

## The Inside Story: Campus Decision Making in the Wake of the Latest MOOC Tsunami

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### Abstract

Over the past year, Duke University faculty, staff, and executive leadership were compelled to make a host of critical decisions related to the opportunities and challenges posed by the current wave of massive open online courses (MOOCs). The lack of available empirical research regarding MOOCs played a significant role in that decision-making process. In this position paper, the author examines the types of choices that universities are confronted with as they wrestle with their own identities in the face of new and disruptive forces. The author also describes the special effort being made by Duke to collect and analyze data with a view toward advancing the assessment of online education more broadly. She shares and discusses the University's preliminary findings with regard to instructor workload as well as student demographics, motivations, and levels of engagement, all based on data derived from the University's first MOOC. Finally, readers are provided with a summary of the types of decisions that administrators, faculty, and staff are likely to face in crafting an institutional response to the brave new world of online education and MOOCs.

**Keywords:** massive open online course (MOOC), Coursera, 2U, assessment, quality

### Introduction

Any casual reading of articles published by [The Chronicle of Higher Education](#) on the rise of massive open online courses (MOOCs) shows one thing clearly: MOOCs have struck a nerve among university executives, trustees, and faculty.

Consider the kinds of questions people in higher education are asking themselves in the wake of what [The New York Times](#) columnist David Brooks has dubbed a "campus tsunami" ([Brooks, 2012](#)):

- *What is teaching?*  
"Coursera and its fellows are offering autodidacts recorded lectures and self-quizzes ... [but] where is the teaching?" asks one reader ([robin\\_hill, 2012](#), para. 2).
- *What role does engagement play in learning?*  
"It is not enough for students to engage with the material through social networking," writes another commentator, but rather "*the teacher* must be engaged with the students ... something that cannot be done well in a class of hundreds, but ... cannot be done at all for a class in the thousands (or more)" ([gbyshenk, 2012](#), para. 3, emphasis added).
- *What will the college experience be from now on, and what will that mean for the job security of instructors?*  
"If you have a world-class researcher teaching the basics of his field to EVERYONE," a third respondent speculates, "will there no longer be a need for 200 lesser copies of the professor at 200 lesser institutions spread around the world, teaching an expensive, increasingly unaffordable class to packed lecture halls of 500 people?" ([Renaud, 2012](#), para. 1).

In this position paper, I take the reader through the decision-making processes that shaped [Duke University's](#) institutional response to the opportunity represented by MOOCs. Duke entered into the MOOC arena in the spirit of exploration; however, the weakness of the existing research base on the efficacy of the MOOC e-learning approach inspired the University to collect and analyze course-related data emerging out of this grand experiment in open educational access. I share and discuss the University's preliminary findings with regard to MOOC faculty workload, student demographics, student motivations, and levels of engagement, concluding with a summary of the kinds of decisions similar institutions are likely to face in crafting their own strategy for online education.

### Literature Review

In the last several months, articles have appeared in peer-reviewed journals that begin to offer a more nuanced picture of MOOCs and their student demographics. [Breslow et al. \(2013\)](#), for example, analyze the data generated by *Circuits and Electronics*, the first MOOC developed by [edX](#), the MOOC consortium led by [Massachusetts Institute of Technology \(MIT\)](#) and [Harvard University](#). The question driving their study was whether certain instructional practices that are known to strengthen learning in the traditional classroom, such as interactive engagement with the material, also do so in MOOCs where learners "differ widely in age, level of preparedness, family or work responsibilities, etc." ([Breslow et al., 2013](#), p. 21). By focusing on the time students spent on each resource, including online labs, and then looking at the relationship between the scores on the practice problems and the final exam score, the investigators made inferences regarding the impact of time spent on practicing concepts and the level of knowledge retention and transfer attained.

However, just one short year ago, when Duke was considering a partnership with a start-up company called [Coursera](#), the number of peer-reviewed studies using data sources to gain insights into the nature and efficacy of open online education on a massive scale was quite small. Interesting lines of thought were beginning to be pursued. Chaos theory continued to be used as a descriptive framework for understanding the complexity of peer interaction in MOOCs ([de Waard et al., 2011](#)). Investigators pointed to the challenges MOOCs posed for "connectivist learning" ([Kop, 2011](#)), while others drew attention to the ethical issues involved in mining student data for insights ([Esposito, 2012](#)). Meanwhile, criticism was already being directed at the overreliance on prerecorded video lectures in online education, which prompted Duke professor Cathy Davidson to characterize this period as "the horseless carriage stage of MOOCs," when we are simply "taking the lecture – the most traditional form of education – and motorizing it" (quoted in [Bonnett, 2013](#), para. 27).

### Methods: Using Questions to Explore Institutional Readiness

Despite this backdrop of uncertainty, Duke administrators, faculty, and staff managed to arrive at a plan of action. Choices were based on a wide-ranging discussion of the following questions: How well does the Coursera model of partnership and pedagogy align with the University's distinctive strengths and strategic academic goals? Did it represent a sustainable model for advancing open education as a social good? Would the partnership with Coursera generate new data that might improve teaching and learning, both on campus and online?

#### *Aligning Participation with Institutional Goals*

Universities and colleges are notably cautious and deliberative institutions. Yet over the 2012 Memorial Day weekend, Lynne O'Brien, the director of Duke's [Center for Instructional Technology \(CIT\)](#), quickly assembled a small group of faculty to advise the Provost on unfolding events [O'Brien \(2012\)](#). A year-old company named Coursera was set to announce its second set of university partners on July 17, 2012. The question for the committee: Should Duke University be among them? By the end of the week, Duke had signed a contract with Coursera, and by the end of the summer (September 1, 2012, to be exact), the first Duke-produced MOOC went live.

Duke had a number of reasons for partnering with Coursera. First, the Provost entered into the agreement in the spirit of exploration and experimentation, reasoning that the massive reach of these new online learning models would capture the imagination of faculty and focus their attention on innovative teaching strategies. These innovations, in turn, would then find their way into our campus classrooms. In the context of a MOOC, course design could be reconsidered without the constraints of semesters, credit hours, and room scheduling. Moreover, by reimagining a course as a collection of topic-specific modules, we might eventually produce a library of multi-disciplinary assets that faculty could recombine, remix, and repurpose to build new and different online learning experiences.

Aside from their capacity to stimulate innovation on campus, MOOCs offered Duke a chance to showcase faculty, connect with alumni, and support the University's strategic goals around (1) internationalization; (2) knowledge in service of society; and (3) interdisciplinary studies – all of which were signature strengths for the institution. Interdisciplinary courses, in particular, were challenging to mount on campus, where faculty have limited time allotted for teaching outside their home departments, courses need to be approved for cross-listing, and students must be reassured that credits earned will be counted toward their degree. In this context, faculty might use the MOOC platform as a test-bed for rapid prototyping and piloting of interdisciplinary courses with the goal of building a case for their inclusion within the University's approved curriculum.

Once Coursera announced that Duke would be among the universities offering new MOOCs in the Fall, press coverage was immediate, with articles appearing that very day and the next from [The New York Times](#), [The Wall Street Journal](#), [Bloomberg News](#), [Forbes](#), [Slate](#), [Inside Higher Education](#), and [The Chronicle of Higher Education](#). The CIT at Duke saw a rise in consulting requests from faculty interested in developing online lectures that students would watch prior to class, freeing up class time for other learning activities – a pedagogy known as "flipping the classroom" ([Duke University CIT, n.d.](#)). And with the release of the Duke course description pages on the Coursera website, confirmation arrived that people from 57 countries were intrigued by the initial offerings, with the highest number of web "hits" coming from the U.S., Brazil, Canada, U.K., India, Russia, Australia, Spain, Germany, and China (in that order).

(For more information about the alignment of Duke's MOOC initiatives with its institutional goals, please see [this video](#), in which Lynne O'Brien delivers a briefing session at the Fall 2012 meeting of the [Coalition for Networked Information](#).)

#### *Advancing a Sustainable Model for Social Good*

In discussing sustainability in online education initiatives, it is useful to view Coursera within a broader historical framework, one that encompasses the slightly older global open educational resource (OER) movement. The OER movement was ignited in part by the launching of the [MIT OpenCourseWare project](#) in 2001 and embraced during the 2002 [United Nations Educational, Scientific and Cultural Organization \(UNESCO\) Forum on the Impact of Open Courseware for Higher Education in Developing Countries](#) ([Johnstone, 2005](#)). The major initiatives within the OER movement were responding to projections that put the number of students enrolled in some form of higher education worldwide at 160 million by the year 2025 ([Oblinger & Lombardi, 2008](#)). [MERLOT](#) (an initiative of the [California State University](#)), [Connexions](#) (an initiative of [Rice University](#)), and [MIT OpenCourseWare](#) were designed to help democratize access to knowledge by building online libraries of teaching and learning materials. This content is contributed for the use of anyone under non-restrictive licenses, permitting individual learners and instructors to repurpose those materials, customizing them to meet local needs. The vision relies on an all-volunteer army of content producers willing to contribute resources without compensation.

There were a number of ways in which OER initiatives could support quality claims for their libraries of content, including the integrity of an institutional brand (MIT OpenCourseWare), traditional quality assurance indicators including discipline-specific peer review and citation indices ([MERLOT](#) – see [Moore, 2013](#)), and the integrity of individual self-publishing experts committed to broadening their reputation and impact ([Connexions](#) – see [Connexions, 2010](#)). In large part, the OER movement relies on the willingness of content developers and contributors to value the currency of attribution over monetary compensation. Attribution, through which an author's name is associated with content contributions and modifications, is a longstanding marker of scholarly reputation and impact, and the number of times an attributed work is cited indicates expert consensus on its importance to the field – a convenient proxy for quality. Yet, the absence of agreed-upon mechanisms for assuring content quality was an issue at the dawn of the OER movement ([Oblinger & Lombardi, 2008](#)) and continues to be an issue today, as is suggested by [MERLOT's](#) recent efforts to marry quality assurance in content development and online course design (see [Quality Matters & MERLOT, 2012](#)).

Coursera's use of university partners as course developers is one method of addressing the problems related to productivity and quality assurance that have plagued the OER movement since its inception. Coursera takes the democratizing educational mission of the OER movement and wraps it in the newer trappings of revenue-generating social entrepreneurship, through which various avenues for "monetizing" mass education will be explored. Quality assurance for Coursera relies almost entirely on the company's understanding of what motivates its "channel partners." These partners – an ever-expanding roster of top-

flight universities – cannot afford to release sub-par courses that bear their names. So, Coursera is quickly becoming what industry might call a "value-added reseller" of partner-guaranteed courseware products. As of this writing, the company is exploring nominal student fees or alternate means of generating revenue to be shared with its channel partners, who could funnel that revenue share back into the production and delivery of new courses, if they choose ([Dellarocas & Van Alstyne, 2013](#); [Kolowich, 2013a](#)).

In place of a searchable online library of resources, Coursera took a page from George Siemens and Stephen Downes, who co-taught [the first of the MOOCs](#) in 2008, by adopting an educational product much more familiar and attractive to the partners who would be supplying the content at their own expense – that is, the unfolding *course* in which a *cohort* of students could share an unfolding sequence of events led by an expert and organized around intelligently curated materials. In a nod to personalized instruction, video lectures pause to let students answer questions, with immediate feedback provided when the video resumes; the most relevant student questions as determined by the wisdom of the crowd rise to the top of discussion forums and are sent to the instructor for response ([Coursera, 2013](#)).

Any university that chooses to partner with Coursera takes on the responsibility of provisioning support for MOOC course production ([Young, 2012](#)). Personnel must be dedicated to understanding the capabilities and limitations of the Coursera technical platform, uploading content for faculty, troubleshooting issues, registering institutional concerns with the company, and generally ensuring that the technical partnership between the university and Coursera runs smoothly. For example, Coursera's agreement with the University of Toronto (obtained by [Butosi, 2012](#) through a [Freedom of Information](#) request to that University) stipulates that:

Under the University Monetization Model, [the] University (through its Instructors) will develop, produce and submit Courses, and [Coursera] will host and make such Courses available through the Platform. [The] University will be responsible for providing [Coursera] the Content in a format that can be hosted and streamed via the Platform, and such Content, while not required to satisfy Course Criteria in order to be made available on the Platform, must satisfy the Quality Standards. (p. 5)

At Duke, MOOC faculty are assigned to an instructional design team and essentially undergo a crash course in "the possible" as they learn the ways in which Coursera's evolving technical platform both supports and limits their instructional creativity. Since video lectures need to be in high resolution to meet Coursera requirements, faculty are given the option of having their class sessions recorded using a specially outfitted on-campus [Multimedia Project Studio](#), or checking out a video loaner kit for convenient high-resolution lecture capture at home or in the office. In addition, videography and post-production services are made available for location shooting, laboratory demonstrations, in-studio interviews, and the like. A CIT staff member helps instructors review content permissions and negotiate the use of copyrighted material when necessary. Finally, all the new media created for distribution via Coursera is backed up in campus media storage allocated for this purpose ([Riddle, 2012](#)).

#### *Generating New Insights about Quality in Online Education*

There are fairly straightforward ways of ensuring a minimum number of technical glitches in course delivery, so long as faculty are encouraged to complete their courses in advance and early enough for the course to undergo a "soft launch" that will test its performance before it goes "live." The burden for this particular level of quality control typically rests squarely on the shoulders of the consultants and technologists charged with "managing" what are essentially faculty-driven course development projects.

However, the more complicated, and more significant, questions surrounding the *quality* of online education in general are not necessarily, or exclusively, technical. How do we assess the quality of any learning experience? Can we apply the same assessment measures to a learning experience undertaken online, whether as an institutional course or as a MOOC, that we would implement for an on-campus course? What impact should the diversity and nontraditional makeup of the MOOC student population have on course planning or outcome measures? In order to investigate these and other questions at Duke, our Vice Provost for Academic Affairs is chairing a committee on online assessment comprised of faculty in psychology, cognition, and neuroscience along with our Duke–Coursera faculty and other institutional assessment experts to discover what datasets Coursera will share with us and how we could mine data with a view toward measuring the effectiveness of teaching and learning in MOOCs.

### Preliminary Results: Sharing the Data on Duke's Bioelectricity MOOC

Tables 1 to 4 present some of the key findings from a report co-authored by Duke assessment specialists Yvonne Belanger and Jessica Thornton (Belanger & Thornton, 2013). The report analyzes data from Dr. Roger Barr's condensed eight-week online version of a challenging course he has long offered to upper-level undergraduates at Duke. The MOOC entitled *Bioelectricity: A quantitative approach* was launched on September 24, 2012.

Table 1. *Duke Bioelectricity MOOC: Course development and delivery*

Hours of instructor effort in advance of the course	210
Hours of instructor effort while course was active	210
Hours of effort on part of staff (including teaching assistant, instructional support, technical support and assessment team)	200
Hours of finished video	11.3
Number of published video segments	97 (12 videos per week)
Number of graded exercises, including a peer-graded writing assignment and final exam	18

Table 2. *Duke Bioelectricity MOOC: Student demographics*

Enrollment at start of course	Over 12,000
Educational background	One third held less than a four-year degree One third held a BA, BS degree or equivalent One third held an advanced degree
Nationalities	Only one third from U.S.; enrolled students represented more than 100 countries; course discussion threads were carried out in many languages, including Russian, Greek, Portuguese, and Romanian, and students also contributed translations of video transcripts in several languages, including Spanish, Chinese, and Indonesian

Note. This table is partially based on data from a "getting to know you" questionnaire distributed by e-mail to enrolled students one week prior to the course launch ( $N = 3,576$ ).

Table 3. *Duke Bioelectricity MOOC: Student engagement*

Weekly video views (one indicator of student engagement and persistence)	8,000 at their height, after which there was a sharp decline, with views eventually leveling off at just over 1,000 views per week
Level of discussion forum activity	800 unique students posted to the forum, with over 550 contributing during the first week
Number of students attempting a quiz during the course	3,600
Number attempting a quiz within the first week of the course	3,200
Number of students who answered a question correctly on the Week 1 quiz	800
Percentage of those 800 students who were successful in completing the course requirements	25%

### Discussion

Much of what was gleaned from student surveys and from monitoring student activities in Duke's first course would seem to confirm certain intuitions about the unmet market for education that MOOCs appear to be tapping into at the moment. Online students expressed a degree of appreciation for their instructor that was a testament both to his singular dedication and skills and to the genuine desire on the part of large numbers of people, from a wide range of backgrounds, for human interaction *in the shared context of intellectual engagement*.

Duke's exploration of new and emerging online educational models, and MOOCs in particular, remains in the data collection stage, as we monitor the number of hours instructors devote to MOOC development

and delivery, student demographics, completion rates, etc. We are able to use our current survey instruments in combination with platform interactions (web hits, natural language searches of discussion forum postings, number of exam attempts, peer assessments, and the like) to draw some inferences about student engagement, satisfaction, and comprehension, but these are "early days" yet and there is much to consider.

Table 4. *Duke Bioelectricity MOOC: Student motivation and course completion (based on pre- and post-course surveys)*

Motivation for enrolling in the course in the first place	Fun, enjoyment, and educational enrichment were selected as important reasons for enrolling by a large majority of students
Reasons for not completing the course requirements	<ul style="list-style-type: none"> <li>• Lack of time</li> <li>• Insufficient math background</li> <li>• Intent to view only the video lectures</li> </ul>
Number of students who completed all requirements	313 students from at least 37 countries
Number of respondents to the post-course survey	105
Proportion of the 105 respondents who earned a certificate in the course	Two thirds
Motivations for enrollment cited by students who completed all requirements	<ul style="list-style-type: none"> <li>• Formal recognition of accomplishment</li> <li>• Professional development</li> <li>• Participation in the forums and other student interaction</li> <li>• Supplementing a formal, credit-bearing course in which they were simultaneously enrolled</li> </ul>

*Note.* These pre- and post-course surveys were conducted prior to Coursera's inauguration of the "[Signature Track](#)" option, in which students may pay to be individually tracked through a course in order to receive verified certification upon course completion. Coursera courses have also begun to be reviewed by the [American Council on Education \(ACE\)](#); all courses that meet the ACE's accreditation standards will be noted and students who complete those courses successfully may take that recommendation to their home institutions, which decide whether or not to follow ACE recommendations and grant the student course credit ([Kolowich, 2013a](#)).

It should not be forgotten that MOOCs remain one choice in a much broader ecosystem of emerging approaches. Long before the advent of this latest wave of MOOCs, online education has been recalibrating our notions of what learning and knowledge mastery mean in varying contexts. Already, [Western Governors University](#) in the U.S. and [Athabasca University](#) in Canada, both established well in advance of the latest MOOC craze, dispensed with "the old proxies of quality" and pioneered so-called "competency-based education" (CBE). The approach measures the performance of a broader, more diverse and far less traditional demographic of postsecondary learners who want to demonstrate to potential employers that they had mastered the required competencies in their particular field. The competency-based model represents a paradigm shift away from semester hours and "seat time" as measurements of attainment toward individualized and self-paced learning ([Fain, 2012](#)). CBE is marked by the achievement of well-defined milestones and demonstrated masteries (often aligned with industry measures as determined through licensure and certification exams).

It stands to reason that the more pragmatic interests of nontraditional students will begin to shape the kinds of courses institutions choose for massive online deployment. Nontraditional students may alter the current balance of theory to practice in the MOOC world, which remains fairly traditional, lessening the present reliance on lecture-driven video content while increasing the creative use of social tools in support of applied learning. If this does indeed become the trend, the technical platforms that now support MOOC delivery must be enhanced to support group and team-based activities on a massive scale. Already, educational theorists are growing concerned that the democratizing potential of MOOCs is being compromised. On the one hand, MOOC start-up companies such as Coursera are appealing directly to American universities' growing commitment to open and accessible knowledge. On the other hand, they reify a notion that genuine knowledge flows from the elite institutions of the West outward to the rest of the globe ([Rhoads, Berdan, & Toven-Lindsey, 2013](#)). Greater support for ad hoc and organized group formation would further the bi-directional exchange of knowledge. Ideally, MOOC students should have the opportunity to identify their own strengths and forge alliances with others whose strengths are

different and complementary in order to shake up their assumptions and break down the barriers of specialization that can impede innovative thinking.

Coursera is not Duke's only suitor in the world of online education. The university and a number of other top-tier universities formed a consortium this year to partner with [2U](#) (formerly 2tor) in mounting a "[Semester Online](#)" program, designed to be neither "massive" in scale nor "open" in enrollment policies. 2U is a purveyor of "School-as-a-Service" ([Hill, 2012](#)), meaning that while faculty subject matter experts from the consortium schools will work with 2U course designers to develop and deliver the course, the universities will be essentially outsourcing this online program to 2U, which will also provide student recruitment and support services.

Again, by contrast with Coursera, Semester Online is targeted exclusively at "academically qualified" undergraduates currently enrolled at one of the consortium institutions or, down the road, at other accredited institutions. In fact, Semester Online bears less of a resemblance to its namesake – semester abroad programs – than it does to certain institutional exchange programs in which a student is allowed to take one or two courses at a nearby institution when those courses are not offered by his/her home institution. Students will pay the same amount for these fully online classes as they would for classes they take on campus, since there will be fixed costs associated with these courses each time they are taught ([Lytle, 2012](#)). The company 2U covers all expenses of course development and delivery for a share of the tuition-based revenue. The financial model, therefore, relies on the assumption that students (and their parents) will continue to regard online courses and on-campus courses as equivalent returns on their investment.

The Semester Online experiment recently took an interesting turn when the [Council](#) of Duke's [Trinity College of Arts and Sciences](#) voted 16 to 14 against participating in the consortium. Reasons for the vote included faculty fear of long-term effects on the University's offerings and hiring practices as well as insufficient consultation with faculty in the framing of the consortium ([Lewin, 2013](#)). Faculty were uncomfortable with an arrangement through which Duke students would gain credit for taking courses developed by other institutions. The concern was that such an arrangement would dilute faculty authority over shaping the curriculum and determining progress toward the degree within the College's departments and disciplines. However, faculty members present at the meeting were also quick to point out that they appreciated the difference between Duke's participation in the MOOC model of open education, which they supported, and the 2U Semester Online venture, which they were not prepared to back in its present form.

## Conclusion

In sum, colleges and universities are developing institutional responses to the opportunities and challenges of online education. Based on the experience of administrators, faculty, and staff at Duke University, careful attention to the following questions should help institutions consider their options in the wake of the MOOC tsunami:

- 1) Will institutional investment in course development and delivery aimed at a global audience advance the institution's distinctive strengths and strategic goals?
- 2) Have institutional leaders consulted with faculty governance councils in a timely fashion, encouraging expressions of concern and taking them into account in framing the institution's approach to new opportunities?
- 3) Does the institution have the capacity to provision a support structure for MOOC course development?
- 4) Must revenue be generated and shared down the road in order to sustain MOOC initiatives on the campus?
- 5) What is the best way for the institution to support cross-disciplinary research that leverages the vast amounts of data from these online experiences to strengthen understanding of learning and cognition and improve educational practices online and in the classroom?

In the best of all possible worlds, traditional colleges and universities will be able to define a whole set of circumstances in which online courses would help to further their mission and institutional goals, and then match each circumstance to the appropriate model, whether massive and open or not. In the meantime, Coursera's founders are being asked where they think the company will be by 2018. Behind that question

is another, largely unspoken one, freighted with meaning and possibility: Where will colleges and universities be in five years' time?

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