“MASSIVE OPEN ONLINE COURSES (MOOC)”

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The proliferation of massive open online courses (MOOCs) has stirred a fervent debate about global access to higher education. While some commentators praise MOOCs for expanding educational opportunities in a more open and accessible fashion, others criticize this trend as a threat to current models of higher education and a low-quality substitute for traditional learning. Drawing on a comprehensive literature review of both academic and popular media sources, this article will explore the impact of MOOCs on the field of higher education, with a particular emphasis on their promise to enhance educational opportunities worldwide. Specifically, the analysis will focus on the four issues that have so far proven to be most significant in shaping the future of MOOC as an equalizing force in higher education: credit, pedagogy, internationalization, and, finally, legal and financial aspects.

Keywords: access; e-learning; equity; higher education policy; internationalization; online education

The recent rise of massive open online courses (MOOCs) can be understood as the confluence of several key trends in higher education: globalization and the push for internationalization; increasing demand for access to higher education; a celebration of lifelong learning and the consequent change in learner demographics; increased personal access to technology and social media; and, last but not least, the need for alternative models of access and affordability in the higher education sector (Powell & Yuan, 2013). In noting the game-changing nature of these online courses, many commentators have pointed to Christensen’s theory of disruptive innovation (Christensen, 1997; Christensen, Horn, & Johnson, 2008) as a way to understand the tremendous impact that MOOCs might have on worldwide learning (Anderson, 2013; Daniel, 2012; Powell & Yuan, 2013; Regalado, 2012). However, the initial excitement about MOOCs as a democratizing force in higher education has recently been tempered by more pessimistic accounts which point to the very real possibility that MOOCs might create a two-tiered system, separating those who have access to on-campus education from those who are less privileged and must, therefore, make do with massive online courses (Carlson & Blumenstyk, 2012). This article will evaluate the social and educational potential of MOOCs, particularly in terms of claims that MOOC proponents make about the empowering and equalizing effects of open online education. After providing a brief background on MOOCs and clarifying the essential yet often

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overlooked distinction between cMOOCs and xMOOCs, I will analyze the potential impact of MOOCs on higher education by zooming in on the issues that I see as most significant – and most contentious – for determining the future of this educational model: credit, pedagogy, internationalization, and, finally, legal and financial aspects.

**Background and key distinctions**

Potentially catering to thousands of learners, MOOCs are online courses generally characterized by free and open enrollment, video lectures and assignments evaluated through peer or automated assessment. Although the internet functions as the platform of delivery, MOOCs are not a synonym for online education – as they are often misrepresented in the press – but rather a specific type of online education. The key difference is that MOOCs, unlike conventional university online courses, are characterized by scalability – usually supporting an indefinite number of participants – and, respectively, open access, allowing (at least theoretically) anyone to participate in the course for free (Glance, Forsey, & Riley, 2013).

Perhaps ironically, given the transformations it has undergone ever since, the original MOOC concept was built precisely on an appreciation of social connectivity. The term ‘MOOC’ was coined by Dave Cormier and Bryan Alexander to describe an open online course at the University of Manitoba, designed and taught by George Siemens and Stephen Downes. The course, titled ‘Connectivism and connective knowledge’, was offered to 25 fee-paying students on the Manitoba campus and 2300 other participants from all over the world, who took the class online for free (Daniel, 2012). Significantly, the pedagogy behind this course was based on the notion of connectivism, which, according to Downes (2012), is ‘the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks’ (p. 9). As a result, this course, and later courses that followed in its pedagogical footsteps, became known as a connectivist MOOC (cMOOC), due to its strong emphasis on ‘creation, creativity, autonomy and social networking learning’ (Siemens, 2012). The earlier tradition of cMOOCs continues, but the attention has shifted to the so-called xMOOCs, which employ a more traditional pedagogical approach focused on video lectures, short quizzes, and little professor-to-student or student-to-student interaction. A prominent early example of the xMOOC approach is Stanford University’s 2011 course, ‘Introduction to artificial intelligence’ (AI), taught by Peter Norvig and Sebastian Thrun, and attracting 160,000 online enrollees. Out of these, 23,000 students completed the course; as Thrun mused, this meant that he and Norvig ‘taught more students AI, than all AI professors in the world combined’ (Thrun, as cited in Shirky, 2012). Realizing the immense potential of this education model, Thrun quit his tenured post at Stanford and founded Udacity, which – together with Coursera and the nonprofit initiative edX – is one of the three major MOOC providers which dominate today’s market.

The current incarnation of MOOCs – where xMOOCs are by far more prominent – represents a significant departure from the original MOOC model pioneered by Siemens and Downes in 2008, especially in terms of pedagogical approach. In fact, Siemens and Downes are among the most disappointed commentators of this shift. According to Downes:

> MOOCs as they were originally conceived were the locus of learning activities and interaction, but as deployed by commercial providers they resemble television shows or digital
textbooks with – at best – an online quiz component … The idea of MOOCs as an experiment in pedagogy and educational organisation has been completely abandoned by the new platforms, to the detriment of MOOCs. (Downes, as cited in Parr, 2013)

In view of their crucial differences in terms of pedagogy, it is important to adequately distinguish between cMOOCs and xMOOCs – and popular accounts of MOOCs often do not. Rodriguez (2012) offers a beautifully simple explanation of these key differences: ‘c-MOOCs establish a many to many relation to develop massive interconnectedness. [xMOOCs] establish a one to many relationship to reach massive numbers.’ In many ways, the bifurcation of MOOCs into connectivist versus instructional models reflects the perpetual debate between learning as process versus learning as outcome; as Siemens (2012) notes, cMOOCs focus on knowledge creation, whereas xMOOCs focus on knowledge duplication. Indeed, cMOOCs and xMOOCs are so different in terms of goals and pedagogy that it is confusing (and generally unproductive) to designate them using the same term. In addition, the confounding of the two types of MOOCs (or, more specifically, the universal use of the term MOOC when in fact commentators are referring primarily to xMOOCs) often prevents the development of a nuanced and productive dialogue, and glosses over key differences in pedagogy and goals. If the differences between cMOOCs and xMOOCs were better understood, opinions would be less polarized, and the impassioned debate about MOOCs and the future of higher education would be a lot more grounded.

Credit

The most vital yet unresolved question that will determine the future of MOOCs both in the USA and abroad concerns the integration of these online classes within the formal system of higher education. Will credit be offered for MOOCs, and if so, for which ones? Are MOOCs meant to replace, supplement or remain separate from traditional college courses? Put bluntly, the shortcomings that critics point out when referring to the current generation of MOOCs would not matter so much if these courses ‘were intended to fill a sink-or-swim niche in higher education, where it might be acceptable that only a small fraction of enrolled students (commonly 10% or less) finish and earn certificates of completion’ (Daniel, 2012). Where MOOCs run into the most trouble is when educators, administrators or legislators see them as a low-cost credit-bearing replacement for traditional college courses. This view is representative of the unhealthy ideology of technological solutionism (Morozov, 2013), and it threatens to create a two-tiered system wherein the most cash-strapped and already marginalized students will take MOOCs for credit, while their more privileged peers will enjoy the advantages of an embodied college experience. What is more, preliminary empirical findings also prove that this strategy is quite ineffective, as seen in the recent fiasco at San Jose State, where more than half of the students who took a (fee-based) Udacity course for credit failed their final exams (Oremus, 2013). As I note in the final part of this article, while MOOCs can be a lower cost and helpful tool in some of these settings, it is important to provide alternative sources of support that will guide students through the learning process and provide them with individual feedback and assistance.

Although the American Council on Education (ACE) has announced that it has started reviewing MOOCs for credit (Jaschik, 2013), at this point, credit-bearing MOOCs are a small minority, and most MOOCs are still free and credit-less. In fact, the current lack of credit options, coupled with the unavailability of individualized
support mechanisms for MOOC learners, can explain, at least in part, the frequently cited attrition challenges in MOOCs. For this reason, it does not always make sense to compare MOOC attrition levels with the attrition levels of traditional college courses where students have clear incentives to complete coursework. Since most MOOCs are free and do not offer credit, lurking or auditing is more accepted than in a traditional classroom environment, and participation is not subject to the same normative and financial pressures to finish and do well in a course. Indeed, research shows that many MOOC participants sign up out of curiosity or enjoyment, and do not even intend to complete quizzes or assignments (Rivard, 2013). Given the scale and the diversity of participation, it is important to acknowledge that learners engage with MOOCs in a variety of ways, and for different reasons.

For those who are taking non-credit MOOCs but would like to pursue these topics further as part of a college degree program, a head start can make a huge difference. According to The Council for Adult and Experiential Learning (CAEL), students who receive credits for prior learning are 2½ times as likely to graduate as those who do not earn such credits (Selingo, 2012). Prior learning assessment is a promising yet lesser known path towards obtaining college credit for MOOC participation, as it enables students to get official credits for college-level learning gained outside of traditional academic contexts (Fain, 2012). Here is how it works in practice: (1) a student successfully completes a non-credit-bearing MOOC and receives a (non-credit) certificate of completion from the MOOC provider; (2) the student describes what they have learned in the MOOC – usually through an academic paper – and demonstrates their mastery of the subject by building a custom portfolio on LearningCounts.org (a service facilitated by CAEL) or a similar site; (3) a CAEL-affiliated faculty member with expertise in the relevant subject matter reviews the student’s write-up and portfolio, and decides whether they are worthy of college credit; (4) if the faculty expert makes a recommendation for awarding college credit (which is very specific: say, two credits to be applied for an engineering program), the student can then take this document – which would be backed up by the ACE – and enroll in one of the many colleges that accept ACE’s credit recommendations or that are partner institutions for LearningCounts.org. The entire process is quite complex, so students attempting to take this route must be committed and proactive; in addition, there are some fees involved ($250 for the CAEL-affiliated faculty review of a 1–12 credit portfolio) (Fain, 2012). Nonetheless, this approach is worth pursuing as a potential bridge between non-credit MOOCs and the achievement of a college degree, since it relies on a promising model of fair and individualized assessment. Moreover, it could further be improved, for instance, by replacing the centralized portfolio site with smaller customized sites, developed and run by the colleges themselves, according to their own certification criteria.

Georgia State University has already taken an important step in this direction, by announcing in 2013 that it will start reviewing MOOCs for credit, just like it reviews courses taken at other institutions, or Advanced Placement exams. In order to receive credit for MOOCs that they have previously completed, students will have to work with the Office of Undergraduate Admissions and relevant academic departments, in order to demonstrate competency in specific academic areas (Jaschik, 2013). In a similar initiative, Academic Partnerships, a company that collaborates with public universities to put their academic offerings online, announced a new program called MOOC2Degree, where students can take an initial MOOC for credit, free of cost, in the hope that they will later enroll in the full degree program. Cleveland State
University, Florida International and the Universities of Arkansas, Cincinnati, Texas at Arlington and West Florida are among the first institutions that have signed up to pilot this initiative in collaboration with Academic Partnerships (Jaschik, 2013; Kiley, 2013).

Pedagogy

As Potter (2013) asks, pragmatically, in a recent Chronicle of Higher Education article, ‘what course open to thousands of random people could really teach all of them well?’ To achieve scalability, xMOOCs rely on the large lecture format, with filmed lectures and automated quizzes, thus effectively substituting student–teacher interaction with student–content interaction. CMOOCs, on the other hand, substitute student–teacher interaction with student–student interaction, counting on course participants to take a more active role in their own learning, and that of their peers (Anderson, 2013). Seen from this angle, when scalability is the ultimate goal, critics are (most often) right to be concerned about the pedagogical foundation of massive online courses. I say ‘most often’, because many commentators make blanket statements about the pedagogical shortcomings of MOOCs, failing to distinguish between xMOOCs and cMOOCs, and not giving proper credit to innovative experiments that test out different models of engagement. As I will describe towards the end of this article, we are witnessing the emergence of an impressive set of alternative MOOC models – such as the hybrid distributed open online course (DOCC) designed by Anne Balsamo and Alex Juhasz, or the P2PU or NovoEd platforms – which indicates that there is indeed some hope in regard to the pedagogical ambitions of such courses.

Due to pedagogical shortcomings, commentators have argued that, rather than courses, MOOCs can better be understood as digital textbooks (Oremus, 2012), curation systems (Literat, Carstocea, & Kramer, 2013), libraries (Fister, 2012) or, simply, information (Selingo, 2012). However, as Literat and colleagues (2013) observe, it is possible that the function of MOOCs as curated informational resources is simply more noticeable because that is ‘the only aspect of traditional classroom coursework that Coursera preserves in full . . . Curation becomes much more visible when the interactions and engaged learning practices that form much of the traditional seminar experience disappear.’

It is also important to note that, from a legal perspective, the terms of use (TOU) that students accept when joining a MOOC usually contain a clause to the effect that the MOOC provider (Coursera, Udacity etc) does not make any guarantees as to the quality of the learning experience therein (Davis, 2013). The companies do not accept any liability, and there are no mechanisms to enforce a higher quality of learning in a MOOC. This is a significant contrast with the traditional university, where a system of evaluation and accountability (including course evaluations, departmental hierarchies, official complaint policies) is in place to ensure adequate standards of instruction. Quality in online learning can be operationalized in a variety of ways – quality of content, quality of design, quality of instructional delivery and quality of outcomes (Legon, 2013) – but the process of MOOC accreditation should be tempered, rather than accelerated, until there is a feasible way to evaluate the quality of MOOCs and to provide students with a firm guarantee that their experiences in MOOCs will be worthwhile (especially when participation is fee-based). Significantly, we must also acknowledge that the perceived quality of a MOOC will depend, to a great extent, on students’ personal goals – which differ greatly when it comes to MOOC participation (Rivard, 2013) – and their consequent engagement with the course. Indeed,
given the major departure from structured degree programs and institutional standards that MOOCs represent, the concept of quality may need to be reconsidered for this context.

Nonetheless, there are several pedagogical opportunities to be gleaned from MOOCs. One such opportunity is the ability to meticulously design a course and learning environment. ‘When we teach online, we have to build both the course and the classroom,’ writes Stommel (2013), cautioning against the disconnect that exists at many institutions between those that build online courses and those that teach them. Of course, given the technical infrastructure of MOOC delivery platforms, it is not always possible to modify certain parts of the learning environment — and indeed, this inability to make key design choices in the interest of pedagogy is often cited as one of the most frustrating aspects of teaching a MOOC (Head, 2013). MOOC experiences can also help inform innovative pedagogical practices in the embodied classroom, and some universities are using MOOCs as an incubator or ‘skunkworks’ for pedagogical experimentation (Armstrong, 2012; Weissmann, 2012). In fact, in The Chronicle’s survey of MOOC professors, 38% of respondents said they were motivated to try out MOOCs in order to pick up tips that might help improve their classroom teaching (Kolowich, 2013). For one, platforms like Coursera, edX and Udacity provide detailed metrics, tracking student interactions, participation and performance; these data (though exclusively quantitative) can help professors determine which methods and materials are seen as useful and engaging, and which are not. At Wesleyan — the first small liberal arts college to venture into MOOC territory — the allure of these rich data was one of the main reasons the university decided to partner with edX. Once the first Wesleyan MOOCs have run their course, the president of the college, Michael Roth, plans to get together with the faculty who are teaching MOOCs in order to discuss lessons learned and potential implications for the improvement of on-campus learning (Tilsley, 2012).

MOOCs in international contexts

In The chronicle of higher education’s expansive survey of professors teaching MOOCs, the most frequently cited reason for embracing this model was the desire to increase access to higher education worldwide (Kolowich, 2013). Tabarrok (2012) argues, rather naively, that ‘the best way to increase the quality of teaching is to increase the number of students taught by the best teachers. Online education leverages the power of the best teachers, allowing them to teach many more students.’ (Of course, as Vaidhyanathan (2012) astutely points out, this perspective rests on the assumption that popularity is a proxy for quality). But, when MOOC proponents — many of whom enjoyed top-quality educations at elite residential colleges — argue for the great potential of MOOCs to increase access to higher education, they are not referring to increased opportunities for their children and their friends’ children, but for ‘others’ who are impoverished and marginalized, and for whom a college education is an ambitious dream (Carlson & Blumenstyk, 2012). Specifically, they generally invoke the needs of two populations: American students who cannot afford the rising costs of college in the USA, and also, importantly, students in developing countries. Indeed, it is this latter category of student that is often showcased in the most utopian accounts of MOOCs.

The debate around MOOCs and their potential to trigger an educational revolution in developing countries is a worthy and important conversation to have, but, for now, it
is still steeped in idealism. Putting free American courses online and opening them up for massive global participation cannot solve higher education needs around the world; at this point, it is just a small step in a generally promising direction. When it comes to widespread MOOC adoption in developing countries, the rhetoric is still very far from reality. Jamie Hodari (executive director of Generation Rwanda, a local nonprofit experimenting with a MOOC-based university) has captured this sentiment poignantly, noting that:

"It's hard for us to read these op-eds all the time, saying now a student in Sudan can get a first-rate college education for free. It's just so far from the reality of what could happen for all but just a few right now." (Leber, 2013, n.p.)

Empirical data about the location of MOOC participants have shown, so far, that the large majority come from North America and Europe, with very limited participation from Asia and even less from Africa (Liyanagunawardena, Williams, & Adams, 2013) – although this is likely to change as MOOC offerings are becoming more diverse and accessible. Many developing countries still struggle with poor digital infrastructures, especially in rural areas, while MOOCs usually require fast connections and frequent logins. But beyond these technological concerns, a further obstacle is the participation gap, described as the inequality of access to the full range of ‘opportunities, experiences, skills and knowledge that will prepare youth for full participation in the world of tomorrow’ (Jenkins, Purushotma, Clinton, Weigel, & Robinson, 2006, p. xii). The new media literacies identified by Jenkins and colleagues are particularly valuable in this respect, since a learner’s successful performance in a MOOC – and particularly in a cMOOC – depends heavily on their ability to navigate multiple digital spaces, engage in complex interactions, and read and write multimedia texts. In addition, the vast majority of MOOCs are in English; foreign students need a superior level of English language proficiency in order to understand course materials (especially non-subtitled video lectures) and to participate in forums.

There are also significant cultural and ethical considerations that need to be taken into account. How do you tailor the content of a massive online course to the diverse cultural contexts of its thousands of enrollees? Critics fear that the notion of all these students taking the same courses, with the same content, from the same instructor will lead to the ‘McDonaldization of higher education’ (Lane & Kinser, 2012) and might result in the dominance of a few elite Western institutions over the global realm of higher education (Leber, 2013). When considered in an international context, this dynamic poses an important ethical challenge. The president of the University of South Africa labeled MOOCs a form of ‘intellectual neo-colonialism’ (Daniel, Uvalič-Trumbič, & van Wyck, 2012). Yet we like to assume that university administrators in developing countries cannot jump on the MOOC bandwagon fast enough, and are eagerly awaiting American MOOC offerings. Upon closer scrutiny, that is not the case. A vital takeaway from the annual meeting of the Learning International Networks Consortium at MIT was that virtual universities abroad are resistant to the inclusion of American-made MOOCs in their curricula because they do not aptly reflect ‘[their] own realities, context and culture’ (Young, 2013).

Beyond these context-specific technological and cultural challenges, one of the most crucial issues that needs to be resolved before MOOCs can make a true impact on education in the developing world is, again, the question of credit. Students in developing countries, perhaps more so than elsewhere, need to be assured that the time they
put into online education will lead to a job and a paycheck (Bartholet, 2013). Although a minority of them might participate in MOOCs for fun or curiosity or self-actualization, real change will occur only when these students are able to obtain credit – or some kind of alternative certification that local employers will find valuable – for their work in online courses. Fortunately, we are starting to see some promising opportunities for the local/cultural customization of MOOCs. The vigorous public debate surrounding MOOCs in the USA has already encouraged foreign universities to devote more attention to online learning and to develop their own locally relevant models (Daniel, 2012). In India, for instance, Microsoft Research is launching a pilot project to develop MOOC-style online classes, taught by leading Indian professors and compliant with the existing curriculum at Indian engineering schools; the program is called Massively Empowered Classrooms (MEC) (Bartholet, 2013). Future initiatives in this spirit might be more feasible, more effective and also, importantly, more ethical.

Legal and financial considerations

There is also a set of legal and financial issues that need to be resolved before a verdict can be reached as to the positive and democratizing potential of MOOCs. Foremost among these is the problem of copyright and intellectual property. Currently, commercial MOOC providers operate with very restrictive terms of service, maintaining all rights to use, reproduce, distribute and modify user content, including user data like clicks and demographic information, and student content like forum posts and media artifacts (Davis, 2013).2 Professors, too, are concerned about intellectual property in MOOCs, because the commercial agreements between MOOCs and educational institutions often conflict with the common institutional policy approach that grants intellectual property rights to faculty who develop a course (Cheverie, 2013). Faculty members, therefore, consider copyright one of the key issues that need to be clarified before they can fully embrace these online courses (Bacow, Bowen, Guthrie, Lack, & Long, 2012; Schmidt, 2013).

Mittell (2013) draws out an interesting contradiction when he contrasts the MOOC phenomenon with another crucial albeit lesser known movement in academia: the Coalition of Open Access Policy Institutions (COAPI). Launched in 2011, COAPI includes more than 40 higher education institutions across the USA. Its general aim is to offer a platform for colleges and universities to coordinate and advocate for open-access policies; in practice, this entails making faculty publications available for free online, streaming lectures and faculty talks, and increasing access to course-specific educational resources. As Mittell convincingly argues, although MOOCs are often promoted as a step towards openness and more equitable access to educational material, fewer than 20% of the institutions that are offering MOOCs on Coursera are also members of COAPI. Mittell is right in pointing out that such a discrepancy is, at least to a certain extent, rather hypocritical. Moreover, as he further notes, the disconnection between the rhetoric of MOOCs and the rhetoric of open-access policies is equally concerning, because on a basic level it speaks to the profit-seeking incentives that characterize Coursera and similar MOOC providers.

This brings us to another essential but unresolved variable in the MOOC equation: the monetization strategies that commercial MOOC providers will employ in order to make a profit. In an excellent synthesis of MOOC business models, Daniel (2012) identifies the following potential sources for monetization:
• Certification (students pay for a badge or certificate)
• Secure assessments (students pay to have their examinations invigilated (proctored))
• Employee recruitment (companies pay for access to student performance records)
• Applicant screening (employers/universities pay for access to records to screen applicants)
• Human tutoring or assignment marking (for which students pay)
• Selling the MOOC platform to enterprises to use in their own training courses
• Sponsorships (third party sponsors of courses)
• Tuition fees.

MOOC providers have already experimented with many of these models (particularly the first and the last on this list), but it is still not clear what the future holds in terms of monetization strategies. What is clear, however, is that MOOC stakeholders – including students, professors, administrators, legislators and entrepreneurs – should keep a close eye on these financial developments, which are often not prominently featured in the popular press reporting on MOOCs. After all, as Bogost (2013) skeptically reminds us, ‘MOOCs are an expression of Silicon Valley values’ and their main motivation is to maximize profit, not access, or equality, or pedagogical quality. While he is partly right, Bogost’s statement also illustrates, unfortunately, the unproductive trend of failing to discriminate between different types of MOOCs; his criticism might hold true in the case of xMOOCs, but cMOOCs are certainly not an expression of Silicon Valley values, nor do they value profit over pedagogy.

Conclusion and future research
The debates around MOOCs are anchored almost universally in a comparative approach, evaluating the educational potential of MOOCs side by side with that of traditional classroom instruction. While this approach is understandable, and makes sense both heuristically and practically, it should also be interrogated more critically. What kind of ‘traditional’ classroom are we comparing MOOCs to? When commentators and analysts criticize MOOCs, the yardstick that they generally invoke – sometimes explicitly, sometimes implicitly – is the romanticized image of higher education as the intimate college seminar, preferably conducted by tenured faculty, at a selective residential college (Shirky, 2012). As Shirky (2012) aptly notes, ‘the fight over MOOCs is really about the story we tell ourselves about higher education.’ However, considering the economic realities of going to college in the USA, the reality of the American higher education system is worlds apart from this idealized image:

If you want to know what college is actually like in this country, forget Swarthmore, with 1500 students. Think Houston Community College, with 63,000. Think rolling admissions. Think commuter school. Think older. Think poorer. Think child-rearing, part-time, night class. Think 50% dropout rates. Think two-year degree. (Shirky, 2013, n.p.)

And that is just the American landscape; educational systems in the developing world have their own host of challenges. We need to be more aware of what we are actually comparing when assessing the effectiveness of MOOCs, and to avoid making generalized claims without being mindful of the socioeconomic and cultural particularities of
specific educational systems. Perhaps this is a needed opportunity to rethink what we mean by ‘traditional classroom’, in both domestic and international contexts.

It is also necessary to note that, although certain dynamics and interactions can be mirrored in online courses, the unique ecosystem of the physical campus cannot be reproduced, and MOOC students cannot benefit from the infrastructure, services and resources that brick-and-mortar colleges provide. Granted, this ‘college experience’ may not be an ideal – or even desired – option for all learners. However, college, in a sense, is a support system, and it is the students from the bottom tiers who need this support system the most. But in the absence of such opportunities for millions of learners, both in the USA and abroad, we must consider, pragmatically and with a solid empirical base, whether MOOCs could perhaps make a positive impact. While MOOCs may not be ideal, can they at least represent a viable option for some learners and in some circumstances?

In their current incarnations (after all, it is probably safe to say we are still in the MOOC 1.0 era), MOOCs may not yet be the answer to the problems that plague higher education, but they could offer helpful tools to better achieve solutions. They could also engender a much-needed push towards experimenting with different educational models; indeed, in many areas, they already have. As Davidson (2013) suggested, MOOCs can be ‘a useful goad toward educational experimentation that may lead to methods for educating more students and in ways more responsive to the connected world they inhabit everywhere except in school.’ Therefore, there are important opportunities where MOOCs could make a positive impact on the current higher education landscape. One such opportunity refers to hybrid models that combine MOOC instruction with face-to-face teaching or even with small virtual classes that offer individual feedback and support. Such models would preserve the advantages of small group learning, feedback and interaction, while simultaneously removing the need for lecturing and allowing instructors to devote more time to interacting with students (Burke & Mahoney, 2013). The DOCC, designed by Anne Balsamo and Alex Juhasz, is a great example of an ethical and innovative hybrid model. According to Juhasz and Balsamo (2012), the DOCC is a feminist rethinking of the MOOC concept, where professors at participating institutions will rely on a shared set of online resources (including course materials and assignments), but will customize the content of the course, tailoring it to the interests and goals of their students.

The issue of credit and certification will continue to play a big part in determining the future of MOOCs. But the absence of credit, while posing serious problems for the integration of MOOCs within college degree programs, does not mean that these online courses are not valuable to some communities. Non-credit-bearing MOOCs can function well as communities of inquiry, participatory cultures (Jenkins et al., 2006) or affinity spaces (Gee, 2007). In fact, some of the best MOOCs I have seen – and participated in – have been credit-less cMOOCs that allow learners, young and old, to explore new interests, brush up on old ones and achieve some form of self-actualization, gratis, and at their own pace. For instance, by engendering a helpful community and using video, audio, chat and discussion forums, MOOCs could be an amazingly effective platform for learning foreign languages.

It is also important to acknowledge that there is a lot we do not know yet about MOOCs. Research in this area is still in its infancy, and, as of now, there is not enough empirical data to reach a definitive conclusion (Glance et al., 2013). In addition,
we do not know much about the experiences of learners who have dropped out of MOOCs (Koutropoulos et al., 2012). As Veletsianos (2013, p. 4) notes:

[The narrative of MOOC successes is often one-sided. MOOC providers tend to share the stories of extraordinary individuals that overcome insurmountable struggles to succeed in MOOCs (e.g., individuals in conflict-ridden Afghanistan and Syria that participate in MOOCs)… At the same time however, there are numerous individuals that have struggled with and abandoned MOOCs, individuals whose life circumstances, motivations, and needs negatively impacted their learning. The stories of these individuals are rarely shared. They are, in fact, concealed. They become figures and statistics (e.g., ’90% dropped out’ or ’82% completed the first two assignments’), and their stories remain untold.]

We need a better understanding of how students from different educational, cultural and social backgrounds navigate MOOCs. We need to know what motivates them and, conversely, why they might fail or drop out. In order to paint a richer picture of student experiences in MOOCs, quantitative research needs to be supplemented by thick description and qualitative assessment (Stommel, 2012). Importantly, this approach also involves paying more attention to student voices, which are most often problematically missing from the debates that can decide their academic futures.

Notes
1. Although this list is growing fast, for now, most of the partner institutions are state schools and community colleges, and the program does not include any top-tier universities. The full list of affiliated institutions is available at http://www.learningcounts.org/affiliated-universities/
2. And since MOOC participants are not considered to be students of the universities delivering these courses (no matter whether these online participants receive university credit or not), Family Educational Rights and Privacy Act (FERPA) regulations do not apply either, which means that students’ personal information and privacy are not legally protected in the same way that they are in the traditional classroom.

References


Students’ and instructors’ use of massive open online courses (MOOCs): Motivations and challenges
Massive open online courses (MOOCs) are among the latest e-learning initiative to attain widespread popularity among many universities. In this paper, a review of the current published literature focusing on the use of MOOCs by instructors or students was conducted. Our primary goal in doing this is to summarize the accumulated state of knowledge concerning the main motivations and challenges of using MOOCs, as well as to identify issues that have yet to be fully addressed or resolved. Our findings suggest four reasons why students sign up for MOOCs: the desire to learn about a new topic or to extend current knowledge, they were curious about MOOCs, for personal challenge, and the desire to collect as many completion certificates as possible. Up to 90% drop out due to reasons including a lack of incentive, failure to understand the content material and having no one to turn to for help, and having other priorities to fulfill. Findings suggest three main reasons why instructors wish to teach MOOCs: being motivated by a sense of intrigue, the desire to gain some personal (egoistic) rewards, or a sense of altruism. Four key challenges of teaching MOOCs are also surfaced: difficulty in evaluating students’ work, having a sense of speaking into a vacuum due to the absence of student immediate feedback, being burdened by the heavy demands of time and money, and encountering a lack of student participation in online forums. We conclude by discussing two issues that have yet to be fully resolved – the quality of MOOC education, and the assessment of student work.
1. Introduction

Throughout history, educators and researchers have always been intrigued with the potential of technology to help transform education and improve student learning (Hew & Brush, 2007). One such technology is the use of the Internet to deliver courses; typically known as e-learning. Over the past few years, the practices of e-learning have undergone a number of initiatives, particularly with regard to the openness of the learning environment (Kikkas, Laanpere, & Põldoja, 2011). One specific initiative that is fast increasing in popularity with educational researchers, instructors, and learners is the massive open online course (MOOC). The MOOC initiative may be situated within the larger framework of open educational resources which is typically defined as digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research” (OECD, 2007, p. 30).

The term MOOC was originally used by George Siemens and Stephen Downes in 2008, and since then has gained popularity in the USA especially when Sebastian Thrun, a Stanford professor offered an artificial intelligence course for free (Hu, 2013). Basically, any individual with an Internet connection can join a MOOC, to access the available resources, interact with other students, reflect and share what they have learned with others (Kop, 2011; Koutropoulos et al., 2012). Enrollment sizes of MOOCs tend to be high, generally over 500 participants (Koutropoulos et al., 2012). MOOCs are generally offered by universities in partnership with providers such as Coursera, and Udacity. Currently, one of the fastest growing MOOC providers is Coursera which has more than 30 university partners including Princeton, Brown, Columbia, Duke, Stanford, and Johns Hopkins, and has registered 2.8 million students and sees 1.4 million course enrollments every month (Cusumano, 2013; Woo, 2013).

Advocates of the MOOC initiative believe that it can offer educational benefits to higher education institutes, professors, and students. For example, some believe that MOOCs represent the ultimate democratization of education, by making education more accessible to as many people as possible (Jacobs, 2013). In most cases participants sign up for MOOCs free of charge and in some cases for a small or minimal fee to obtain a completion certificate. Others believe that MOOCs can increase an institution’s prestige, or as a tool for universities to market themselves to potential students, faculty, and donors, (Belanger & Thornton, 2013; Rice, 2013), as well as allowing professors to experiment with the pedagogy of teaching online courses to large number of students. Skeptics, on the other hand, voice concerns that MOOCs will offer a watered-down education, harm less prestigious education institutes, and increase the risk of further state school budget cuts (Jacobs, 2013).

2. Purpose of study

Notwithstanding the debate between the advocates and skeptics of MOOCs, current popular discourse in mainstream media has created a bubble of hype and a desire to embrace MOOCs (Haggard, 2013). In this context, there is a need for a thematic analysis of related studies to gain a better understanding of MOOCs in higher education. The current review follows Creswell’s (1994) guidelines which stated that the purpose of a review is to summarize the current state of knowledge concerning a certain topic of interest and highlight issues that have yet to be fully resolved.

Specifically, the focus of this study is on the motivations and challenges related to instructors’ or students’ use of MOOCs. These include student motives for signing up MOOC, student attitudes toward MOOC, student challenges of learning in a MOOC, instructor motivations for offering MOOCs, as well as their methods used to engage students, and the various challenges encountered in teaching a MOOC. This article also identifies important issues that have yet to be fully addressed which can suggest directions for further work.

3. Review of literature on the use of MOOCs

3.1. Sources of data

In this section, we summarize previous literature regarding the use or experience of MOOCs by academic leaders, instructors or students. To do this, we first searched for the relevant literature. The literature search was conducted in two stages. In the first stage, we searched for empirical-based articles in electronic databases using the keyword Massive Open Online Course or MOOC, and open-ended search period. In the second phase, snowballing searches on the papers cited in some of the articles were carried out. The electronic databases used for the literature search included: Academic Search Premier, ERIC, and Education Research Complete. Academic Search Premier offers indexing and abstracting for more than 8500 journals. It is considered one of the most prominent databases in academic institutions (Blessinger & Olle, 2004). The ERIC database contains more than 1.3 million records and links to more than 323,000 full-text documents, while Education Research Complete
provides indexing and abstracts that cover all educational disciplines for more than 2100 journals. We believe the use of these three databases reasonable and sufficient.

As of July 31, 2013, a total of 362 abstracts of articles were found. The first author screened all the identified abstracts of the articles. Articles were selected for review (inclusion requirements) if they provided empirical report on instructors’ or students’ motivations and challenges of using MOOCs. Articles unrelated to the use of MOOCs by instructors or students such as college librarians’ use of MOOCs were excluded. Non-empirical descriptions of MOOCs were also excluded from this review, although they were used as background reference material where appropriate.

An independent observer randomly checked 10% of all the identified abstracts and then based on the inclusion requirements also selected the relevant articles. The percent agreement between the two researchers was 96.9%. At the completion of the filtering process, 25 articles were eligible for review (see Appendix). Although effort was made to include as many relevant articles as possible, we make no claim that the identified publications represent an exhaustive list.

3.2. Data analysis

The identified articles were qualitatively classified using the method of constant-comparative espoused by Glaser (1965), a technique that is typically used by other researchers who are engaged in similar review pursuits (e.g., Gao, Luo, & Zhang, 2012; Liyanagunawardena Adams, & Williams, 2013; Sim & Hew, 2010; Williams, Terras, & Warwick, 2013).

The basic unit of analysis was each individual identified article. Utilizing the constant-comparative method, the first article was read and its content noted to form an emergent theme that best described its finding. For example, if the finding of the article read: “the survey revealed that a number of professors hoped to use MOOCs to increase their visibility among their peers and with the general public, increase their earning power, or chance of getting tenure”, it was coded as a "motivation by egoistic motives to offer a MOOC" theme because the motives all seemed act for one’s own interest.

The next article was then read and its finding noted to compare whether it was similar to that of the first article. If so, the finding of the second article was put into the first theme category. If otherwise, the finding of the second article represented the first entry in a new second category of them. This process was repeated until all the articles were read and examined. It is possible that one single article might yield more than one category of theme. These theme categories were repeatedly examined to make sure that they are mutually exclusive.

3.3. Results

Our analysis revealed that all articles relied on some forms of self-report data such as personal reflection, or questionnaire survey. In addition, some articles relied on log data such as students’ posts in discussion forums for their analysis. No article reported the use of the experimental or quasi-experimental research design. Many of the articles described the experiences of the students who enrolled in a particular MOOC, or the instructors teaching the course. Table 1 lists the main themes, along with their corresponding sub-themes and main findings.

3.3.1. Student perspective

3.3.1.1. Motives for signing up. Overall, our analysis suggests four reasons why learners enroll in a MOOC. First and foremost, most learners enrolled in MOOCs mainly because they wanted to learn about a certain topic, or to increase their knowledge, to refresh what they had learned before, or to learn a “just-in-time” topic that could help them in their work, somewhat akin to borrowing a textbook from the library to learn (e.g., Agarwal, 2012; Allon, 2012; Belanger & Thornton, 2013; Breslow et al., 2013; Evans, 2012; Fini, 2009; Kaul, 2012; Kolowich, 2013; Rice, 2013). The fact that almost all MOOCs are free also acts as an additional incentive for these learners to enroll (Instructure, 2013). Many learners do not seek credit toward any credential (Fini, 2009; Kolowich, 2013).

Second, learners also enrolled because they were curious about MOOC, and hence wanted to experience taking a complete online course along with thousands of other people dispersed throughout the world, and interacting with the instructor (Belanger & Thornton, 2013; Jacobs, 2013; Martin, 2012; Young, 2013), to “test the MOOC waters” (Kirschner, 2012, p. B21). Third, there are learners who enrolled in a MOOC for the personal challenge, such as wanting to see if they could make it through a MIT course (Breslow et al., 2013). Fourth and interestingly, there were some individuals who signed up primarily with the motive of winning as many course certificates as possible from either the instructors or the MOOC providers (Young, 2013). These students appeared to be obsessed or addicted with MOOCs and treated viewing online lectures as a pastime (Young, 2013).

Attitudes toward MOOC. Results regarding students’ attitudes such as satisfaction taking MOOCs are mixed. Some articles reported positive student experiences with MOOCs. For example, a student who participated in the ‘Circuits and Electronics’ course, commented that taking the MOOC was like taking a real class with simulated lab experiments, homework deadlines, a midterm and a final (Agarwal, 2012; Frank, 2012). Other articles reported students being satisfied with the high degree of participation (e.g., posting of thoughts, questions, and useful website links) found in the online discussion boards or chat rooms (Frank, 2012; Levy, 2011), as these activities helped them in their learning.

On the other hand, there were articles that reported students being dissatisfied with their MOOC experiences (e.g., Kirschner, 2012, Kirschner (2012), for example, reported that the quality and format of the online discussions were immediate disappointments because too many postings were “at the dismal level of most anonymous Internet connections: nasty,
Table 1
Summary of main findings related to current MOOC studies.

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<th>Theme</th>
<th>Sub-theme</th>
<th>Main finding</th>
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<td>Student perspective</td>
<td>Motives for MOOC sign up</td>
<td>Students signed up because:</td>
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<td>• They wanted to learn about a new subject or to increase their knowledge on something they learned before (Agarwal, 2012; Allon, 2012; Belanger &amp; Thornton, 2013; Breslow et al., 2013; Evans, 2012; Kaul, 2012; Rice, 2013)</td>
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<td>• For personal challenge (Breslow et al., 2013)</td>
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<td>• Students' frustrations were mainly due to the poor quality of discussion postings or slow response on the forums; ambiguous instructions about assignment or expectations of the course; technical glitches; and the use of peer review (Breslow et al., 2013; Jacobs, 2013; Kirschner, 2012; Kolowich, 2013; Koutropoulos et al., 2012; Krause, 2013; Mackness et al., 2010; Young, 2013)</td>
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<td>Challenges of learning in a MOOC</td>
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<td>• A lack of focus on the discussion forum (Rice, 2013)</td>
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<td>• Having insufficient prior knowledge about the topic (Belanger &amp; Thornton, 2013)</td>
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<td>• Ambiguous assignments and course expectations (Young, 2013)</td>
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<td>• Failure to understand the content and having no one to turn to for help (Belanger &amp; Thornton, 2013)</td>
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<td>• A lack of time due to other more important priorities and commitments (Belanger &amp; Thornton, 2013; Rice, 2013)</td>
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<td>Instructor perspective</td>
<td>Reasons for offering MOOCs</td>
<td>Three main reasons:</td>
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<td>• A sense of intrigue about MOOCs and wanting to experience teaching/connecting to a large and diverse audience (Agarwal, 2012; Mackness et al., 2010; Roth, 2013)</td>
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<td>• Egostic motives (e.g., to increase personal reputation, to be the first among peers to offer a MOOC, to help get tenure)</td>
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<td>• Altruism (Kolowich, 2013)</td>
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<td>How instructors try to engage students</td>
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<td>Instructors of xMOOCs tend to structure their courses very similar to traditional higher education courses. They mainly had a syllabus, along with a course content that typically consisted of readings, discussions via online forums or chat rooms, assign ments which usually consist of auto-graded quizzes, essays, or activities/projects, and videos of lectures that are pre-recorded by the instructors prior to the lessons (Agarwal, 2012; Belanger &amp; Thornton, 2013; Chamberlin &amp; Parish, 2011; Evans, 2012; Frank, 2012; Kaul, 2012). The recorded video lectures usually lasted between 2–7 min</td>
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<td>Instructors of cMOOCs also provided a course outline but the actual course materials and course content were defined by students as the course progressed, rather than defined by the instructors before the course (Rodriguez, 2012). Learner autonomy is typically emphasized in a cMOOC (Mackness et al., 2010). In cMOOCs, students were encouraged to create their own personal learning environments and networks of co-learners (Conole, 2013). However, since a cMOOC content usually evolves while it is in progress, it becomes difficult for learners to know in advance if a course is suitable for them (Rodriguez, 2012). Further, learning in many cMOOCs was not assessed as it was difficult to give credit when all participants are not doing the same work (Rodriguez, 2012). The role played by an instructor of cMOOCs resembled more a discussion moderator than that of a tutor as played by instructors of xMOOCs (Rodriguez, 2012)</td>
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<td>Challenges of teaching MOOC</td>
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<td>• Heavy demands of time and money (Belanger &amp; Thornton, 2013; Head, 2013; Kolowich, 2013)</td>
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<td>• Issues about evaluating student work (Head, 2013)</td>
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brutish, and long” (p. B21). Others found that a majority of students, ranging from 85% to 97%, were either lurkers or failed to even access the online discussions altogether (Breslow et al., 2013; Koutropoulos et al., 2012). Participants also tended to read and view other resources such as blog posts and videos rather than create them (Kop, 2011).

Others reported that students tended to explode with complaints even if a small percentage of people had a negative experience concerning technical glitches such as poor video quality (Kolowich, 2013). Students were also frustrated with MOOCs that gave unclear instructions pertaining to the assignments or expectations of the course (Young, 2013). Finally, the use of peer assessment might also not be entirely satisfactory as student evaluations could either be fierce (Kirschner, 2012), or poorly done (Krause, 2013). More discussion on the use of peer assessment is provided in the Discussion section.

Challenges of learning in a MOOC. Although students have the convenience of working through a MOOC at their own time and pace, up to 90% drop out. Students drop out due to a variety of reasons such as a lack of incentive, insufficient prior knowledge (e.g., lack of math skills), a lack of focus on the discussion forum (e.g., off-track posts), failure to understand the content and have no one to turn to for help, ambiguous assignments and course expectations, and lack of time due to having other priorities and commitments to fulfill which resulted in procrastination and eventually dropping out (Belanger & Thornton, 2013; Evans, 2012; Fini, 2009; Instructure, 2013; Rice, 2013; Young, 2013). Furthermore, since many students attend MOOCs based on personal interests, it is reasonable to assume that some might only be interested in a particular topic of the course; hence they quit after they have gone through the particular topic (Fini, 2009).

In order to motivate students to finish a course, many MOOC providers give out some form of incentives such as completion certificates. For example, as many as 74% of the MOOCs in our corpus offered free certificates to students who completed them. Although about two-thirds of 1834 respondents indicated that they would be more likely to complete if MOOCs offered completion certificates (Instructure, 2013), it really remains to be seen how useful an incentive MOOC certificates will actually be. As one of Coursera’s founders Andrew Ng admitted, MOOC certificates are not the real deal because they will never be as valuable as traditional degrees from a university (Parr, 2013). Even some students themselves do not think that a completion certificate issued either by the instructor or the MOOC provider would be a sufficient reason for them to finish a MOOC (Fini, 2009).

However, if universities were to start offering actual course credits to students who have completed MOOCs, this incentive will work. The American Council on Education recently endorsed five MOOCs from Coursera for credit, which means that students who pass a MOOC could redeem their learning for credit toward a traditional degree (Kolowich, 2013). Some students indeed reported that participation in a MOOC for credit had indeed made them more committed to finishing the course and improved their understanding of the topic (Chamberlin & Parish, 2011).

But it is worth noting that in a survey of 103 professors, as many as 72% of the respondents did not think that students who succeed in their MOOCs deserve to get formal course credit from their home institutions (Kolowich, 2013). Further, as many as 66% of professors did not believe that their home institutions would eventually grant formal credit to students who succeeded in their MOOCs. Therefore, it remains unclear, how seriously viable is the notion of awarding formal course credit to MOOC students. One of the greatest concerns is to ensure that the person who submits a piece of work is indeed the person taking the MOOC. We provide more discussion of this issue in the Discussion section.

3.3.2. Instructor perspective
3.3.2.1. Reasons for offering MOOCs. Overall, our analysis of the published literature suggested three general reasons why instructors decide to offer MOOCs. First, there were some instructors who were intrigued by MOOCs, and wanted to experience teaching and connecting to a large and diverse audience throughout the world, which no residential course could boast of (Agarwal, 2012; Mackness, Mak, & Williams, 2010; Roth, 2013). Some had found such experience very useful because the sheer size and diversity of participants helped generate rich perspectives and resources (e.g., links, complementary course materials ranging from songs to scholarly articles to cartoons) which instructors might not ever encounter on campus (Belanger & Thornton, 2013; Roth, 2013). These vast perspectives and resources could later be incorporated by the instructor back into his or her regular on-campus courses; thus enriching the instructor’s own classroom teaching. Moreover, some instructors found the process of preparing MOOC materials such as video lectures a useful way to hone their pedagogical presentation because it was much more challenging to captivate a vast anonymous online audience than a small familiar group of students in a physical classroom (Kolowich, 2013).

Second, some instructors were impressed about MOOC providers such as Coursera’s success in attracting large number of students to sign up for courses taught by professors at other universities and decided to join in the bandwagon by becoming a partner (Roth, 2013). These instructors were mainly motivated by egoistic motives – some hoped to use MOOCs to increase their personal reputation both among colleagues within their discipline and with the media and the general public, to be the first among their peers to offer a MOOC in order to establish himself or herself as an expert in a particular field, to increase their earning power, or to help get tenure (Kolowich, 2013). Indeed, Young (2013), in his interview with six MOOC students, found that when students talked about the courses they had taken, they usually mentioned the professor first rather than the university.

Third, there were other instructors who cited altruism as the reason for offering MOOCs. Altruism may be defined as a motive that increases the welfare of one or more individuals other than oneself (Batson, Ahmad, & Tsang, 2002). Batson et al. (2002) further elaborated that the most commonly proposed source of altruistic motive is empathic emotion; which can be described as other-oriented feelings that are consistent with the perceived welfare of another person. In the case...
of the MOOC instructors, the most commonly cited source of emphatic emotion was the desire to increase student access to higher education worldwide (Kolowich, 2013).

**How instructors try to engage students.** To date, MOOCs may be generally classified into two types of courses, which are known as xMOOCs and cMOOCs (Conole, 2013; Daniel, 2012). Basically, xMOOCs follow a cognitivist-behaviorist approach, and based primarily on video plus multiple-choice quizzes or other types of assignments (Conole, 2013). Examples of xMOOCs include the Introduction to Artificial Intelligence, Machine Learning, Introduction to Databases, and Python Programming and Building a Search Engine courses (Rodriguez, 2012).

Instructors of xMOOCs tend to structure their courses very similar to traditional higher education courses. To engage students, the instructors had a syllabus, along with a course content that typically consisted of readings, discussions via online forums, assign ments which usually consist of quizzes, essays, or projects, and videos of lectures that are pre-recorded by the instructors prior to the lessons (Belanger & Thornton, 2013; Kaul, 2012). The video lectures were generally between 3 and 15 min long. Typically, students would start each week’s lesson by watching the video lectures, read the assigned material such as textbook and articles (usually for free), participate in online discussions with other learners, and complete the quizzes, assignments, or tests on the course material. Students could view and pause the video lectures at their own pace to take notes (Frank, 2012). Students could email the instructors via the course email system or post their questions on the course discussion forums should they have anything to ask. Although instructor participation in discussion forums varied, most instructors tend to post at least once or twice every week (Kolowich, 2013).

Some instructors of xMOOCs strived to further engage their students by incorporating online simulations (e.g., a circuits sandbox), and game-related elements in their courses (Agarwal, 2012; Frank, 2012). Other instructors made use of online office hours to answer selected questions from a pool proposed and voted by students (Martin, 2012; Rodriguez, 2012). There was also an instructor who arranged live exchanges with students via a video chat room, in which six to eight students participated with the instructor in a seminar-style discussion of course readings while thousand other students listened to either the live stream or recordings later (Duneier, 2012).

cMOOCs, on the other hand, are based on a philosophy of connectivism (Daniel, 2012; Rodriguez, 2012). Connectivism has been offered, but has not yet been universally accepted, as a new learning paradigm for a digital age (Bell, 2011; Kop & Hill, 2008). Connectivism basically posits that learning is a process of a student seeking information from human or non-human sources and to share the information with other participants (Siemens, 2004). The main examples of cMOOCs include Connectivism and Connective Knowledge, Personal Learning Environments, MobiMOOC – mobile learning, and EduMOOC – online learning today and tomorrow courses (Rodriguez, 2012).

Instructors of cMOOCs also provided a course outline but the actual course materials and course content were defined by students as the course progressed, rather than defined by the instructors before the course (Rodriguez, 2012). Learner autonomy such as students’ choices of how, and how much to engage with the course is typically emphasized in a cMOOC (Mackness et al., 2010). Consequently, this may result in multiple topics or areas being examined depending on the interests of various students.

In cMOOCs, students were encouraged to create their own personal learning environments and networks of co-learners (Conole, 2013), instead of depending on the instructor for guidance. However, since a course content usually evolves while it is being developed, it becomes difficult for learners to know in advance if a course is suitable for them (Rodriguez, 2012). Further, learning in many cMOOCs was not assessed as it was difficult to give credit when all participants are not doing the same work (Rodriguez, 2012). The role played by an instructor of cMOOCs resembled more a discussion moderator than that of a tutor as played by instructors of xMOOCs (Rodriguez, 2012).

It is important to note that there is a large variety of possible learning and instructional strategies within each of the two general paradigms of MOOCs: xMOOC and cMOOC. We cannot at this moment make any reliable conclusions as to which paradigm is better or more effective than the other.

Finally, although MOOCs have been classified as either xMOOCs or cMOOCs to date, some scholars argue that such a classification is too simplistic. Conole (2013), for example, suggested a MOOC classification scheme that consists of 12 dimensions: the degree of openness, the scale of participation, the amount of use of multimedia, the amount of communication, the extent to which collaboration is included, the type of learner pathway (from learner centered to teacher-centered and highly structured), the level of quality assurance, the extent to which reflection is encouraged, the level of assessment, how informal or formal it is, autonomy, and diversity. However, it is still too early at this moment, to determine how well this new classification scheme would be adopted by other scholars.

**Challenges of teaching MOOC.** Generally, the challenges of teaching MOOCs included the following: (a) a lack of student response in the online discussion; (b) a sensation of speaking into a vacuum due to the absence of student immediate feedback; (c) heavy demands of time and money; and (d) issues about evaluating student work. Allon (2012), for example, found that the online discussion board in his MOOC a disappointment with most threads consisting of little more than a posted question he had answered. Other researchers found that a majority of students, ranging from 85% to 97%, were either lurkers or failed to even access the online discussions (Breslow et al., 2013; Koutropoulos et al., 2012). Some instructors also found it difficult to teach when not facing a real audience of students, particularly when producing video lectures to be recorded and uploaded onto the Internet (Allon, 2012). The experience was like speaking into a vacuum or to a wall without the instant feedback (e.g., bored looks, frowns) that an instructor typically gets from students when they are talking to them in a face-to-face classroom (Roth, 2013).
The demands of time and energy could also pose problems especially to instructors who are untenured or who do not have any grant to support their teaching a MOOC. For example, Karen Head reported that her team spent about 20 h just to plan and develop content for the three lectures offered in a single week, not including the additional eight hours she spent on rehearsing the lectures, four hours to record the videos, and five to 10 days to edit the videos and get Coursera approval (Head, 2013). Other instructors such as Robert Sedgewick spent hundreds of hours preparing the material, and devoted 14 days each to recording and fine-tuning videotaped lectures (Kolowich, 2013). Over at Duke University, Roger Barr and staff reported spending over 620 h of preparation effort, 420 h of course delivery hours, and at least 200 h of teaching assistant’s time, instructional support, technical support, and assessment staff’s time just to run an eight-week MOOC course (Belanger & Thornton, 2013).

Spending so much time and energy on preparing a MOOC, which may count nothing more than a mere line item in a teaching portfolio (Head, 2013), could rob untenured instructors of time to do other duties such as writing and publishing papers, committee service, or traditional teaching. It is therefore not surprising that a survey of 103 instructors who have taught a MOOC revealed that two-thirds of instructors were already tenured, with most having more than a decade of college teaching experience under their belt (Kolowich, 2013). Most respondents also reported that teaching a MOOC distracted them from their normal on-campus duties and responsibilities because many colleges currently do not yet have a protocol to integrate their instructors’ work on MOOCs into normal faculty work flow or classroom teaching load (Kolowich, 2013).

Instructors were also daunted with the prospect of evaluating the work of their students in a MOOC. Since it is close to impossible for an instructor or teaching assistants to assess each written assignment from thousands of students (Head, 2013), some instructors rely on multiple-choice questions which could be easily auto-graded by the computer, while some employ peer assessment. Some instructors, on other hand, do away with assessment completely. In recent years, some universities have been experimenting with the use of computers to grade student essays (Markoff, 2013; Tamar, 2012). Such technology, however, is not perfect. A more detail discussion about the use of automated essay-grading software, as well as peer assessment is provided in the following Discussion section.

4. Discussion

Overall, we found that many of the MOOCs reported in the literature resembled xMOOCs which are similar to the structure of traditional courses run by colleges and universities with pre-recorded video lectures by professors, examinations and/or individual final project (submitted online), and discussions (via online forum). However, the three main differences between many MOOCs and traditional university courses are: the large and diverse student enrollment in MOOCs, the high drop-out rate of MOOCs compared to that of traditional courses, and the relatively lack of instructor presence or support in MOOCs compared to traditional courses. In this section, we discuss two key issues or questions that are currently not fully resolved by current research: the quality of MOOC education, and the assessment of student work. These two issues were chosen because they were the main unresolved concerns surfaced by most of the instructors and students in the articles reviewed. The purpose of identifying such issues is to suggest follow-up research that could help advance the knowledge base on MOOCs in higher education contexts.

4.1. Quality of MOOC education

Ultimately, how effective are MOOCs in helping students learn? Or how to measure the quality or success of a MOOC? Some researchers quantify a MOOC success or quality by measuring students’ learning outcomes. In perhaps one of the very first studies that empirically carried out predictive analyses to investigate what individual student factors might correlate with their success (i.e., grades earned) in a MOOC, Breslow et al. (2013) found no relationship between age and student achievement, or between gender and achievement, or motivation for enrollment and achievement. However, one interesting finding stands out; that is on average, with all other predictors being equal, a student who worked offline with someone else in the class or someone who knows about the subject would have a predicted score almost three points greater than a student working alone (Breslow et al., 2013).

Although this study is only limited to one MOOC and direct causation could not be actually inferred since the data was correlational, it provides some evidence that student support (whether from the instructor or peers) is a crucial part of learning. On the other hand, the finding gives ammunition to critics who say that MOOCs cannot really offer quality education because our review suggests that many MOOCs lack student-instructor support, as well as student–student support. In addition, many professors or teaching assistants do not work offline with their MOOC students. For example, Jacobs (2013) who enrolled in 11 MOOCs found that there was little to no contact with his professors. Student-instructor support is a crucial part of learning because it allows weaker students to raise questions or comments that they are not very sure of, and get their doubts cleared by the instructor, and at the same time challenge the better students (Martin, 2012).

Some instructors have attempted to circumvent the lack of student-instructor support by hiring teaching assistants or experienced students to guide the online discussions. But still with a large student to teacher ratio in a MOOC, how much individual attention can a teaching assistant give to each student to mentor them on their ideas?
Besides the lack of student-instructor support, there is also a lack of student–student (peer) interaction in many MOOCs. Peer interaction may be considered a form of student–student support because when peers interact with one another, they could generate extra activities (e.g., explanation, disagreement, negotiation) as well as additional cognitive mechanisms (e.g., knowledge elicitation and sharing) which may not occur as frequently in individual learning (Dillenbourg, 1999). These extra activities and mechanisms could help broaden students’ own individual understanding and perspective of a particular topic. Currently, our review suggests that many MOOCs offer students the opportunity to interact asynchronously with their peers via a discussion board or forum. However, the mere presence of a forum does not automatically guarantee that active interaction will take place (Cheung & Hew, 2006). Certain elements or factors have to be fostered in order to promote peer interaction via discussion forums. More details and suggestions about these factors have been discussed elsewhere (e.g., Hew & Cheung, 2012).

4.2. Assessment of student work

Issues related to assessment of student work are another set of challenges that remains to be resolved in MOOCs. Three main questions are discussed here. First, what is the value or benefit of using automated essay-grading software in MOOCs (Markoff, 2013; Tamar, 2012)? Because grading student written work is so labor intensive, some instructors are turning to automated grading software for help. A recent study that compared the scores of more than 16,000 middle school and high school test essays graded by people and computers found that computers were capable of scoring essays as well as human beings do (Shermis & Hammer, 2012). Does this mean that the era of computer-grading system has finally arrived? Les Perelman, a director of writing at the Massachusetts Institute of Technology, does not think so. Perelman found that some automated essay-grading software cannot identify truth, can be easily gamed, is vulnerable to test prep, and sets a very limited standard for what good writing is (Winerip, 2012).

Second, how valid is the use of peer assessment in MOOCs? Although peer assessment has been proposed as a means to provide human assessments at scale in MOOCs (Cooper & Sahami, 2013), it is not without problems. An important assumption underpinning the use of peer grading is that peers or fellow students know enough about the subject matter (Rees, 2013). But how valid is such an assumption? Fellow students who are in the same course trying to learn the same subject may not have the necessary knowledge and experience, particularly as far as new topics are concerned. The use of peer grading may therefore lead to uninformed people leading others who are similarly incapable, somewhat like the blind leading the blind. Why then should a student believe the comments of their peers? Indeed as Jacobs (2013) remarked, “Three of my peers graded my paper. They were kind overall, but I bristled at every slight. Who died and made you professor?” (p. 7). In addition, many students really have no idea who their peers are given the large number of enrollment, so why should they really care about what their peers have to say? (Krause, 2013).

Furthermore, peers may not be consistent in their quality of feedback. Some students take the peer grading responsibility seriously and gave meaningful comments but others (usually the majority) are hardly engaged at all (Krause, 2013). Reasons for students’ lack of accountability in peer grading include students are not being graded in any way for the reviews, and that there is no intervention or check from the instructor – hence why bother (Krause, 2013). Moreover, some of the rubric criteria used for peer grading are so poorly defined and are never discussed prior to their usage (Krause, 2013). Studies have shown that students found peer assessment to be undesirable when guidelines for evaluation were not clearly established in the beginning (Dochy et al., 1999). Faced with such ambiguity, a student may be beset by confusion when assessing their peers’ contributions.

Third, how do we eliminate cheating and fraudulent practices (Snyder, 2012; Young, 2012)? Cheating and fraud are, of course, not new issues in online education. But given the great hype over MOOCs, and talk of granting formal course credit to students who succeed in their MOOCs, cheating and fraudulent practices take on a greater significance. Basically, how can one ensure that the individual who submits a piece of work is indeed the person taking the MOOC? Kirschner (2012) reported that despite a nicely written code of honor such as upholding academic honesty and integrity, cheating does happen. One of the ways by which cheating can occur in MOOC is voluntary identity sharing – where a “fake student avatar, now available for a small fee will take your class for you” (Kirschner, 2012, p. B22).

Currently, there are two possible ways to eliminate cheating and fraudulent practices. These two methods, however, are not free but require students to pay some fees. The first method is to sign up for a Signature Track option available with some Coursera courses for a fee of US$49.00 to earn a verified certificate issued by Coursera and the participating university (Signature Track Guidebook, n.d.). The Signature Track option attempts to eliminate cheating by creating a Signature Profile for each student to link a student’s identity to each piece of coursework he or she submits. The Signature Profile is created by recording a student’s unique typing pattern, taking a webcam photo of the student, and taking a webcam photo of the student’s picture ID (e.g., driver’s license). The Signature Profile concept is founded on the assumption that an individual’s typing pattern is unique and different from someone else’s. The students will also need to use a webcam throughout the course. However, it is too soon to establish how really effective the Signature Track option is in curbing cheating. No research study has been conducted yet at the time this paper is written.

The second method, which is probably the only cheat-proof way, is to have proctored assessment where students who have completed a MOOC coursework could go to a specific test location to do the individual exams under a teaching assistant’s or instructor’s supervision.
5. Conclusion

MOOCs have captured the attention of many higher education institutes around the world. To recall, proponents argue that MOOCs can help make education more accessible to as many people as possible, increase an institution’s reach, and enable professors to experiment with the pedagogy of teaching online courses to large number of diverse students. Opponents, however, denounce MOOCs as a potentially harmful and disruptive technology that offer a watered-down education, and increase the risk of further state school budget cuts.

We found evidence to support both sides of the argument to a certain extent. MOOCs can certainly increase an institution’s reach because they tend to attract a large number of students to sign up due to the courses being so easily accessible to anyone around the world with an Internet connection. Our review also suggests that teaching a MOOC can help a professor to experiment with the pedagogy of teaching online courses to large number of diverse students. Some professors have found this experience beneficial in terms of honing their own teaching skills, as well as enriching their on-campus classes.

On the other hand, although MOOCs attract a large number of students to sign up, only about 10% eventually complete the courses. There is also evidence from our review that some students still got good grades from their peers even though they wrote some garbage (Krause, 2013). This gives ammunition to critics who say that MOOCs offer a watered-down education. In addition, although there may be some benefit to professors teaching a MOOC, a word of caution is necessary as we noticed that teaching MOOCs may be a double-edged sword. Since many professors tend to adjust the syllabus as they go along rather than having the whole semester planned nicely before they start (Young, 2013), any lack of planning or ambiguity surfaced during the course really shows. This could really hurt a professor’s reputation as every little glitch tends to be multiplied a thousand-fold or 10,000-fold, resulting in posts of frustration and misinformation in the forum discussions (Young, 2013). However, professors who prepare and manage the course well tend to achieve a level of adoration not likely to be seen in on-campus classes.

At the moment, it seems that MOOCs, if nothing else, are merely another resource for learning, albeit a significantly more interactive content delivery platform as compared to a traditional printed book (Krause, 2013). Just as there is no one perfect method or solution for learning, MOOCs may be a viable avenue for people who are interested in a particular topic to learn something but are not really interested in gaining a credential. However, we doubt it can completely replace face-to-face teaching and learning in on-campus universities or colleges.

Appendix A

Summary of reviewed studies.

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<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Context</th>
<th>Basic findings</th>
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<tbody>
<tr>
<td>Agarwal (2012)</td>
<td>1 student and 1 instructor</td>
<td>'Circuits &amp; Electronics' course from MITx (edX) with certification</td>
<td>Student perspective: purpose of signing up was to increase knowledge. Felt that the MOOC was like taking a real course with online experiments, homework deadlines, midterm, &amp; final. Instructor perspective: Able to learn more about how to engage students in online courses. Found that 2 pedagogical approaches useful: ‘gamification’ of learning and interactive stimulation</td>
</tr>
<tr>
<td>Allon (2012)</td>
<td>1 student and 1 instructor</td>
<td>'Operations Management' course from Northwestern at Udemy</td>
<td>Student perspective: purpose of signing up – develop management skills. Instructor perspective: Found that the discussion board was a disappointment because most threads consisted of little more than a posted question that the instructor had answered. Found that video segments of 5 min apiece helpful to engage students</td>
</tr>
<tr>
<td>Belanger and Thornton (2013)</td>
<td>3,576 participants who responded to the survey</td>
<td>'Bioelectricity: A quantitative approach' at Coursera</td>
<td>Student perspective: Approximately 2/3 of students reported holding at least a Bachelor’s degree. Students signed up mainly due to interest in the topic, personal development, or extending current knowledge. Some factors promoting student completion: desire to gain completion certificate as recognition of accomplishment, gaining knowledge to improve current job performance, support &amp; encouragement from peers or instructor/Tas (typically via the forums), and as a supplement to a credit-bearing course. Barriers to completion: lack of time, insufficient prior knowledge, and difficulty in applying</td>
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### Study Participants Context Basic findings

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<th>Study</th>
<th>Participants</th>
<th>Context</th>
<th>Basic findings</th>
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<tbody>
<tr>
<td>Breslow et al. (2013)</td>
<td>1555,000 people initially enrolled, of which about 7,100 passed the course. 7161 completed the survey.</td>
<td>'Circuits and Electronics' course at edX</td>
<td>Student perspective: purpose of enrollment – gain knowledge, employment/job advancement, and personal challenge to see if they could make it through a MIT course. 90% of activity in the discussion forum resulted from students who merely viewed discussion threads and posts. No relationship between age and student achievement, or between gender and achievement, or motivation for enrollment and achievement. However, on average, with all other predictors being equal, a student who worked offline with someone else in the class or someone who knows about the subject would have a predicted score almost 3 points greater than a student working alone.</td>
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<tr>
<td>Chamberlin and Parish (2011)</td>
<td>2 students</td>
<td>Number and name of MOOCs not mentioned</td>
<td>Instructor perspective: Participation in MOOCs allowed learners to hear from a global voice but found the effort to keep track of the various questions and posts overwhelming. Course credit served as an external incentive to complete MOOCs and improve understanding of the topic. Found the facilitation for many MOOCs surpassed traditional online college coursework. Most MOOCs had weekly synchronous activities such as guest presenter, live weekly recap, Q&amp;A sessions, or project help sessions. But it was hard to actually interact with the guest speaker because the chats were rapid and filled with so many voices at any one time making it difficult to ask a question and get it answered.</td>
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<tr>
<td>Duneier (2012)</td>
<td>1 instructor</td>
<td>'Introductory sociology' course from Princeton University at Coursera (noncredit)</td>
<td>Instructor perspective: found the lack of cues (e.g., bored looks, knowing nods, furrowed brows) disconcerting when recording lectures to be uploaded to the Internet. But the use of forums allowed the instructor to see what issues were most meaningful to the students. Found that the use of live exchanges via a video chat room with 6-8 students from around the world) in a seminar-style discussion of the readings helped the instructor get to know students a little better as well as touch on issues raised in the online postings. Received more feedback on his sociological ideas than in a career of teaching.</td>
</tr>
<tr>
<td>Evans (2012)</td>
<td>1 student and 1 instructor</td>
<td>'Introduction to computer science' from Stanford University at Udacity</td>
<td>Instructor perspective: realized the importance of engaging students so that they would keep coming back. Structured the course around a fun activity – to build a search engine, &amp; had many quizzes &amp; programming exercises. Used short video segments of 2 min each for a total of 90 min per week</td>
</tr>
<tr>
<td>Fini (2009)</td>
<td>83 students</td>
<td>'Conectivsim and Connective Knowledge (CCK08) course</td>
<td>Instructor perspective: found the lack of cues (e.g., bored looks, knowing nods, furrowed brows) disconcerting when recording lectures to be uploaded to the Internet. But the use of forums allowed the instructor to see what issues were most meaningful to the students. Found that the use of live exchanges via a video chat room with 6-8 students from around the world) in a seminar-style discussion of the readings helped the instructor get to know students a little better as well as touch on issues raised in the online postings. Received more feedback on his sociological ideas than in a career of teaching.</td>
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Instructor perspective: The size and diversity of student population helped generate various ideas, links, commentary that enrich the course experience. Found that teaching the course required more time than expected particularly interacting with students, troubleshooting problems, and attending course planning meetings.
### Appendix A (continued)

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<th>Study</th>
<th>Participants</th>
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<tr>
<td>Frank (2012)</td>
<td>1 student</td>
<td>MITx's Online circuit and analysis course</td>
<td><strong>Student perspective:</strong> Felt that participating in the MOOC was comparably very well with a live class. Was impressed by the resources used by the instructor to engage students: online version of textbook, virtual circuit sandbox, and a lively discussion board. Also felt that the ability to pause online video lectures helped him to easily take notes.</td>
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<tr>
<td>Head (2013)</td>
<td>1 instructor</td>
<td>College writing course from Georgia Institute of Technology at Coursera</td>
<td><strong>Instructor perspective:</strong> challenges of designing &amp; teaching a MOOC include: time demands, logistics &amp; technical issues, assessment of student work, safety &amp; privacy issues.</td>
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<tr>
<td>Instructure (2013)</td>
<td>1,834 students</td>
<td>MOOCs at Canvas.net</td>
<td><strong>Student perspective:</strong> About 75% of participants indicated the fact that MOOCs are free as a primary factor in enrolling. About 2/3 of respondents indicated that they would be more likely to complete if MOOCs offered certificates or transferable credit. About 10% who failed to complete reported a lack of incentive as the main reason. About 24% who completed their courses reported being highly engaged in course discussions with peers, compared to only 3% who did not complete. 77% of participants reported holding a bachelor’s degree or higher when signing up.</td>
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<tr>
<td>Jacobs (2013)</td>
<td>1 student</td>
<td>Enrolled in 11 courses, the bulk of which were on Coursera.</td>
<td><strong>Student perspective:</strong> found that most of the MOOCs instructors knowledgeable, organized, and well respected in their field. Believe that MOOCs are creating ‘a breed of A-list celebrity professors who have lopsided sway over the landscape of ideas’, and felt pity for the non-MOOC instructors who may be sidelined. Found that taking MOOCs really put the onus of learning on students as students can choose to view the content or complete assignments at their own time and pace. Had little or no contact with the professors. Reported that peer interactions ranged from merely decent to unsatisfying although there were many ways to connect with other students. Reasons included slow response on the discussion board and off-topic comments. Cheating could a big concern (found a Canadian website with answers for a genetics quiz questions). Most quizzes graded immediately by computer and some were judged by fellow students.</td>
</tr>
<tr>
<td>Kaul (2012)</td>
<td>1 student and 1 instructor</td>
<td>‘Introduction to Finance’ from the University of Michigan at Coursera.</td>
<td><strong>Student perspective:</strong> purpose of signing up was to refresh knowledge. <strong>Instructor perspective:</strong> decided not to interact with students as he feared doing so would take up all his time. Commented on the difficulty of creating tests or assignments that were challenging yet not too hard had been particularly complex.</td>
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<tr>
<td>Kirschner (2012)</td>
<td>1 student</td>
<td>‘Health policy and the affordable care act’ from the University of Pennsylvania at Coursera.</td>
<td><strong>Student perspective:</strong> Found the quality of the online discussions disappointing. Many postings were nasty and long. The instructor was a presence only in videos. Found peer learning inadequate to help in learning the subject. Decided to quit due to other more important priorities.</td>
</tr>
<tr>
<td>Kolowich (2013)</td>
<td>103 instructors</td>
<td>A survey of instructors who have taught a MOOC. A variety of MOOCs covered.</td>
<td><strong>Instructor perspective:</strong> teaching a MOOC is time consuming. Nearly 50% of 103 instructors felt that their MOOCs were as rigorous academically as their classroom versions. 72% did not believe that students who succeed in their MOOCs deserve formal credit from their home institutions. 66% did not believe that their home institutions will eventually grant formal credit to students who succeed in their MOOCs. 55% reported that teaching a MOOC significantly...</td>
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### Study Participants Context Basic findings

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<th>Study</th>
<th>Participants</th>
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<tr>
<td>Kop (2011)</td>
<td>55 PLENK students, number of respondents for critical literacies MOOC not reported</td>
<td>'Critical Literacies' &amp; 'Personal Learning Environments, Networks &amp; Knowledge (PLENK)' MOOCs</td>
<td>caused them to divert time from other duties Students' perspective: About 77% of 55 PLENK students indicated that course resources such as the Daily newsletter, the Moodle, and the wiki were enough to make them understand what the course was all about before starting. Most PLENK participants felt happy to aggregate, relate, and share resources, but only a minority were engaged in the creation of digital artefacts (e.g., blog posts). A majority of PLENK participants aged 49 or above</td>
</tr>
<tr>
<td>Koutropoulos et al. (2012)</td>
<td>Number of students who completed survey not reported</td>
<td>'MobiMOOC' a MOOC structured around mobile learning</td>
<td>13.3% of 536 participants completed the course as active participants. 86.7% were either lurkers or dropped out of the course. No correlation was found between the use of emotive language and the degree of student participation in the online discussions component of the MOOC. Emotive language refers to words or phrases that express some forms of feelings (happy, sad, frustrated)</td>
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<tr>
<td>Krause (2013)</td>
<td>1 student</td>
<td>'Listening to World Music' from Coursera</td>
<td>Student perspective: Professor hardly showed up in the online discussion forum; her graduate assistants were much more present. All grading of written assignments based on peer review without intervention of professor or graduate assistants. Found the experience of peer review something like garbage in/garbage out because no one really cared what a student wrote</td>
</tr>
<tr>
<td>Levy (2011)</td>
<td>1 student</td>
<td>Personal learning environment, networks, and knowledge (PLENK)</td>
<td>Student perspective: Took the course out of curiosity. Found that learning in a MOOC was possible due to the active online interaction among other participants who posted their thoughts, questions, and useful links. Felt that the PLENK course served as a model in which learning occurred without any assessment criteria</td>
</tr>
<tr>
<td>Mackness et al. (2010)</td>
<td>23 participants (actual number of students or instructors not reported)</td>
<td>Connectivism and Conective Knowledge (CCK08)</td>
<td>Student perspective: Students reported mixed satisfaction concerning learner autonomy of the connectivist MOOC. Some liked the autonomy because they could basically do what they wanted without any assessment method put in place. Others longed for some instructor guidance. Some students reported that the quality of peer interaction was poor (e.g., patronizing posts)</td>
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<tr>
<td>Martin (2012)</td>
<td>1 student</td>
<td>Stanford-Al course 'Introduction to AI (CS221)'</td>
<td>Student perspective: one of 23,000 students who completed the course (85.6% dropout rate). Enjoyed and found the experience a lot like a well-taught conventional course. Reasons: video lectures (about 6-7min long each) containing well-explained ideas, checking of students' understanding through quizzes embedded in the lectures that were autograded for correctness followed by further explanation via videos, &amp; use of several online 'online hours' where students submitted questions, then voted on their favorite ones, and answered by the instructors on camera. Later on, used the Stanford-Al MOOC as a flipped classroom for own students at Massachusetts, Lowell</td>
</tr>
<tr>
<td>Rice (2013)</td>
<td>1 student</td>
<td>'Listening to World Music' from Coursera</td>
<td>Student perspective: Reason for signing up – wanting to learn about a new subject. Found nothing odd or extraordinary about the MOOC that one might not already find in a large lecture course in a given university. Did not follow through the MOOC. Reasons included: competing priorities, lecturers offered no interaction with the videos that students were required to watch, discussion forums used only by a few students and went off-track</td>
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### Appendix A (continued)

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<th>Study</th>
<th>Participants</th>
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<tr>
<td>Rodriguez (2012)</td>
<td>1 student</td>
<td>'Connectivism and Connective Knowledge (CCK08)', 'Personal learning environment, networks, and knowledge (PLENK)', 'MobiMOOC' (focused on mobile learning), 'EduMOOC' (on the topic of online learning today... and tomorrow), 'Introduction to AI (CS221)', and 'Building a Search Engine (CS101)';</td>
<td>Student perspective: Compared two types of MOOCs – cognitive-behaviorist MOOCs (CS221, CS101), and connectivist MOOCs (CCK08, PLENK, MobiMOOC, EduMOOC). Geographical spread of participants, big dropout rate.</td>
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<tr>
<td>Roth (2013)</td>
<td>1 instructor</td>
<td>'The Modern and the Postmodern' at Coursera</td>
<td>Instructor perspective: Reason for teaching – intrigued by the prospect of teaching a course with a large international group of people. Found the level of diverse opinions and variety of resources offered by the students impressive and useful.</td>
</tr>
<tr>
<td>Young (2013)</td>
<td>6 hard-core MOOC students</td>
<td>Various MOOCs</td>
<td>Student perspective: Enrollment driven mainly by curiosity. All felt that ambiguous assignments and expectations of courses were the main MOOC problem. Students usually remembered the professor first rather than the university offering the course. Students also wanted some accompanying text materials (e.g., copy of slides, lecture transcripts) instead of lecture videos only since it is hard to go back and search for specific segments of the videos. One student remarked that the level of student commitment was lower in MOOCs.</td>
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### References


The advance of the MOOCs (massive open online courses)
The impending globalisation of business education?
The advance of the MOOCs
(massive open online courses)
The impending globalisation of business education?

Thomas Clarke

UTS Sydney, Sydney, Australia

Abstract
Purpose – The purpose of this paper is to analyse the rapid development of the massive open online courses (MOOCs) and the implications for business education, to critically examine the educational and business models of the MOOCs, to assess their present scale and scalability, and to explore the responses of the universities to this challenge.

Design/methodology/approach – The paper provides an analysis of the origins, structure and orientation of the MOOCs, assesses their future trajectory and compares this development with earlier waves of e-learning.

Findings – The massive open online courses have considerable potential for growth with high quality products supported by leading universities. However they still need to resolve issues other e-learning organisations have faced including assessment, high drop out rates, and how to maintain viability.

Research limitations/implications – The MOOCs remain at a developmental stage, and it is not yet apparent whether their growth trajectories will be as ambitious as anticipated. However they are a definite advance over earlier online learning systems, and are worthy of further research regarding their performance.

Practical implications – The recent origin of the MOOCs involves an idealistic phase that is inspiring, but the question is will it last? Have the MOOCs the resilience to continue to develop as the universities have done over many decades? Further research will be required on this.

Social implications – The MOOCs have immense social implications for access to higher education in both the advanced and developing worlds.

Originality/value – This is one of the first studies of the MOOCs to emerge which compares them with earlier initiatives in e-learning, and considers the adaptive responses of the universities.

Keywords Massive open online courses, Globalization, Business education, Online learning, Education

Paper type Research paper

Introduction
The astonishing idealism and energy manifest in the advance of the Massive Open Online Courses (MOOCs) in 2008 has taken the educational world by storm. The grandeur of the ancient universities and the elan of the new ambitious universities were both shaken to their foundations by the apparent sudden availability – universally – of the highest quality higher education subjects online and free. As edX the Harvard/MIT pioneer of the MOOCs projected this could mean access to the best quality online higher education courses “for anyone, anywhere, anytime”.

The campaign of the MOOCs has focused upon online access for the many people in the advanced economies who were presently marginalised by existing university provision, and the billions of people in the developing world who had little hope of ever entering conventional higher education. However, it did not take anxious vice chancellors long to realise that if free online higher education courses were available from the top global universities, this might quickly erode large elements of their
potential student base load in popular subjects areas such as business education and computer science.

The business models of mainstream universities internationally appear to be in significant danger of being outflanked by the irresistible global advance of the MOOCs. Soothsayers such as Ernst & Young in University of the Future: A Thousand Year Old Industry on the Cusp of Profound Change insisted that “the dominant university model […] a broad-based teaching and research institution, supported by a large asset base and a large, predominantly in-house back office – will prove unviable in all but a few cases over the next 10-15 years. At a minimum, incumbent universities will need to significantly streamline their operations and asset base, at the same time as incorporating new teaching and learning delivery mechanisms, a diffusion of channels to market, and stakeholder expectations for increased impact” (Ernst & Young, 2012, p. 4).

Before we give up the integrity and achievements of a thousand year old university system, perhaps we should ask some questions about the MOOCs, including what are they and what do they hope to achieve? How massive are they and might they become? And what impact will they have on university-based delivery of education? Also worth exploring is the question of whether universities may simply adapt their business model to the existence of the MOOCs, develop and refine their skills in blended learning, and reinvent themselves with additional digital technologies while maintaining the free inquiry, pedagogic quality, and educational ideals conceived as the essence of university existence.

What are the MOOCs?
MOOCs as the name suggests are large-scale initiatives in the provision of online courses. They developed from the increasing expertise of the universities in the use of distance learning and open educational resources. Distance education as an industry has been growing for some decades internationally and clearly has great potential for further expansion, particularly with the advance of the web and broadband technology. However, the problems often associated with distance education are the limited quality of the resources and materials supporting online learning, the interaction of students and academics, the high fees charged by premier online courses, and difficulties with assessment and accreditation. The multiple breakthroughs achieved by the MOOCs include the capacity to assemble some of the finest academics in the leading international universities, to develop what are often superb learning materials, and to offer the courses for free. The MOOC is a supercharged distance learning course:

“A MOOC is an online course with the option of free and open registration, a publicly shared curriculum, and open-ended outcomes. MOOCs integrate social networking, accessible online resources, and are facilitated by leading practitioners in the field of study. Most significantly, MOOCs build on the engagement of learners who self-organise their participation according to learning goals, prior knowledge and skills, and common interests. The term came into being in 2008, though versions of very large open online courses were in existence before that time” (McAuley et al., 2010, p. 10).

MOOCs often presently do not lead to formal qualifications, but are accessible and high-quality courses allowing students to develop valuable knowledge to support their own learning goals. The key attribute of the MOOCs is their scalability, once developed they can have global reach and hundreds of thousands of students can take part in a subject on offer.

The MOOCs remain in a developmental stage, with a number of companies associated with prestigious universities quickly assembling very large consortia of
international universities in support. The existing MOOCs are in the process of extending from a few initial subjects in mathematics, science, computing, social science, economics, finance, and business. The MOOCs presently are largely free to students, though they continue to think through their potential business models.

The development of the MOOCs was a fairly natural outcome of the increasing accessibility of the digital networked world, with vast quantities of information becoming freely available, and networks forming across geographic boundaries. The MOOC has structured this experience into well-prepared subjects which have a specific start and finish date, which students may sign up to online. Typically the subjects will last for some weeks and be presented several times during the course of the year. Subjects will include video lectures, online discussion boards, blogs, wikis, and social networking sites. Support tends to come from the online learning community rather than academics, and if there is any form of assessment it is often either peer-assessment written assignments and computer assessed tests (http://futurelearn.com).

With the largest higher educational establishment, many of the most prestigious universities, and an extensive technological base, the USA has proved the main hub for the development of MOOCs, and 18 leading US universities are now involved in MOOCs consortia, together with a growing number of leading international universities. Three of the largest of the original MOOCs are Coursera, edX, and Udacity. In 2013 they will be joined by Futurelearn based at the open university in the UK which has over 40 years of experience in distance education. A brief explanation of the members, objectives, and approaches of these four principal MOOCs will illustrate this emerging field.

**Coursera**

Coursera is a social enterprise company owned by Andrew Ng and Daphne Koller, partnering with leading universities aiming to educate millions of people “Our technology enables the best professors to teach tens or hundreds of thousands of students. Through this we hope to give access to the world of top-class education that has so far been available only to a select few” (www.coursera.org).

Coursera emphasises the enlightened pedagogy of its approach to learning, and offers immediate feedback to facilitate understanding. Peer assessment is used as a more versatile mode of assessment than automated computer grading. Students are instructed in grading techniques, and taking ideas from crowd sourcing, Coursera can take many ratings of varying degrees of reliability and combine them to secure a more accurate result comparable to an experience teacher’s grading. Also offered are proctored exams via webcam at a small charge. There is a stress on active learning, and partner universities are enabled to offer content online, allowing classes to concentrate on more active learning.

Coursera has had five subjects approved for credit by the American Council on Education, and has extended its university partnerships from the original Stanford, Michigan, Princeton, and Pennsylvania with another 58 universities added by 2013. These partner universities are heavily concentrated in the USA, but include universities also from France, Switzerland, Israel, Germany, Taiwan, Singapore, Italy, Denmark, Mexico, Hong Kong, Scotland, Japan, Spain, and Australia.

**edX**

edX was founded by Harvard University and MIT, with the intention not only of offering interactive study on the web, but researching how students learn and how technology can transform learning both on-campus and world-wide. The president of
edX is Anant Agarwal, formerly director of MIT’s Computer Science and Artificial Intelligence Laboratory. Currently edX offers HarvardX, MITx, and BerkeleyX classes online. In 2013 edX will add WellesleyX, GeorgetownX, and the University of Texas System classes, and will expand internationally in 2014 with classes from McGillX, ANUx, TorontoX, Ecole Polytechnique Federale de LausanneX, and DelftX. The different universities educational content will be available from the same site, and for free. Certificates will be awarded at the discretion of the X university involved, and there is the intention to charge a small fee for certificates. “Improving teaching and learning for students on our campuses is one of our primary goals. Beyond that, we do not have a target group of potential learners, as the goal is to make these courses available to anyone in the world – from any demographic – who has interest in advancing their own knowledge. The only requirement is to have a computer with an internet connection” (www.edx.org).

Udacity
Udacity developed from free computer science classes offered through Stanford University in 2011. It is a private educational enterprise founded by Sebastian Thrun, David Stavens, and Mike Sokolsky with significant funding from venture capital. Like the other MOOCs Udacity is rolling out courses in batches concentrating in fields such as computer science and programming, web development, artificial intelligence, mathematics (with San Jose State University), and entrepreneurship. Three categories of student are identified: high school students preparing for university entry; university students looking for engaging alternatives, and possible options for college credit; and professionals wishing to update skills or shift careers.

Udacity proclaims on its web site that “The lecture is dead” and highly interactive, project-based exercises, and bite-sized videos make learning fun, particularly if they are delivered by recognised experts. The claim is that real-world examples allow learning in context with virtual field trips, and forums creating active communities of scholars, leading to certificates that may advance careers. Essentially the courses consist of several short units consisting of video lectures integrated with quizzes, and some follow-up homework to promote learning by doing. With this formula Udacity has reached students in 203 countries, though a high percentage are concentrated in the USA. Students who complete the subjects can secure a certificate at no cost, but if they take a proctored 75-minute exam with Pearson VUE for $89 this may count towards a more recognisable credential (www.udacity.com).

Futurelearn
Building on the decades of experience of the Open University, Futurelearn is determined to be different to the other major MOOC players. Instead of redirecting existing content Futurelearn will actively engage with people seeking self-enrichment as well as those interested in more formal learning experiences. Simon Nelson the CEO of Futurelearn with a background as head of digital activities at BBC television and radio, argues “The role that entertainment plays in learning is often overlooked. Take a glance at massive open online courses (MOOCs). They’re often very conventional, based on lectures broadcast “at” students, rather than engaging with them. The language can be rarefied and niche [ask most people the meaning of “MOOC” or “pedagogy” and they wouldn’t have a clue]. Perhaps this partly explains the enormous drop-out rates and why many of those completing MOOCs are practicing academics who are familiar with the culture and semantics” (http://futurelearn.com).
While based at the Open University, Futurelearn Ltd has signed up the following UK universities as members of the consortium Bath, Birmingham, Bristol, Cardiff, East Anglia, Exeter, King’s College London, Lancaster, Leeds, Leicester, Nottingham, Queens Belfast, Reading, Southampton, St Andrews, and Warwick. Another powerful ally for Futurelearn is the British Library. The first Futurelearn subjects will be launched in 2013, with the backing of the UK government interest in reaching rapidly emerging economies including Brazil, India, and China.

In summary the MOOCs appear well equipped to connect with the digital generation who prefer to parallel process and multi-task, prefer video and graphics before text, and function best when fully networked (Prensky, 2001; Clarke and Clarke, 2009). As Gottfredson (2011) argues the learner of today is impatient and performance driven: “The actual nature of twenty-first century learners is resistant to learning options that are delayed and removed from the here and now. They are self-directed, adaptive, and collaborative in their approach to learning. These kinds of learners will ultimately abandon outright our formal learning solutions if what we provide them fails to efficiently prepare them to effectively perform at their moments of “Apply”. Why? Because when facing a traditional course that fails to do this, today’s learners are predisposed to simply walk away and look elsewhere for the shortest path to successful performance”. The MOOCs may appeal more readily to the multi-media networked simultaneity of digital learners than the more thoughtful and sequential approach of mainstream education (Table I).

In terms of educational philosophy the MOOCs embody much of what George Siemens has defined as connectivism – a theory of learning for the digital age. Fortunately Siemens and Downes have presented their theory in a MOOC called Connectivism and Connected Knowledge 2011 (CCK11). They suggest what we learn has changed, how we learn, and where we learn. For Siemens and Downes learning and knowledge rest in the diversity of opinions, is a process of connecting, and nurturing connections for continual learning. This theory of learning contrasts with behaviourism where the stimulus/response of observable behaviour involved in task-based learning is the focus; cognitivism where learning is understood to be

<table>
<thead>
<tr>
<th>Digital native learners</th>
<th>Digital immigrant teachers</th>
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</thead>
<tbody>
<tr>
<td>Prefer receiving information quickly from multiple multimedia sources</td>
<td>Prefer slow and controlled release of information from limited sources</td>
</tr>
<tr>
<td>Prefer parallel processing and multi-tasking</td>
<td>Prefer singular processing and single or limited tasking</td>
</tr>
<tr>
<td>Prefer processing pictures, sounds and video before text</td>
<td>Prefer to provide text before pictures, sounds and video</td>
</tr>
<tr>
<td>Prefer random access to hyperlinked multimedia information</td>
<td>Prefer to provide information linearly, logically and sequentially</td>
</tr>
<tr>
<td>Prefer to interact/network simultaneously with many others</td>
<td>Prefer students to work independently rather than network and interact</td>
</tr>
<tr>
<td>Prefer to learn “just-in-time”</td>
<td>Prefer to teach “just-in-case” (it is on the exam)</td>
</tr>
<tr>
<td>Prefer instant gratification and instant rewards</td>
<td>Prefer deferred gratification and deferred rewards</td>
</tr>
<tr>
<td>Prefer learning that is relevant, instantly useful and fun</td>
<td>Prefer to teach to the curriculum guide and standardised tests</td>
</tr>
</tbody>
</table>

**Sources:** Ian Jukes and Anita Dosaj, The InfoSavvy Group, February 2003, cited in Dosaj A. (2007)
structured and computational involving encoding, storage and retrieval; and constructivism where social meaning is created by learners engagement and participation in social and cultural contexts.

**How massive are the MOOCs?**
The main MOOCs are contemplating student numbers reaching into the millions world-wide, and edX has contemplated ultimately reaching one billion students. The figures claimed for the three main MOOCs in 2012 are included in Table II. At first sight these numbers do appear stunning, with some subjects enrolling over 100,000 students the first time they were offered. However, the figures of student numbers claimed by the MOOCs are highly speculative, and may include students who do not complete their subjects (Vogel, 2012). Indeed some of these students may have had little more than a passing curiosity rather than any real commitment to learn.

In fact, though the MOOCs clearly have a potential to grow immensely, these figures as they stand are similar to what was achieved during the last wave of e-learning euphoria in the early 2000s, when John Chambers, the CEO of Cisco (the provider of much of the internet hardware that supports e-learning) insisted that the scale of networked traffic generated by e-learning would make the exchange of e-mail messages look like a rounding error (Economist, 2001; Clarke and Hermens, 2001; Kenny et al., 2004). During this earlier wave all of the US investment banks in the late 1990s and early 2000s extended the hype cycle from the adventures of dot.com companies directly into e-learning: Merrill Lynch, Goldman Sachs, Bank of America Securities, Hambrecht and Co, Sun Trust, and many others relentlessly spruiked the e-learning industry as destined for fabulous growth trajectories and mouth-watering revenue streams. Identifying the US education and training industry as worth $772 billion in 2000, the second largest sector of the US economy at 9 per cent, next only to healthcare, investment banks could not wait to secure a piece of this action: “By our estimates, the e-knowledge market will reach $53.3 billion by 2003 from $9.4 billion in 1999, growing at a CAGR of 54 per cent. Web-based corporate learning should enjoy explosive growth, measuring $11.4 billion by 2003, up from $550 million in 1998, an 83 per cent CAGR” (Merrill Lynch, 2000, p. 4).

 Goldman Sachs (2000) was even more effusive insisting the internet is revolutionising education: “The market opportunity for e-Learning is vast. A broad measure of e-Learning’s potential is the approximately $646 billion spent on corporate training, higher education, and K-12 schooling in the USA in 1999. While e-Learning will never capture 100 per cent of this market, we believe that it can generate billions in new wealth for investors off relatively small market shares. Solid fundamentals and economic models foretell sustainable profitability for e-Learning companies. Propelled by the enormous possibilities unlocked by the internet, e-Learning can deliver more value at less cost than traditional education. This competitive advantage, coupled with high-operating leverage for e-Learning companies, should translate into high margins and returns on capital in the industry” (Goldman Sachs, 2000, p. 1).

<table>
<thead>
<tr>
<th>MOOC</th>
<th>Student numbers 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursera</td>
<td>2,926,062</td>
</tr>
<tr>
<td>edX</td>
<td>500,000</td>
</tr>
<tr>
<td>Udacity</td>
<td>400,000</td>
</tr>
</tbody>
</table>

**Table II.** The scale of the MOOCs
In a thorough review of the e-learning sector at the time Hambrecht & Co (2000) claimed: “Corporate e-learning is one of the fastest growing and, we believe, most promising markets in the education industry. While the market is currently relatively small and early stage, it is poised to explode. We expect the online training market to nearly double in size every year through 2003, reaching approximately $11.5 billion by that time. Investment opportunities in online pure plays will emerge, as numerous e-learning companies are now preparing to tap the public markets” (Hambrecht & Co, 2000, p. 1). Hambrecht happily quoted one authority: “Education is about to change. Fundamentally. Why? Because almost everything we know about education is up for grabs: the way it is funded, designed, managed, and even delivered. Around the world, wholesale efforts at education reform are already underway; and [...] these changes are taking place in “internet time”. This is the new education economy – the global education economy” (Hambrecht & Co, 2000, p.4). Yet of the 46 most promising e-learning companies involved in delivery of technology, services or content identified in the comprehensive Hambrecht & Co survey in (2000), Cross (2011) could only find evidence of six still in existence in 2010, and most of these had morphed from being learning technology companies into social network companies.

Will the MOOCs experience the same fate as these earlier entrepreneurial efforts to change the face of education overnight with e-learning technology? Hopefully the MOOCs are built on more solid educational foundations and ideals: the MOOCs are offering at this stage provision of a valuable educational service for free, they have a vital connection to distinguished universities, and they have a global vision of educating the masses which fits well with the transformation towards a knowledge economy. Most importantly much of the broadband technology that was in its infancy a decade ago is now more extensively available, with an unimaginable array of software tools and rich content to fuel the educational aspirations of the new digital generation. If well conceived and delivered, the MOOCs could be at the forefront of the globalisation of higher education though they do have many issues to negotiate first, and could lose their way as the early pioneers of e-learning largely did.

There are many issues that remain to be resolved including problems with assessment, plagiarism, and high drop-out rates encountered at MOOCs. The simultaneous pursuit of ideals to educate the world with excellent products, while commercially surviving in order to be able to do so will test the MOOCs resilience: as Simon Nelson the CEO of Futurelearn nobly states, “We are looking at ways of monetising some aspects of Futurelearn including paid-for certification and proctored exams but the quality of the learning experience trumps profitability as our biggest driver every time”. At Coursera they are engaging in brainstorming with their participating universities to discover new ways to generate revenue, looking at ways such as certification fees, employment introductions, tutoring, sponsorship, and tuition fees. While venture capital is available, and universities are willing to share their resources, the advance of the MOOCs is assured, however, if they do face serious pressures to generate revenue, then fee income for some courses at least will be likely.

A residual set of problems are those that impacted on the first e-learning wave including an unquestioning belief that digital and online will be a superior experience for students compared to face to face, when often it is not. Related to this is the common misunderstanding of the extent of resourcing and experience required to produce high-quality e-learning materials. An expert in the e-learning field Michael Moore (2003) has stated that “the current exuberance for practicing distance education is in the dark,
uninformed by theory and research, is tragic, particularly from the point of view of students who are being served up with programs that fall far short of what informed people should be able to deliver, but also for administrators and policymakers who have put far too much faith in new communications technologies and missed the point that good-quality distance education requires changes in organisational structures and pedagogical methods” (Moore 2003).

Moore insisted “My experience as a consultant to a wide range of institutions, states, national governments, and international agencies over several decades has led me to conclude that an impatience for moving to action without adequate comprehension of previous experience characterises not only the research but virtually all American practice in this field” (Moore and Anderson, 2003, p. x).

**What impact will the MOOCs have on business education?**

In the context of the previous experience of investments in e-learning, and the issues still be resolved by the new exuberant generation of MOOCs, it will be advisable for universities to adopt a measured approach to developing their responses. One response that would be scarcely rational would be to ignore the existence of the MOOCs and hope an orthodox commitment to mainstream university higher education will continue impervious to the transformations evidently occurring. While many of the surveys of the current advance of online learning seem heavily committed to the e-learning industry (Allen and Seaman, 2013), there are other surveys that suggest it is time to take stock. For example, the US Department of Education (2012) in a meta-analysis of online learning studies, found that with the wide range of Web resources, including not only multi-media, but Web-based applications and new collaboration technologies that the relative efficacy of online and face to face instruction needs to be revisited.

Possible strategies for universities thinking through the challenge of the MOOCs might include:

- launching their own MOOC – though this would require major resourcing and an international network to build an effective consortium;
- joining an existing MOOC consortium – though the question is which MOOCs is really going to excel (some universities have covered their bets by joining several MOOC consortia);
- ensuring all courses and subjects taught by the university are up to MOOC standards in content quality, technological sophistication, and employ blended learning throughout; and
- emphasising the distinctive qualities of face to face, applied university education with peer group collaboration and the unique experience of campus living for personal development.

What is clear is that for many years in the future universities will be developing and applying different approaches to blending technology with face to face learning (Table III). The proliferation of technology and software tools provides a powerful platform which universities can use just as well as the most advanced MOOCs to enrich the learning experiences including Twitter, YouTube, Google Docs, Google Search, WordPress, Dropbox, Skype, PowerPoint, Facebook, Wikipedia, Moodle, Evernote, Slideshare, Prezi, and many others (Centre for Learning and Performance Technologies, 2012).

Perhaps a Web 2.0 approach to business education as with other disciplines will flourish. Dede (2005, 2008) has called for higher education institutions to base their
strategic investments on developing emerging educational technologies to match the increasingly neo-millennial learning styles of their students. “Based on mediated immersion in distributed-learning communities, these emerging learning styles include:

- fluency in multiple media and in simulation-based virtual settings;
- communal learning involving diverse, tacit, situated experience, with knowledge distributed across a community, and a context as well as within an individual;
- a balance among experiential learning, guided mentoring, and collective reflection;
- expression through non-linear, associational webs of representations; and
- co-design of learning experiences personalised to individual needs and preferences” (Dede 2008).

Dede proposes the necessary strategic investment in technical infrastructure includes infusing wireless networking throughout the campus and creating multi-purpose habitats personalisable by students. Already many contemporary universities have adopted these approaches in large parts of their provision and across the campus. Essentially universities are gradually morphing into mass online campuses in their own right, though maintaining the wonder of face to face encounters, and a role for the most flexible, interactive, intelligent, and responsive pedagogic technology of all – the teacher.

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Further reading


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