**Some tips and feedback on online teaching**

Suggestions from WHOI JPBO students and faculty following Spring 2020 semester

* **Familiarity with platforms**: It's important for the instructor to be very familiar with the online teaching platform (e.g., Zoom), and it may also be helpful to orient students. By Fall 2020, more students will be familiar with the Zoom platform, but it may be new to some.
  + Several tutorials are available, but Spring 2020 instructors found that they varied in their utility. The training provided by MIT focused heavily on uploading recordings to Stellar and was not found to be particularly helpful. Tutorials provided by the Zoom help center were found by some to be more useful: https://support.zoom.us/hc/en-us/articles/217214286-Watch-Recorded-Training-Sessions
  + A student noted that a course "spent the first ~10 min of the first zoom lecture giving an overview to Zoom and having students practice finding and using each of the features. I thought this really helped the rest of the course run smoothly; we knew, for example, to click the hand-raise button to show when we had a question (as we were a small enough class so as to all be visible)".
* **Class recordings:** Uploading to Stellar is time-consuming and instructors usually found other work-arounds. Either uploading to the cloud directly within zoom, or uploading to dropbox and providing links in Stellar.
  + Note that JP Instructors can get a large dropbox account through MIT at no charge; contact Julia Westwater to request this. One student specifically noted that Dropbox was the best (fastest) way to share and access the files.
  + The students who replied were all glad that the class recordings were available and cited a variety of reasons (connectivity issues, missing a class due to illness, having questions about specific points)
  + No students reported being uncomfortable with being recorded on student noted "most (all?) of my instructors purposely started recording after any chatting/personal updates at the beginning of class."
* **Plan B:**  Instructors should think about a "Plan B" in case of issues with connectivity or other problems with the technology. For example, if a student presenter loses connectivity, there should be plans for another student to step in. A co-instructor or TA (if there is one) might help if the instructor loses connectivity. If there is no co-instructor or TA, perhaps a list of discussion questions might be provided at the start of class.
* **Facilitating discussion and engagement:** Some instructors noted that there tended to be less discussion in the virtual format. Student feedback:
  + Sometimes it felt hard to jump in on a discussion because of the delays and nature of virtual format. One student suggested that a good approach could be to introduce some discussion prompts and go around the room, giving each student a chance to comment. Another student noted that it was difficult to ask questions (due to delays) without feeling like interrupting. The student suggested that it would be helpful for professors to take a longer pause to stop and ask for questions before moving on.
  + Instructors writing live on a tablet like they would a blackboard worked really well and was much more engaging than powerpoint slides or a shared word doc [see also notes on tablets, below].
  + Some students and faculty both felt that discussion breakout rooms were helpful for increasing engagement, particularly in larger classes [see further notes on breakout rooms, below].
  + Students found classes less engaging when the instructor(s) did not turn on their cameras. Students also suggested that all students should be encouraged to turn on their cameras if possible.
  + One student particularly appreciated recitations with TAs "where we could chat more and were less held down by the structure of a lecture".
* **Break-out rooms** are a good mechanism for engaging discussion in classes larger than 4-5 students. However, break-out room discussions take more time than most instructors had expected. Student feedback:
  + This was cumbersome when doing work that involved writing/equations. Despite this frustration, students found using the whiteboard features to be useful in these sorts of breakout discussions. [would this be easier if students also had tablets?]
  + It was sometimes hard to keep track of what students were specifically supposed to discuss (especially when toggling back and forth between screens). One student found it easier if discussion questions/materials were sent in advance (e.g., as pdf), so student could have pdf open alongside the discussion.
  + One student (involved with a couple different classes) said it worked better when hard time limits were set for break-out rooms.
  + A student suggested that breakout discussions were more useful and productive when there was a specific structure for the discussion (such as list of questions to discuss, possibly with a TA or instructor in the group).
    - An alternate structure might be to assign a student as the "leader" for each group. It's sometimes helpful on video call to have someone in this role, calling on people to speak and moderating flow of discussion.
* **Technology: Tablets** work well for some types of instruction, particularly where a lot equations are used. Last semester APO offered to procure some supplies like this for instructors. Please think about if there are supplies (tablet, whiteboard, something else) that might help your teaching. We can try to get you what you need.
  + A student TA mentioned using the tablet both as a second screen (using the "Dust" app) and as a white board. Tablets may be broadly useful for both students and instructors.
  + A second student mentioned that showing **videos** (movies) really didn't work well: Videos were inaudible, instructor audio went garbled, and the videos lagged. Our eventual solution was that the videos were sent out ahead of time, and we were told when in class to view them — this worked much better.
* **Communications:** Some instructors felt like students didn't check in with questions or for feedback as much as they would in a traditional class. Holding **virtual office hours** (a zoom scheduled open zoom meeting with a waiting room) might be a way to encourage interaction. A class **Slack channel** was another proposed idea (this was used previously for the Environmental Bioinformatics class, for example).
  + One student thought a slack channel was more likely to be useful (questioned whether students would really take advantage of office hours).
  + A second student agreed: "A Slack channel per course is helpful, especially because we get so many emails that course-relevant ones can be missed or hard to relocate and because students can easily make a private channel (without instructors/TAs) to discuss homework etc. to replace a normal study group. Stellar is good for uploading files but not for sharing updates, asking questions, etc."
  + A third student saw a lot of value in both office hours and Slack: I would have found it helpful if there were set office hours that the professors held and encouraged us to attend, and study groups with my peers when assignment deadlines or tests were coming up (this would be easier to facilitate with a classroom Slack).
* There are several different approaches to avoid "zoom-bombing" type disruptions, such as requiring pre-registration, assigning a password or having a waiting room.
* "Zoom fatigue"...suggestions from students
  + Some classes responded to this [big increase in screen time] and related issues by reducing the amount of reading we were asked to do outside of class, but of course this is not a universal fix.
  + Most pdf viewers have in their accessibility settings a way to have the program read the pdf out loud. That really helped me get through homework readings and could perhaps be listed somewhere as a potential resource that students could look into. It does not work for all pdf’s, and I often have to read along to really digest the content, but I have found it incredibly helpful nonetheless.
  + I appreciated instructors pausing between sections of lecture or discussion to encourage everyone to stand up and stretch for a minute. I had 5-6 hours of class on Tues and Thurs and my back was not happy about sitting at my desk for that long with so little movement.