Online Course Delivery Approaches

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Some instructors have developed effective approaches to deliver their course content online, and through experience have refined and improved their approach. Others of us are facing the realization that we need to develop an approach for online course delivery by the start of the next quarter in two weeks. I am among the latter group. I have explored several options, and I hope that by sharing these approaches in this brief note it might save you from needing to duplicate my efforts and relieve some of the anxiety from the current situation.

As a disclaimer, I have never taught an online course. My preferred course delivery style is verbal lectures with extensive whiteboard use and occasional computer projection of images, videos, and numerical demonstrations. The approaches outlined here are functional, but leave significant opportunity for improvement. Feel free to contribute suggestions.

I use a MacBook Pro and an iPad Pro with an Apple Pencil, so the approaches described may need to be modified for your computer hardware. I plan to deliver the class lectures in real time through Zoom while sitting at my office desk. Zoom allows students to ask questions either by unmuting and speaking, by typing in the chat window, or by raising a virtual hand to be recognized.

1 Presentation of Electronic Material: PowerPoint, PDF, Word,...

Zoom allows you to share a window that you have opened on your desktop and annotate the material as you speak to it. This approach does not require an iPad and will work with any computer hardware.

1. Open the presentation window, e.g. PowerPoint, on your desktop computer.
2. From the Zoom window, click the green share button and select the PowerPoint window. A green halo will appear around the window you are sharing. You can also share your entire desktop if you prefer.
3. The Zoom toolbar can be activated by moving the mouse to the top of your desktop beyond the “Stop Share” button and then drawing the mouse downward.
4. The toolbar allows you to annotate the slides as you lecture.

2 Zoom Whiteboard

Zoom has a feature that allows you to handwrite on a virtual whiteboard.

1. From the Zoom window, click the green share button. Select "Whiteboard" and share. A blank window will appear that is shared with your Zoom attendees.
2. The "Draw" tool allows you to lecture as usual. Note: writing with the Draw tool using a mouse is imprecise but works well using the Apple Pencil with Zoom on the iPad.
3. Lecture as usual by writing on the virtual whiteboard.

3 Third-Party Whiteboard

Using the Zoom whiteboard presents some limitations from the available tools and from the ability to switch between screens. An improved technique is to couple Zoom to a third-party writing app. I have used GoodNotes and PDF Expert ($7-$10 each). The approach described is specific to using a Mac and iPad, though a similar approach is likely possible with other hardware.

1. Connect the iPad to the MacBook with a USB cable.
2. Open the writing app on the iPad.
3. Open QuickTime Player on the MacBook. Close the file selection window that automatically opens. Start a movie recording: File → New Movie Recording. A window will open and activate the laptop camera. Switch the input from the laptop camera to the iPad screen: Activate the camera selection menu attached to the red record button. Select the connected iPad.
4. From the Zoom window on the MacBook, click the green share button and select the QuickTime Player window.
5. Lecture as usual by writing on the iPad app.
6. If desired, the lecture can be easily recorded with QuickTime and then shared with your students.
7. If desired, the lecture notes from the writing app can be exported to a PDF file at the end of the lecture, which can then be shared with your students.

4 Third-Party Whiteboard (wireless connection)

If the USB cable connection of approach 3 is undesirable, a wireless option is to use AirServer ($12) on the MacBook and the iPad. AirServer mirrors your iPad output. The other steps from approach 3 remain the same. Note: this wireless approach reduces the resolution of the iPad app.