TIPS FOR REMOTE INSTRUCTION
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This document assembles tips from instructors in the department that taught remotely over the past year and from student feedback. Please feel very welcome (encouraged) to share your thoughts about these tips or to share additional tips about remote instruction with me. I will incorporate such suggestions into the document and share updated versions.

In contrast to earlier versions of this document, I have added a discussion of exams and academic integrity issues. In effect, I have folded the document Fred Finan prepared last summer into this document and updated those parts based on our experience in the fall semester.

The Center for Teaching and Learning has a very useful Keep Teaching page which covers most of the topics discussed in this note (as more).

Basics:

The most common arrangement for remote instruction has been to:
- Give syncronous lectures on Zoom (i.e., at the alloted time with a live audience)
- Record these lectures and post then on bCourses for asyncronous viewing
- Share your screen and use slides or a pen-enabled touch screen

Many instructors used two devices: one main device for slides / writing / talking and another with a gallery view of students and GSIs and possibly a chat window.

Jim Campbell has used the following screen layout during lectures which has worked well: He has a touchscreen laptop and attaches an external monitor to it. He then shares the touch screen. He toggles between slides and a whiteboard app on the touch screen (such as OneNote or simply Paint) and also uses a split screen layout with slides on half the screen and a whiteboard app on the other half. (Windows has a way of making an app exactly half the screen by pushing that app almost off the screen on one side. Windows also has short-keys for these various toggle functions. There must be some Apple equivalent.) On the external monitor, he had the Zoom chat box, participants box, and gallery view of students open. If you don't have a touch screen laptop, you can purchase a touch screen external monitor to be able to use this setup. Another alternative is to log into the Zoom meeting twice, once with your computer and a second time with your touch screen device.

If your course has less than 300 students, you should use regular Zoom meetings for your lectures. If your course has more than 300 students, you can request to use Zoom webinars for your lectures. Please contact digitallearning@berkeley.edu to request Zoom webinars.

Student Engagement during Lecture:

Last spring when the switchover occurred mid-semester, many instructors reported finding it challenging to maintain engagement during lectures. By the fall, however, it seems that instructors had developed effective techniques to maintain engagement.

Instructors have reported some decrease in live attendance and some fall off of attendance as the semester progressed. Attendance in the range of ½ to 1/3 seems typical. This is likely due to time zone issues and the students having the option to watch the recorded lectures at other times.

Benjamin Faber: "The main downside/challenge that I sensed was on the receiving side from students: having online lectures that are recorded and uploaded to BCourses drastically decreases attendance for any given live lecture. And I fear that students having lectures "on demand" could lead to problems of putting this off for too long (not following the course) or multi-tasking when watching the lecture."

The instructors have employed several approaches aimed at countering this:
- Adding a grade for participation / frequent quizzes
- Judicious use of Zoom's chat channel
- Mixing in "whiteboard" style lecturing with PPT style lecturing
- Moving to a partial "flipped classroom" approach
- Making an extra effort to pause for questions
- Using the Zoom poll function

Adding a Participation Grade and Frequent Short Quizzes

Some instructors have added short weekly quizzes or short quizzes due after each lecture to encourage students to keep up with the lectures.

My own version of this was to have a lecture quiz for each lecture. I would post these right before lecture and make them due 30 hours after lecture (to allow for asynchronous viewing of the lecture). Each quiz consisted of 4 simple multiple choice questions in bCourses (so, no grading by GSIs). The quiz was designs just to test whether students had watched the lecture. Students really liked this aspect of the class. They seemed to think it helped them keep up with the lectures. I think it was key that I made these quizzes count towards the grade (5% all together). Also, it was crucial to allow students to drop 4 or 5 quizzes to cut down on requests for exceptions.

In addition to this, I had a 5% participation grade. Care must be taken not to disadvantage students that reside in different time zones in designing a system for a participation grade. However, asking GSIs to track participation in lecture, sections, Piazza, etc. is relatively easy in the online environment.

Ben Faber: "One thing I found helpful to try to avoid these potential pitfalls was to have part of my grade (5%) accounted for by "participation". In my class that participation grade comes down to uploading 5-slide summaries of the papers that we read each week. At the beginning of the lecture, I then randomly pick a student to present (while students can opt out on being called on, but still have to upload slides). On Zoom that worked with a simple screen sharing switch for 5 minutes without a problem."

Using the Zoom Chat Channel during Lecture:

Several instructors have indicated that using Zoom's chat channel during lecture was key to getting good student engagement during lectures. Doing this is tricky though because it is hard to both lecture and monitor the chat channel.

A solution to this problem is to ask the GSIs to help manage the chat channel during lecture. The GSIs can answer simple clarifying questions and interrupt the lecture to bring more substantial questions to the attention of the instructor.

Stefano DellaVigna: "I really liked asking Qs and having them respond on the chat because it offered more people the option to chime in, including the shier kids that would not raise their hand. Also, easier to record class participation (which can slightly bump your grade)."

Some attention may need to be paid to setting ground rules regarding chat etiquette.

Writing on the "Whiteboard" during Lecture

Another approach to increasing engagement was to mix in "whiteboard" style lecturing.

Marty Olney: "[I] started my pen-enabled laptop, started a ppt deck with ~30 blank slides, shared that screen, then wrote on the laptop. My sense from teach-net is that similar good results are possible with an ipad pro and notability."

Stefano: "I wrote notes / drew graphs on the PDF during lecture, and then I saved the "noted" PDF on bcourses, that is an improvement to the past for me when I could not screenshot my work on the board."

Jim Campbell's setup discussed above is another version of this.

Student responses seem to indicate that mixing in "whiteboard" type lecturing increases engagement.

Lecturing with an Actual Whiteboard through Zoom:

Haluk Ergin, Chris Shannon, and David Romer (and perhaps others) have had success lecturing on an actual whiteboard through Zoom. Haluk did this both for 103C and for 201B/207B. This approach has been very well received by students.

Haluk used his MacBook camera and microphone without any extra attachments. He used this whiteboard purchased on Amazon. Amazon also sells stick-on wall whiteboards that can easily be removed from the wall in question after the semester.

Move to a Partially of Fully Flipped Classroom

Some instructors have moved to a partially flipped classroom format. For example, Danny Yagan teaching 131 lectured for 90 minutes on Zoom (synchronously but also recorded) each week and then recorded a 90 minute lecture for all students to view asynchronously.

Stefano recorded 20 to 30 minute videos and mixed these in lecturing through Zoom.

Supreet Kaur moved to a fully flipped classroom format in Econ 174 this fall. She pre-recorded one lecture per week and held one live session that consisted of students working collaboratively on a Lecture Exercise in breakout rooms. This worked well. Student reviews were very positive.

If you have been curious about the flipped classroom idea, this may be the semester to try it out.

Extra Effort to Pause for Questions

An alternative to using the Zoom chat channel to handle questions is to make an extra effort to pause for questions. Emmanuel Saez said that he had success with this. In particular he said:
  - Stop after each slide (or short sequence) to ask for questions. Once students get used to it, they would typically ask questions (as they were doing in person in class)
  - Ask yes/no questions to the full class that they can answer on the spot using the zoom buttons. You can see the tally in real time. This was particularly effective on normative questions in the PF class especially when a topic generated questions (e.g. "Do you think the wealth tax is good idea?"). Also useful to ask: did you understand this slide?

In my own experience, pausing for questions worked well. I asked students to use the "raise hand" feature in Zoom. They seem to have appreciated the Q&A aspect of the lectures very much.

It is important to pause extra long to get students to participate. Feels unnatural but works.

Using the Zoom Poll Function:

Zoom offers an ability to do polls during a meeting. This is a relatively easy way to increase engagement. There are two approaches technically speaking. One is to prepare each poll ahead of time, which is somewhat labor intensive. A low effort alternative is to prepare a "blank poll" with (say) four blank answer options and use this poll over and over again during your lecture with the actual questions and answer options on your slides.

Other Ideas / Tips:

David Romer: "The students like it a lot if you log into zoom a few minutes early and stay a few minutes after class and "socialize" with the students who are on. A couple of times, we stayed on for extended periods after lecture—once to discuss grading, P/NP, exam procedures, etc., and once to discuss the economics of the pandemic. Those went well."

Yuriy Gorodnichenko: "One thing I should have done is to have more "chat rooms" with students (e.g., create a small group of students, give them a "project" based on the class material, and talk to them as a group). It may be hard to do in a really large class, but I think it could be done as a GSI/prof combo."

Benjamin Schoefer: "To stimulate discussion/interaction, I tried to enforce some discussion by saying: for next lecture, prepare some thoughts on topic X, and we'll devote 15min to this. This worked well"

Setting Up Zoom Meeting:

Your class will likely have a lot of Zoom meetings (lectures, sections, office hours, etc.). Managing this well is important. For this, it is useful that you can set up Zoom meetings for your class from within bCourses. You can do this by going to Settings -> Navigation and enabling Zoom for your course.

There are several benefits of setting up Zoom meetings for your class from within bCourses:
1) Zoom meetings created on bCourses will show up on the bCourses calendar for the class.
2) Students can access the meeting from bCourses without a link and without using the password for the meeting.
3) Students don't need to have a long list of links and passwords. You don't need to maintain and organize a long list of links and passwords.

Zoom allows you to create a recurring meeting. Doing this cuts down on the complexity of managing Zoom meetings for the class.

When setting up Zoom meetings there are several things to attend to. These are options you may want to enable:
 – Mute participants upon entry
 – Enable join before host
 – Don't allow participants to change their display name
 – Don't allow participants to share their screen
 – Don't allow participants to annotate

It is also useful to remember that there is a "mute all" button at the bottom of the participants' box in Zoom.

You will also likely want to make your GSIs co-hosts during lectures.

Tips for avoiding Zoom bombing are available [here](#).

Tips for a healthy virtual environment are available [here](#).

Recording Zoom Meetings

We encourage instructors to record their lectures and post them on bCourses. Students may face unstable Wifi and they may be in a different time zone.

Zoom provides you with the option of saving the recording to the cloud or to your device. We recommend that you record the meeting to your device and then upload it to bCourses.

On your Berkeley Zoom page, under Recording, you can find some useful options. For example, if you would like not to have thumbnails of participants show up in the recording, you can turn off that option.

In uploading your recording to bCourses, it is useful to use the Kaltura My Media and Media Gallery tabs in bCourses. These can be found in Setting -> Navigation in bCourses (see this link for instructions). If you do things this way, here are the steps for posting a recording:

1. Go to My Media in bCourses and upload the mp4 file for the meeting in question.
2. Go to Media Gallery for the class and add the mp4. Students can view it from the Media Gallery.

If you would like to create pages in bCourses with nicely laid out lists of the material you are recording and posting for the class, it is easy to embed your recordings into these pages once you have uploaded them into My Media. The way to do this is to press the little "v" icon in the icon bar when you are editing the page in question.

Students in China (and others with a weak internet connection) may have difficulty streaming lectures through bCourses. These students may prefer downloading files. If so, they may prefer downloading only a chunk of the lecture at a time. This can be accomplished by stopping and starting your Zoom lecture half-way though. If you do this, Zoom will create separate files for the different chunks once the meeting ends. (Pausing the recording does NOT have the same effect.)

Interaction between Instructor and GSIs

The need for regular interaction between the instructor and GSIs is likely higher than normal. We recomment weekly interaction between instructors and GSIs either by email or in person.

Disability Students' Program

Accommodating DSP students will require special attention. See campus DSP best practices.

Sections:

GSIs are generally quite opposed to having live syncronous sessions recorded. We recommend that this preference be respected.

The usual practice of having each GSI give two or three repetitions of the same section is probably not optimal when instruction is remote. The following is an alternative system suggested by Marty:

– Each week have one GSI record a single one-hour section. Make this available to all students in the class at the beginning of the week. This recording could be made asyncronously without live audience. In a class with several GSIs, this responsibility could rotate across GSIs.
– Use section times for small-group conversations, Q&A, hands-on helping students solve problems. Here each 30 student section could be broken into two 15 student groups that meets once a week. Each student would then have one hour of asynchronous lecture type section material and one hour of syncronous small-group interactive section. Students would be expected to already have watched the asynchronous section recording. So, these small group sessions would hopefully have a flipped classroom feel to them.

If you plan to go with this plan, please take care to discuss this with your GSIs early. They may not be expecting this.

Some GSIs have used the Breakout Room feature on Zoom. Success has varied. The benefit of breakout rooms will be smaller if sections are broken into groups of 15 as described above.

Marty's advice on how to do breakout rooms well is that the key issues are:

- Content -- what are students being asked to do in breakout room, does task lend itself to conversation & collaboration
- Checking in -- GSI needs to jump from room to room and check in with each group, not use this as a chance to make coffee
- Reporting out -- students need to anticipate that they will be expected to report out once the b/o room closes

You may want to be more lenient than usual about which students attend which section due to time-zone issues that some students may face.

An idea from a GSI: "One strategy to make the section more engaging and increase attendance is to give grade incentives in the following way. Students divide into different groups during the whole semester. Then, they discuss the solutions to a problem during the section. It can be a question of a problem set or the section notes. Then, the GSI randomly chooses one of the groups to present the solution to the rest of the class. If the students do a good job, they obtain a 1, otherwise, a 0. This can be considered an additional problem set(s). Each group must present at least twice during the semester. This can be done in the first 20 minutes, and then, the rest of the section remains the same."

David Romer: "We tried to strike a balance in terms of whether students stuck with their own GSIs or just did whatever they wanted. The GSIs provided the zoom info about their section meetings and OH only to the students in their sections, but we told students they were free to email another GSI to ask for, say, OH info if they couldn't make it to their own GSI's OH. (Our head GSI says that it might be good to be freer with allowing students to attend different GSIs' OH in the fall.)"

Office Hours:

Instructors and GSIs generally have held these on Zoom. In most cases, these have not been recorded. Attendance has varied.

Marty: "Held OH at the same times but were I doing this again, I'd have times that are further apart (morning, late afternoon or evening) to accommodate students in different time zones."

David Romer: "Attendance at our office hours was initially way down relative to the live versions, to the point where it was often painful (e.g., just a couple of students without a lot of questions). We started announcing that we'd dedicate the first hour to a specific topic (e.g., financial crises), which worked well."

You may want to consider using Piazza more intensively than in a usual semester to answer student questions and carry on a discussion with the class.

Problem Sets / Other Assignments:

David Romer: "We switched from p sets every other week to weekly to encourage students to keep up, which we think worked well."

David Romer: "The move to online teaching eliminated some sources of connections between us and the students and, especially, among the students. One thing we'd started to do a few years ago was have a "problem set work session" before each problem set was due. It seemed to be a great way for shy kids to meet others in the class, form study groups, etc. (Our head GSI described them as "irreplaceable parts of the college experience.") Assuming the fall starts online, finding ways for kids to make connections with one another seems very important."

Ray Hawkins: "I've used Gradescope for problem sets for years and continue to do so in the online setting. Students create a pdf of their problem set and upload that pdf to Gradescope. Most, if not all, GSIs are familiar with Gradescope."

Exams

By far the most painful and difficult part of remote teaching has been fielding exams.

Over the summer, campus outlined best practices that included giving timed exams (say 90 minutes) but allowing students flexibility as to when they started their exam within (say) a 24 hour window. In classes where this guidance was followed there were instances of massive cheating. A few students would start the exam early in the 24 hour window and post the exam on the web (e.g., on Chegg) for all to see. Others could then work on figuring out the answers for 18 hours or so before starting their exam. I think it is fair to say that this system does not work well for large classes (i.e., for most of our undergraduate classes). Campus has since moved away from this recommendation.

The current Academic Senate recommendations for remote examination can be found [here](#).

Many instructors have moved to a system where they offer two exam times for each exam. For the final exam, the "main" exam time should be the official exam time for the final exam in that class. The second exam time should give students in time zones for which the main exam time does not work well a more convenient exam time, e.g., a time 8-12 hours after the main exam time.

If you adopt this system, we recommend that you ask students to sign up for the "alternate" exam time ahead of time if they want to make use of that exam time. You may also want to indicate that this alternate exam time is intended for students in certain time zones (although some flexibility may be warranted). Having an accurate read on who is taking the exam at which time is crucial if you plan to write different exams for the different exam times (more on that below).

A strategy adopted by some instructors (including David and Christy Romer, Pierre-Olivier Gourinchas, and myself) to raise the cost of cheating is to field several different versions of the exam. For my midterm exam, I offered six versions. I wrote three different exams and then I shuffled the order of the questions to create two versions for each exam I had written. This obviously takes extra effort and also raises the grading burden. But the effort in writing the exams can be limited somewhat by asking variants of the same question on the different exams.

If you intend to offer several versions of an exam, an important issue is how to field the exam without students knowing ahead of time which version they are taking (and therefore which of their classmates are taking the same version). There are several approaches to solving this problem:
- The lowest tech solution is to email the exam to the students at the start of the exam. In this case, all you need to do is create separate email lists for the different exam versions.
- Another solution is to create different assignments in bCourses all with the same name (i.e., "midterm"). A downside of this approach is that you need to manually enter into bCourses which students will take which version. This is tedious in a big class. Note though that bCourses offers an option where different students can take an assignment at different times, which is useful for DSP students that have longer exam times. I used this approach and asked the students to upload their solutions in bCourses as a PDF file. I then had my GSIs download the whole thing and upload it into Gradescope.
- A third solution is to create separate "courses" in Gradescope for the students taking different versions of the exam. This approach was taken by David and Christy in Econ 2 and Pierre-Olivier in Econ 182. An upside of this approach is that students can match pages to questions in their solutions to reduce GSI workload when grading.

Another approach to raising the cost of cheating is to proctor the exam over Zoom. Campus has a pilot program for this. If you would like to participate in this pilot, please email Cathy Koshland at ckoshland@berkeley.edu to that effect. In the fall of 2020, Emily Tang used Zoom proctoring for Econ 1. She says this worked well. Here is her description:

"A few weeks before finals week the VCUE sent out their recommendations for remote proctoring collected from EECS experience, and I used that best practice document as a guide. In brief, my students were asked to record to the cloud a Zoom meeting with just themselves, with their screen shared, their face visible, and their audio stream un-muted while they were taking the exam. They were asked to paste and submit a link to the recording as a bCourses text entry "Assignment"."

We strongly recommend that you provide students with an opportunity (and perhaps a small grade incentive) to test-drive the logistics of taking the exam.

David Romer: "We spent a lot of time beforehand preparing. We sent a very long email to the class 9 days before explaining the procedures and why we were using them; extended the lecture 7 days before the exam to give students as much time as they wanted to ask questions about the procedures, P/NP grading, and how the Economics Department was adjusting its criteria for admission to the major (which ended up taking about an hour); met with the GSIs; met repeatedly with the head GSI; had a mandatory trial run the weekend before the exam where students were required to do and upload a trivially simple assignment (which turned out to be crucial); and spent considerably more time than we usually do crafting the questions. We gave everyone 6 points (out of 150) for doing the trial run. Students who didn't do the trial run and didn't explain why lost some or all of the 6 points, as did students who uploaded their exams more their 10 minutes late and offered no explanation. We were quite generous with students who told us that they'd encountered problems in uploading."

Other important issues to consider are:
- Provide clear guidance before the exam about what material students are allowed to use.
- Provide clear guidance on how to contact GSIs/you during the exam (e.g., you might have a Zoom room open)

- Provide clear guidance on what to do if students run into problems uploading their solutions. Screenshots with a time stamp can be super helpful evidence. You may also want to tell students to email you or the GSIs their exam if they are having trouble using bCourses or Gradescope when they are uploading.
- Think carefully about your policy regarding late submissions of exams.
- Factor in the time students need to scan and upload their exams.
- You may want to have the students acknowledge the Berkeley honor code during the exam.
- You may want to communicate to the students the things you are doing to deter cheating and also the notion that you are doing other things that they don't know about to catch cheaters.
- Some instructors have increased the time pressure in their exams to discourage cheating. This however will likely increase stress among students.