**Active Learning in Online Teaching**

Instructors can adapt many active learning strategies to online courses. Online active learning can also provide new ways for students to interact, participate, and collaborate.

For effective active learning, consider ways to combine **practice with feedback, peer learning, and clear structure.** Below are a selection of strategies that are used in Cornell courses for active learning in online teaching.

**Practice with Feedback:**

Alternate short periods of lecturing (live or lecture videos) with time for students to apply what they have just learned and receive feedback. Students can work individually, in small groups, or both.

Strategies include:

* + **Ask questions about a lecture with classroom polling:** if you are giving live lectures through Zoom, periodically pause your lecture and ask students a question about the content in real time using [iClicker Reef polling online](https://teaching.cornell.edu/webinars-teaching-online#POC) , [Poll Everywhere](https://www.polleverywhere.com/), or [Zoom polling](https://support.zoom.us/hc/en-us/articles/213756303-Polling-for-Meetings). You can also pair polling with [Zoom breakout rooms](https://teaching.cornell.edu/teaching-resources/planning-remote-teaching/answers-faculty-questions/zoom-frequently-asked#Breakout) for students to discuss the question. Ask students to share their answers and reasoning and wrap up by explaining the correct answer or your perspective on the issue.
	+ **Low-stakes quizzes to check understanding:** When using short lecture videos, you can ask students to take a low-stakes [Canvas quiz](https://canvas.cornell.edu/courses/1848/pages/quizzes) after viewing the video,  [embed a quiz in a Panopto video](https://teaching.cornell.edu/learning-technologies/assessment-tools/video-quizzes-panopto-kaltura), or use [Kaltura Quizzes](https://corp.kaltura.com/products/interactive-video-quizzes/) to include a quiz in a Zoom video recording. This helps them to check their understanding and to reinforce concepts, especially if you [enter comments when designing the quiz](https://canvas.cornell.edu/courses/1848/pages/creating-a-multiple-answer-question-for-a-quiz?module_item_id=76208) to explain the correct and incorrect answers after they have taken the quiz.
	+ **Zoom chat window to share student responses:** During a Zoom class meeting, you can ask students to post an answer to a question or their thoughts about class content in the [chat window of Zoom](https://support.zoom.us/hc/en-us/articles/203650445-In-meeting-chat) (best for smaller classes). For large classes, you could ask students in [Zoom breakout rooms](https://teaching.cornell.edu/teaching-resources/planning-remote-teaching/answers-faculty-questions/zoom-frequently-asked#Breakout) to choose a group notetaker to post group discussion notes in the chat window after returning to the main class session. You can ask students to post just to you (private chat) or for everyone in the class to see.
	+ **Screensharing:** Students can share their work with the rest of the class or in breakout rooms by [sharing their screen in Zoom](https://support.zoom.us/hc/en-us/articles/201362153-How-Do-I-Share-My-Screen-) or [using their phone or tablet as a document camera](https://cornell.app.box.com/s/gqoezptza4bm0gjpci14yydr0xt5odvh).
	+ **Gradescope:** Ask students to download worksheets and then upload completed work to [Gradescope for grading](https://teaching.cornell.edu/learning-technologies/assessment-tools/gradescope). Gradescope is now integrated with Canvas.

**Peer learning:**

Through discussion with their peers**,** students may see additional patterns and connections between concepts, correct misconceptions, and organize their knowledge. It can also help create a sense of community in the class.

* + **Breakout rooms in Zoom:** During a live online class, pause your lecture and [place students into small groups in breakout rooms in Zoom](https://teaching.cornell.edu/teaching-resources/planning-remote-teaching/answers-faculty-questions/zoom-frequently-asked#Breakout) to discuss a topic or solve a problem. Ask groups to report back or post their answers in the chat window when they return to the main session. Note, some instructors have found that groups of 3-5 work better in online formats (rather than forming pairs of students).
	+ **Online discussion boards:** Ask students to post questions, observations, or answers to questions either before or after class on the online discussion boards in Canvas ([Piazza](https://canvas.cornell.edu/courses/1848/pages/quick-start-how-to-enable-piazza-in-canvas), [Canvas Discussions](https://canvas.cornell.edu/courses/1848/pages/discussions)). If you want them to respond to other students’ posts, remember to give two due dates: one for the first post and the second for a response. Student discussion posts are also a great way to start the next class discussion, identify areas of confusion, and encourage students to complete reading and other assignments.
	+ **Group collaborations in** [**Canvas Groups**](https://community.canvaslms.com/docs/DOC-10717-67952724469)**:** Instructors can set up Canvas Groups  as a dedicated place where students can collaboratively develop and discuss their projects and share materials (they can collaborate on Google Docs, create their own discussion boards, post project announcements, use the Conferences tool, and share files). Consider organizing groups by time-zone to make it easier for students to meet outside of the main class time. Students can also submit their team projects to [Group Assignments in Canvas](https://community.canvaslms.com/docs/DOC-10107-415254248). The [Group Member Evaluation](https://feedbackfruits.com/group-member-evaluation) tool allows students to give feedback on each other's contributions to the team project.
	+ **Peer feedback assignments.** Students can exchange written work, videos, presentations, or other assignments for peer feedback. Providing feedback expectations or a rubric is helpful. CTI is piloting a peer feedback tool in Canvas, [Feedback Fruits](https://secure.feedbackfruits.com/), in Fall 2020. Please get in touch with CTI (canvas@cornell.edu) if you are interested.
	+ **Student prepared videos and other resources:** You can ask students to create a short (3-5) minute video to explain a course concept to their peers and post it to a discussion board in Canvas. Consider trying [Flipgrid](https://info.flipgrid.com/), which can be used to share short student videos. Other alternatives are to ask students to post a concept map, infographic, or content review questions to share with peers.
	+ **Google docs for collaboration:** Consider using Google docs or Google sheets for student collaborations. For example, worksheets or handouts that you might have used for in-person activities can be made into a Google doc. Students can contribute to them simultaneously, as well as provide a way for you to give feedback. [Google Apps can be integrated into Canvas pages](https://canvas.cornell.edu/courses/1848/pages/embedding-google-app-files-into-the-rich-content-editor), and students should access Google Suite using their authenticated Cornell accounts.
	+ [**Hypothes.is**](https://web.hypothes.is/)**:** Students can annotate readings online and respond to each others’ comments using this social annotation tool in Canvas. It encourages students to read closely and thoughtfully and can identify areas of common interest or confusion. CTI is piloting this tool in Fall 2020. Please contact us if you are interested (canvas@cornell.edu).

**Structure: \**

Provide clear instructions, expectations, and accountability

* + **Clear instructions:** Especially when asking students to work or discuss in groups, provide clear written instructions (can be posted in Zoom chat) and guidance on what they are expected to do at the end (report back to the class, answer a question, complete a worksheet etc.).
	+ **Clear purpose:** Explain the purpose and value of the learning activities. How will they help students develop their knowledge and skills?
	+ **Accountability:** Build in some low-stakes accountability to encourage students to participate in the activities (i.e. participation credit, minimum number of required posts per semester in discussion boards, etc).
	+ **TAs** can help by visiting breakout rooms, monitoring the chat or online discussion boards, and by giving feedback to students.
	+ **Expectations and examples:** For example, if using online discussion boards, consider providing examples of a good post and your expectations (i.e. the post refers to the reading, poses a question, considers evidence, etc.). If doing a peer review assignment, give examples of constructive feedback and/or provide a rubric.
	+ **Due dates, grading:** Be clear about grading and deadlines. When are activities due? Are they worth any points? What if students cannot attend or miss a deadline? Cornell instructors have reported that having some flexibility (i.e. dropping lowest grades, student choice in ways to participate or type of assignments) have been helpful especially in accomodating students’ varied circumstances.

**Some challenges encountered when doing active learning online**

* Students are silent in the breakout rooms, or one student would like to talk, but no one else participates or turns their video or audio on.
	+ Spend time building a sense of community, especially in the first week, but also throughout the semester. Give students time to get to know each other so they are more comfortable in talking with one another. [CTI offers additional resources on building community and inclusion in online courses](https://teaching.cornell.edu/teaching-resources/accessibility-accommodation-inclusion/inclusion-hybrid-online-settings).
	+ Consider asking students for their input on online etiquette, [use of Zoom features,](https://teaching.cornell.edu/media/290) and expectations for participation, either with the entire class or as an exercise in building a team contract (if working in permanent teams). This is a good activity in the first week of class.
	+ Students may not see the purpose or value of the learning activities and discussions. Make sure that activities are well aligned with the learning outcomes and assessments for the course. Talk with students about the goals of the activity and the educational value of discussing with others and applying what they are learning.
	+ Consider having more accountability: tell students that each group needs to post an answer in chat, or that groups will be called on to report out, or will need to submit a document.
	+ Assign roles (like notetaker, reporter) to the group members (and rotate).
	+ Try adjusting the group size to see if larger or smaller groups seem to work better. Generally, we suggest around 3-5 students in a group, but it may depend on your class.
	+ Consider having permanent groups throughout the semester by [pre-assigning breakout rooms in Zoom](https://it.cornell.edu/zoom/zoom-set-and-work-pre-assigned-breakout-rooms). Working with the same group each time may help students feel more comfortable in talking. If groups are responsible for assignments, a peer feedback survey around mid-semester can help identify and solve problems in group participation.
* It’s difficult to know how much time groups need in breakout rooms, or if they need help.
	+ Remind students of the [“Ask for Help” feature in Zoom breakout rooms](https://teaching.cornell.edu/sites/default/files/2020-03/More%20Zoom%20information%20for%20faculty%20to%20give%20to%20students_1.pdf).
	+ Visit the breakout rooms and ask TAs to join the rooms as well.
	+ If you have TAs who join breakout rooms, consider setting up another channel (such as Slack) where they can tell you if questions are coming up or if groups are finished or need more time.
* Some students cannot easily participate in synchronous activities (unreliable internet access, no quiet space, not in the same time-zone)
	+ Take advantage of asynchronous options: posting to online discussion boards, downloading/uploading worksheets, short quizzes after lecture videos
	+ Allow a window of time to complete activities (i.e. 24 or 48 hours).
	+ Organize student collaboration groups by time-zones to make it easier to find a time to meet that works for them.
	+ Offer different options for participation, for example students who cannot participate with video/audio in Zoom, can post their comments in the chat box.

**Putting it all together: Cornell courses using active learning online**

In Spring 2020, many Cornell courses adapted active learning strategies from their in-person classes for remote teaching. Often instructors used several approaches to meet their learning goals and to support students. Some examples are:

 In *Applied Econometrics* (Econ 3120), students worked in permanent assigned teams throughout the semester. During synchronous class meetings on Zoom, the instructor alternated between short periods of lectures and time for the student teams to work together in Zoom breakout rooms to solve problems. iClicker Reef polling was also used as a way for students to submit answers to questions as individual work. The student teams also met outside of the regular class time to collaborate on a semester-long data analysis project and on a group portion of the exams.

 In *An Introduction to Evolutionary Biology and Diversity* (BioEE 1780), students watched short lecture videos followed by a Canvas quiz to check their understanding. They were assigned to permanent teams for the entire semester and teams were expected to meet regularly and complete assignments together. In addition to turning in the assignments, teams were also asked to take a screenshot photo of everyone in the online meeting (to show that team members participated) and to submit a mid-semester peer feedback form for their team members. Students also met weekly online with their instructors in Q&A sessions and in TA-led discussion sections.

 In *Introduction to the Classical World in 24 Objects* (Classics 2700), in addition to short quizzes in Canvas after the lecture videos, students were asked to post to the online discussion boards and respond to other students. They also completed peer-reviewed essay assignments. For this art history course, the first discussion board post after moving to remote teaching asked students to find and analyze an object in their homes according to the ‘Big Nine’ concepts of the course. The instructor provided an example analysis of an object in their home. The instructor reports “it was amazingly effective, produced great analyses, and fostered belonging remotely.”  The final assignment asked the students to come up with their own ‘24th Object’ for the course, which produced some wonderful reflections on what was missing from the syllabus and what they would have liked to incorporate (whether a more diverse representation of ethnic, regional or religious groups, more attention to women, a broader range of media etc.).