

COMMENTARY

Balance sheet on MOOCs: Myth, hype and potential

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More than three years have passed since The New York Times declared 2012 the “Year of the MOOC” (Pappano, 2012), a declaration that, looking back, served as an exclamation point after an intense period of media coverage about a new form of online education, one that could reach global masses at a scale previously only imagined. Would this innovation change global higher education as we know it? Would massive open online courses solve problems of affordability, access, and degree attainment? Would we lose important and time-tested qualities of higher education by allowing MOOCs to standardize and commoditize the educational process?

Based on our experience with this online format over the past few years, we now know the questions about MOOCs and the potential future role for MOOCs are much more subtle and nuanced than they appeared during the “Year of the MOOC.” Today, we are fortunate to benefit from increasing amounts of serious research on various aspects of MOOCs. This article provides a high-level overview of some of this latest writing organized around a group of major issues and concerns. This article also attempts to provide an accounting—a balance sheet of sorts—on the status of MOOCs today and what the future may hold for this form of education.

BRIEF DEFINITION AND HISTORY

Starting with the basics, MOOC is an acronym for massive open online course. The three major MOOC platforms include two Silicon Valley based for-profit start-ups, Coursera and Udacity, as well as edX, the nonprofit consortium out of Massachusetts Institute of Technology (MIT). A MOOC typically represents a single course and not a full degree or certificate programme, though some MOOC platforms are promoting groups of courses as a “sequence.”

These courses truly are massive in that the online technology platform and format has permitted extraordinarily large enrollments, including many courses with over 100,000 students. The term “open” in MOOCs simply means there are no admission requirements. Virtually anyone with an e-mail address may enroll.

Courses also can be viewed as “open” because they are offered free of charge. However, many platforms have now adopted a “freemium model,” providing a basic course experience at no cost, but offering additional products or services for an additional fee (e.g., Coursera’s “Signature Track” or edX’s proctoring service). It’s important to note

most MOOCs are not “open” in the sense of open educational resources designed to allow free and open use and repurposing of content. The edX platform is an exception.

Courses are self-directed from the student perspective. In its most pure MOOC form, there is minimal or no interaction with a faculty member or other teaching staff. Discussion forums allow for some interaction among students, but this interaction is largely voluntary and unstructured.

The history and evolution of the MOOC movement have been well documented elsewhere (Hollands and Tirthaly, 2014; Kelly, 2014; Sandeen, 2013). Key milestones in MOOC evolution are outlined below:

- 2008 First MOOC offered by Downes and Siemens at University of Manitoba, enrollment > 2000
- 2011 First US MOOC offered by Schroeder at University of Illinois Springfield, enrollment > 2000
- 2011 Thrun and Norvig offer their Stanford University Artificial Intelligence course online for free, enrolling >60,000
- 2011 Founding of MITx (precursor of edX)
- 2012 Founding of Coursera and Udacity
- August 2012, Coursera enrolls 1 millionth student
- 2013 American Council on Education announces credit equivalency recommendations for a group of MOOCs
- Udacity and Georgia Tech announce collaboration on Computer Science MS degree
- Media backlash against MOOCs

MOOC 3.0

Sandeen has written elsewhere of the various phases of MOOCs (Sandeen, Change and Huffington Post) from MOOC 1.0 to MOOC 3.0, summarized briefly here. The MOOC 1.0 era began with the first known MOOC, “Connectivism and Connective Knowledge” at the University of Manitoba, Canada. The course enrolled a small number of paying students and was also offered to anyone who wanted to participate in the course for free. Over 2,000 student participated. The first US-based MOOC, “Online Learning Today and Tomorrow,” was offered by University of Illinois Springfield in 2011, enrolling a similar number of students. Both courses used a fairly novel concept, a completely open, distributed, peer-learning model, rather than the typical top-down instructor-led

online model. While these courses did not achieve the extraordinary high enrollments of later MOOCs, they did prove the concepts of high global student demand as well as the potential to scale up enrollments dramatically.

Also in 2011, three Stanford computer science professors, Sebastian Thrun, Daphne Koller, and Andrew Ng held their own MOOC experiments with more traditional online pedagogy in subjects including machine learning and artificial intelligence. With high demand subject matter combined with Stanford University’s reputation, these courses generated 100,000-plus enrollments and soon led these faculty to establish Coursera and Udacity. When Coursera achieved an enrollment of 1 million students in August 2012, the MOOC 2.0 era was born.

The early MOOC 1.0 era was built on the foundation of open educational resources. MOOC 2.0 focused on a more top-down video lecture format. Yes, lectures were organized into smaller components and were combined with exercises and quizzes, but they were still embedded within a traditional pedagogical model. University and/or faculty retained ownership of content. MOOCs appealed primarily to the leisure learning or professional development markets—people who already had earned degrees. However, validation and academic credit were of keen interest to some students.

Universities that offered MOOCs did not provide their own academic credit for the courses, most citing the need to protect the integrity of their full residential campus experience or preventing cannibalization of regular enrollments. Experiments in transferable academic credit have occurred, including a pilot by American Council on Education’s College Credit Recommendation Service (ACE CREDIT®) to evaluate some MOOC courses for potential credit recommendations.¹

The question of how MOOCs might integrate into more traditional higher education programmes and processes has led to what I call MOOC 3.0, the hybridization of the original MOOC form in multiple ways. For example, some institutions are importing MOOCs, usually not as complete courses, but as modular components: discrete and specific content, assessments, other methods, or technology tools. Some faculty license content from MOOCs (video lectures, simulations or exercises) and integrate them into their hybrid or “flipped” classes. Other faculty may refer students to a MOOC in order for them to prepare for an upcoming course or for additional practice or tutoring during a course. Some institutions also consider completion of a MOOC during the admissions process.

Hollands and Tirthaly’s list of current “MOOC derivatives” (p. 48) provides a good look at how quickly the form has evolved, excerpted below.

- DOCC: Distributed Open Collaborative Course that allows faculty and multiple

¹ In full disclosure, the author formerly oversaw the ACE Credit Recommendation Service as part of her responsibilities at the American Council on Education.

distributed institutions to team teach using MOOC technology;

- Mini-MOOC: Using the technology and platform of a MOOC, but open only to a few enrollees (not open to everyone); or, alternatively, a short course offered on a MOOC platform;
- MOOC-Ed: Used specifically for teacher training and professional development;
- POOC: Personalized Open Online Course that, to the degree currently possible, uses data analytics to customize material delivered to individual students;
- SPOC: Small Private Online Course that integrates MOOC material into a course offered to matriculated students only (not open to everyone);
- SMOC: Synchronous Massive Online Course that includes live synchronous lectures offered to both matriculated campus students and open online students;
- “White Label” MOOC: A MOOC offered only to a single organization, usually a corporate entity (not open to everyone);
- “Wrapped” MOOC: Using some MOOC content within a campus-based hybrid (classroom and online) course.

MOOC-related acronyms have proliferated rapidly and no doubt more will have emerged by the time this article is published.

STUDENTS

There is a great deal of consistency in the typical MOOC student. MOOCs have attracted two principal student segments: leisure learners and those seeking targeted career development opportunities. A smaller segment includes students seeking degrees or preparing to enter a degree programme. Some specific research on student demographics and motivations have emerged recently:

- Agarwala (2013) reported that over 88% of students enrolled in Coursera courses had already earned one or more degrees.
- Breslow and DeBoer (2014) also found a high educational level across all edX MOOC enrollees (US and non-US) as well as their parents.
- Breslow and DeBoer (2014) also reported higher enrollments by males (87.9%) compared to females (11.6%) in edX MOOCs.
- They also reported the age range of US students was spread across four decades compared to the age of non-US students that skewed sharply toward 20-30 years of age.

- Perna, et al. (2013) reported an overall 4% course completion rate of MOOCs offered by University of Pennsylvania on the Coursera platform.
- Breslow and DeBoer (2014) reported motivations for students enrolling in edX MOOCs were to “gain knowledge and skills” (>50%), followed by “personal challenge” (25%), “employment opportunities,” “entertainment value” (both <10%).

This quick overview of recent student data supports the assertion that MOOC students are mainly leisure learners who are “testing the waters,” sampling various subject areas for personal enrichment. Or they are students who are seeking focused career-related education or professional development rather than a full degree. For either type of student, completion of a full course may not be necessary once they have acquired desired knowledge or skills.

For various reasons—marketing approaches, subject matter, self-directed format, relative lack of academic credit—few current MOOC students are active degree seekers. The pilot at San Jose State University, using MOOC content in developmental education mathematics courses for younger students preparing for university level work, resulted in less than optimal student persistence, completion, and learning outcomes (Kolowich, p. 1). It does not appear that MOOCs are a severe threat that will replace existing traditional academic degree programmes in the near term.

INSTITUTIONAL MOTIVATIONS

In addition to the enormous financial investments by venture capitalists in MOOC platforms, institutions themselves must also contribute financially to produce and deliver a MOOC. Hollands and Tirthaly reported institutional investments in MOOCs range widely from less than \$40,000 (US) to more than \$300,000 (US) per course (p. 139). Granted, comparing instructional costs is a lot like comparing apples and oranges depending on complexity of production values, assessments, and how faculty salaries and general overhead is calculated. Still, offering a free open course does not equate to no cost for an institution. What is motivating colleges and universities to make this investment?

American Council on Education (ACE) and Inside Track collaborated on an interview-based study of senior leaders and faculty of early institutional adopters of MOOCs and reported the following motivations (To MOOC, p. 6).

Principal motivations

- Share knowledge and showcase faculty/research/institution to a global audience;
- Engage faculty in pedagogy improvement and content development to apply in existing teaching modalities;

- Develop infrastructure — process and expertise, not necessarily technology — to support continuing evolution of the institution.

Additional objectives

- Prepare students to succeed in credit-bearing courses;
- Learn how to personalize educational experience at scale;
- Raise awareness and encourage young people to explore overlooked fields and professions;
- Keep alumni connected to institution through lifelong learning opportunities;
- Provide access to the best professors in the world.

There was a good deal of consensus between administrators and faculty involved in MOOCs (p. 3):

- Sharing knowledge more broadly and advancing pedagogical development were key motivations for both groups;
- Neither group saw MOOCs as an immediate path to revenue or cost savings;
- Both groups saw MOOCs as a way to enhance the on-campus experience, not replace it;
- Both groups acknowledged the significant investment involved in pursuing MOOCs and the limitations of measuring the returns.

The initially touted “benefits” of MOOCs—revenue enhancement, cost savings, and scaled up degree delivery—appear to be less important to colleges and universities. Marketing and student recruitment, reputation building, and the ability to test teaching and learning innovations took precedence. As the luster of the early MOOC movement wears thin, will institutions find these to be sufficient motivations for continued investment?

PITFALLS AND POTENTIAL

Academic credit. The vast majority of MOOC students has already earned one or more degrees and they are not enrolling in MOOCs for further degree attainment. However, there is growing interest on the part of individuals and policymakers in exploring the use of MOOCs as a potentially less expensive pathway toward a degree or credential. As the logic goes, if a student were able to successfully complete a number of high-quality, lower division, general education courses through MOOCs at no or low cost—and

those courses were accepted as transfer credit toward a degree—the overall cost to the student to earn a degree should be lower.

The pitfall is that MOOCs continue to be offered without credit from the institutions that produced them. Initially, offering a “no credit” course allowed colleges and universities to bypass lengthy internal course approval and accreditation reviews. Other institutions cited the need to protect the integrity of their full residential campus experience as a rationale for not offering credit. Protecting existing tuition revenue streams may be another rationale. Methods to ensure identity validation and assessment proctoring also introduce an additional degree of complexity when offering academic credit.

Some individual colleges and universities have decided to review and offer transfer credit for certain MOOCs produced by their own and other institutions, a decision at each institution’s discretion. A few early adopters consider MOOC completion as part of comprehensive review in admissions decisions.

The American Council on Education, through its College Credit Recommendation Service (ACE CREDIT®), oversaw a pilot to evaluate some MOOC courses for potential credit recommendations and to establish a consortium of colleges and universities willing to accept MOOC credit recommendations. The small pilot was successful, but the pathway is very new. It proves a potential link to academic credit and degree attainment is possible, but the practice has not yet been widely adopted.

Currently there is no way for a student to earn a bona fide degree by completing a series of free MOOCs and, as MOOCs are evolving and hybridizing, there will likely never be. Much greater integration and contribution of MOOCs toward degree attainment is highly possible, though, and continued use of MOOCs in the professional development arena will continue to flourish.

Scale. MOOCs have shown that extremely large numbers of students can enroll, and participate in an online course at the same time. Platforms can stream large amounts of video content, deliver completely automated learning assessments, collect student behavioral data, and students can learn in this format. Though dramatic enrollments garner the headlines, gaining consistently positive learning outcomes in an automated course delivered to hundreds of thousands of students may be an unrealistic goal. The question is: To what extent can we scale up with quality?

When we consider scale, perhaps smaller increments of growth may offer more real potential and may allow us to achieve positive outcomes in terms of access, learning, and cost. Think of hundreds of students rather than hundreds of thousands. For example, Georgia Tech’s online masters of science in computer science degree will enroll a maximum of 456 students per course at full implementation (Hollands and Trithaly, p. 87), a notable increase compared to their on-campus courses for the same degree.

Business model. We have seen that institutions are not terribly concerned about

immediate direct revenue generating potential from the MOOCs they produce. However, if the MOOC platforms are to survive and continue to host and deliver MOOCs—a service upon which the institutions now depend—a viable business model is essential. Even the nonprofit edX platform must become financially self-sustaining. MOOC business models have evolved at least as quickly as the many MOOC derivatives described previously. Some current revenue streams for MOOC platforms are listed below. In some cases, a portion of the revenue generated from these activities is shared with the institution that created the MOOC.

- “Freemium” model for generating revenue from students for additional services like tutoring, books, identity authentication, and upgraded certificates;
- Course series that encourage repeat enrollments and more add-on purchases;
- Creating and charging for high demand professional development courses, particularly in technology disciplines;
- Creating and charging for private “white label” courses for corporate and university clients;
- Providing platform services for university, corporate, and governmental clients to use internally;
- Providing instructional design, production, and online strategy consulting services;
- Charging royalties for content or platform licensing;
- Offering a “matchmaking service” for employers to identify qualified candidates.

The major MOOC platforms are private enterprises and thus are not required to openly share financial data. Much of our knowledge about finances is anecdotal. Kelly writes that Coursera reported \$1 million in annual revenue from its “Signature Track” offering (p. 19). Udacity stands to gain revenue from its partnership with Georgia Tech on its online computer science masters degree should that initiative achieve enrollment projections. Even the most generous estimates of all these various revenue streams do not seem to equal documented investments in MOOC platforms, let alone providing any return on those investments.

MOOC platforms do not own course content and their contracts with colleges, universities, and systems include fairly liberal termination clauses. What will happen to institutional incentives to provide content if a MOOC platform attempts to expand its ability to sell advertising or student data or if the platform is acquired by another entity or becomes publically traded? A big question is: Will quality faculty and quality content currently associated with MOOCs move elsewhere?

Teaching and learning. Two of the most promising aspects of MOOCs are the window they provide to teaching and learning and the authentic engagement of MOOC faculty in understanding more about and improving their own teaching effectiveness. The ACE/Inside Track study reinforced this observation from both the administrator and faculty perspective (To MOOC, 2013):

- “We can track everything and understand what’s really happening to drive student learning” (p. 7).
- “Embrace that technology is actually drawing attention to pedagogy in general; it’s an opportunity to rethink what the best way is to teach students” (p. 17).
- “I was very impressed by the very California/Silicon Valley attitude of learning by doing rather than trying to make it perfect before launching” (p. 9).
- “I wanted to re-think my on-campus courses and refine the quality of my instruction” (p. 22).
- “It’s deepened my appreciation for the craft of teaching” (p. 26).
- “I am keen to push the boundaries of what can be done using technology to teach material in different ways” (p. 26).
- “Embrace change; while MOOCs are not the end(-)all of anything, they are substantially different from the way we have operated for centuries” (p. 37).
- “They provide a great opportunity to rethink our strategy, education practices and audiences” (p. 37).

Because of their large enrollments, MOOCs have allowed us to capture a vast quantity of student performance and behavioral data that can be used to evaluate teaching and assessment methods and provide guidance to students. Because MOOCs currently exist outside the formal credit-granting environment, MOOCs function as incubators or laboratories. A MOOC can be seen as a “minimal viable product” (MVP) for teaching and learning experts to prototype, rapidly iterate, continuously improve, and eventually import into credit bearing courses and programmes. This may be one of the greatest promises of MOOCs.

Global reach. Another notable feature—and potential promise—of MOOCs is the global composition of MOOC students. Depending on the platform, enrollments from outside the US amount to 65-75% of course enrollments. Institutions and faculty from around the world are now creating and delivering MOOCs. More and more MOOCs are offered in multiple languages.

Worldwide access and global reach are part of the Coursera mission: “We envision a future where everyone has access to a world-class education. We aim to empower people with education that will improve their lives, the lives of their families, and the communities they live in” (Our Mission, 2014). This noble objective was reiterated by one faculty member who participated in the ACE/Inside Track study: “I’m more convinced than ever about the potential for MOOCs to serve students who would otherwise never have the opportunity (e.g. the teenage girl in Pakistan who took and passed my advanced computer science class)” (p. 26). Thomas Friedman also applauded the potential of MOOCs to address global inequality in his op-ed column in *The New York Times* (Friedman, 2013).

MOOCs are open to anyone who is willing to devote the effort to learn. Currently, like most US-based MOOC students, most international students tend to be highly educated and seek to develop their already advanced skills. Given existing student demographics, it is questionable whether MOOCs will do much to reduce inequality around the globe. Though individual course completion is no doubt a positive outcome for students, because MOOCs do not offer a substantial credit pathway, international students may not fully realize they have limited options for linking their MOOC completion to degrees or credentials should that be their ultimate goal.

BALANCE SHEET

The MOOC landscape has evolved greatly in a short amount of time. We now have the benefit of learning from our experience and from some systematic research. In terms of “liabilities,” we can put to rest several early misconceptions and myths about MOOCs.

MOOCs will not replace the higher education system as we know it. Colleges and universities will not disappear because of MOOCs. One cannot currently complete a full degree from an accredited institution by taking a series of MOOCs. MOOCs are most effective for experienced learners and are less helpful for younger, underprepared learners. MOOCs will not immediately help students dramatically reduce their overall degree attainment costs. Faculty will not lose their jobs. Faculty are highly involved and engaged in the creation, monitoring, review, and revision of MOOCs. Institutions and/or faculty have the option of retaining ownership rights in the content they create. MOOCs will, however, continue to operate independently in the non-degree professional development space for individuals who seek to enhance their employability with specific job related—principally technical—skills.

Though MOOCs are free for students, they are not without cost to create. MOOCs are viewed an investment so far, with little financial return expected or achieved. The original concept of MOOC continues to evolve, deaggregate and hybridize. There is no one thing called a “MOOC.” MOOC is a platform.

MOOC is a metaphor. MOOC is a proxy for a new era in online education, in teaching and learning.

We now can articulate a number of clear “assets” associated with MOOCs and these appear now to outweigh the liabilities. MOOCs have given us a glimpse into how we might achieve scale with quality. Eventually, over time, MOOCs may reduce costs to individual students. MOOCs have achieved their promise in terms of attracting large numbers of international students—though largely from the more highly educated segments of the global population.

MOOCs have provided unprecedented transparency into the teaching and learning process, data we have only scratched the surface of in understanding. MOOCs have ignited interest in teaching and learning and in new or different pedagogical models. Through the original peer-to-peer, connectivist MOOC model, MOOCs offer a compelling new concept for education. Mastery learning models built into MOOC inspired online courses will improve learning outcomes compared to the more prevalent “proficiency level” model of learning and assessment. In the MOOC environment, the focus on student learning outcomes is clear and unrelenting.

MOOCs have introduced the concept of public-private partnerships throughout a broader swath of institutions, allowing colleges and universities to accomplish more through carefully constructed agreements than they might have been able to do on their own. MOOCs have led to a high degree of innovation within institutions as well as in private enterprise. This innovation spans technology, assessment, authentication, as well as organizational and business model innovation. MOOCs have created a space within colleges and universities to practice rapid prototyping of content, delivery, and evaluation at a time when many see rapid innovation as a necessity.

MOOCs have fostered greater appreciation for online learning in general. They have encouraged the expanded use and acceptance of instructional staff other than faculty—instructional designers, assessment experts, education researchers, student coaches and mentors. In this way, we are able to test new roles for faculty alongside other types of teaching and learning professionals, all with an intense focus on increasing student learning outcomes.

WHAT DOES THE FUTURE HOLD?

In the MOOC world, making predictions is somewhat precarious. Ignoring this precaution and based on information available today, I am willing to make a few educated guesses about what the future may hold.

- MOOCs as a distinctly separate category will disappear. Large free and open online courses will continue to be developed and offered by some institutions for various purposes, but these will be

subsumed under the general and broad category of online learning. MOOC platforms will evolve and will find other products and services to market besides “traditional” MOOCs.

- Increasing refinement of teaching and learning will continue apace. We will eventually achieve the “holy grail” of completely customized and personalized learning adapted to the preparation, needs, ability, and learning style of each individual learner.
- Based on substantial improvements in pedagogy and technology—especially analytics, artificial intelligence, and automation—we will be able to scale up to serve more students while also achieving positive learning outcomes. As we scale, we should be able to reduce costs for the individual student. This will allow us to serve more students. We will not cannibalize existing residential programmes or institutions. We will expand our service to provide access to the vast numbers of students globally who need it.
- We will capitalize on opportunities presented by the global nature of students enrolling in massive online courses by creating intentional and deeper ways to foster truly multicultural experiences with meaningful interaction and understanding among individuals around the globe.

Finally, we will look back on MOOCs as a phase—but an important one—that served as a tipping point, opening up conversation and debate about access, teaching, learning and the role of technology, globalization, and true innovation in higher education.

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