Technological Innovations in Learning: A Focus on MOOC

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Abstract

Technology such as gaming, animations, and interactive problem-solving have been adapted at learning platforms to help explain or illustrate complex concepts, and even make learning fun for the audience. However, such technologies are deployed in limited number of learning environments due to the lack of financial resources, expertise, change agents, and willingness of educational institutions to move beyond traditional practices. The Massive Open Online Course (MOOC) phenomenon, started three years ago, could address the above challenges, and create a great technological disruption in education. With millions in venture capital backing, MOOC providers have the expertise and money to incorporate the latest technologies into e-courses and revolutionize learning. But the economic model of MOOCs is still evolving. MOOC organizations such as edX, Coursera, Udacity, Udemy, and NovoEd have yet to figure out a financially viable model. At the current time, most MOOCs are free (or at nominal fees) to the students. Hence, one of our research questions in this paper is how would MOOCs generate sustainable revenue in a few years? Our second research question deals with how MOOC providers plan to facilitate learning and assessments (even with state-of-the-art technologies) for the thousands or tens of thousands of students per course. If partnerships with universities or colleges would be an economically feasible and manageable solution, then how would MOOC providers' business model change strategically? We discussed a number of financial models on monetizing MOOC, and strategies for MOOC organizations to make MOOC more mainstream and accepted by academe and prospective employers.

Keywords: MOOC; business/economic models; monetizing a site; strategic partnerships; online learning technologies; managing learning interactions; online assessments

■1.0 INTRODUCTION & RESEARCH QUESTIONS

Technology such as gaming, animations, and interactive problem-solving have been adapted at learning platforms to help explain or illustrate complex concepts and even make learning fun for the audience. However, such technologies are deployed in limited number of learning environments due to the lack of financial resources, expertise, change agents, and willingness of educational institutions to move beyond traditional practices. Massive Open Online Course (MOOC) platform has the ability to solve the above challenges and revolutionize education. MOOC, started three years ago, has attracted millions of students around the world. Coursera, the largest MOOC player, alone has drawn over five million registrants while edX has garnered 1.3 million students (Fowler, 2013). The idea of having tens of thousands of students that can now afford and access education; participating, working at their own pace, relying on their own style and pace of learning, and learning through interactions in a massive single course has changed the landscape of online learning. (The NMC Horizon Report, 2013).

A large number of universities and colleges have only started to add completely online courses to their portfolio of course offerings; let alone determine which online communication tools suit teaching and learning best. Despite MOOC providers' novel online course approach, MOOC organizations such as edX, Coursera, Udacity, Udemy, and NovoEd have yet to figure out an economically viable model (Kolowich & Steve, 2012). At the current time, most MOOCs are free (or at nominal fees) to students. Hence, one of our research questions is how MOOCs would generate sustainable revenue in the future?

When MOOC organizations first started, their mission was simple: to provide education for those who either lack the funds, or are geographically far from universities and colleges (Ripley & Amanda, 2012). MOOC providers' missions are already evolving. MOOC organizations may no longer focus on altruistic goals of providing people globally access to free education. They want to change the whole concept of education and the way people learn. According to a *Nature* article at Scientific American website (http://www.scientificamerican.com/author/nature-magazine), brick-and-mortar campuses are unlikely to keep up with the demand for advance education. The world would have to construct more than four new 30,000-student universities per week to accommodate the children who will reach enrollment age by 2025; let alone the millions of adults looking for further education or career training (Waldrop & Mitchell, 2013). Colleges and universities are also under tremendous financial pressure, especially in the United States, where rocketing tuition fees and ever-expanding student debt have resulted in a backlash from politicians, parents, and students demanding to know what their money is going towards (Waldrop & Mitchell, 2013).

There is reason to hope that MOOC is a positive development. Science, engineering and technology courses have spearheaded the movement, but offerings in management, humanities and the arts are growing in popularity. MOOCs, which have incorporated decades of research on how students learn best, could free faculty members from the drudgery of repetitive introductory lectures (Waldrop & Mitchell, 2013). In addition, professors may well assign viewing the online video lectures as homework, and build on the content through more in-depth and interactive discussions in the classroom. This has been referred to as "flipping the classroom" so that the classroom is used for interaction, not passive absorption of the professor's insights (Scorton et al. 2013). "Flipping" is a new paradigm or a new 'buzz' phrase in

the education world. However, interactive classroom discussions between professor/s and students, or even among students, may not be feasible in a MOOC, with thousands to tens of thousands of students enrolled in a course. The flip pedagogical approach may not be scalable to a MOOC. This leads to our second research question in our present paper: how will MOOC providers overcome the challenge of offering interactive classroom discussions and assessments (synchronous or asynchronous) in a MOOC? If partnerships with universities or colleges would be a feasible economic and manageable solution, then how would MOOC providers' business models change strategically?

■2.0 STRATEGIC CHANGES

2.1 Addressing "Student Interactions" in MOOCs

When MOOC providers enter into partnerships with universities and colleges, the two entities may pursue different goals. MOOC providers may prioritize growing the user base rapidly for marketing value. Traditional education institutions are more interested in learning outcomes, than novelty or rapidly adopting "revolutionary" communication tools. Studies have been conducted to ascertain how online education compares to traditional classroom education, and many findings revealed that online education has a negative impact on course grades (Martin & Fred, 2012). Interaction and face-to-face communication matters. Students lose interest when they do not feel engaged (The NMC Horizon Report, 2013). Other studies suggest that when appropriate technology is used and when interactivity is present, online classes can be as effective as traditional classes (Singh et al. 2010). One such success story is NovoEd, a new MOOC provider that fosters peer interaction (New & Jake, 2013). This new platform is designed specifically for teamwork. Students get into groups in the beginning, have discussions by messaging one another or via discussion boards, and evaluate each other's work. Other MOOC providers are already working on enhanced social tools such as live video and text chat (Waldrop & Mitchell, 2013). However, some of the tools or interactions are either asynchronous or still not scalable to the full MOOC enrollment.

   A particular MOOC could leverage on the partnership by having the professor/s for the course and their teaching or lab assistants handle the multiple live interactive sessions, or respond to asynchronous discussions. But that would likely escalate costs and the university/college is probably unwilling to bear the additional costs to support non-tuition-paying students that enrolled through the MOOC provider site rather than the university's registrar.   That brings us to the next issue of revenue.

2.2 Generating Revenues For The MOOC Organization

MOOC organizations currently do not have sustainable revenue models. edX is funded by Harvard and MIT -- $30 million from each institution (Guthrie & Doug, 2012). Coursera has raised a total $63 million from venture capitalists (Bersin &Josh, 2012). MOOC providers can pursue a number of revenue streams (see below), but the amount of the revenue that can be generated is debatable.

- *Charge for Complements*
  MOOC providers can charge based on a variety of "*freemium"* models where basic course content is free and students pay for complements such as certificates of course completion, class performance/assignments assessments, private tutoring, and assigned or customized textbook for the course (Qureshi et al, 2014). Coursera already charges its students $30-$80 if they would like to receive a certificate (Kolowich & Steve, 2012). However, without prospective employers' and academe's (e.g., for transfer credit, or as pre-requisite admission to a graduate program) wide recognition and acceptance of the certificates, we questioned the number of certificates that would be purchased in order to generate significant revenue for the MOOC organization.

- *Charge for Partnerships*
  First, we need to address the critical question: what is MOOC's value offering to the education partner? Is the MOOC organization licensing the technology platform to the university or college partner, or charging for the course content, teaching, assessment, and grading? The latter set of value offerings is probably not the case. Universities and colleges already have the content, professors/instructors, teaching/lab assistants, and existing curriculum. It would be too costly for MOOC providers to "re-invent the wheel" and offer their own courses, personnel, and content. If MOOC providers were to primarily license their digital platform for course delivery to universities, would MOOC's platform become essentially a Learning Management System (LMS)? We should keep in mind that many universities already have existing licensing arrangements with LMS such as Blackboard or Moodle. Thus, in this partnership, we are unsure how much licensing fees can MOOC providers secure from their education partners.

   If education partners were to provide the course content and use their own teaching staff, MOOC players would be lucky to negotiate away an even exchange (where there is no net monetary compensation by one partner to the other). The irony is that universities and colleges can offer MOOCs or mini-sized MOOCs on their own without the brand name MOOC organizations. Proprietary LMS providers such as Blackboard, Desire2Learn, or SharePointLMS may already be working to scale up their systems or course authoring tools to compete with MOOC provider. Then, there are many other open source LMS such as Canvas, Moodle, and Sakai which could compete with MOOC platforms as well [14]. Textbook publishers would be another threat to MOOC organizations, as they, too, already are content and teaching tools suppliers, and their own digital platforms can be stand-alone sites or integrated with the university's existing LMS.

   One of Coursera's co-founder pointed out that most course offerings from Coursera are adapted from existing courses at a specific university (Pappano & Laura, 2012). Udacity has a partnership with San Jose State University. Each partnership would likely feature a unique compensation arrangement. If the universities were to pay Udacity or Coursera for the MOOC, it is likely that the universities would limit the size of the enrollment in that MOOC. It would be in the interest to the universities to keep the MOOC course to a manageable size to enhance their tuition-paying students' learning opportunities and interactions. If MOOC organizations were to pay the education institutions, the latter parties may be weary of MOOC players overlooking academic quality standards, and instead, over-zealously market complements such as completion certificates, and/or priced each support service on an "a-la-carte" basis. Hence, we do not envision great revenue streams for MOOC organizations in partnerships with education institutions.

- *Earn State Subsidies*

  MOOC providers could collaborate with universities and earn State subsidies. This is already happening at San Jose State, where students can take MOOC courses for credit hours (Dellarocas et al. 2013). MOOC organizations are already working with accreditation agencies to have their course credits be recognized (Waldrop & Mitchell, 2013). Another alternative is blended classes. The results from Fall 2012 semester partnership between San Jose State and edX indicated that incorporating content from an online course into a for-credit campus-based course increased pass rates to 91% from as low as 55% without the online component Fowler (2013) . Will 2-year (Associate degree granting) community colleges be the most likely type of education institute to leverage MOOC since they are State supported, least likely to receive private endowment, but yet have student enrollments?

  Consistent with the "flipped" pedagogical model, universities and colleges could pay a MOOC organization for the on-demand general course content and have their own instructors, professors, and teaching assistants conduct the multiple in-house customized interaction sessions for their students only, and handle grading or assessments. This revenue stream has potential as a MOOC player could be licensing the same on-demand, online course content to many universities simultaneously.

  A MOOC provider could charge for additional complements such as online assessment and validation (i.e., the student who sign up for the class is indeed the student who attempted the assignments and exams). Coursera has introduced "Signature Track," in which students will verify their identity in two steps (Young & Jeffrey, 2013). First, a student would take two photographs with his/her web cam: one of himself/herself and another of an acceptable photo ID document. Second, the student would help create a biometric profile of his/her unique typing patterns by typing a short phrase. When students submit work in the course, they authenticate their identity by typing the same short phrase, which is then matched to their recorded samples (Young & Jeffrey, 2013). Coursera said it would charge between $30 and $100 for 'verified certificate'.

- *Offer Recruiting Services & Networking Opportunities*

  Udacity has suggested that it could serve as a "headhunter" for companies that might like to hire some of its more impressive students. Instead of simply selling those students credentials to list on their resumes while looking around for jobs, Udacity would offer to match students with companies that have enlisted Udacity as a talent scout. The company would take a commission for each successful match (Kolowich & Steve, 2012). In the Silicon Valley, headhunters may receive a commission of 20% to 25% of the successful candidate's annual salary.

  MOOC providers could create a premium product around the demand for networking opportunities. Take edX, the nonprofit MOOC platform from MIT and Harvard. The universities could organize conferences in different cities for students who take a certain number of edX courses and maintain a certain grade point average. MIT and Harvard professors could give talks, employers could send recruiters, and students could participate in workshops (Kolowich & Steve, 2012).

- *Look to Continuing Education/Corporate Training*

  The corporate training marketplace has begun to seriously consider MOOCs. Bank of America partnered with Khan Academy to create BetterMoneyHabits.com, a cobranded MOOC to educate consumers on personal finance (Bersin &Josh, 2012). SAP developed the openSAP MOOC platform to educate its developers and partners on SAP technologies. Yahoo is reimbursing employees for the cost of verified course-completion certificates from Coursera (Bersin &Josh, 2012). AT&T's partnership with Georgia Tech and Udacity to deliver an online Masters degree in computer science appears to be going smoothly (Bersin &Josh, 2012).

- *Monetize "Eyeballs" (aka "Advertising")*

  Advertising could be another way to make money, but the problem with this one is that it may be too distracting (Dellarocas et al. 2013). Imagine having pop-up ads while taking a final or viewing a video lecture. MOOC providers have to be very careful if they decide to take this route. Advertising textbooks or tutoring services could work, but they have to be almost subtle.   Would subtle ads be noticed or be effective? Even if the ad were to appear only during or after logins, would users be annoyed?

2.3 Enhance the Learning Experience

Technical subjects like computer science and math are the kinds of contents that, if well done in video lectures/explanations, lend themselves to be re-used and repeated (unlike subjects such as marketing, advertising, or media communications which can evolve or change rapidly). Technical subjects benefit from the ability to replay or review the content unlike traditional face-to-face lectures. Providing instructor connection and more personalized feedback as well as fostering student interactions are trickier. The challenge is for MOOCs to feel more intimate (Pappano & Laura, 2012). However, MOOC providers have access to analytics which could show which teaching methods and user interfaces worked, and make improvements in the delivery or content (Waldrop & Mitchell, 2013). The analytics may just give MOOC designers an edge over schools that just converted some traditional courses and programs to online formats. There is a growing demand for totally online courses as the higher education market and the Internet are becoming more global. But MOOCs need to deliver more than just contents online. To the critics who are skeptical of credentialing and validation of online students, technology and software are already available to help detect cheating and plagiarism. iParadigm, offers TurnItIn, a web service that ran plagiarism screenings on 60 million student papers last year (Anders & George, 2012).

■3.0 CONCLUSION

In order for MOOCs to gain mainstream acceptance, they have to pass many trials and tests, which would take time. But time also creates a threat to MOOC organizations but provides opportunities for other technology players in the education market (e.g., Learning Management System providers and textbook/content publishers). MOOC organizations should strive to become active content partners with colleges and universities, rather than evolve to just licensing their digital platforms. MOOC providers could offer services to professors who use the MOOC platform to jazz up their video lecturers and other learning materials (e.g., animate, and polish up professors' video contents, add appropriate levels of interactivity, and assessments/checks /quizzing, etc.), rather than provide professors with authoring programs with little training and live support (which are typical cases with LMS providers). *Learning Informatics* could provide an unprecedented level of feedback for colleges and universities on what teaching approaches and interface worked, or what did not. MOOC organizations would have access to the data (if the courses are conducted via their platforms), and advance technical analytics to turn the data into strategic information for educators and university administrators. Again, MOOC providers need to play an active education role in helping education institutions develop the metrics for learning outcomes for online, flipped, and MOOC-style classes. Such efforts would differentiate them from LMS providers.

MOOC players could contract with "superstar" professors (well known for their teaching and content delivery skills; not research skills, or ability to secure millions of dollars of research grants) to develop their own collection of in-house courses, and license out the same on-demand, online course content to many universities and colleges simultaneously. These education institutions would then employ the flipped classrooms method to customize the contents, interactions, and assessments further to their curriculum or course catalogs. We think this is one of the more promising revenue lines for MOOC organizations. Technology today makes it possible to reach many more students at lower costs; once MOOC providers' platforms are established, the marginal cost of each student registering for a MOOC is close to zero (Cusumano & Michael, 2013). Thus, MOOC players would enjoy a low-cost maintenance model in the future.

MOOC providers need to move away from the "free" classes, and start to place enrollment qualifications. We understand that MOOCs are trying to aggressively build up word-of-mouth; but, in the longer horizon, stories of 11-year olds without former foundation knowledge but completing a MOOC on Machine Language or Artificial Intelligence Programming may create more skeptical perceptions of MOOC's quality/rigor, than the positive heart-warming publicity. Finally, to be more accepted in the education market, MOOC organization should widen their circles of partnerships and their business development efforts to the non-elite schools and colleges.

References

Anders, George (2012). Are They Learning or Cheating? Online Teaching's Dilemmas. *Forbes*, http://www.forbes.com/sites/georgeanders/2012/08/16/are-they-learning-or-cheating-online-teachings-dilemma/
Bersin, Josh. (2013). The MOOC Marketplace Takes Off. *Forbes*. http://www.forbes.com/sites/joshbersin/2013/11/30/the-mooc-marketplace-takes-off/
Cusumano, Michael A. (2013). Are the Costs of Free Too High in Online Education. *Communications of the ACM*, 56(4), 26–29.
Dellarocas, Chrysanthos, and Alstyne, Marshall V. (2013). Money Models for MOOCs. *Communications of the ACM*, 56(8), 25–28, http://en.wikipedia.org/wiki/List_of_learning_management_systems.
Fowler, Geoffrey A. (2013). An Early Report Card on Massive Open Online Courses. *The Wall Street Journal*. http://online.wsj.com/news/articles/SB10001424052702303756045790934008347389 72
Guthrie, Doug, (2012). Jump Off the Coursera Bandwagon. *The Chronicle of Higher Education*. http://chronicle.com/article/Jump-Off-the-Coursera/136307/
Kolowich, Steve. (2012). How Will MOOCs Make Money. *Inside Higher Ed*. http://www.insidehighered.com/news/2012/06/11/experts-speculate-possible-business-models-mooc-providers
Martin, Fred G. (2012). Will Massive Open Online Courses Change How We Teach?. *Communications of the ACM*, 55(8), 26–28
New, Jake. (2013). New MOOC Provider Says It Fosters Peer Interaction. *The Chronicle of Higher Education*. http://chronicle.com/blogs/wiredcampus/new-mooc-provider-says-it-fosters-peer-interaction/43381
Pappano, Laura. (2012). The Year of the MOOC. *The New York Times*. http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html
Qureshi, M. I., Bhatti, M. N., Rasli, A. M., Yasir, M., & Zaman, K. (2014). The Delphi Method for Internationalization of Higher Education in Pakistan: Integrating Theory of Constraints and Quality Function Deployment.Mediterranean. *Journal of Social Sciences*, 5(20), 2702.
Qureshi, M. I., Janjua, S. Y., Zaman, K., Lodhi, M. S., & Tariq, Y. B. (2014). Internationalization of higher education institutions: implementation of DMAIC cycle. *Scientometrics*, 98(3), 2295–2310.
Ripley, Amanda. (2012). College is Dead. Long Live College! *Time*. http://nation.time.com/2012/10/18/college-is-dead-long-live-college/
Scorton, David, and Altschuler, Glenn, (2013), MOOCs: A College Education Online? *Forbes*. http://www.forbes.com/sites/collegeprose/2013/01/28/moocs-a-college-education-online/
Singh, Anil, Mangalaraj, George, and Taneja, Aakash. (2010). Bolstering Teaching through Online Tools. *Journal of Information Systems Education*, 21(3), 299–311.
The NMC Horizon Report: (2013) Higher Education Edition. *New Media Consortium and EDUCAUSE.* http://www.nmc.org/pdf/2013-horizon-report-HE.pdf
Waldrop and Mitchell**.** (2013)**.** Massive Open Online Courses, aka MOOCs, Transform Higher Education and Science**.** *Scientific American / Nature Magazine*. http://www.scientificamerican.com/article/massive-open-online-courses-transform-higher-education-and-science/
Young, Jeffrey R. (2013). Coursera Announces Details for Selling Certificates and Verifying Identities. *The Chronicle of Higher Education*. http://chronicle.com/blogs/wiredcampus/coursera-announces-details-for-selling-certificates-and-verifying-identities/41519