

How Economics Faculty Can Survive (and Perhaps Thrive) in a Brave New Online World[†]

Peter Navarro

The academy in which we toil is moving rapidly towards a greater role for online delivery of higher education, and both fans and skeptics offer strong reasons to believe this technological shock will have substantial disruptive effects on faculty. How can we as economic educators continue to provide sufficient value-added to justify our role in a world where much of what we now do is effectively being automated and commoditized?

In their annual survey of online education trends, Allen and Seaman (2015) cite evidence that over 70 percent of all degree-granting institutions “have some distance offerings” while that number jumps to 95 percent for institutions with 5,000 or more students. Online learning in higher education also seems to be spreading much faster than faculty acceptance. On the one hand, the proportion of American “academic leaders” citing online learning as “critical to their institution’s long term strategy” has risen from 49 percent in 2002 to an all-time high of 71 percent. On the other hand, “only 28% of chief academic officers say that their faculty members accept the ‘value and legitimacy of online education,’ a rate substantially the same as it was in 2003.”

At its most extreme, online higher education involves an elegant digital platform capable of seamlessly delivering multimedia content while engaging and evaluating students across the globe at (close to) zero marginal costs. A competition to develop this kind of platform is at the heart of the so-called “MOOC” or “massive open online course” phenomenon. Private sector MOOC leaders include Coursera,

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[†] For supplementary materials such as appendices, datasets, and author disclosure statements, see the article page at <http://dx.doi.org/10.1257/jep.29.4.155>

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edX, Udacity, and Udemy, but there are many other options including even an “iTunesU.” On the university side, “free course” leaders range from Carnegie Mellon, Duke, Harvard, and MIT to Stanford, Yale, and University of California campuses including Berkeley, Los Angeles, and Irvine. The availability of high-end online course content provided by an array of educational entrepreneurs is also rising quickly. Access to innovative software applications designed to provide an engaging and interactive learning environment and experience is on the rise, too.

In this brave new online world, many successful and resilient faculty will add value (and differentiate their product) not by producing costly and elaborate multimedia lectures in which they become a superstar professor-celebrity (a model discussed, for example, in Delbanco 2013; Glader 2012), but rather through the careful, clever, and innovative choices that they (and their departments) make regarding both the adoption of the online content of other providers and the forms of online interactions they integrate into their course designs. Possible forms of faculty-to-student and student-to-student interactions run the digital gamut from discussion boards and electronic testing to peer assessments, games and simulations, virtual office hours, and other forms of interactive experiences that may yet be only a gleam in the eye of some entrepreneurial developer.¹

The degree to which online education may eventually substitute for traditional classroom delivery will likely depend on both the course level and the nature and size of the institution itself. For example, the traditional large lecture hall principles courses may go the way of all flesh. However, intermediate college and graduate-level economics courses may survive and thrive in a “flipped class” format in which online content is used to free up the traditional classroom for higher-level discussions and interactions.

Similarly, large public universities in which a substantial share of students can find it difficult to take the courses that they need to graduate on time may move more quickly to build their online catalogues, in part as a way of addressing their capacity constraints. However, small private institutions may see the “personal classroom touch” as a key differentiator in the market and largely maintain the traditional classroom and/or “blend” online content into partially online “hybrid” courses more judiciously.

This article explores some of the basic descriptive questions economic educators and their administrators are likely to face as the online education tide rises: for example, how much does it cost to develop online content and how much time does it take? This article also tackles some important prescriptive questions as well. For example, what are the key “ingredients” for a pedagogically sound online course? Should you produce your own full service MOOC or adopt the content of others?

¹ For an overview of discussion boards as a collaborative learning tool, see, for example, Curtis and Lawson (2001). On the effectiveness of games and simulations in Kolb’s experiential learning cycle relative to traditional teaching methods, see, for example, Herz (1998). The benefits of and technologies to implement “peer assessment” are reviewed in Luxton-Reilly (2009).

Throughout this exploration, I will draw on both the extant literature as well as my own experience at the University of California, Irvine, where the online evolution is advancing rapidly. At UCI, the economics department has already put its entire principles sequence online. Other large enrollment courses now offered in an online format include Academic Writing; both Basic and Classical Physics; Criminology, Law, and Society; Introduction to Business and Management; Preparation for General Chemistry; Pre-Calculus; Philosophy 1; Principles of Operating Systems (in the computer science department); and Principles of Materials Science and Engineering. Within my own unit, the Merage School of Business, we have uploaded and offloaded all the core courses in our undergraduate business minor to the cloud, and online course options are being rapidly developed to service both core and elective courses across our MBA programs.

What should faculty be doing to cost-effectively meet the challenges of the online education shock while best serving not just their own interests but those of their institutions and consumer-students as well? This article will help answer this prescriptive question. While acknowledging there may be sharp, short-run divergences between stakeholders,² we focus here on “joint utility maximization.” As online education is rapidly becoming the new norm, we assume that most economic educators will have greater professional success over the long run by deftly and skillfully adapting to this technological shock rather than resisting it.

The Global Reach of MOOCs

As a starting point, it may be useful to note the astonishing scale and scope of MOOCs: For example, my “Power of Economics” two-course principles sequence and personal finance course for undergraduates delivered by the Coursera platform has, in less than three years, seen more than 400,000 students enroll from over 190 countries.³ Like virtually all MOOCs, only a small fraction of those enrolling—about 5 percent—actually complete my MOOC courses. While these low completion numbers are rightly viewed as the Achilles’ heel of MOOCs, it is worth remembering that a modest fraction of a very large number can still be a large number. Of the top nine courses listed by lifetime enrollment on Coursera, all exceed 100,000 in signups, while a single Social Psychology course from Wesleyan University is approaching the quarter-million mark (Leek 2013).

² The short-run politics are admittedly difficult: the more senior faculty members there are, the more power they are likely to have but the less likely they will be able to adapt because of a skill set developed in a traditional classroom era. For those faculty caught in this “Mr. Chips” world, utility maximization may simply equate to full resistance to the adoption and diffusion of online education in any form. However, as Nobel Laureate Paul Samuelson often quipped in a Keynesian context, “funeral by funeral, science makes progress” (for example, *Economics U\$A*, 2012).

³ The principles of economics courses for macroeconomics and microeconomics are available at <https://www.coursera.org/learn/principles-of-macroeconomics> and <https://www.coursera.org/learn/principles-of-microeconomics> respectively. The personal finance course for undergraduates is at <https://www.coursera.org/learn/managingmoney>.

This is not to say that the MOOC specifically, or online education in general, necessarily spells the end of the traditional lecture hall. Rather, in thinking about your own choice set, it is important to understand not just how online education works but how a MOOC—or, more generally, online content—might fit into your own strategy of delivering more customized, differentiated, and interactive education to your students.

While you can certainly develop your own online content to compete in the new marketplace, a properly designed MOOC can provide high-quality content that you otherwise might spend vast amounts of time (and money!) developing on your own. (And even if you did spend all that time and money, you could easily end up with an inferior product.) But how will the availability of such online content affect your classes?

The Death of the Large Lecture Hall Is Not Greatly Exaggerated

The large lecture hall classes often used to teach basic principles courses across many disciplines is the format most threatened by this new technology. In the existing “live theater” large lecture hall paradigm, students must assemble in synchronous fashion at assigned geographic coordinates, where they sit passively to receive content from a live body at a lectern. In the new online “movie” paradigm, students can receive content asynchronously almost anywhere on the planet, while the live body no longer has to perform the same content repeatedly. Rather, some variation on this performance simply has to be captured and “bottled” in some type of video, audio, or multimedia format.

Of course, the live-theater paradigm has its advantages: for example, the excitement of a live performance and a focal point in time and space for students to meet in-person. But over time, technological advances will allow the bottled performance to become ever more high-quality, well-presented, flexible, and interactive. While it takes neither a rocket scientist nor an economist to predict which side is likely going to win,⁴ it is worth considering where this battle may best be fought. One can choose a position at one of three main locations along the online education continuum: the flipped, hybrid, and fully online classrooms.

At one end of the online education continuum, there is the “flipped classroom.” In this model, the physical classroom remains a staple of the academy. However, students are tasked with mastering some or all of the basics *outside* the classroom while classroom time is reserved for an interactive discussion of higher-order concepts, ideas, and applications based on the principles.

⁴ In Navarro (forthcoming), I offer a more in-depth treatment of the relevance of the large lecture hall in today’s e-learning world. One interesting piece of survey data indicates that 37 percent of the respondents from my online undergraduate class in personal finance said that “at least half” of the large lecture hall courses at UCI “could be delivered in an online format,” while 33 percent answered “most” and 11 percent said “all.”

Online content can be particularly valuable for delivering such basics;⁵ and the benefits of this flipped model have been extensively studied. They include: students take more responsibility and are more active learners, and they cultivate a deeper understanding of the content and how to apply it (for example, see Zappe, Leicht, Messner, Litzinger, and Lee 2009; Bergman and Sams 2012; Berrett 2012).

I have used this flipped model in conjunction with my own online and digital content (in the early years, using CD-ROMs) to teach basic economics going back almost 20 years, and I've seen these benefits first hand. While MOOC courses are well-suited for delivery in a totally online format with virtually no personal touch, my executive MBA students who have gathered together in a 60-seat amphitheater expect a more complex and personalized experience for their tuition dollars—and that's one key area where the flipped approach excels.

At the other end of the online content continuum, there is the fully online course. While non-online assets such as textbooks and printed articles may continue to play a role in this world, the fully online course is an immersive digital experience for students—and an uncomfortable environment for at least some “Mr. Chips” faculty weaned on live performance education and reliant on the cues, customs, and feedback of the traditional classroom.

In between the flipped and fully online classrooms, there is the partially online *hybrid* model, also called the *blended* model. It substitutes online content for some substantial fraction of the time spent in traditional classroom meetings, while the remainder of the time occurs in the classroom. Together with the flipped model, this hybrid/blended model may offer the most promising 21st century combination of high-quality, personalized, and noncommoditized education in a form that both usefully leverages online content and helps to justify one's salary and the continued existence of the broader physical academy. The hybrid and flipped models are not mutually exclusive. For example, half of your classes in a course might be fully online while the other half might be delivered in a flipped, rather than traditional, classroom format.

The research on this point is encouraging, particularly for the integration of MOOCs into various blended curricula. For example, in the Griffiths, Chingos, Mulhern, and Spies (2014) study of the University of Maryland system that incorporated MOOC content into the delivery of hybrid courses, side-by-side comparisons found that: “Students in the hybrid sections . . . did as well or slightly better than students in the traditional sections in terms of pass rates and learning assessments, a finding that held across disciplines and subgroups of students.”

⁵ It may be useful to distinguish here between the “online education” model of today and the “distance education” model that has been around since the days of correspondence courses. In the survey mentioned at the start of this paper, Allen and Seaman (2015) equate “distance learning” with “online learning,” but this need not be the case. While distance education can certainly be delivered in an online format, it can also be delivered in purely analog fashion. In contrast, online education is delivered primarily in a digital framework, but may still feature analog elements like the printed textbook.

We are experimenting heavily with this hybrid/blended model within my own business school to leverage the skill sets of our teaching corps while offering students more scheduling flexibility. The goal is to continue to personalize the MBA experience and convey the complexities of the MBA curriculum in at least a partially live theater format and, thereby—in all frankness and in the very real world of profit and loss—at least partially justify the high cost of an MBA degree.

We are far from the first to pursue this hybrid/blended model. For example, Kolowich (2015) reports that 2U, a company that helps universities develop online and blended degree programs, has already assisted clients ranging from Georgetown and George Washington University to Simmons and Yale. Other major players in this “enabler market” include Bisk Education and Pearson Embanet. A typical arrangement usually involves substantial revenue sharing (often 50 percent or more) with the partnering university. For example, Bisk receives “80 percent of the gross revenue from the three-course, online certificate program in executive education the company runs with the University of Florida. The contract, which was signed in 2012, projects that after five years the program will have made about \$1.6-million for the university and \$6.3-million for Bisk” (Kolowich 2014). According to Howard (2014): “There are now in excess of 2,000 online degree programs in the U.S. About half of the schools rely on a third-party facilitator . . . [F]acilitators currently bring in an estimated \$1 billion a year in tuition revenue. That market is expected to double in four years . . .”

The “Net Generation” Bids Adieu to Mr. Chips

In my view, both the flipped and hybrid class formats leveraging MOOC and other online content are likely to be relatively more useful than fully online courses as one moves up the ladder of higher education, both from lower to upper division courses and from the undergraduate to graduate level. One reason supporting such speculation may be found in surveys of American and British students that have found a high degree of boredom with traditional class lectures. On the American front, as reported in Berk (2009), a national survey conducted by UCLA’s Higher Education Research Institute of nearly 250,000 college freshman at more than 500 colleges and universities (Pryor et al. 2008) found that over 40 percent of the students report “they are frequently bored in class. As Berk (2009) reports on the British experience, of the 211 students surveyed “59% found lectures boring in at least half of their classes and 30% find most or all of their lectures boring” while “the use of PowerPoint® slides was the most important factor contributing to boredom.” Most interestingly from a hybrid and flipped class perspective, “the least boring methods were found in seminars, practical sessions, and group discussions, where students could interact and actively participate.”

One underlying cause of this pervasive boredom with the traditional lecture hall appears to be a generation gap between older vintage “sage on the stage” economic educators (King 1993) and a new Internet generation now streaming into our

classrooms with very different expectations (and perhaps shorter attention spans). In a survey of more than 7,000 US college students, Junco and Mastrodicasa (2007) profile a “net gen” world where computers, cell phones, web searches, instant messaging, blogging, music downloading, and multitasking are second nature, and net gens themselves find some of their deepest connections in the virtual rather than physical world.

In serving this net gen market, Berk (2009) argues that the traditional, talking-head broadcaster and transmitter of information must morph, as a matter of both sound pedagogy and survival, into group facilitator and orchestrator of collaborative knowledge creation (Brown and Adler 2008), thus taking the role of a “guide on the side,” with a concomitant shift from “‘teacher-centered’ to ‘learner-centered’ teaching methods.” (DeAngelo et al. 2009)

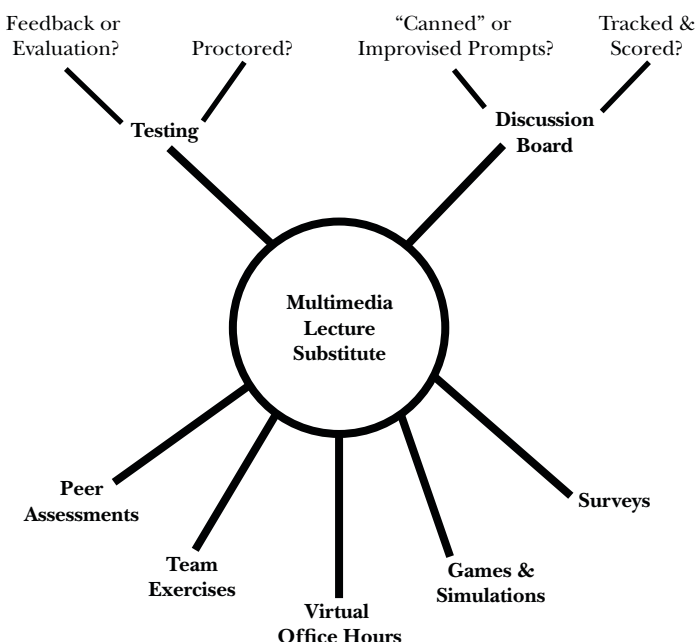
In fact, the online education world provides abundant opportunities to hit all points of this net gen compass while avoiding the Achilles heel of the traditional classroom—understimulation. At the anecdotal level, I have heard more than one of my sage-on-the-stage, PowerPoint-dependent colleagues complain (sometimes bitterly) that while they are teaching as well as they ever have, their teaching evaluation scores continue to fall. There appears to be little understanding of the increasing mismatch between their own skill sets and the net gen consumer-students they increasingly serve.

From a labor market perspective, there is also this observation, which follows from the discussion in this journal by Autor (2015): online education technologies will both substitute labor *and* complement labor. For example, while MOOCs may spell doom for some type of teaching like traditional lectures that cover the basics of a discipline, a shift to more hybrid courses might increase the demand for other types of teaching, like personalized in-class discussions of examples and applications. While the overall effect on labor demand is unclear, there certainly will be distributional consequences, with winners and losers among educators depending on their skills, willingness to adapt, and ability to innovate.

What’s in Your MOOC?

Let’s suppose now you want to create your own online course. How should you go about it—and what will it cost in both human and financial capital? There certainly is no shortage of books, articles, and manuals offering tips on proper design and delivery: for example, see Clark and Mayer (2011) for a comprehensive “how to” book. Figure 1 provides an illustrative overview of the various elements you may choose to include in your particular production.

At the center of this online course blueprint is some form of multimedia substitute for the traditional lecture. In addition, the top half of the figure lists both electronic testing and a discussion board as essential elements, while the bottom half of the figure adds nonessential “bells and whistles” that may be used to improve pedagogy, to help differentiate one’s teaching product, and

*Figure 1***Illustrative Elements of a Pedagogically Sound MOOC**

Source: Author.

thereby to add further value to the online experience.⁶ Each of these elements in the figure is examined now in more detail starting with the critical multimedia lecture substitute.

A Continuum of Production Value Complexity

The multimedia lecture substitute can involve a continuum of complexity, defined by the range of the production and associated production values.

At the simplest end, a single camera records your lectures, which are memorialized as videos on the web. The next step past the talking head video is to superimpose a set of your lecture slides over all (or some portion) of your recorded lectures. To maintain a personal touch, you can have your talking head video appear in a little box super-imposed on the slides. Alternatively, you may choose to by-pass the recorded video lecture altogether and go right to a “voiceover” of your lecture notes, which serves as the narrative element for the sequence of the slides you might ordinarily use in a lecture. Here, the slides from, say, your

⁶ For a more skeptical view than the one offered here, some of the main research studies calling into question the efficacy of online education include Carpenter, Brown, and Hickman (2004), Zavarella (2008), and Xu and Jaggars (2011).

PowerPoint or Keynote lecture presentation can be easily converted into either a video format or a set of images that can then be added to the timeline in the video editing process.

For additional levels of complexity, one can add various forms of so-called “b-roll” to the video editing process. Such b-roll ranges from simple photos and images and video clips to more complex graphics and full-blown animations. One can also add visual effects. For example, “green screen” technology allows a video editor to replace a green background with still images or video using a process called “Chroma keying.” While this technology used to be the exclusive preserve of weather reporting on TV, today the cost of high-quality Chroma keying has gone from the tens of thousands of dollars to virtually zero. Other editing effects include transitions like the spinning cube or cross dissolve between clips, various sound effects, and perhaps even a musical score.

Based on my own experience and feedback from students,⁷ I believe both administrators and educators should strive to include as much complexity in their online content as budget and time allow. I have regularly conducted exit surveys for my online courses at UCI; and one result has been consistent across both undergraduate and MBA populations: my high production value multimedia lecture content delivered through the Coursera MOOC platform is regularly rated as the most essential instructional technology of the class.

A Sole or Joint Venture?

If you decide to develop some form of multimedia lecture substitute for use in a flipped, hybrid, or fully online format (rather than adopting an already-existing MOOC or other online content), you face a practical choice: Should you produce the content as a do-it-yourself “stand-alone venture” in which you are the sole developer, or as a “joint venture” in which you partner with, or hire, a team of developers?

The do-it-yourself model is the most daunting. To achieve high production values will require a significant capital investment in the necessary equipment and software. In my case, I have more than \$15,000 invested in a studio that features state-of-the-art video cameras and audio recorders; top-shelf software for animation, graphics, and editing; a professional grade lighting setup, and a green screen background that accommodates “full body shots” rather than the more typical waist up look. (“Full body shots” allows an editor to place the subject in any environment in creative ways that avoid the trap of the “talking head” presentation.)

Beyond this financial outlay, you will also have to invest in your own human capital if you truly want to “do it yourself.” The requisite skills range from learning how to perform well on camera and executing compelling voiceovers to mastering

⁷For example, in my inaugural core curriculum class delivered online in Summer 2014, 86 percent rated the Coursera lectures and quizzes as “absolutely essential” (53 percent) or “essential” (33 percent) while an additional 10 percent found the content “useful” or “very useful.” In my standard “value proposition” question, a supermajority of my MBA students also have rated my online macro class as more or much more valuable than the average value of the other core classes they had taken; and much of the credit may be assigned to the multimedia experience students are exposed to.

basic camerawork, sound and video editing, and perhaps producing your own advanced graphics and animation. Most of you will conclude that this was not what you got your PhD or Master's degree to do and either abandon the idea entirely or quickly opt for the "joint development" option.

With joint development, you must find some facilitating entity to assist you. This can be a private sector facilitator like the aforementioned 2U or Bisk. However, at least based on some of the revenue-sharing "deals" in the public record to date (as documented earlier), the cost of using a private sector provider is likely to be higher relative to another possibility—an existing unit on your own campus to assist faculty with the development of online and hybrid courses.

To provide an idea of what joint venturing with such an in-house production team entails, it may be useful to summarize a few highlights from a document distributed by the UCI Distance Learning Center (2014) on my own campus. According to this analysis, "faculty members can expect to spend between 60 and 120 hours to prepare existing content for online delivery" and "an additional 80 hours" to develop a new fully online course. The steps involved include: selecting the appropriate instructional technologies; adjusting existing or creating new content suitable for online delivery; preparing supplementary materials, notes, references, articles, and other resources for posting online; creating discussion forum prompts; and developing the various learning assessment tools.

To assist in these tasks, the Distance Learning Center assigns each faculty member an instructional designer, a videographer, a video editor, an animator and/or graphics artist, and a web designer. The price tag for a single one-quarter, four-credit course ranges from \$4,000 to \$12,000 (and does not include faculty labor costs), with the final price depending on the level of service sought and the production values of the multimedia content itself.

Production values can range from the simple "turn the camera on and talk" approach to highly sophisticated lessons featuring an abundance of graphics and animations along with sophisticated editorial cuts and sound effects. As you add complexity, you quickly (and exponentially) add costs. For example, video editing and animation services are billed out at \$50 an hour by UCI's Distance Learning Center, and both graphics and animations are highly labor-intensive. Similarly, the costs of "b-roll" to cover your own talking head entail not just labor search costs to find suitable images and video clips, but often royalty payments for use of the content as well.

Ten (More) Commandments

How should your online content look and feel? Guo, Kim, and Rubin (2014) offer some insights. In a large study involving 6.9 million views of 862 lectures by almost 128,000 students enrolled in the edX MOOC platform, they found evidence that: "Videos produced with a more personal feel could be more engaging." They also found that students were more engaged by shorter videos and by a mixture of talking heads and graphics rather than either alone. This lesson also held true for high-quality recorded classroom lectures edited into shorter segments.

Based on such research and my own experience in the trenches—and always keeping in mind that today’s net gen “consumer-student” is accustomed to fancy and punchy video—I offer “Ten Commandments” of developing engaging and pedagogically sound online content.

1: *Do NOT put yourself on camera for any extended period of time.* Today’s students abhor “talking heads” like nature abhors a vacuum. Even if you are a better-than-average classroom lecturer, what works in the classroom doesn’t necessarily work online.

2: *DO stress high production values.* Online platforms for distributing content are agnostic about quality. They can deliver a low-resolution PowerPoint slide show choreographed to scratchy audio—“garbage in, garbage out”—just as easily as they can deliver high-definition, surround sound multimedia presentations with 3D animations. If you are to compete successfully with other content providers—and thereby successfully compete for the attention of your students—you must strive for the highest-end production values your budget allows. This means a well-lit set, full high-resolution video, rich sound, crisp graphics, and high-end animation. It is pointless to hope that good content will overcome poor production values—which is perhaps a sound reason to consider adopting the content of others rather than producing your own.

3: *DO break each of the presentations up into short modules.* A good guideline is that such modules should be 3 to 7 minutes, and never exceed that limit. Such modules appeal to the time constraints facing today’s students and also to the customs and styles of their interconnected social media world. From an instructor’s point of view, organizing your material in this way also helps you better orchestrate the flow of the content, even as it forces you to think about the right breaks in the material and find the appropriate segues.

4: *DO include interactive elements in the presentation.* For example, I include a low-tech “question wizard” in my own presentations. Specifically, at key interactive nodes, I instruct students to pause in viewing the material and take time to provide a possible response to a question posed or task assigned—for example, illustrating how a rise in a factor price will cause a supply curve to shift. Higher-tech alternatives continue to emerge that allow you to embed quizzes in your videos or to add interactive questions.⁸

5: *DO make your multimedia presentation content “timeless.”* Focus on economic principles that are consistent over time and minimize the use of material with dates on it that is not of an historical nature. Handle current events within the context of other modalities like the discussion board. It will be costly and time-consuming for you and any staff to update and reload multimedia presentations that will otherwise

⁸ Entities like Camtasia, Google, and TedEd appear to be fruitfully pushing the envelope on this. Other interesting webtools include HapYak, Educanon, Blubbr, and Vialogues: for example, HapYak helps you add links and text to your videos while Blubbr helps you create quizzes around YouTube videos. For more information, visit <http://www.educatorstechnology.com/2014/02/8-good-web-tools-to-create-video.html>.

quickly become dated. That said, there are some workaround possibilities here. For example, you might reference the latest data on the unemployment rates in Europe and the United States in your voiceover and then periodically update only the actual graphic in your video presentation. This can easily be done if you are producing your own “mini-MOOC” and post your videos online on YouTube or Vimeo for your classes. Another alternative is to include a sprinkling of more contemporary modules that you redo each year. In a MOOC format, you may wish to manage this periodically updated content yourself on an external site like YouTube or Vimeo, and then just list links to these modules on the course page; this avoids burdening MOOC administrators with the uploading of the revised videos.

6: *DO proof everything very carefully.* It’s one thing to screw up a calculation on a PowerPoint slide in front of a few hundred students. It’s quite another to screw up a multimedia presentation with 80,000 eyeballs on it. Here, the pedagogical literature strongly suggests that technical or other problems experienced by students will translate into lower levels of satisfaction (for example, Carswell, Thomas, Petre, Price, and Richards 2000; Carswell and Ventaktesh 2002). As an example, I mentioned earlier that I codeveloped an online course on personal finance for undergraduates in 2014 that debuted to over 40,000 Coursera enrollees and close to 500 UCI undergrads. In a key module, the voiceover did not match the graphic example, which resulted in a flurry of negative email and activity on the discussion board. Fixing the problem required re-recording the audio, re-editing the video, outputting a new video file, and replacing the flawed video with the fixed video on the Coursera platform—hours of work to fix a 20-second error. As they say in carpentry: “Measure twice, cut once.”

7: *DO pay careful attention to copyright issues.* A common tendency these days is to rip off images and video from the web with little regard for intellectual property. This practice is risky, particularly when done by faculty who are affiliated with universities that can be sued. Therefore, rely as heavily as you can on images that are free to the commons—Wikipedia is often a useful source—and cite everything you use. You can also use the advanced search engine on Google to find royalty-free images; but if you truly want higher-end imagery, build it into your budget and use a service like Getty Images to help you search for and acquire such imagery.

8: *Do NOT wing it.* I always write scripts for everything I record either on camera or as voiceover—umms, ahs, and awkward pauses or rambling threads just don’t cut it with today’s discerning students. For video camera work, I use a teleprompter software called “Presentation Prompter” loaded onto my laptop computer, and I place the laptop strategically beneath the lens so it appears like I’m looking right into the camera. (The teleprompters of old were clunky contraptions costing \$10,000 or more, while teleprompter software on a laptop can be found for \$100 or less (and even for free with limited options). The trick is to write your copy as if you were speaking it—after all, it *is* a lecture—and then read that copy as if you *are* speaking it. If a newscaster can do it smoothly, so can you with a little practice—so warm up your voice and do one or more practice runs before hitting the “record” button.

9: *DO have accurate scripts or transcriptions of your presentations and use them for captioning your course.* Captioning is important both for the hearing-impaired and for students for whom English is not their first language. It is also possible to translate the captions, so that students can see subtitles in their preferred language. In a “tip sheet” for foreign students, the University of Canberra (2015) acknowledges a common set of problems: “The lecturer speaks too fast,” “Different lecturers have different pronunciation,” “Some lecturers use strange idioms,” and “I don’t know enough vocabulary.” The advice includes that students seek “recorded lectures.”

10: *DO keep your user interface as simple as possible.* I have not strictly followed this rule. The instructional environment has become technologically rich, and so I have used multiple platforms to build my online courses. While the requirement that students engage in multiple logins on different platforms has led to some student complaints in my exit surveys, I have thought it to be a worthwhile tradeoff. That said, seek for yourself, and perhaps you will find better ways to integrate competing and complementary technologies and content into a single seamless platform for your course.

The Essential Elements of Testing and Discussion Boards

Let’s turn now from the multimedia lecture substitute and consider two of the most essential elements of a hybrid or fully online course: testing and the use of discussion boards (also known as online forums). With the testing element, it is useful in addition to distinguish in an online world between the use of testing for students’ own feedback and the need by instructors to evaluate student performance.

By way of example, the approach Coursera takes with my MOOC courses, which I believe is a good one, is to allow students to take the quizzes attached to the lessons multiple times. In this way, students are allowed to test their retention and mastery of the material. Evaluation and grading can then be achieved through proctored exams like a mid-term and a final.

This distinction between unproctored “feedback quizzes” and proctored evaluation exams is important. In an asynchronous online environment, cheating is often much easier. For example, online quizzes taken asynchronously can be “cut and pasted” into a document or captured as images with screen shot technology, and this information can then be shared with other test takers—Student A takes a quiz on Monday and emails it to Student B who takes it later in the week. It may even be that Student A is simply a stalking horse for other students, and Student A has no intention of completing the class.

The emergent industry of digitally proctored exams can address this academic integrity issue to some extent. Competitors include Proctor Free, Software Secure, and, the one that I have relied on, ProctorU. With ProctorU, students must have a computer with sound and a webcam. Each student registers in advance for the exam in question and ProctorU verifies the student’s identity. On “game day,” the student logs in via ProctorU. At that point, a live human proctor watches both the student (via the student’s own webcam) and the student’s computer display during the entire exam. This makes it much harder for a student to use cheat sheets, get

assistance from friends, or otherwise use forbidden test aids. I have used this tool for students to log in for my final exams from all over the world. The primary downside is that online proctoring entails an additional student cost—around \$15 for a one-hour exam to about \$30 for a three-hour exam. Another negative, according to my student exit surveys, is that a small but vocal minority find the process of being watched over by a nanny-cam to be Orwellian. (And speaking of Orwell, students of mine who ventured to China during the exam period couldn't get through China's firewall to reach ProctorU.)

Another approach to reducing cheating on midterm and final exams is to specify a very tight window of time during which the exam can be taken. But of course, that decision defeats at least some of the advantage of the flexibility of the online course. Like fighting ants and roaches, dealing with cheaters is a never-ending battle; and the need for effective one-on-one or in-class monitoring of cheating will likely continue as a serious limitation on taking degree-granting, for-credit MOOCs to large scale.

Discussion Boards and Online Forums

When class sizes are large, classroom discussion becomes logistically difficult and faculty office hours can't hope to allow meetings with more than a small fraction of the enrolled students. Perhaps for this reason, the electronic discussion board has become a best practice and staple of online courses (and many traditional classroom courses as well). Suler (2004) and TeacherStream LLC (2009), for example, offer an overview of the various methods to facilitate discussion board interactions.

A typical online board will feature a "prompt" from the professor often tied to some news article, assigned reading, or portion of a lecture. Student "discussants" can respond both to the prompt itself and to other responses by students in a system of discussion threads with possible feedback from the instructor. More sophisticated boards can introduce a "points system" whereby posts are graded by one's peers and/or the instructor. In these ways, discussion boards provide peer-to-peer learning opportunities along with personalized instructor-to-student interactions in a collaborative learning environment.⁹

Your choice of possible discussion prompts spans the spectrum from pre-packaged "canned prompts" synchronized to the course material to "improvised prompts" tied to the current news of the day that feed back into the course material. For example, a typical canned generic prompt in a macroeconomics class might be "what factors move exchange rates?" Alternatively, for an improvised prompt, you might post a current events question (with a related article link) like "how is today's announcement by the European Central Bank to cut interest rates likely to affect the value of the euro?"

The virtue of canned prompts is that they can be automated by the MOOC platform into the delivery of the course and monitored by teaching assistants given

⁹ Moore (1989) formalized the key types of interaction useful in a learning context. For a literature survey of the virtues of various forms of interaction, see Su, Bonk, Magjuka, Liu, and Lee (2005). The *Journal of Interactive Learning* publishes a steady stream of research in this area.

a “cheat sheet” of likely responses, with the instructor only participating when a student question has stumped the staff. The advantage of the improvised prompt is that it weaves immediate real world applications into the fabric of economic theory. Either way, it is essential to monitor any discussion board; anything from irrelevance and irreverence to profanity and pontificating can infect the discussion. In addition, if you want students to pay attention to the board, you need to provide appropriate incentives. Here, a points system may be helpful and can be implemented with higher-end software, for example, at the time of this writing I am experimenting with Yellowdig.

More Value-Added For Your Online Course: Peer Assessment and Team Exercises

Let’s turn briefly now to the nonessential elements that may be included in an online course as a way of adding further value and differentiation to your teaching product. For example, both the peer assessment and team exercise can be used to enhance student-to-student interactions and help overcome some of the alienation and social isolation that can occur in an online learning format (for example, Rovai and Wighting 2005).

With peer assessment, increasingly sophisticated software tools such as Blackboard, Moodle, and WebPA allow you to subdivide a class into microcells and to have these cells internally evaluate and perhaps grade assignments. Topping (1998, 2009, 2010) offers an interesting look at the development of peer assessment theory and practice. In their technology review, Honeychurch, Barr, Brown, and Hamer (2012) find that peer assessment not only helps overcome the hurdle of having an instructor grade large numbers of assignments; they argue the “real value . . . resides not in the feedback itself (the product) but in the process of constructing the feedback.”

As an example, suppose you want to assign a paper or YouTube-style video presentation¹⁰ on quantitative easing (a macro application) or a game-theoretic analysis of competition in a specific industry of the student’s choosing (a micro application). You divide your class into microcells of five students per cell. Within each cell, each student reads and comments upon the papers or presentations of the others—and perhaps assigns a grade. In the process, as Luxton-Reilly (2009) notes, “a high degree of individualized feedback for students can be maintained by engaging them in tasks that promote learning by interacting with each other.” Watters (2012) discusses the constraints on using peer assessment in a MOOC world of very large numbers. Alternatively, in a team exercise format, teams can be tasked with the assignment rather than individual students.

In my own case, I regularly subdivide my classes into small teams and encourage them to develop their own support groups for the class. I also offer students the opportunity to meet in virtual space with both me and with their teams using conferencing softwares like Google Hangout and VirBela. For example, VirBela

¹⁰ In an online world, the traditional “paper” is sometimes giving way to more multimedia productions. Such productions still require students to write—in this case a script—but also help develop other soft presentation skills increasingly valued in today’s labor market.

offers a complete virtual environment that allows students and instructors to meet as “avatars” in a virtual lecture hall or team room and communicate verbally and/or through messaging. In this way, softwares such as VirBela offer a high-tech alternative to the traditional office hours and help mitigate one of the major downsides of online learning—the loss of the traditional face-to-face sit-down with an instructor or teaching assistant.¹¹

As for simulations and games, entire journals are dedicated to their applications and uses in an experiential learning environment: for example, *Simulation & Gaming* and the *International Journal of Gaming and Computer-Mediated Simulations*. Such tools allow students to come at the material from a different direction, learn the material with a more hands-on perspective, and perhaps introduce a competitive element into the pedagogical equation.¹² I use a stock market simulation via a software called Stocktrak to inform the complex relationships that may exist between stock prices and macroeconomic events and allocate points on the basis of contest winners and losers.

The broader point here is that technologies continue to evolve that help you better “touch” students in ways that could hitherto only be done in the traditional classroom or an office hours setting.

The University as “Company Town”

As an additional consideration regarding whether you want to develop your online content personally, there is the critical issue of the assignment of property rights. The assignment of these rights can have significant impact on your own welfare—as well as on the pace of online content development at your institution.

In one scenario, you develop your own content on your own time and with your own resources, you own the intellectual property rights, and the only person who can use your content without your permission (and possible compensation) is yourself. In the opposite scenario, you develop online content, but the university owns the property rights by contract because you are in its employ. There is a debate on the University of California, Irvine campus, and I’m sure on other campuses as well, as to whether development of course materials has now become part of one’s job description, such that no additional incentives should be required. One can imagine a “no good deed goes unpunished” scenario in which other faculty and lecturers free ride on your effort, and you wind up with fewer classes to teach—or even possibly without a job.

In this latter scenario, the overarching problem is that the faculty labor market may be prone to monopsony power from universities (for discussion, see Ransom

¹¹ In the early development of online education, this loss was at least partially offset by the obligatory string of email correspondences between students and professors as well as the occasional phone call. However, instructors can quickly get buried in an avalanche of email from students all asking the same or similar questions. In this scenario, email is simply a time suck rather than an effective teaching tool, and discussion boards go a long way towards solving this problem.

¹² For the use of games and simulations in economics education, see, for example, Greenlaw (1999), Gremmen and Potters (1997), Lean, Moizer, and Towler (2006), and Schmidt (2003).

1993; Hallock 1995). In the presence of such monopsony power, universities are more likely to impose conditions on new hires that reflect the emergence of online education options. Within my own business school, for example, all new ladder faculty sign contracts committing them to possible online teaching—and by implication developing online content on behalf of the campus.

If you are going to expend the time, resources, and energy to produce substantial online content or even a full-fledged MOOC, know the rules in advance. This is not just about being selfish; the unchecked exercise of monopsony power by the academy will almost certainly lead to an undersupply of quality online content. Campus administrators who see the benefit in having their faculty involved in generating high-quality online content should therefore tread lightly, rather than trample, the intellectual property rights of their academic cadres.

On-Demand versus Phased Delivery

The advent of online education affects not just the space in which we teach (physical or virtual) and classroom times (synchronous or asynchronous). It also opens up the traditional quarter/semester structure of content delivery to disruption. Should online courses be offered in a phased delivery/cohort format that mimics the traditional classroom model and calendar? Or alternatively, should the academy more heavily emphasize “on-demand” education—with all the implications for “college life” as we know it?

As an example of the most regimented form of the phased delivery/cohort model, I originally offered my economics principles sequence on the Coursera MOOC platform in a ten-week quarter format. Each week, a new topic would be introduced (for example, production theory, the Keynesian model); and the student cohort had to complete the multimedia presentation and pass the requisite quiz in a timely manner. In addition, the discussion board was refreshed with new prompts tied to the weekly topic. Students could go back and review previous material, but they could not jump ahead.

The MOOC community quickly let me—and Coursera!—know that this regimented delivery is anchored in an old school traditional classroom mentality. Effectively, the cohort model chains a powerful digital tool to the artificial bounds of time in the same way that for decades, network television remained bound to the formula of releasing one episode a week of a prime-time series. After cascades of student complaints, Coursera decided to experiment with the on-demand format, with me as one of their first guinea pigs. With this approach, eager beavers can now “binge” their way through my Coursera courses as fast as Netflix users have gone through a season of *House of Cards*. At the other end of this on-demand spectrum, slow pokes can turn a normal ten-week race into a six-month marathon—and thereby better avoid contributing to the high drop-out rate symptomatic of MOOCs.

While many students appreciate the flexibility of an on-demand model, this structural shift also creates significant pedagogical problems. One of the biggest downsides of an on-demand approach is the loss of synchronicity for student-to-student and professor-to-student interactions. In the regimented cohort

format, Week Three of the macro principles course might feature fiscal policy, while Week Four could feature monetary policy. During those weeks, all students as a cohort and community could be presented with discussion prompts geared to the topic at hand. Once the on-demand approach kicks in, the class discussion boards and virtual office hours lose their sharp focus, and the courses devolve, at least to a certain extent, into mastery of basic timeless content. Another downside is that “binge learning” may lead to lower longer-term retention of the material—a prime topic for future research as this topic is now currently an empirical black hole.

On the plus side, an undervalued virtue of the on-demand model may well be its ability to move more highly motivated students (perhaps with greater aptitude for the topic) more quickly through the curriculum. This on-demand virtue may play particularly well at many public universities where certain key courses have had enrollment limitations that can make it difficult for students to fulfill both major and graduation requirements in a timely manner. For this reason alone, the on-demand format may (largely) win out, warts and all, at least for a number of core courses and particularly for public universities struggling to graduate their students on time.

Some Final Career Advice

How can an economics educator continue to provide significant value (and thereby stay gainfully employed) in a world where online education is automating and commoditizing many of the tasks that have traditionally been part of the job? How you proceed from this point in time will depend in large part on your current stage of career and position. While I am certainly not tooled up to be anyone’s career counselor, here is how I see the chessboard.

If you are primarily a research economist with some teaching responsibilities in the mid to later stage of your career at a higher-ranked research institution, don’t bother with developing online content on your own. The most you may want to do is explore flipping or blending your traditional classroom by leveraging already existing online content either from a MOOC or elsewhere. By following this seemingly modest path, your students will get a better education. At the same time, you may find teaching to be a fresh pleasure because you are no longer spending so much time explicating basic material and instead will have more time to share actual theoretical and empirical complexities with your students (as well as perhaps more of your own research).

If you are a research economist much earlier in your career, you should, at least as a hedging strategy, learn more about technology-mediated education, and perhaps build some competencies in this area. If you fail to do that, your hope for academic survival will rely on prodigious research output in top tier journals—an option that only works for a chosen few.

If you are primarily an economic educator with less demand that you publish, it is essential that you make the transition to the virtual world and take to both heart

and head all of the online ways to add value to the classroom and differentiate your product. This will require a degree of retooling similar to what America's blue-collar manufacturing workers have experienced in adapting to a world of automation and robots, but it will likely be a very worthwhile investment as the live performance "sage on the stage" steadily gives way to the "cyber-guide on the side."

If you are a department chair or a dean and want to meet the competitive challenge posed by online education, you must set up appropriate incentives for online course development. This likely means the carrot of proper funding and reduced teaching loads in the development stage (and perhaps any gentle sticks at your disposal). Particularly at research institutions, it means providing your faculty with the necessary assurances that contributions in helping an institution move to an online and/or flipped class world will carry significant weight when it comes time for merit, tenure, and promotion decisions.

In addition, department chairs and deans hoping to innovate rapidly should consider moving beyond the "volunteer model" of offering incentives and hoping for a response and instead move to a "recruitment model." We have learned this lesson painfully at my business school: if you wait for volunteers, the response will likely be tepid, the faculty best suited for the task may not respond, and you may wind up with more online clunkers than hits. Instead of waiting for volunteers, identify the faculty you think will do the best job helping you move into the online space and vigorously woo and recruit them.

Finally, for chancellors and other central administrators, my perhaps counter-intuitive advice is not to get caught up in the hype over online education. Assess your institution's skills and build your program to amplify its strengths. For example, if you are a small liberal arts college or an elite MBA school, posting everything online may diminish the competitive and comparative advantages you might now have in the marketplace. In such cases, follow the blended and flipped routes and leverage your strengths. Perhaps most importantly, as your faculty develop online content, be zealous about quality control. Don't let the current frenzy to produce online content result in low-quality offerings that diminish rather than build your reputational capital over time.

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