Are MOOCs sustainable?

Devayani Tirthali*1
*Brown University, Providence, RI, U.S.A.

Introduction

Higher education institutions (HEIs) for some years have been under pressure to innovate due to two environmental forces:

(i) A push towards cost reduction while accommodating the growing demand for HE (higher education)
(ii) A pressure to prove the relevance of their degree programmes for employability as well as for the ever-changing world degree holders find themselves in upon graduation.

MOOCs (massive open online courses) were introduced into this landscape as the next big thing in HE, the tool for ‘innovative disruption’ that will improve education.

In the true spirit of the Silicon Valley start-ups, the big-name MOOC platforms started with a large cash inflow, seemingly without a systematic revenue model worked out \( a \ priori \). Coursera started with a venture capital backing of US$16 million in 2012 and raised US$85 million in three years \[1\]. edX started with US$30 million investment each from Harvard University and MIT (Massachusetts Institute of Technology), as well as buy-in from the collaborating institutions in cash and/or resources. HEIs are also investing sizable resources to develop MOOCs, some of it in terms of faculty time, over and above regular teaching responsibilities. It is not realistic to imagine that such cash flow will keep MOOCs afloat to eternity. As the MOOC hype dies down and we move beyond the phase of ‘proof of concept’ for this innovation, the question of sustainability has become important. Sustainability of MOOCs at this stage has to be examined from the following two perspectives:

(i) The cost–revenue maths, i.e. how much did it cost to produce and how can these costs be recovered?
(ii) The desirability issue, i.e. if the cost–revenue maths add up, do we want to support MOOCs in their current version?

---

1Email: devayani.tirthali@gmail.com
The cost–revenue maths

Cost of production

MOOCs are expensive to produce. We have heard figures ranging from as low as a few thousand to an estimated US$1 million for some high-end courses. Unlike a traditional course, a MOOC is a team effort, involving considerable amount of time investment from faculty, teaching assistants, instructional designers and videographers, as well as graphic designers and programmers for some high-end projects involving interactive simulations and virtual laboratories. Hollands and Tirthali [2], on the basis of the cost analysis of MOOCs offered by four institutions, estimated the cost of development and delivery as ranging from US$38,980 to US$325,330 per MOOC. This is the cost to the institution producing the MOOC and does not include the cost of developing the platform, video captioning and hosting the MOOC borne by the platform provider. The cost per completer for the MOOC on the lower end of the spectrum was US$74 per completer for an eight-week xMOOC. For another institution, it was US$272 per completer for a four-week MOOC. The completion data for the MOOC at the higher end of the cost spectrum was not available. Hollands and Tirthali [2] report that, compared with the estimated cost of US$7000–US$10,000 for traditional online programmes, cost of delivery per participant was much lower for the xMOOCs in their case study. However, they caution that with a ratio of 25–30 students per instructor, regular online courses provide a better quality of student engagement than MOOCs which have a ratio of thousands of students per instructor. Moreover, regular online course offerings as an institutional strategy are designed to recover cost of development and delivery, whereas MOOCs are not [3].

Revenue generated by MOOC platforms

For MOOCs to be a sustainable strategy for institutions, it is important to be sure that the platform developers will survive beyond the initial influx of investment. All three of the largest MOOC providers, i.e. Coursera, edX and Canvas Networks, have a different business strategy. edX is non-profit with financial stability as one of its four principles at par with collaboration and openness. The sustainability strategy for edX includes revenue from corporations and educational institutions to build and host private or white label courses, in addition to the revenues from for-fee MOOC certificates. Canvas Networks by Instructure, the third largest in terms of number of courses offered, entered the MOOC space with a slightly different background. Their primary business is providing and supporting their Learning management system (LMS) for-fee to various educational institutions. As part of their ‘freemium’ model, they have always provided the LMS with limited capacity free for instructors. In November 2012, Instructure introduced Canvas Networks to host MOOCs for any faculty, two- or four-year HEIs, educational consortiums and other education-focused organizations without the exclusivity and institutional buy-in needed for Coursera and edX. As of July 2015, Canvas Networks lists more than 125 participating institutions from North America, Europe and Australia [4]. The primary aim of
Instructure does not seem to be earning revenue, but to promote their brand and market their primary product. Venture-capital-backed Coursera, however, needs to have a robust strategy to recoup costs. Coursera lists a variety of possible monetization strategies in their contracts with universities, for example, tutoring and manual grading services, corporate sponsorship of courses and MOOCs packaged for specific employee groups. Over the years, it has experimented with various strategies such as employee matching services and various for-fee offerings.

Some of these ideas for revenue generation such as employee matching did not find traction. The service was expected to use sophisticated analytics based on participant data to match MOOC participants with employers who paid a flat fee for the introductions. The service, started in December 2012, is not offered any more, and no revenue details are available. Fees from verified certificates and for-fee for-credit MOOCs has been the most direct way to earn revenues so far. Although all Coursera and edX courses are free, they also offer verified certificates of completion for as little as US$25–US$30 per course. In the Coursera Partners’ Conference in 2014, Andrew Ng, co-founder of Coursera, reported revenue from the Signature Track, their for-fee certificate option to be US$1 million a month and increasing exponentially [5]. Coursera has pushed for a higher rate of registration in Signature Track by increasingly removing the option of free certificates for its MOOCs. Another recent strategy introduced by Coursera to capture revenue from participants unable to keep up with a specific MOOC timeline or start date is MOOCs on-demand.

edX and Coursera also offer course series, named xSeries and Specializations respectively. The revenue from these MOOCs and course series is shared with the collaborating institutions. On the basis of the number of registrations in the Data Science Specialization developed by Johns Hopkins University, Class Central, a MOOC aggregator, estimated that Coursera received US$3.5 million in fees as of February 2015 [6]. Coursera reports that the Specializations attract more students in the for-fee options than individual courses. In 2015, Specializations and on-demand MOOCs are two of the strategies Coursera is pushing forward to increase revenue.

**Institutional motivations for investing in MOOCs**

The institutions producing MOOCs had a variety of goals when investing in MOOC production, the benefits of which may or may not be monetizable. Hollands and Tirthali [7] conducted a study in 2013–2014 to understand what might be institutions’ goals for offering MOOCs. The study reports on interviews of 83 participants knowledgeable about MOOCs, online and open education from 62 institutions, including universities, community colleges, research organizations, platform providers and for-profit educational companies. In addition to the altruistic goal of expanding access to education, institutions also thought of MOOCs as a branding strategy, way to improve economics and educational outcomes, a vehicle for innovation and to conduct research on teaching and learning. In spite of MOOCs being a drain on institutional resources and personnel time, more than one-third of the interviewees thought that MOOCs could potentially save ongoing costs and also generate new revenue streams. The
cost savings were expected to accrue from reusing MOOC material multiple times, repurposing MOOC materials for flipped learning, sharing MOOCs or MOOC materials across campuses and institutions, and replacing on-campus courses with MOOCs. These ideas did not always pan out as expected. Cost reduction for reuse was not always sizable depending on the type of content and pedagogy. Repurposing MOOCs created by other instructors was time-consuming; in addition, sharing MOOCs across campuses and institutions proved challenging because of issues related to fee sharing and licensing ([3], see chapter 3). Most interviewees thought of MOOCs as an investment, but also suggested some ideas for revenue generation such as providing certificates and course credits for-fee, drawing students into traditional degree programmes, and offering student services such as tutoring, employee matching and face-to-face meet-up support. Licensing of the MOOC material to be used in hybrid courses was another possible revenue stream.

Revenue from verified certificates was the most direct way of recuperating costs for institutions. According to the report on MOOCs offered by ULIP (University of London International Programmes), as of January 2015, the five partner institutions that developed Coursera MOOCs with ULIP received about £21,500 total in revenue [8]. Given ULIP’s estimated outlay of £20,000 for each course (excluding staff time) combined with the cost of academic staff time at the partner institutions, this revenue might not have covered much of the cost of MOOC production to start with. If revenue sharing is based on number of fee-paying registrants, given the wide variation across MOOCs, not all partner institutions might have recuperated an equal percentage of costs.

Interviewees also pointed out indirect monetizable benefits such as increased recruitment, alumni outreach leading to increased alumni giving and research grants for MOOC research. Some institutions are actively thinking about these strategies and documenting the effect. For example, ULIP envisioned their MOOC offerings as a way of recruiting students and improving brand recognition for its distance learning programmes as well as the offerings of the partner institutions. As part of this strategy, ULIP conducted a post-MOOC survey to gauge interest in its programmes and asked questions about MOOC involvement to students signing up for their online programmes. On the basis of the post-MOOC survey, 71% of the students were interested to know more about ULIP as well as the institutions that collaborated in the development of the MOOCs. A total of 142 students who took one of the four first wave MOOCs in 2013–2014 registered for a distance learning programme offered by ULIP, whereas 155 registered in 2014–2015. More institutions need to engage in such cost–benefit analysis to ascertain whether MOOCs are the most effective ways to achieve their goals given the expense. Other potential less monetizable benefits expected were partnerships with other HEIs, attracting the best faculty and students, branding as an expert in a particular field, improving educational outcomes of fee-paying students and learning about learning.

Although MOOC costs are still high and revenues do not cover it so far, some promising direct and indirect revenue streams are developing. If the low costs per completer could be recuperated directly from the participants or from grants and subsidies, MOOCs can be a viable option.
The desirability issue

The second question posed above was, if the cost–revenue maths becomes favourable, do we want MOOCs to be promoted in the current form? MOOCs have seen a rollercoaster ride of hype and hate. As we think about sustainability of MOOCs, it is imperative to touch upon at least some of the misgivings and debates about MOOCs to see whether they are worth the effort. The present section therefore touches upon a few of these themes briefly, provides some examples of practices that work or not, and what might be done differently. The themes are, firstly, MOOC pedagogy, secondly, scale as a way for standardization compared with opening up education, and, thirdly, profitability compared with social good.

MOOC pedagogy

MOOCs claim their lineage to the open education movement, in the case of xMOOCs, referring mostly to open learning resources provided by MIT’s OpenCourseWare and Stanford’s Engineering Everywhere. Extending on these offerings that were primarily recordings of actual classroom lectures, xMOOCs are designed as weekly sequences of instruction in the form of short video lectures punctuated with quizzes, supplemental readings and assignments. If we care about MOOCs developing into innovative teaching and learning practice, we have to be careful not to get caught up in the superficial aspects of the open education movement such as free access to material and lose the sense of openness of ideas and learning processes [9]. The cMOOCs, on the other hand, incorporated the idea of ‘opening up learning’ more fully, breaking down the traditional roles of instructor and student, moving away from prescribed content and encouraging variety of ways of showing mastery. With xMOOCs being the most prominent in terms of number of offerings, media attention and institutional investment, I focus mostly on xMOOCs in this chapter when discussing sustainability.

xMOOCs became prominent in the HE world with the promise of scale, thus taking a stab at the problem of cost per student. Let us focus on the two critical pressure points for HEIs that pushed the innovation: firstly, reducing costs while increasing student throughput, and, secondly, improving the quality and relevance of education. The key questions would be the following. (i) Do MOOCs address these pressure points in the current form? (ii) What are some of the models that do or do not work and what can be done differently?

One of the strong oppositions to xMOOCs has been its claim to being the next big innovation in HE. Instructors, educational researchers and experts in online learning point out that MOOCs, in reality, feature regressive pedagogy that ignores what we have learnt from decades of online teaching experience. Traditional lecturing treats or assumes learning to be an information dissemination problem. MOOCs, with strategies such as putting video lectures online, takes the passive transmission-based learning strategy of the traditional classroom and exacerbate it by involving massive numbers of students in the exercise without building cohesive opportunities for interaction with the instructor and peers.

As platform producers experimented with the initial format, skill-based and employability-focused offerings such as Nanodegrees emerged. These series with their project-based course sequences offers one of the solutions to the problem
of relevance of the degree programmes for employability. Job-centric course series according to Udacity and Coursera have been a successful business model that might address learning needs for the beginning of the career trajectory for some fields such as programming, at lower costs than those for a degree programme. However, there is no replacement possible for soft skills and experiential learning with peers and mentoring by supervisors.

MOOCs do not address the pressure faced by HEIs to move away from education as knowledge acquisition to more nuanced aspects of learning to do, learning to be and learning to learn. Learning to do can be thought of as learning a skill, i.e. gaining fluency in performing motor and/or cognitive tasks. Learning to be, for example, learning to be an economist, a teacher or a mother, in addition to specific skillsets needed for a job includes being able to take part in socio-cognitive processes of the specific community of practice (see Chapter 4 by Gerhard Fischer in this volume). This cannot be done alone in a self-paced on-demand course. Learning to learn encompasses the metacognitive skills, i.e. planning, monitoring and evaluating one’s own learning, essential for an individual to be a lifelong learner. Barring some well-designed MOOCs from community colleges and features such as self-assessments in lecture videos, xMOOCs for the most part assume these skills rather than help to build them. Also, many xMOOCs, except for those providing virtual laboratories or project-based instruction, currently focus on knowledge acquisition towards the first step of learning to do.

The question of the quality of the learning experience has become more prominent as institutions start offering credits for MOOCs making them an experience equivalent to face-to-face or formal online courses. ASU (Arizona State University) recently attracted criticism for their decision to offer credit-bearing MOOCs through Global Freshman Academy, a series of MOOCs that participants can take to complete the first year of university. ASU’s rebuttal explained that the student–teacher interaction in large lecture classrooms were no better than that offered by MOOCs. By offering MOOCs for credit for a smaller fee, students were at least getting an option to take classes at lower cost and then be able to move quickly to more advanced courses that would offer a better learning experience on campus [10,11]. Although the strategy of reducing cost to match reduced quality seems logical and a win-win situation, from my perspective as an educator, it seems to be a step in the opposite direction.

iMBA offered by the University of Illinois expected to launch end of 2015 on the Coursera platform combines the idea of an employment-focused course series and building a degree programme with MOOCs. iMBA offers free courses, as well as for-fee certificates for courses bundled in multiple specializations useful for specific job-related skills on their own. Participants can enrol in the course supplement consisting of ‘high engagement interactions’ with facilitators and students for an enhanced learning experience and earn credit for that course. The specializations that are useful for employability on their own thus can also be used as building blocks towards the MBA degree [12]. iMBA offers a MOOC-based degree programme at lesser cost for students with a slightly better option to accommodate the missing interaction in the ASU solution. As the courses have not launched yet, it remains to be seen whether participants opt for more than a regular verified certificate option and how much revenue it generates.
Are MOOCs sustainable?

© 2016 Authors; published by Portland Press Limited

for the University. The learning experience, in addition, would depend on how well the supplementary interaction piece works with the MOOC.

On the other hand, the University of Oklahoma model, which focuses on developing quality courses for fee-paying students with a secondary focus on making it open to others for free without credit, seems more promising in balancing the cost and quality dynamic. The Janux platform used to offer MOOCs allows for taking notes, sharing notes and conducting discussions within the course content including text, videos and assignments [13]. Unlike the discussion boards in xMOOCs, the social learning features in Janux provide a richer learning experience while students engage with course material and offer the possibility of building an ongoing learning community. Students can be part of this enhanced experience for about three-quarters of the resident and one-quarter of the non-resident tuition cost per credit (based on US$450 for a three credit MOOC and US$250 and US$750 for one credit for residents and non-residents respectively).

Scale: colonization through standardization or opening up education

The initial MOOC media discourse highlighted free courses from elite universities as one of the most exciting aspect of MOOCs, something unattainable for most of the populace, given their selective recruiting practices. The push by some HEIs to reuse these MOOCs attracted some resistance from professors alarmed with the assumption that one way of teaching from one instructor in an elite university can be considered the best for the masses, instead of having a multiplicity of views reflected in the selection of instructional resources and approaches [14,15]. Head [15] cautions that MOOCs in this way, with the possibility of single provider models, support a “more general move toward limiting canons and of privileging only certain ways of thinking” (p. 17). As most of the MOOC resources created for mass consumption come from Western universities, it amounts to academic colonization through standardization in the guise of altruism.

Whether massive numbers of participants force standardization of curriculum or prove to be an unprecedented opportunity for multiple perspectives depends on how the course and the platform are designed. Some instructors have been mindful of or have been forced by their MOOC experiences to think beyond their own contexts and make the content global. Some have talked about challenges of localizing the content similar to localizing software. Scale, instead of being a challenge, can also be thought of as an opportunity to bring the diversity of local into the global. For example, an assignment in an environmental science course asking students to share instances of erosion in their locality can be most informative for all participants without having to go on a field trip around the world (example shared by Pierre Dillenbourg). This might be a simplistic example of bringing local to enrich global; however, MOOCs can offer and accomplish much more if we look at achieving scale as a starting point of innovation and explore what the individuals bring to the mix rather than scale itself being the end result.

A diverse group of participants with a variety of cultural backgrounds also means multiplicity of points of view. The experiences of Professor Arnold Weinstein, who offered the humanities MOOC 'Fiction of Relationships' on Coursera in conjunction with his on campus course, for example, highlights the
benefits of having many to many conversations: “these discussions had ‘legs’; that they entailed points of view from students aged 16 to 90, from many different countries; and that they ultimately dwarfed in scope and sometimes in intensity the ‘section discussions’ in the bricks-and-mortar Brown setting.” The on-campus students he thought “were struck by the reach and tenor of the online discussions, by the sheer diversity of points of view (and life situation) they encountered through their Coursera involvement” [16]. ‘Connectivism and Connected Knowledge’ facilitated by Siemens and Downes or the Dual Layer MOOC ‘Data, Analytics, and Learning’ offered by a team of facilitators are other more robust examples of how scale can mean opening up education rather than colonization through standardization [17,18]. These MOOCs envisioned the learning process as creating knowledge through participants traversing and forming learning networks of people, tools, artefacts and organizations to reach their individual and collective objectives. The learning dynamic in these cases, to varied extent, is not one to many, but many to many, a welcome change for educators who celebrate multiplicity of opinion.

**Profitability or social good**

As MOOC platforms move towards specific subjects and types of MOOCs to make the offerings more profitable, let us not forget about the courses and subjects that might benefit from the MOOC format, but are not the usual revenue magnets. Subjects such as environmental sciences, religious studies, arts and humanities might benefit from bringing together diversity of voices. In the context of increasing globalization, such MOOCs, if designed well, could be a vehicle to fulfil the UNESCO goal of learning to live together that includes “discovery of others and experience of shared purposes throughout life” [19]. MOOCs for teacher professional education, training for social workers and activists are some other examples of courses that might have larger societal benefit, but not a profitable revenue model. Just as HEIs support research and teaching in a variety of disciplines as part of their mission in spite of some being more profitable than others, a good mixture of content areas that will benefit from the scale and diversity needs to be offered as MOOCs. Such a mixture of MOOCs can be sustainable through carefully managed offerings of profitable courses and beneficial courses. The cost can also be recuperated through a variety of grants, federal student aid and other governmental subsidies extended to specific courses that fulfil the policy objectives of various government bodies and organizations.

**Conclusion**

To summarize, although MOOC costs are still high and will remain so, some promising revenue streams are developing. If the low costs per completer could be recuperated directly from the participant or from grants and subsidies, MOOCs can be a viable option. However, it would be hasty to suggest MOOCs as a solution for all problems faced by HEIs. Now that the hype has died down, it is time to evaluate the different models and their effectiveness for various learning purposes and outcomes. The sustainability of MOOCs and their place in the HE
system depends not only on the cost–revenue maths of MOOCs, but in realizing ways in which various learning systems, digital, face-to-face or hybrid, massive or one-to-one, including MOOCs, fit together to enhance the current system of HE to make it more relevant for the students individually and as part of the society in its current as well as future form.

References

13. https://janux.ou.edu/about.html
16. Excerpts from Citation for Professor Arnold Weinstein, Teaching with Technology Award Ceremony at Brown University on 4 May 2015
18. http://linkresearchlab.org/dalmooc/overview

© 2016 Authors; published by Portland Press Limited