

TheTrophicLink

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My first flipped classroom course

Flipped classroom courses involve students watching lectures in their own time, and working on assigned problems in class ([more info. in this Wikipedia article](#)). Summer 2014, I and three colleagues decided to develop such a course to teach R and some statistics at a basic level. We were each already teaching our own traditional format courses, so thought to both rationalise this teaching by sharing our resources, and to do so via online learning, which led us to the flipped classroom. We were also influenced by the rise of MOOCs and their online learning methods, but aimed for a course that was for UZH students (initially at least). Given those aims, the following questions and answers arose.

What structure for the course? We developed a structure with two types of online lesson: Problem Studies and Skills Lessons. The Problem Studies present and solve a real problem, and also communicate the solution. They do not go into details about R or statistics: this is the realm of the Skills Lessons. For example, we have a Problem Study about the relationship between income and orgasm frequency based on real data, and a Skills Lesson about Preparing Data. This course structure attempts to keep students focused on understanding and solving problems, and efficiently communicating the answer. Proficiently using R and statistics is necessary but not the focus, so it goes in Skills Lessons, so as not to distract during the Problem Studies. So far this structure is working well. Aside from that, the edX advice about lesson structure was very valuable (e.g., each lesson consists of multiple short [5-10 minute videos] with a few somewhat formative questions after each).

What online learning platform to use? We chose [Open edX](#) for at least two reasons:

- It is proven, both for instructors and students. It works and is pretty easy to use.
- Creating courses is easy, and there's good [documentation](#) and [support](#). There's even a [course about creating edX courses](#).
- It can "freely" be installed on a University server, which provides the potential for complete control of learning material and student information. (Freely in quotes, since although the software is free, someone has to install and maintain it.)

How to do the videos / screencasts efficiently? Preparation is key. I found an hour writing a good script meant I could make the video / screencast in one or two takes. When I didn't prepare a good script, it was a mess that either required lots of video editing, or couldn't be fixed at all. Bit of advice... dig out your personal photos and videos, and make a home movie. Doing this will either: give you get nice home video and knowledge of how to use video editing software that can be used to prepare you flipped course material; or a crappy home video (even no home video) and knowledge that you should prepare really well, so you need very little editing.

How to make screencasts? I can only answer from the perspective of a Mac user (though was not so difficult for my alternatively blessed colleagues). As such I use Quicktime Player to record the screen and audio, and sometimes Photo Booth to simultaneously put my face in the screen, so students can see me at the same time as whatever else is on screen (only problem is I can't figure how to resize the Photo Booth window, or get rid of everything apart from the camera image). I use a nice microphone (e.g., Apogee Mic 96k) and a mic stand (rather than stand it on my desk) to isolate the mic from the sounds of me typing, clicking, and doing other things on my desk. I try to record in one or few takes, not being too fussy about little mistakes. This cuts down on editing time, as well as being quite adequate (no complaints so far). I then use iMovie to do any little edits, to make small adjustments to sound levels, and to make an mp4 which I upload to Youtube. Be sure to make an at least HD mp4. All this I do in my office when I know it will be quiet, and I switch off all electrical devices I can (e.g., external drive, printer, silent phone, Skype off).

UPDATE: Looks like Camtasia might be very good for making screencasts, in particular as it can capture the view of the HD camera at the same time as the screen.

How to make the videos of yourself in front of a black / white board? I use my iPhone, the same mic as above, with an appropriate stand for both. Be careful that the iPhone focuses properly on you and the board. Make sure your writing is big enough. Try to do one take, so you need less video editing. Test the sound levels.

Was I smug about using a Mac? Yes, I was. But I tried to hide it 😊 And my Windows and Linux colleagues found good solutions also. So probably I had no good reason to be smug.

Where to host videos / screen casts? Somewhere reliable and able to handle however many students you expect to have, all watching at the same time. Before you invest lots in a solution, check the url of the video works when pasted into an edX lesson. We are currently using YouTube (which means we don't have total control of course material), as its easy and works.

How did we avoid lots of tech problems? We each made about five of test videos and screen casts, put them on edX, and looked at the result. Thus we got to see and test the whole process, and troubleshoot it, rather than making 20 lessons only to find something was wrong with them. Also useful, was making one lesson (i.e., getting it fully working on edX) at a time. Again, this avoided any large scale screw ups.

What did I do wrong? I wore a variety of shirts in different videos. I ended up with a lesson where I magically grow a beard, changed shirt, and lose hair during a short break. I recorded several videos out of focus, some with sound levels too low, I messed with sound too much in iMovie sometimes, so had to export the mp4s again. I tried to get rid of background noise after the recording is done, e.g., via the background noise reduction in iMovie. It takes all the life out of a voice. So record where you have little background noise, and or use a lapel mic.

How bad is it that the four instructors use three different operating systems (1 mac, 2 linux, 1 windows), and different methods of interacting with R (e.g., Rstudio, base R, emacs speaks statistics)? Not too bad... the students haven't given much negative feedback, though some has suggested they'd prefer everyone using Rstudio — in which case OS is less relevant).

Should we make the course a MOOC? Not at the moment. For one thing, the time in class, chatting face to face, seems really important. I recently heard about an Intro to R course with ~37'000 students enrolled. I'm not sure we're ready for that!

Will it become a MOOC? Probably not. We are, however, thinking of giving the material / course away, but haven't yet got it to a standard at which we would be happy to do so. There are also issues with this that we haven't thought hard enough about.

Did it work? Yes, in the sense that the students seemed to really like watching lectures online, as they can pause them, can watch them again, can watch them at 1.5x speed (or half, or double). The in-class session were fun for me, and it seems the students. Most had done the work required, and engaged very well.

Was it all worth it? Yes, and it wasn't so difficult anyway. Fun to make the course, especially collaboration to do so, nice to try and learn something new. Great to be finally comfortable listening to and watching myself (I sound and look OK!).

Does it save time? The point isn't to save time... its to give a different and hopefully better learning experience. But to answer the question, I expect its about the same overall time investment, over 3-5 years, as preparing and running a standard format course.

Some notes on technical issues, after a second round of recording.

I got an iMac with 5K screen. Seems that using quicktime cannot now make a recording with well synced photobooth window. So I recorded the screen with quicktime, and my face with iPhone. Worked mostly fine,

though extra work in iMovie, to put video of face within the screencast, and to sync them.

I was recording in summer in a warm office, and with the recording work, my computer fan came on. Some background noise on the video. Though iMovie can get rid of this, it takes some life out of vocals.

Finally, have some trouble with always getting 1080p HD. Sometimes iMovie will only output in max 720p. Will update when I figure out what's going on.

Checklist in iMovie:

- Trim and sync screencast and face videos.
- Position and flip face video as required.
- Audio off on face video, audio auto on screencast, consider background noise reduction.
- Export at 1080p if possible.



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