

How and Why Do You Make Those Lecture Videos?¹

[Gary King](#)²

Department of Government
Harvard University

I recorded all my lectures for “Quantitative Social Science Methods, I” -- the first course in the Harvard Government Department’s graduate methods sequence -- and made them publicly available (on YouTube [here](#)). In response to lots of subsequent requests for details on my technology and pedagogy, here’s a summary of what I figured out and what I am still working on. Some of the ideas below come from my research; others from my personal experiments; and the rest from great advice I got from others directly or indirectly. Details on my class are available at j.mp/G2001.

Why record lectures? Live lecturing is great *for the lecturer*. It is fun and rewarding. I love it. Interruptions with questions enable you to adjust your talk to the audience. After all, teaching teaches the teacher, and so when you lecture you learn a lot. Unfortunately, live lectures are not as great *for the audience*. Students can ask questions, but doing so holds up everyone else in class, and so most questions go unasked and unanswered. We know from research in psychology that, on average, people in day to day life are not paying attention to what’s going on about 50% of the time (See the discussion in [King and Sen, 2013](#)). I am not sure we even want to know what that percentage is for those sitting in the back of a big lecture hall! So odds are the most important unasked question is “Wait! I just spaced out and missed what you said; can you go back and say that again?” Of course, few will embarrass themselves and ask that but, with a video, you can easily hit rewind, pause, or fast forward as you like.

A good class is an engaging collective experience and provides a feeling sociologists refer to as “collective effervescence,” which is the reason we are willing to pay so much more for a concert, if we choose to go, than a music download. If you get together with students physically (or virtually) in a class, why not talk with them, and engage with them, rather than lecturing at them while they sit there quietly? From the same psychological research as above, we know that if you’re engaged in conversation, you’re only mind wandering about half as often as you do normally (25% of the time), so a conversation in class seems wise. Think about it this way: when you assign a book, why don’t you walk into class and read it word for word? I think of the lectures I just posted as the equivalent of a book. In fact, I could easily make it a book but I think the material is more natural as a set of videos. (It is true that we’ll need to find a way to evaluate junior faculty who write “books” as videos, but we can figure that out; let’s lead with the best thing for our students.)

Why do you give the videos away? In academia, the more you give away, the more you get. We learned that long ago with publications: If I give you my writings, you may learn something; I’ll benefit from

¹For many helpful suggestions, my thanks goes to Jon Alper, Robert Browning, Mary Godfrey, Kevin Guiney, Dan Isola, Brian Lukoff, Eric Mazur, Rebecca Nesson, and Dustin Tingley. The current version of this paper is available at GaryKing.org/videos.

²Albert J. Weatherhead III University Professor, and Director Institute for Quantitative Social Science, Harvard University, GaryKing.org, King@Harvard.edu.

feedback or corrections or because you can build on my work; and the community will benefit from the interaction. We then learned the same lesson with data sharing (“[Replication, Replication](#)” was about this point, which “[Publication, Publication](#)” built on for a class assignment). The newer movement to give away teaching materials will make us all better. Creating, preserving, and distributing knowledge is what universities and academics do; it’s our job. Also, most of the material in my lectures I learned with, for, or from generations of students who might find some of the videos useful when they teach.

Using the videos: When I teach this class, I do not point students to the YouTube videos. Instead, I put all the videos in [Perusall.com](#), a free platform my collaborators and I developed. Perusall turns reading text and videos from solitary experiences into engaging collective ones. Students annotate the video timeline (and passages in texts) and then respond to each other’s questions and comments in threads, Facebook style. They also interact with Slack-like chat channels and in various other ways. With some novel algorithms, Perusall then automatically manages the out-of-classroom student experience (without instructor involvement), and ensures that students do the work, get full credit, and are motivated. You can use [Perusall.com](#) for your class by going to the site and setting up a course. If you’d like to use it with my videos, go to [Perusall.com](#), create your own course, and then use “copy code” **6AFEYRZH4P**, and all the videos will be pulled into your course automatically. Either way, you can then sign up your students (directly or through your learning management system like Canvas or Blackboard).

Class: Before I walk (or Zoom) into class, I print out Perusall’s “student confusion report”, which summarizes the student annotations and interactions and gives me the key points to lead a discussion. This works better than asking “any questions?” which is apparently designed to generate a sea of blank stares.

OK, so how do you make those videos?

Slides: I made the slides in [latex](#) using [beamer](#); PDFs of my slides are [here](#). In Github, you can find an [IQSS beamer theme](#) I designed especially for teaching and lecturing. It has a variety of features designed from what we know about psychology, education, and behavioral science (including special fonts, colors, emphasis methods, designs, sizes, lack of distraction, special navigation, and others). It even includes little things like a “.” that subtly appears to the right of the page numbers after the last click on a page so you know you’re about to flip the page with the next click. For these lectures, I use `aspectratio=54` in the documentclass header, move the slide to the left, crop it at the right of the “.”, and leave the right side for a video of me.

Recording: To make the final videos look right, record the slides and the video in the identical screen resolution and dimensions (I used 1080p for both, although I plan to increase this). Before you start editing, make sure both the slides and the video are also magnified to the same full size, which should make both will be exactly the same size and shape on the screen. You can then crop both as you like to make it all fit (I only cropped horizontally). If you follow these rules, you won’t wind up with squished text, a video of you that looks like a funhouse mirror, or different resolutions of you and the slides. If you want to go another step and make the slides perfect, record them in the same resolution as you plan to distribute (because downsizing screen recordings often doesn’t work as well as videos), but this may not

be necessary, if you follow the other advice here depending on what you plan to display. Because of these rules, my videos even work well on a cell phone with text and math that remains crisp and clear. To be clear, these rules are more important than high end video recording and editing equipment.

Video Design: The apparently unusual feature of my design is that the lecturer is (1) as full size as possible, with no wasted screen real estate, and (2) the lecturer never obscures the slides. The first is important because evidence indicates that larger, more realistic video is more engaging, which is critical, especially because you can't adjust what you're saying on the basis of audience interactions. It is easy to see by self-experimentation: Try making your Zoom correspondents bigger for 10 minutes and you'll pay more attention to them; make them really small for 10 minutes more, and you'll find yourself reading the news or doing email more frequently.

The second point is important because it makes no sense to cover up technical material, even occasionally. If your slides are mostly photos or other imagery, then you might want to use the disembodied torso style that hovers in front of the slides; you might even be able to format the text to go around you if you can deal with that complication. My design enabled me to create slides with the right sized rectangles, which is easier for the substance of what I'm teaching, and for me to occupy the entire rest of the screen so no screen real estate is wasted.

The scene. This isn't hard if you know a few rules, but they can really matter. First lighting: light yourself from both sides (maybe from about 10:00 and 2:00 if midnight is straight ahead), without dark shadows or bright shiny "hot" spots, and without much light coming from above you. Make sure there is some definition in your face, so you look three dimensional rather than a character in Flatland. Many people don't follow these simple rules and, on zoom, don't actually seem to have faces at all. Fortunately, this is easy to fix. If you don't have extra lighting, you can buy inexpensive selfie rings (usually with a button that cycles through three colors to choose from).

In the pre-pandemic world, scenery existed all over the world, and we moved around to see it. In the pandemic world, we stay in the same place, and the scenery behind moves behind us. In my view, a lecture is about you personally, and so I prefer a genuine background, with whatever scenery is there. You wear clothes when you go out and the clothes say something about you that people want to hear. The same goes for the scenery around you. You can have a green screen behind you and change the scene to something different, which is fine if you prefer, but I'd rather see something real and perhaps even interesting. If my dog runs behind me while presenting, maybe it's not so bad since you'll think I wasn't constructed entirely out of pixels. Of course, you may find yourself in a small apartment or difficult living arrangements, and so obviously do what you can and don't feel guilty about it. (I recorded most of these videos in my home, but a few were in a hotel room on a trip.)

Put the camera at eye level (and I'd suggest you stand up so it looks like you're actually alive, engaged, energetic, and interested in what you're doing) and be sure you're not looking down or up at your audience. Study TV newscasters: They are looking straight ahead and (seemingly) directly at you, and the best ones do not move their eyes back and forth when they read. But that means you need to look at the camera, making eye contact with the little green light on the camera. This is not easy and I think it took

me a while preparing these videos to get somewhat more of the hang of it. Of course, be yourself too, which also isn't easy when no one is there to listen.

Hardware. If you get the above right, the hardware and software doesn't matter as much, and there are lots of other good solutions, but here's what I did: I have a monitor plugged into my laptop, which has a pretty good webcam and so I use that. For a few of the videos, I used a [Logitech Breo](#), which is also fine. I have a Macbook Pro laptop, which I upgraded because the software was crashing my computer too often (about which more below). I also use a [Logitech Spotlight](#) clicker, which has some nice special effects you can see in my videos. The main expense I had aside from my time was for better audio. Because I didn't like the sound quality from either my laptop mic or a USB lavalier I tried, I switched to a [Countryman headset](#) connected [directly](#) or [wirelessly](#) via a [USB interface](#) into my laptop (although I still need to remove some background noise from the audio feed generated by my laptop's fan).

Software. Video recording is computationally intensive and so a good computer is important. Of course, those of us doing sophisticated data analyses use plenty of computationally intensive algorithms, but we design these algorithms so they do not crash even if they run slower. In contrast, video editing and recording software is written to not only go slower, but to crash or to degrade your video or audio without telling you. That is the biggest problem I had in preparing my videos.

I looked for software that has recording and editing all in one package, just for ease of use. I tried [ScreenFlow](#), [OBS Studio](#), and [Camtasia](#) in that order and presently use Camtasia. OBS is free and open source. The other two are commercial but inexpensive with excellent customer support personnel who patiently try to help you with programs that often fail for inexplicable reasons. (The world would be better if developers working in software companies were required to periodically work in customer service; at least at the early stages, I've tried to enforce this rule with the startups I've founded.) The complicated nature of video software means that you probably do need someone to talk to. In practice, I found getting recording to work much more challenging than editing.

All three packages are pretty similar and once you learn one the others are easy. The problem for me was that all three failed regularly in a variety of ways: At various times, they made me look like Max Headroom (with dropped frames), one of the English-dubbed Japanese-speaking actors in the old Godzilla movies, pixelated, blurry and out of focus, etc., and all those things happened midway through an hour-long lecture, and so I had to re-record regularly (which admittedly did enable me to learn and improve while presenting to my silicon audience of one). I finally managed to resolve most, but not all, of the problems by recording in 20 minute chunks and pasting them together, which means both that I don't waste as much time if something goes wrong and, more importantly, the odds of something going wrong in the first place are much lower. I will continue to look for better solutions as I record more videos.

Suggestions welcome, updates likely!