



Engaging Learners in Online Instructional Environments

Bryan Guarente, Andrea Smith, and Tsvetomir Ross-Lazarov
University Corporation for Atmospheric Research, The COMET® Program, Boulder, CO, United States



Virtual Engagement

Virtual Engagement isn't an easy task. And you've been dealing with this over the last 9 months! Engagement is one of the keys to learners' retention of knowledge. To engage with students online, we suggest:

- Breakout Rooms
- Analysis Exercises
- Polling Questions and
- COMET Modules

Each poster section discusses one of these topics. Make sure to scroll through each section of the poster for more content. Have your phone ready to engage with QR codes to get to even more relevant content.

Synchronous Engagement: Breakout Rooms

Using breakout rooms in your classes can give students the opportunity to engage again with other students in their cohort. The benefits of this for developing community, building support structures, finding like-minded people, and engaging with content meaningfully cannot be overstated. Letting students engage with content on their own terms without injecting yourself (instructor) into the conversation (until later) builds learner confidence and helps them develop personalized questions about your content.

To properly design a breakout room:

- Give learners a task
- Ask them to go into a breakout room and come up with their analysis, solution or suggestions TOGETHER
- Bring groups back to discuss their results

Some ideas for breakout rooms include:

- customize a weather briefing for a different audience
- develop a section of an outreach pamphlet
- assess service delivery for a severe weather event and identify needed improvements
- analyze a different level/height of the troposphere
- analyze a different case event
- agree on a forecast outcome for the same event; follow-up debate

Synchronous Engagement: Breakout Rooms

Active analysis exercises worked well in your face-to-face classroom, but putting pencil to paper isn't as easy virtually. The amount of prep work to get a case study in place, or upload all your imagery to an LMS made the task harder. Then ensuring your students had software to draw on the maps was a further struggle.

The **COMET Program's Real-time Drawing Tool** gets rid of the need for your students to have local software to complete this task. It also makes getting imagery into the drawing tool simpler. And it can all be done on the web. As long as there is a URL to the image, you can get import that image into our tool.

Click on the image below to see the process for importing real-time images into the drawing tool.



To get to the Real-time Drawing Tool, scan this QR code or go to: <http://www.comet.ucar.edu/tools/draw/>



Zoom Annotation Tools

When running your training virtually, it is good to get your students involved with some analysis. Some of the higher-order learning objectives often involve analyzing data. If you are using Zoom, this can easily be handled with Zoom's annotation tools (click on the image below to see how).

The entire class can annotate on your screen to make the analysis go faster. It can also show others some common issues with analyses by showing others' mistakes at the same time (anonymously).



Let your students correct each others analyses or ask clarifying questions to help their communication skills while improving their analysis skills.

Synchronous or Asynchronous Engagement: Polling Questions

When engaging with students online, it can feel like they aren't involved in your content at all. Blank webcams, silent audio, crickets... To bring students into the content, you can ask anonymous polling questions to check their understanding, assess their knowledge retention, and provide them with novel situations to up their game to higher order learning.

The following questions are examples of polling questions that you could use within your courses. Engage with these questions yourself by scanning the QR codes next to each question.

In one word, what is your greatest challenge going virtual with your course/internship/workshop?



Where are the positive vorticity centers on this satellite image?

To see the live results of these polls, scan each of the QR codes below:



Asynchronous Engagement: COMET Modules

When you are running asynchronous courses, engagement is exceptionally hard. But with cleverly designed instruction, COMET modules can help your students engage with harder topics in the geosciences. Check out our catalog at <http://MetEd.ucar.edu>. Click on the "Education and Training" tab to find all of our instructional content.



Maybe you are running a specific university-level meteorology course that we may already have content for but you may not know where to find that content. We have already mapped our content to some popular meteorology courses to help you find what you need as an instructor or as a student. Go to the QR code at left, to find those resources, or click this link: [University Course Mappings](#)