 | 71 |
| Recorded - live | 528 | 129 |
| Student presentations | 126 | 98 |
| Recorded - online | 659 | 165 |
| Breakout groups | 287 | 138 |
| Short reading... | 357 | 104 |
| Group work outside... | 227 | 89 |
| Other videos | 353 | 112 |
| Homework | 628 | 159 |
| Low-stakes quizzes | 429 | 120 |
| Non-proctored exams | 616 | 171 |
| Proctored exams | 179 | 34 |

■ Instructors  ■ Students  ■ signifies <100 instructor responses

*Figure 12. Activities and student-instructor connection*

*I had one professor who sympathized with the students and took every opportunity to make the class feel as stress free as possible. They would cater to the students if there was an internet problem, they would throw in humor in lecture. The professor being very kind helped motivate the students. They always attempted to encourage participation in the students and compared many of the concepts to the quarantine happening at the moment, which made me feel connected to the class...*

-Student Survey Response

Students rated how each activity affected their feeling of connection to classmates on the same scale. The activities that helped most were group work outside of class, student presentations, breakout groups, online message boards, and live discussions. For performance classes, online rehearsals and performances also helped connectedness between students.
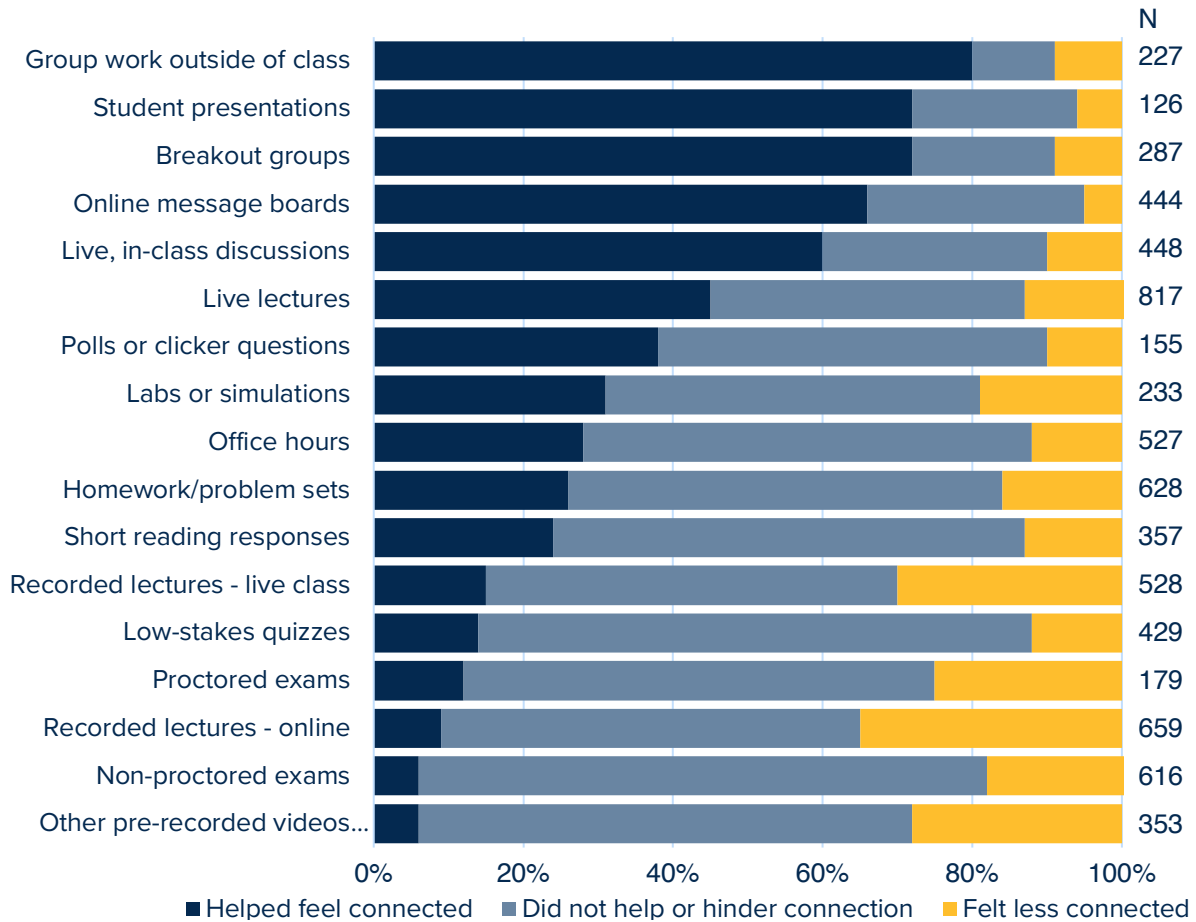


N

| Activity | N |
|---|---|
| Group work outside of class | 227 |
| Student presentations | 126 |
| Breakout groups | 287 |
| Online message boards | 444 |
| Live, in-class discussions | 448 |
| Live lectures | 817 |
| Polls or clicker questions | 155 |
| Labs or simulations | 233 |
| Office hours | 527 |
| Homework/problem sets | 628 |
| Short reading responses | 357 |
| Recorded lectures - live class | 528 |
| Low-stakes quizzes | 429 |
| Proctored exams | 179 |
| Recorded lectures - online | 659 |
| Non-proctored exams | 616 |
| Other pre-recorded videos... | 353 |

■ Helped feel connected  ■ Did not help or hinder connection  ■ Felt less connected

*Figure 13. Activities and student-student connection*

*"Discussions are possible over zoom! The best classes I had involved small-group discussions in breakout rooms and large-group discussions where people were able to ask their questions to the instructor for the whole class to hear."*

*"Learning is so much easier if you can discuss concepts with classmates."*
*-Student Survey Responses*

## 2.15 Most effective and time-efficient

Finally, instructors selected which activities they found "most effective for teaching, taking into account how much time was required to implement them and how much you think students gained from them." Instructors considered live discussions, live lectures, office hours, non-proctored exams, and short reading responses to be the most time-efficient class activities for emergency remote instruction.
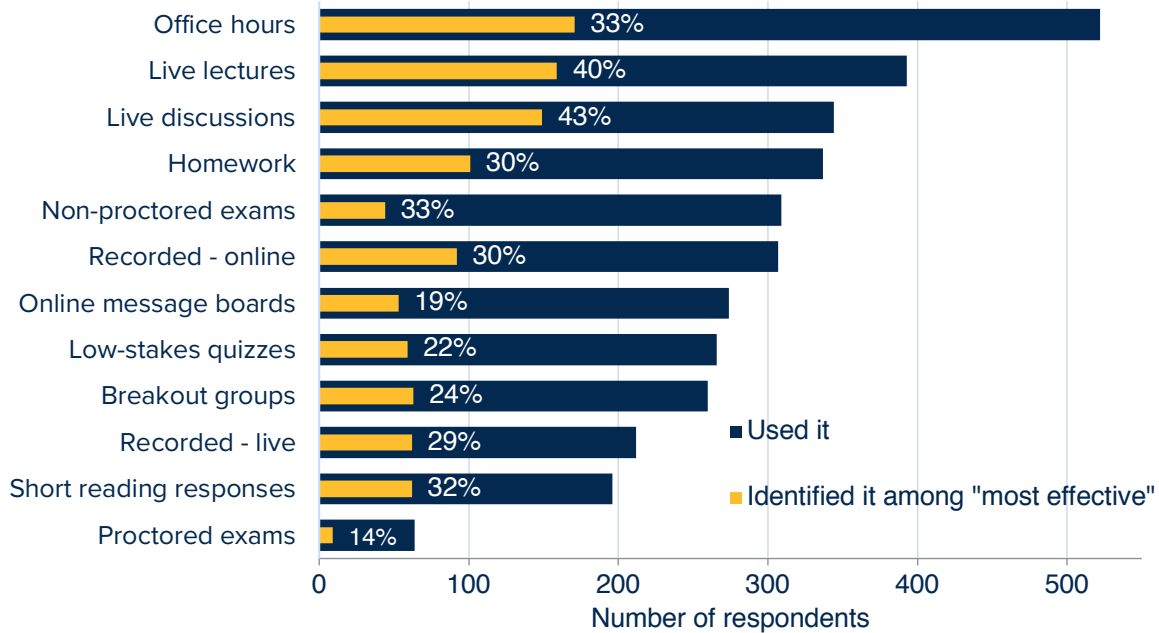


*Figure 14. Most effective activities considering the time spent*

## 2.2 What worked best?

Students were asked to compare a class that worked well in the remote environment to a class that did not by first identifying and rating the activities used, and then describing what they thought made the difference.

The students reported generally similar activities in classes that worked well and those that did not, with the main difference being that there were often more different kinds of activities in the classes that worked well. Activities particularly likely to be used in classes that worked well included recorded lectures or demonstrations designed to be watched online, rather than simply recorded from live lectures, online message boards, low-stakes quizzes, and short reading responses. Other pre-recorded videos, non-proctored exams, polls or clicker questions, and live discussions were also more common in classes that worked well. Proctored exams were somewhat more common in classes that worked poorly Table 1 shows the percentage of students reporting each activity in a class that worked well versus a in class that did not (activities chosen fewer than 100 times are not reported).

*Table 1. Percentage of students reporting each activity in a class that worked well remotely vs. a class that did not work well remotely.*

| Worked well (N = 1059) | Not well (N = 989) | Difference | Activity |
|---|---|---|---|
| 58% | 41% | 17% | Recorded lectures or demonstrations designed to be watched online |
| 45% | 28% | 17% | Online message boards (e.g., Canvas, Piazza, Slack, etc.) |
| 42% | 27% | 15% | Low-stakes quizzes (e.g., reading quizzes, lecture quizzes, quizzes worth less than 10% of total grade) |
| 35% | 20% | 15% | Short reading responses (e.g., written answers, reflections) |
| 37% | 23% | 14% | Other pre-recorded videos (e.g., YouTube) |
| 55% | 42% | 13% | Non-proctored exams (e.g., open book or honor system) |
| 21% | 8% | 13% | Polls or clicker questions |
| 44% | 32% | 12% | Live, in-class discussions |
| 45% | 37% | 8% | Recorded lectures or demonstrations presented as if for a live class |
| 31% | 23% | 8% | Breakout groups |
| 44% | 37% | 7% | Office hours |
| 63% | 59% | 4% | Live class lectures/meetings |
| 52% | 48% | 4% | Homework/problem sets |
| 5% | 2% | 3% | Other interactive teaching methods |
| 12% | 9% | 3% | Student presentations |
| 4% | 2% | 2% | Online rehearsal or performance |
| 19% | 17% | 2% | Group work outside of class |
| 4% | 4% | 0% | Other method, not listed |
| 17% | 22% | -5% | Labs or simulations |
| 10% | 18% | -8% | Proctored exams |

The ratings were generally similar between the classes that worked well and those that did not, with some exceptions. Recorded lectures designed to be watched online were much more helpful for learning in the class that worked well, while lectures (live or recorded) helped motivation in the classes that worked well more than in the classes that did not. Proctored exams were problematic for many students regardless of class type. Comments relating to these exams typically described either technological difficulties with proctoring software, stress from feeling an invasion of privacy, or frustration that everyone was being punished for the relatively small number of students who cheat.

*Next, students were asked to describe the key elements they felt helped one class work better than the other, focusing on elements relevant for remote instruction.*

Table 2 shows the most frequently mentioned overall themes and sub-categories drawn from their comments. The percentages for the overall themes indicate the relative frequency of references contained in the entire data set, while the percentages for the sub-categories refer to relative frequency of references within the theme.

*Table 2. Themes from comparisons of a class that worked well remotely vs. a class that did not*

| Worked Well (N = 1340) | Not Well (N = 1235) | OVERALL THEME Sub-category |
|---|---|---|
| 34% | 37% | COURSE DESIGN |
| **31%** | **54%** | **Nature of course** |
| 19% | 10% | Engagement |
| 10% | 13% | Pre-recorded |
| **19%** | **2%** | **Synchronous/asynchronous** |
| 8% | 12% | Length |
| | | |
| 25% | 25% | ASSIGNMENTS/ASSESSMENTS |
| **32%** | **17%** | **Assessment format** |
| 18% | 29% | Difficulty |
| **8%** | **23%** | **Workload/relevance** |
| 16% | 14% | Learning/study materials |
| 11% | 3% | Variety |
| | | |
| 14% | 14% | CONNECTEDNESS |
| 62% | 55% | Student-student |
| 33% | 30% | Student-professor/TA |
| 5% | 15% | Student-content |
| | | |
| 18% | 10% | INSTRUCTOR FLEXIBILITY |
| 39% | 41% | Syllabus/organization |
| 14% | 27% | Attendance/participation |
| 25% | 14% | Empathy/caring |
| 14% | 14% | Expectations |
| | | |
| 7% | 9% | PROFESSOR COMMUNICATION |
| 30% | 30% | Accessibility |
| **40%** | **9%** | **Office hours** |
| **10%** | **38%** | **Engagement** |
| 20% | 23% | Platform |

Bolded text indicates a significant difference in representation between comments on the course that worked well and comments on the course that did not work well remotely.

There were two sub-categories that tended to influence students' feelings about most aspects of the courses they chose. These were 1) instructor flexibility (the degree to which instructors were flexible with deadlines, attendance, and assessments, as well as whether students perceived

them as caring and empathetic), and 2) the nature of the course. The latter represents students' awareness that some types of courses did not translate well to remote learning, particularly with such little time for instructors to prepare. These courses included labs, studio courses, and courses that require a lot of group work and/or student presentations.

**Assessments and Assignments.** In general, students preferred a variety of multiple, low-stakes assessments interspersed throughout the material as opposed to larger, proctored, more traditional exams. Timing was another often-mentioned issue as many students felt that being allowed a generous window of time to complete assignments and assessments was less stressful and gave them a buffer in case technology wasn't working. Following are a few examples of student responses regarding assessments and assignments. "[WELL]" replaces the names of classes that worked well remotely, while "[NOT WELL]" replaces the names of classes that did not work as well.

- "The quizzes in [NOT WELL] were a real blow to my morale, there was never enough time for them and they were longer than ones that we had taken in the past. The reason [WELL] was better for me was because my professor was very flexible with us and allowed us to do things at our own pace so long as they were done before the deadline."

- "The specific element that I believe was handled more effectively in [WELL] vs. [NOT WELL] is the evaluation/testing of students. [WELL] had a mix of evaluation between OPEN NOTE post-lab assignments and post-lab quizzes. [NOT WELL] however relied on self-proctored, closed book multiple-choice exams; which I think is an unrealistic testing/evaluation format for remote instruction."

- "It was more about how the tests were handled in [NOT WELL] that made it not work as well.  By being "closed note", we were not allowed to look back at our answers, and our time was limited. [WELL] was open book, and I usually had enough time to finish everything.  In remote learning, since you can't really stop it from happening, all tests and quizzes should be made "open note", in my opinion."

Difficulty, and workload/relevance of course material and assignments were other points of issue for students. Many felt that instructors assumed that since students were at home they had more time for coursework. Examples of comments regarding workload, difficulty, and relevance of coursework are below:

- "[WELL] covered less material throughout the course but I feel like I feel more knowledgeable in [WELL] given the amount of time we took to learn topics. [NOT WELL] was every day so it was like trying to fit more water into a sponge each day. [NOT WELL] was an insanely aggressive amount of information we were expected to know."

- Don't give a ton of extra reading and essay assignments to make up for not being in class. I ended up hating [NOT WELL] because it was so much extra work and the grading was extra picky and the reading was WAY too much! Just because we aren't physically in class, doesn't mean we have time to sit down and read three articles that are fifty pages long each week. This is all in regards to [NOT WELL]. In my [WELL] class, the professor was engaging and the lectures were short, sweet, and to the point. There was no unnecessary extension of lecture time just to fill the gaps.

**Instructor Flexibility**. Instructor empathy and flexibility were also important, not only in the course comparison question but also in a different question in which students were asked what advice they would give instructors of remote courses. This theme was closely connected to open and clear communication. Below is a sample of comments regarding this theme:

- "The professor cared more about the students and was more engaging. Learning in [WELL] was more connected rather than disconnected like [NOT WELL]."

- "In [WELL], my professor cared about us and our well-being and always told us to ask if we needed extensions, more support, etc., as this has been a quarter more stressful than any other. In [NOT WELL], my professor had close to no syllabus, would inform us of quizzes only two days in advance, and would overwhelm us by posting 15 lecture videos at a time."

- The TA [WELL] was helpful. Both the instructor and TA in [NOT WELL] were not. Several times I reached out for help and they sort of brushed me off. I discussed program problems on the homework and the instructor said it's my issue basically. The class was not effective in teaching.

Regarding the way in which the course was delivered, students vastly preferred to be able to work at their own pace as much as possible. A combination of live lecture followed by a posted recording of the lecture was most often mentioned, as well as adequate windows of time to complete exams and assignments.

Most of the themes were similarly represented in discussions of both types of course, which makes sense given that the prompt was to compare the two courses. That said, the bolded themes in Table 2 highlight some contrasts in the way students described courses that worked well, and those that didn't work as well.

**What Worked "Really Well" for Instructors?** Instructors and TAs, meanwhile, were asked to reflect on what worked "really well" in their classes during the spring quarter. The activities and class characteristics they mentioned most frequently are shown in Figure 15.
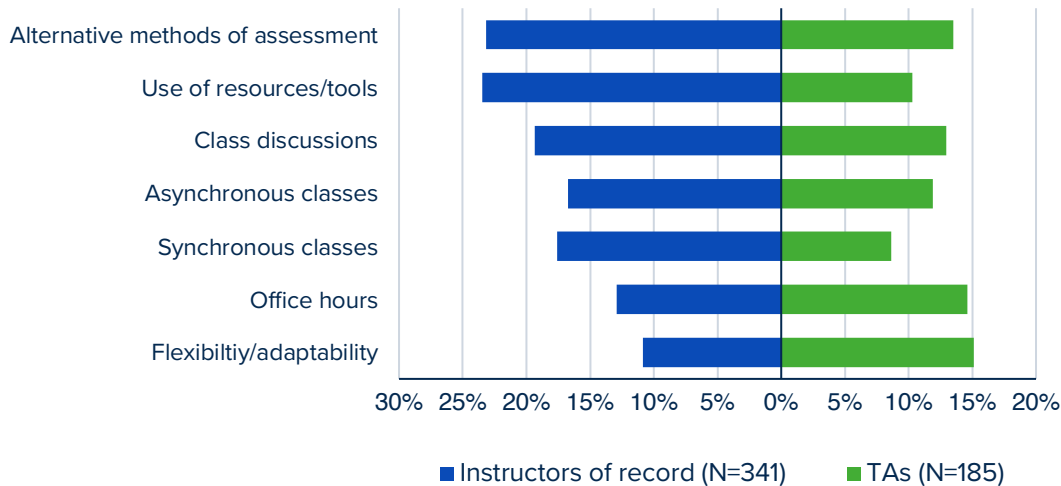


*Figure 15. Themes from instructor and TA comments on what worked "really well"*

Instructors and TAs, like students, found that alternative methods of assessment worked better than the midterm-and-final model. Some examples included a variety of formative assessments (e.g., low-stakes quizzes, assignments, reflective assignments, in-class exercises), open-book exams, and projects or writing assignments.

Many instructors and TAs indicated using specific resources and/or tools, often options in Zoom or Canvas such as Canvas Modules, and discussion forums like Piazza. They found that these tools provided new and convenient ways to help students stay organized and engaged.

Both asynchronous and synchronous lectures were described by instructors and TAs as having worked "really well." These results agree with student comments that a combination was helpful – live meetings promoted engagement and helped students stay on track, while recorded meetings allowed flexibility for students in different time zones or with inconsistent internet connections. Class discussions were helpful in either mode, through message boards asynchronously or in person during live meetings.

Holding office hours was another activity deemed by many instructors as extremely helpful. In fact, some instructors even reported an increase interest from students to participate in Zoom office hours. They noted that the office hours helped forge connections between instructors and students, alert instructors and TAs to problems in the class, and allow for individual assistance when the distance learning resources were not enough.

Instructors and TAs agreed with students that flexibility and adaptability were key elements that made remote instruction better. Respondents described being flexible with students in terms of grading, deadlines, access to lectures, attendance, and more. In addition, they noted that flexibility was crucial for being able to successfully adapt classes from the in-person to remote context.

Other activities or characteristics of the instruction in the spring quarter that were mentioned as working well included smaller class sizes and/or the breakdown of lectures into shorter lectures, clear communication of expectations, implementation of group work, having a community of support, and intentional adaptation of an in-person class into remote format.

There were a few important differences between the comments of instructors of record and TAs. For instructors, the use of resources and the implementation of alternative methods of assessment were the most mentioned ways that made the quarter successful. On the other hand, for TAs what worked really well was being flexible and holding office hours or one-on-one meetings with students. In addition, while both synchronous and asynchronous modalities worked similarly well for instructors, more TAs preferred to teach asynchronously.

## 3. Challenges of remote teaching

We asked instructors and TAs about the challenges particular to remote teaching and how they compared to in-person instruction. Interestingly, there was substantial disagreement about four key elements of the transition to remote teaching. However, most instructors and TAs found managing lecture time and ensuring their own technological capacity easy, while ensuring students' technological capacity and adapting content were more challenging.
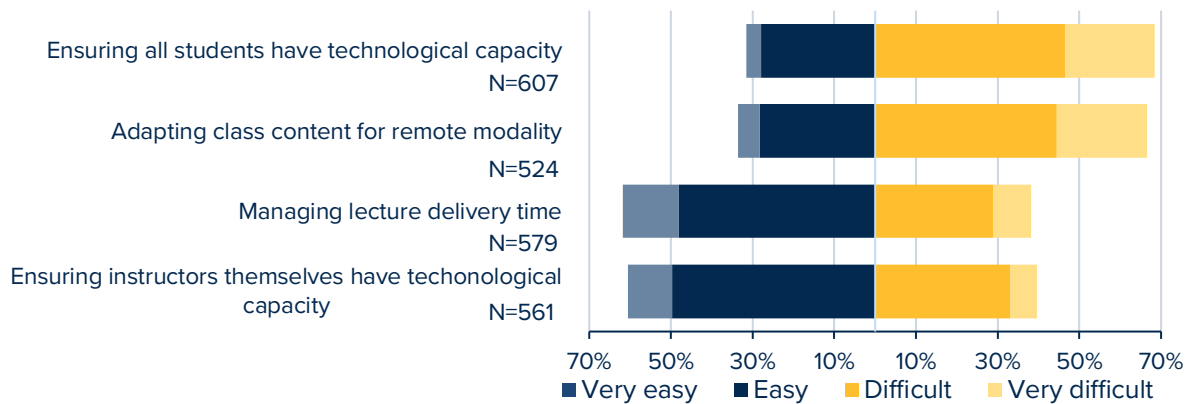


*Figure 16. Difficulty of activities related to the transition to remote teaching*

Instructors and TAs who had taught their spring 2020 course previously in-person were asked to compare the experiences. Most reported that keeping students engaged, facilitating participation during live meetings, achieving the course learning goals, answering questions, and administering tests or exams were more difficult in remote learning. A substantial minority of instructors and TAs described these activities as "much more difficult."
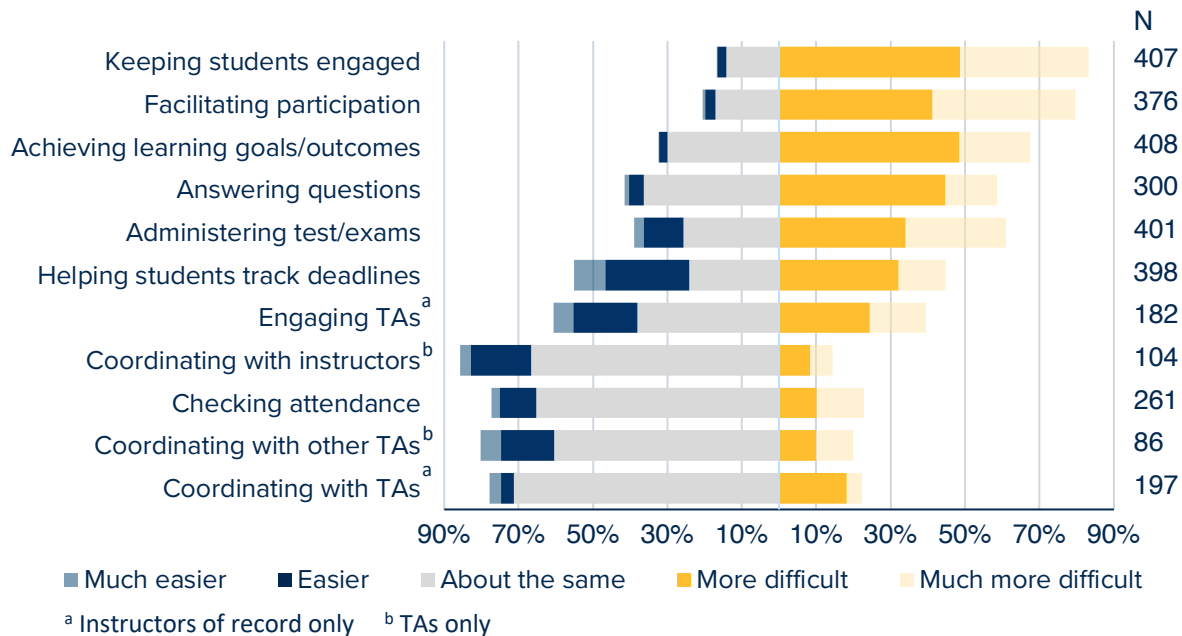
*Figure 17. Difficulty of instructional responsibilities*

## 3.1 Suggestions for overcoming difficulties

Instructors and TAs were asked to reflect on one difficulty they experienced during Spring 2020 and offer any suggestions to overcome it. The three most mentioned challenges for which suggestions were provided were: 1) Keeping students engaged (N = 105, 34%), 2) Administering or proctoring tests/exams (N = 47, 15%), and 3) Connecting with students (N = 35, 11%). The following were some of the most frequently suggested solutions.

*Table 3. Themes from instructor and TA suggestions for overcoming challenges*

| Challenge | Instructor/TA Suggestions |
|---|---|
| Keeping students engaged | 1. **Use online tools** such as Zoom polls, Zoom chat, breakout rooms, Google forms.<br>2. **Implement classroom activities that promote engagement** such as group projects, collaborative writing assignments, quizzes after asynchronous lectures, presentations. |
| Administering/proctoring tests or exams | 3. **Use alternative methods of assessment** such as take-home exams, open-book exams, and low-stakes and frequent quizzes.<br>4. **Use online tools or other resources** including Canvas quizzes, PDF forms, and Gradescope. |
| Connecting with students | 5. Hold frequent office hours, or informal one-on-one meetings.<br>6. Avoid completely asynchronous classes – include a synchronous component.<br>7. **Use online platforms** that encourage students to ask questions, such as Piazza. |

## 3.2 Additional time and responsibilities

The majority of instructors and TAs reported spending more time preparing for the remote format compared to the time the spent for the in-person format. Five activities were identified by most instructors and TAs (55% to 64%) as taking longer to do when teaching in the remote format: 1) Preparing small group/interactive activities, 2) Preparing for the lecture, 3) Planning entire course content, 4) Creating tests/exams, and 5) Creating quizzes. Other activities that instructors and TAs suggested as taking longer in the remote context included, answering to emails, managing content in online platforms (e.g., uploading content), and ensuring academic honesty.

A few activities were reported as taking about the same amount of time in the in-person and remote context, such as grading and creating assignments.
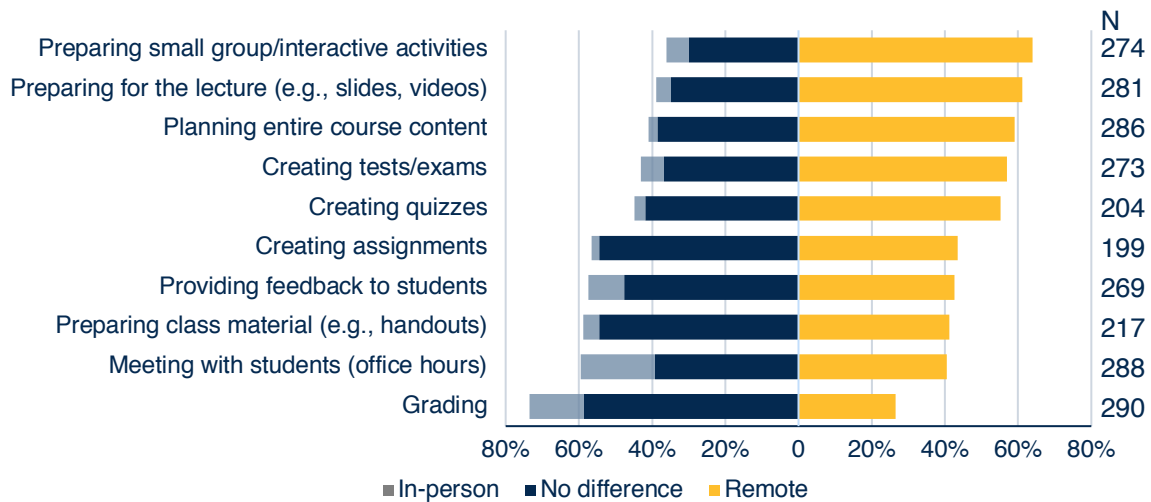


*Figure 18. Time spent for in-person vs. remote teaching*

For most of the activities, instructors and TAs reported requiring about one to three more hours per week than when preparing the same activity for an in-person class.
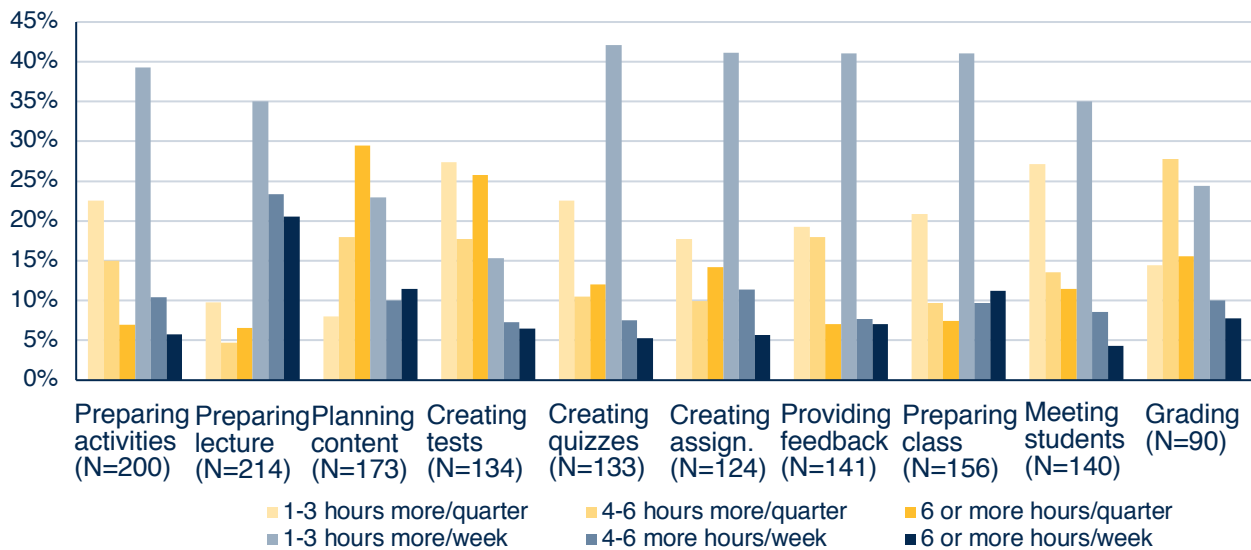


*Figure 19. Additional time spent in the remote context*

Instructors and TAs were also asked to describe any additional responsibilities associated with remote instruction. Out of the 233 responses to this question, the majority mentioned having additional tasks related to preparing for teaching in the remote context. For example, most respondents (*N* = 103 or 44%) mentioned new responsibility for learning how to use Zoom, Canvas and other online tools, as well as recording and organizing lectures, creating online version of laboratories, or even building kits and mailing them to students. Other frequently reported additional responsibilities were supporting students through emotional and mental health issues related to COVID and riots (*N* = 32 or 14%), and making sure all students were able to fully participate and be engaged in the course (*N* = 31 or13%) (see Appendix C for the description of the main themes).



*Figure 20. Themes from instructor and TA comments on additional responsibilities*

## 3.3 Disabilities and remote learning

At the request of the Student Disability Center, we asked the 184 students who self-identified as having disabilities to describe how remote learning affected them.

53% said remote learning made it more difficult to fully participate in some classes due to their disability. The most common reasons included heightened impact of anxiety and ADHD, vision difficulties with computer screens, difficulty connecting with instructors or the Student Disability Center to ask for help, and not receiving accommodations. Several students specifically noted that captioning was not always available or was inaccurate. In a separate question, 25% of respondents stated they had difficulty accessing their accommodations. Follow-up comments described a range of challenges from being ignored by overworked instructors to technical difficulties with proctoring services. Nearly 70% reported being moderately or very satisfied with accommodations in Canvas and Zoom. About half were dissatisfied with accommodations in Examity and Respondus.

Fifty percent of respondents, including many of the same students, said they had experienced reductions in barriers due to remote learning. These responses highlighted the ability to pause and replay lectures, schedule flexibility, freedom from commutes, freedom from interacting with classmates, and opportunities to participate non-verbally.
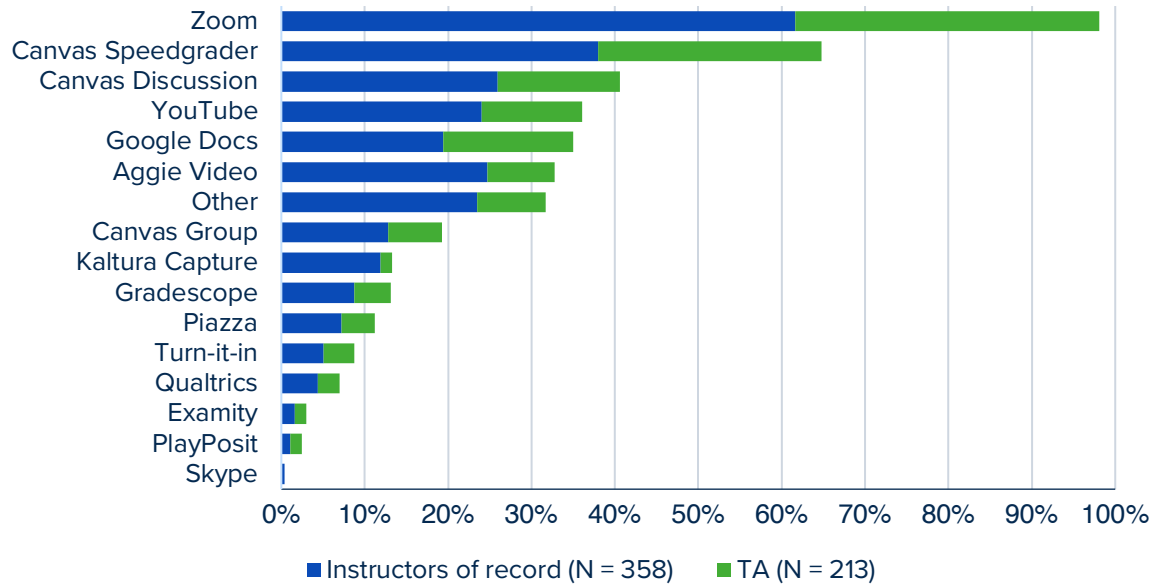
# 4. Software



*Figure 21. Use of software for remote instruction*

Unsurprisingly, Zoom was the most used software during spring 2020, with 98% of instructors indicating its use. Other frequently used software included Canvas Speedgrader (65%), Canvas Discussion (61%), YouTube (36%), and Google Docs (35%). Instructors additionally mentioned a variety of other software including other Canvas tools (e.g., Canvas Quizzes), other Google tools (e.g., Google Hangout), and Slack.
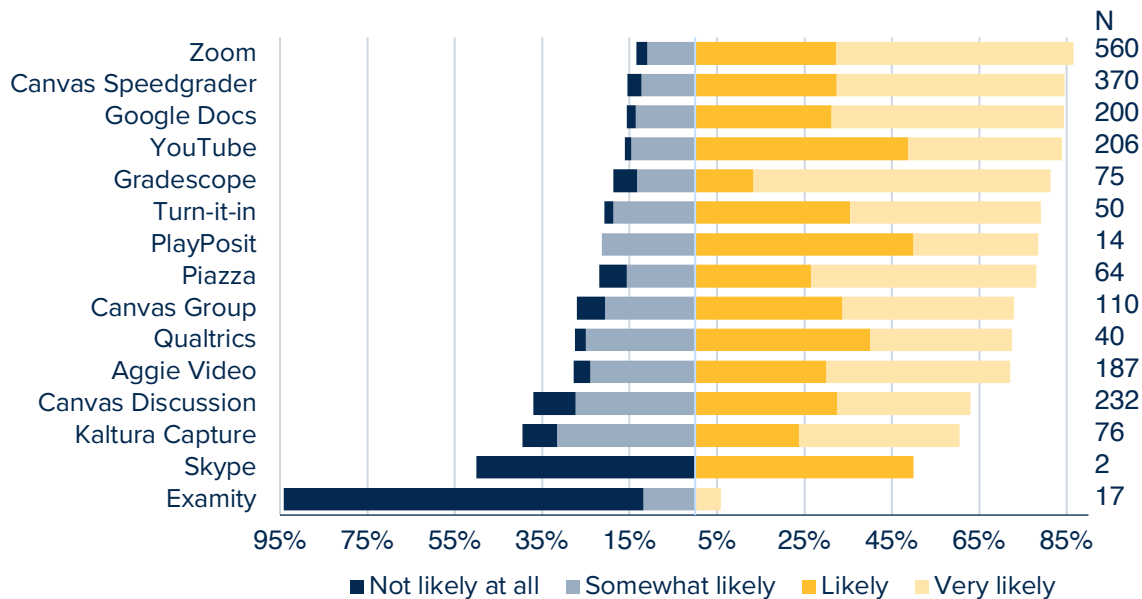


*Figure 22. Recommended software for remote instruction*

A similar percentage of users for most of the tools reported for both instructors and TAs. There were, however, some differences for certain tools. For example, a larger percentage of instructors indicated using Aggie Video. Similarly, more TAs appear to have used Google Docs than instructors.
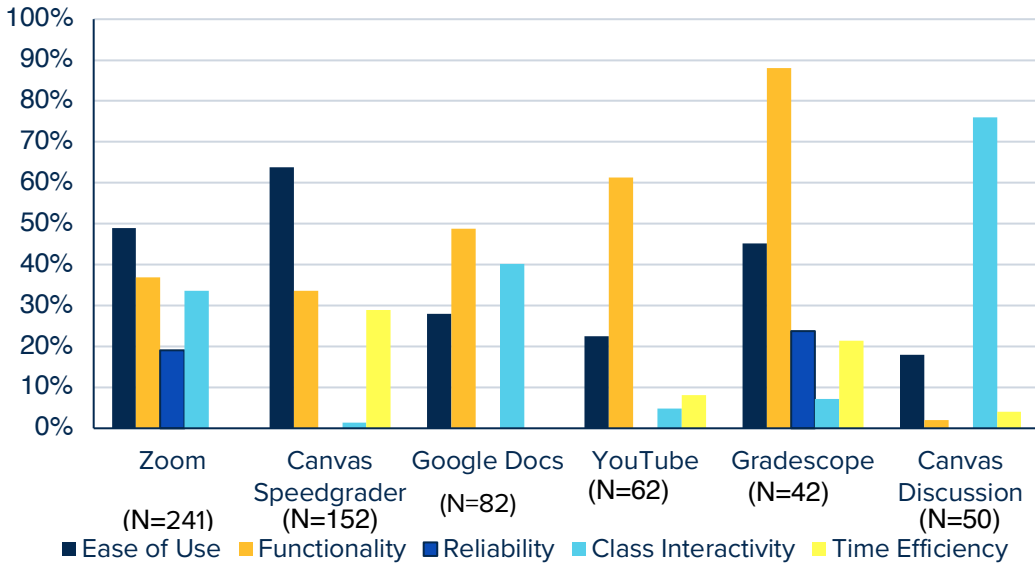


*Figure 23. Themes from software recommendations*

When asked to rate the degree to which they would recommend the use of each tool, instructors and TAs were overall very positive about most of the software they used during the spring quarter. From the most used software, a range of 81% to 84% of instructors and TAs indicated likely or very likely to recommend their use. In general, the characteristics most commented when describing software they recommended were 1) ease of use, 2) functionality, 3) reliability, 4) class interactivity, and 5) time efficiency (see Appendix C for definitions). For example, a large percentage of Gradescope users (81%) explained that this tool included various functions that made it easy for them to provide feedback and include open-ended questions in tests/exams. It is worth mentioning that the software rated by most of its users to not likely to be recommended at all was Examity. Its users expressed dissatisfaction with the non-user- friendly functions and most importantly, its negative impact on students.

*[Canvas Discussion] allows students to interact with each other and with the professor in a lower stakes manner than speaking up in a Zoom call. It does give them more space and time to express their written ideas. Students also seem to learn how to use the discussion board quickly.*
*-Instructor Survey Response*

# 5. Institutional and Department Support

In a four-point scale from poor to excellent, instructors rated UC Davis's campus-level support for instructors as "good." About 57% of instructors (*N* = 201) and 51% of TAs (*N* = 108) rated it "good" or "excellent."
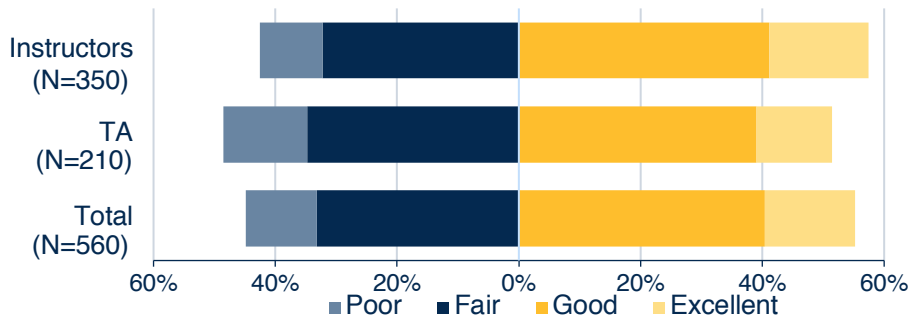


*Figure 24. Ratings of campus-level support*

The analyses of open-ended responses revealed that instructors perceived UC Davis as doing well in the following areas to support instructors in the spring quarter:

1.  Access to technology/software (e.g., Zoom pro account)
2.  Instructional support (e.g., workshops, webinars)
3.  Keep Teaching website
4.  IT Support (i.e., people supporting instructors with IT-related issues)
5.  Departmental/ Campus guidance (i.e., department- or campus-level guidelines provided to instructors for teaching remotely)
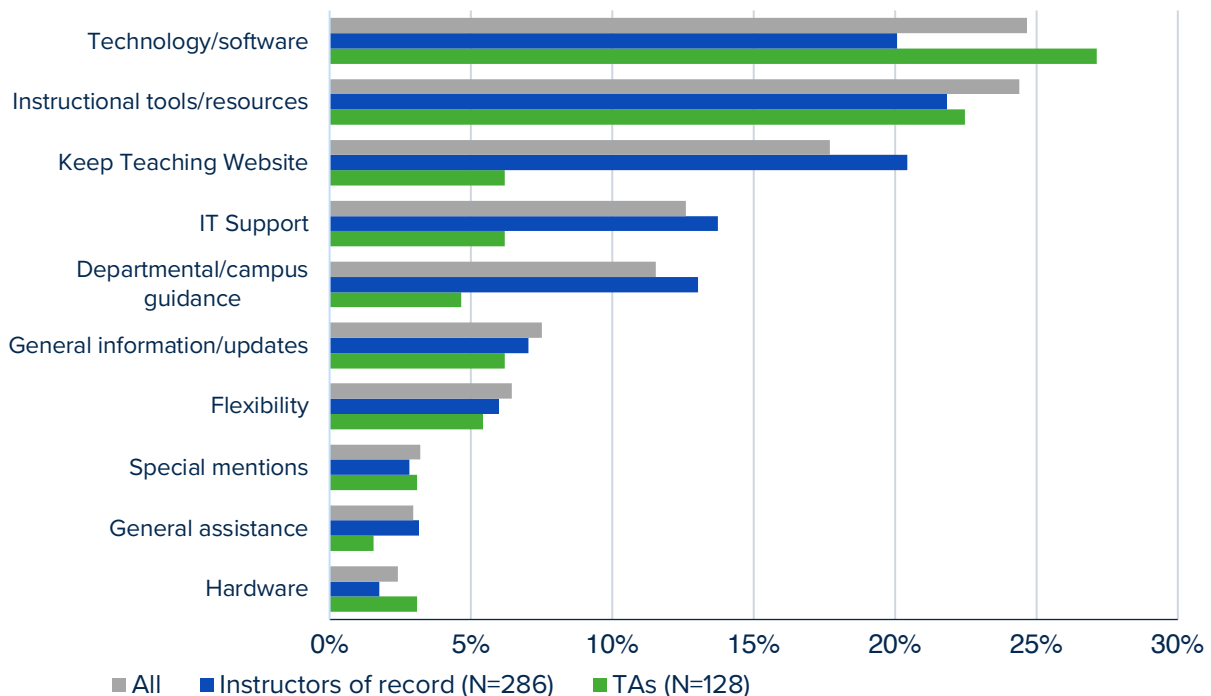


*Figure 25. Most useful support for instructors and TAs*

As noted in Figure 25, there were differences in the types of support perceived as useful between instructors and TAs. The Keep Teaching website, IT support, and departmental/campus guidance were mentioned more frequently by instructors as supporting them in their teaching in spring. It is not clear whether TAs did not find these types of support particularly useful or whether they were not made as available
to them as to the instructors. Notably, TAs frequently mentioned as part of their response to other questions that they did not feel supported by the University and instead depended on their instructors for information and updates on policy and guidance.

Instructors were also asked to provide any thoughts on what UC Davis could have done better to support instructors. The three main themes that emerged from the instructors' responses were:

1. Access to online tools and how to use them
2. Guidelines for teaching (i.e., how much to teach/how to change expectations for remote teaching/more concrete guidelines of best practices)
3. Hardware/technology support

Interestingly, these results appear to contradict the results of the previous question where instructors also mentioned access to technology/software as well as instructional tools and resources as support that was provided by the university. These conflicting results highlight the differences in the degree of access that instructors had to various types of institutional support. TAs in particular expressed a need for support for online tools and how to use them, guidelines for teaching, hardware/technological support, as well as a way to balance their workload.
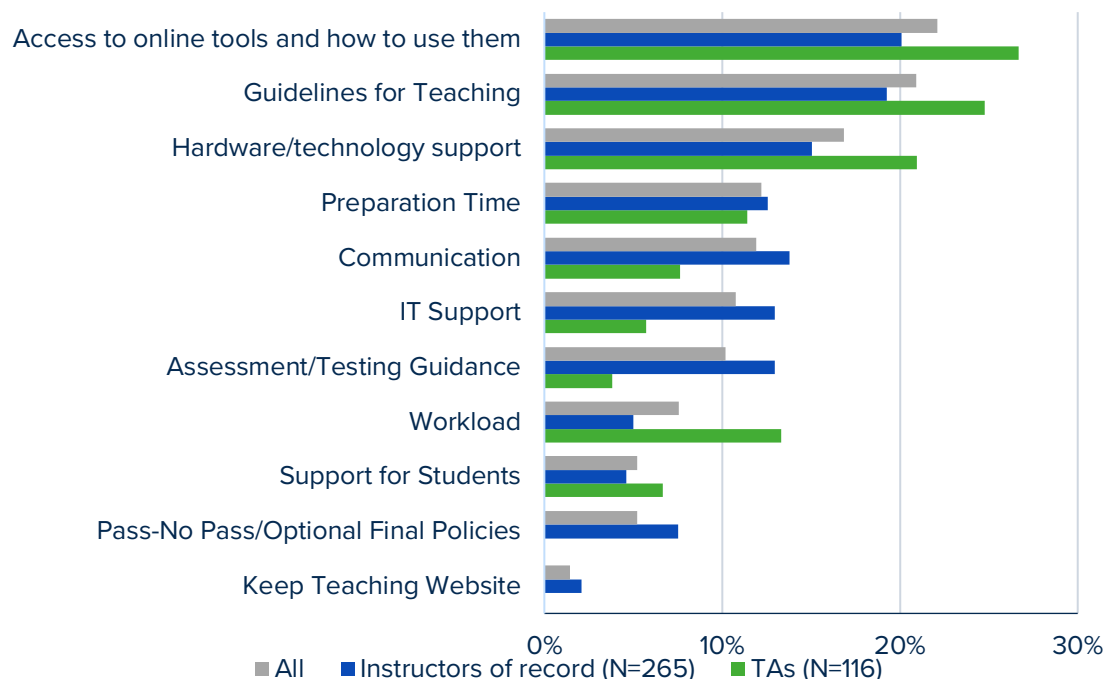


*Figure 26. Themes from instructor and TA comments on needed institutional support*

In addition to institutional support, instructors and TAs were also invited to share how their departments provided support during the spring quarter. Formal and/or semi- formal training sessions or meetings about instruction in the remote context were the most frequently mentioned supports offered by departments. Other types of support included shared resources among colleagues, infrastructure (i.e., space, equipment, software), and human resources (i.e., support provided by people, including IT support staff or TAs). It should be noted that about 28% of respondents (*N* = 94) indicated receiving no support from their departments. In particular, a larger percentage of TAs (33%) said they did not receive any departmental support.

Moreover, there were differences in the type of support that instructors and TAs received from their departments. For instance, while 29% of instructors (*N* = 74) reported getting some type of formal or semi-formal training about instruction in the remote context, only 11% (or *N* = 27) of TAs indicated receiving that type of support. Similarly, sharing resources about instruction in the remote context was mentioned much more frequently by instructors than by TAs.

The open-ended responses to questions about the support received highlight the importance of providing more support for TAs not only in terms of tools/resources but also training on how to use them to make instruction more effective in the remote context.
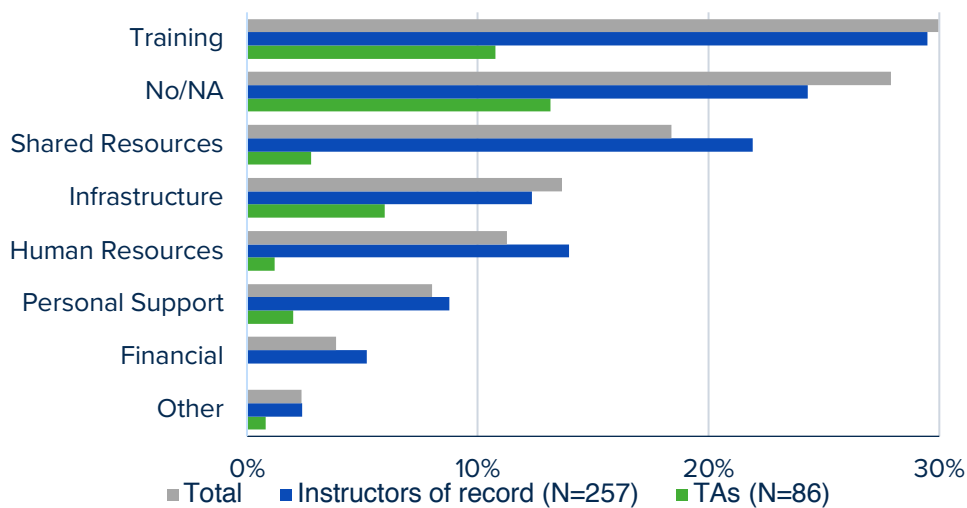


*Figure 27. Themes from instructor and TA descriptions of departmental support*

*"We had several highly focused zoom meetings, a few optional support/ Q&A zoom meetings, a designated canvas course for sharing materials etc, and regular outreach and communication by dep[artmen]t leaders with relevant articles, data, information about providing quality remote instruction."*
*-Instructor Survey Response*

# 6. Preparing for Fall

## 6.1 Instructor Concerns

A total of 471 instructors and TAs indicated that they expected to teach and 52 reported not planning to teach during the fall 2020 quarter. At the time they responded to this survey, 24 instructors and 26 TAs were still uncertain whether they would teach in the fall.
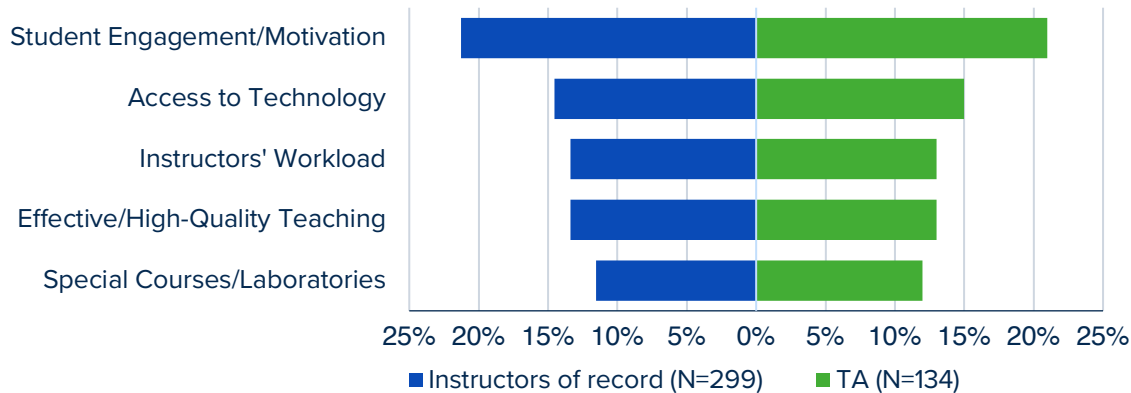


*Figure 28. Themes from concerns about teaching in fall quarter*

Among several concerns about teaching in the Fall quarter, the five most frequently mentioned concerns were:

1. Student engagement
   The most frequently mentioned concern by instructors was students' limited engagement or motivation with the course, as well as their lack of participation in class.
2. Access to technology
   Instructors expressed concerns about not only their access to technology (e.g., internet, software, computers) but also that of their students.
3. Effective instruction
   Another concern was providing students with less effective and/or lower-quality instruction when teaching remotely as opposed to when teaching in-person
4. Workload
   Instructors noted their concerns about the increase workload and burnout when preparing for remote instruction
5. Teaching courses not suitable for remote instruction
   Several instructors indicated a great degree of difficulty in trying to adapt a hands-on, experiential, and practical course (e.g., laboratories) to be delivered remotely.

## 6.2 Student advice to instructors

Student respondents were asked instead what advice they would give to instructors for remote instruction. Their responses fell into four overlapping categories: communication, organization of instruction, engagement, and external factors.

Students' comments linked **communication** with engagement and connectedness. Taking the time to ensure that expectations were clear and materials and deadlines were accessible made students feel that the instructor cared about their success in the course. Timeliness of responses to emails and individual feedback on assignments were also mentioned as ways for students to feel connected to the course.

Students felt disconnected from the entire educational experience in spring quarter and reported that **organization of instruction** in a remote learning environment was more important than ever. Students favored a variety of activities and/or experiences rather than just straight lecture for ten weeks. Additionally, students preferred that delivery of instruction be as flexible as possible. While many students felt that the opportunity to ask questions and interact with classmates and instructors in live, synchronous course sessions increased their motivation and enjoyment of the course, they also appreciated having the lectures recorded and posted and felt that the recordings were extremely useful study tools. The issue of students residing in various time zones is especially pertinent to this topic – some students questioned the fairness of being graded on attendance when the lecture occurs in the middle of the night for them.

*Be flexible and long with deadlines. We are spreading ourselves thin between family responsibilities, school responsibilities, and trying to maintain our mental health. Make assignment directions explicitly clear, and provide example assignments when available. It is difficult to ask the subtle questions that we would normally be able to after class.*

*Understand that you may not be able to get to all of the content that you "normally" do - these times are not normal. It is easier on us, and arguably you, to take things just a bit slower and focus more on quality of instruction over quantity. Non-video-proctored exams are much easier on us: there is an impending pressure and anxiety to make sure that our cameras are working, and to look up and see you watching us. That makes us incredibly self-conscious, and detracts from our ability to concentrate on the exam*
*-Student Survey Response*

**Opportunities to engage** with instructors were similarly important both for clear communication and for staying connected. Students emphasized the importance of instructors being available for help both during and outside of class time, with office hours cited as a valuable time to interact one-on-one with instructors and regain some sense of interpersonal connection. Dedicated opportunities for students to interact with one another also reportedly helped students stay motivated to put effort into the course. Breakout rooms or group projects without appropriate

guidance from the instructor or TA, however, could lead to frustration. Structured activities in which the instructor guided the discussion seem to have been the most useful.

Finally, students felt more connected to instructors who were **empathetic with the stress** of global circumstances and did not ignore current events thereby humanizing themselves and somewhat normalizing the entire remote learning experience. Patience and understanding were two of the most frequently occurring terms in the student advice to instructors.

## 6.3 Advisor advice to instructors

In July 2020, Academic Advising Enrichment surveyed the academic advising community for advisor feedback on spring quarter. The Spring Quarter 2020 Advisor Feedback Survey was distributed to academic advisors via the OASIS users listserv and received responses from 77 academic advisors, comprising 59% of the target population. The following results were reported by survey authors Nicole Wood and Andrea Duff.

Advisors were asked to identify insights about student experiences in the remote learning environment that they would like faculty to know. The majority of responses fell into the following categories: technology, environment, flexibility and understanding, connections, and added external responsibilities.

Academic advisor comments echoed much of the advice provided from students to instructors. Advisors identified the following challenges that many students voiced as concerns in light of remote circumstances:

- Expectation to take on extra household and family care responsibilities while living at home.
- Struggles with access to reliable technology and internet.
- Lack of quiet, suitable study space and some in less stable environments.
- Difficulty maintaining connections and sense of community.

Students expressed to advisors that **flexibility and understanding** from an instructor was imperative to help them navigate the added stressors of the remote learning situation. Additionally, concise and **clearly communicated expectations** created more favorable learning environments.

Faculty are encouraged to **refer students to advisors** who can help establish/reinforce connections with campus resources and services that support students' academic goals and interwoven personal wellness.

# 7. Discussion and Conclusions

Over the course of a few days in March 2020, faculty, lecturers, and teaching assistants, most of whom had never previously taught online, moved their courses to a remote-teaching format. Students, most of whom had never taken an online class, scrambled to ensure access to the tools they would need to study remotely. Many students and instructors faced additional challenges due to crowded living situations, caretaking duties for children or elderly relatives whose normal caregivers were suddenly unavailable, or limited finances in addition to the uncertainty of the pandemic. Despite these conditions, the survey responses create a picture of creativity, empathy, and adaptability among both students and instructors. We believe that the lessons of this quarter can help us prepare for remote learning in less extreme circumstances, providing both warning of the challenges and suggestions for overcoming those challenges.

Instructors and students agreed that it was hard for instructors to **connect with and engage students** while teaching remotely. Instructors discussed the difficulty of reading reactions or gauging involvement, particularly when some students are present during synchronous classes and some are not. They also noted that a sense of community is more challenging to build in the virtual context. Students described struggling to stay motivated and to pay attention in virtual lectures. Favored practices to increase engagement included using polls, quizzes, message boards, and other interactive tools. The most prominent suggestion, however, was to hold and participate in live class sessions.
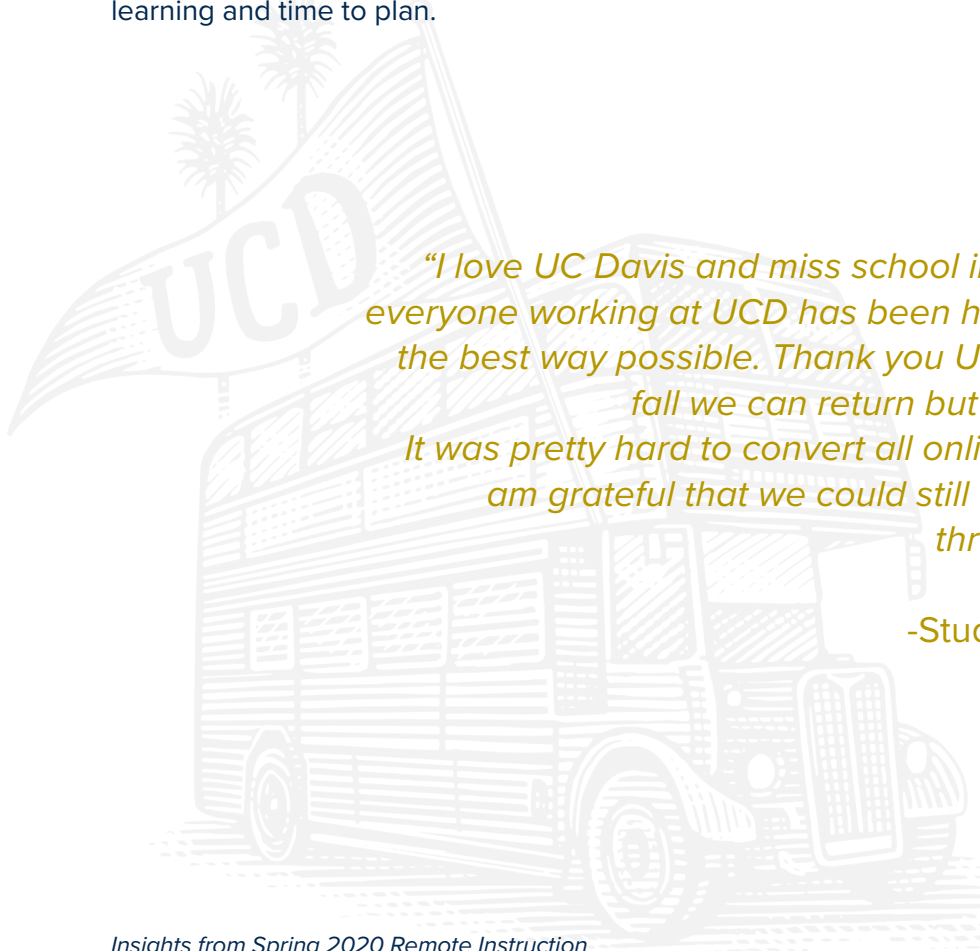
The second greatest challenge for instructors was the **equitable assessment of student learning**. On the one hand, instructors expressed concerns about the fair administration of exams in the remote context. In particular, several instructors worried about academic honesty. On the other hand, instructors were also concerned about assessing students' learning *equitably*, when the class content might not have been accessible to every student. Students described technological problems with online exams, particularly live timed or even more so proctored exams. They also described feeling alienated by the emphasis on cheating with proctored exams. Students wanted instructors to treat them more as partners in their own learning, and instructors who explored different assessment methods generally had excellent things to say about them. Reportedly successful practices included spreading credit among many lower-stakes assessments, project or writing-based assessment, and open book exams.

Students and instructors both found that the **stress and personal challenges** of spring 2020 were formidable. Both groups described facing mental and physical health problems, difficulty finding quiet space and time to work away from roommates or family, and additional stress from the political upheaval triggered by the murder of George Floyd, which occurred near the end of the quarter. Some students lived in very different time zones from their instructors. Respondents in both surveys emphasized the importance of empathy and flexibility in facing these challenges. Students described tremendous gratitude towards professors who extended a deadline or offered an alternative way to complete an assignment. Instructors noted the importance of offering recordings of live class session for students who couldn't attend or couldn't keep up, as well as flexible grading schemes and lots of time for one-on-one meetings with students.

**Time management** was difficult in very different ways for instructors and for students. Instructors reported spending at least 1-3 hours more per week in the remote context, and in many cases

much more, on activities such as preparing and recording lectures, creating a larger number of assignments and assessments, planning interactive class activities, and meeting with students. Students reported difficulty keeping up and keeping track of deadlines. Suggestions to help students included sending regular reminders, keeping schedules and expectations very consistent and well-documented, and using low-stakes assessments or participation points to promote completing class activities on time. There were fewer suggestions for instructors to manage the additional workload. A few respondents did note that having more warning would allow them to move more of the work ahead of the quarter. Some also said that training and support from technology or teaching experts would help them avoid wasting time.

Finally, **learning and using new technologies** inevitably created challenges for both students and instructors. Instructors indicated that while they were given access some software, such as Zoom pro accounts, other resources including training in how to use online tools were limited. Students described a variety of technological difficulties, with poor wireless access being the most common. However, both groups also described great successes with technologies they had not previously used, ranging from Canvas modules and quizzes to Zoom polls to newly-designed laboratory simulators. Many also noted a general attitude among both students and instructors of patience and flexibility that allowed them to learn the technology and find solutions.
This report has a number of limitations. Most obviously, all information is self-reported – we did not have access to direct evidence of student learning. Furthermore, the samples were self-selected such that we may be capturing the views of a specific sub-group of students and instructors; the results may not apply to other groups of students or instructors. Finally, these surveys covered emergency remote instruction in a pandemic – some of the results may have reduced relevance now that both students and instructors have more experience with remote learning and time to plan.

*"I love UC Davis and miss school in person deeply. I think everyone working at UCD has been handling this situation in the best way possible. Thank you UC Davis and I hope this fall we can return but understand if we can't.*
*It was pretty hard to convert all online from in person, but I am grateful that we could still continue our education through this terrible time."*

-Student Survey Response