Abstract
Some observations on the differences between teaching face-to-face and through an online course. The opportunities, as well as the things that may be lost, as online education grows.

Keywords: edX, online learning, mechanics review, active engagement, MIT

Coordinating the edX online course Mechanics ReView
I have recently finished coordinating my first online course.

I chose the word ‘coordinating’ rather than ‘teaching’ in that sentence, and I’d like to take a little time today to explain why.

Some preliminary details: The course was Mechanics ReView, a physics course offered on edX in the summer of 2013. The course was created by the RELATE physics education research group at MIT, led by Dr David Pritchard. Dr Pritchard’s group continues to research the course, and if you’d like to read more about his conclusions I encourage you to follow the group’s recent papers. I was part of the group at the time, but have since moved down the street to Harvard.

Mechanics ReView focused on the usual topics in Newtonian mechanics - force, energy, momentum, rotational motion, and so forth - at a fairly sophisticated level. It was intended as a second introduction to the topic, for those who had seen the material before and were interested in re-learning it or sharpening their skills. Teachers were our primary target, but because the course

OPINION PIECE
Coordinating the edX online course Mechanics ReView: some observations

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was offered on edX, we attracted students from all
different backgrounds and from all across the world.

The materials used in Mechanics ReView came
from a fairly successful on-campus course taught in
an active-engagement style, with students doing
problems at the board for 80% or more of the class
period. I have several years of teaching experience
at a variety of levels, and I was fortunate enough to
assist Dr Pritchard in teaching Mechanics ReView
on-campus to our students at MIT. The comparison
between the on-campus and online experiences, even
in courses that drew from the same resources, was
sharp enough that I felt compelled to write about it.

Teaching a face-to-face course is something I
enjoy. I like that there is an immediate feedback
loop between teacher and student, whether
via conversation or clicker. Dialogues are
high-bandwidth situations: I not only hear a
student’s words, but hear the tone as well,
read facial expression, see body language, and
my students can take in the same from me.

I also like being able to twist my lesson and change
it on the fly to respond to an insightful question, or
even one that comes from ignorance. I’m limited in
what resources I can use, but I can deploy them as I
see fit, and I can do so very quickly, especially if I’m
in my own classroom full of my favourite diagrams
and demonstrations.

More than anything, I love seeing the lightbulb
moment when a student suddenly grasps a difficult
concept. That’s what warms my heart and keeps me
going on the tough days.

Online courses are a very different environment.
Even in places where internet access is reliable and
fast, teaching an online course is a low-bandwidth
experience. You never see the vast majority of your
students, never hear their voices. Communication is
typically through written word alone. Responses
take hours if not days.

Making a change in the course also takes days.
It’s not acceptable to deploy a homework problem
that no one has tested, or text that has not been
proofread. When you have a sudden brilliant
inspiration, you need to be patient and develop
it just as carefully as you do the rest of the course.

With the entire internet at your disposal, you
have many more resources to deploy, but only of
certain types. You can’t just pop into the demo
room to pick up a balancing bird and pass it
around the classroom.

In online education, the lightbulb moment becomes
something you hear about after the fact. When a
student has a realization, no one else knows about
it until and unless they write in the course forums.
There is no immediacy.

The majority of my job this past summer was not
as a teacher, but as a coordinator. I was lucky
enough to have a large and wonderful team
working with me, and even they weren’t teaching
the way we think about it in the classroom. They
checked problems, proofed texts, fixed bugs,
participated on the discussion forums, and generally
took care of the day-to-day operations of the
course. My job was to provide them with what
they needed to do their job well, mostly in the
form of support, guidance, and executive decisions.
The less work I had to do, the better the rest of the
course was working. It was far more managerial
than professorial.

Don’t take my words as disparagement for online
education - take them as ‘forewarned is forearmed’.
Online education provides many wonderful
opportunities, not only for students, but for us as
educators. If you’re the sort of person who enjoys
being in the classroom, you have the opportunity
to learn new skills and habits when you move to
the online arena. If you don’t really enjoy teaching
and see it as more of a burden, you have the
opportunity to educate others without needing to
do it in the classroom.

As an educational researcher and developer, I
can’t help but be enthusiastic about the current
form of online education. Thousands of students!
Millions of data points! I’m looking forward to
seeing some of the amazing research results that
will come out of this over the next 5–10 years. I
enjoy being in this field and riding the wave. I’ll just
need to find another way to scratch that itch for
in-person teaching.