Making the jump to online and remote teaching: tips and tools

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Don’t forget the humor…
Online learning is the next progression in education technology...
My journey with online/remote learning

2012-2013: Got involved in Massive Open Online Courses (MOOCs)
2013-2014: “Flipped” my writing and intro stats courses at Stanford
2014-2015: Flipped my advanced stats courses at Stanford
2020: Currently adapting in-class components for remote learning

Flipped classroom works well for subjects where you learn by doing, e.g., writing and applied statistics.

What do we do in class?
- examples from the news
- challenge problems
- data analysis
- *code diagnosis*
- homework assignments
- cool projects, example: Community service data analysis projects.
Tips for pre-recorded lectures

• Break lectures into “chunks”
• It is not necessary to follow hard-and-fast rules for the lengths of these chunks
• Write on the screen
• Include “pause the video” exercises
• Follow videos with easy online quizzes
• Consider including “how to”/“demo” videos...
“How to” lectures
Statistics Demo

Walk through a data analysis from start to finish (50 minutes)
Editing Demo

Edit a 500-word essay in real-time (30 minutes).
Tools for video production

Powtoon, https://www.powtoon.com/
Biteable, https://biteable.com/
Rawshorts, https://www.rawshorts.com/
Do-it-yourself lightboard: https://www.youtube.com/watch?v=L1au1JxMSaA
Tips for synchronous remote lectures

• Do not simply deliver your in-class lecture online.
• Break lectures into smaller segments
• Intersperse didactic materials with interactive exercises
• Have a TA or co-instructor present to monitor the chat for questions
• Have a TA or co-instructor present to interject with questions/create a dialogue
• Give breaks for classes >1 hour
• If bandwidth permits, ask students to leave their videos on
• “Cold call” on students
• Be flexible!
Interactive Poll

Go to Menti.com and enter the code: 99 16 59 3

Poll question: During a typical Zoom (or equivalent) meeting with >5 people, about what percent of time do you spend multi-tasking (e.g., checking email)?
Menitmeter (polls, word clouds)

What words best describe the writing in this paragraph?
Highlight jargon and “scientist speak” (words and phrases not found in nature):

1. Here we leverage the wide usage of smartphones with built-in accelerometry to measure physical activity at the global scale. We study a dataset consisting of 60 million days of physical activity for 717,527 people, giving us a window into activity in 111 countries across the globe. We find inequality in how activity is distributed within countries and that this inequality is a better predictor of obesity prevalence in the population than average activity volume.

2. This protein is interesting as it seems to be a part of function protein. We thought prions were formed by an entirely aberrant process that was confined to the space of disease, but we've realized that prions are formed by natural conformation changes that happen stochastically or are induced by environmental signals as an adaptive mechanism. There are actually plenty of examples of prions that have this ability to take on alternate conformations.
Whiteboard Fox

\[
\begin{align*}
3.11 & \times 0.56 \\
& = 6
\end{align*}
\]
Tools for interactive exercises

• Mentimeter, [https://www.mentimeter.com/](https://www.mentimeter.com/)
• Google docs, [https://docs.google.com/](https://docs.google.com/)
• Poll Everywhere, [https://www.polleverywhere.com/](https://www.polleverywhere.com/)
• Padlet, [https://padlet.com/](https://padlet.com/)
• Whiteboard Fox, [https://whiteboardfox.com/](https://whiteboardfox.com/)
• A Web Whiteboard, [https://awwapp.com/](https://awwapp.com/)
• Google jamboard, [https://edu.google.com/products/jamboard/](https://edu.google.com/products/jamboard/)
• Annotate (in Zoom), [https://zoom.us/](https://zoom.us/)
Tips for conducting active learning exercises remotely

• There is a treasure-trove of real-world statistics examples in the news right now!
• Twitter is a good source for examples
• Use break-out rooms to allow students to work in smaller groups
• Offer multiple remote office hours for code help
Why We Still Don’t Know How Many NFL Players Have CTE

By Christie Aschwanden
Filed under NFL

Dr. Ann McKee announces her findings after an examination of a former NFL player’s brain in 2017. (JON TULLY/ THE BOSTON GLOBE VIA GETTY IMAGES)

Zachary O. Binney, and Kathleen E. Bachynski

Estimating the prevalence at death of CTE neuropathology among professional football players

Zachary O. Binney, Kathleen E. Bachynski Neurology 2019;92:43-45
Ready-made statistics lessons on Twitter!
Tips for online assignments and exams

• Give clear instructions for auto-graded materials
• Build in sufficient tolerance for rounding errors
• Use multiple choice for checking that students have properly graphed data (with “decoy” graphs)
• Include multiple versions of questions, randomly assigned, if software/platform allows
• Make timed exams open-book—ask questions that require students to think or do
• Include some assessments that are graded off-line
Parting thought

Education was moving in this direction anyway. The pandemic is just going to kick us there faster!