Preface

MASSIVE OPEN ONLINE COURSES: AN OVERVIEW

Massive Open Online Courses (MOOCs) is the term emerged in 2008 for a particular type of open online course format. In these courses, students have the opportunity to engage with other people from all over the World, taking into consideration each person’s learning goals and interests.

“Massive” means that MOOCs easily accommodate large number of students who self-organize their participation according to their own learning objectives, prior knowledge and skills, and common interests. It is considered “Open” because it is open to everyone. Generally it has no fees, no prerequisites other than Internet access and interest, no predefined expectations for participation, and no formal evaluation and accreditation. “Online” because everything happens on the web and “Course” because it is a structure of learning. It brings together people interested in learning and an expert or experts who seek to facilitate learning. It might take place over 4 to 10 weeks, of which most are given to learning, and a final week or fortnight to produce something, sometimes a video. Participation is voluntary and it depends on the individual interest. Usually students dedicate two to six hours a week to the course although a small cohort of highly engaged learners may be much more committed.

Collaboration in MOOC can occur using different platforms and technologies (Liyanagunawardena et al, 2013). Furthermore, MOOCs also mean the use of several means and channels pedagogically, to involve student in the learning process. Many MOOCs use video lectures, combining the old form of teaching with new technology. As Sebastien Thrun (started Udacity with AI-Stanford course) testified on November 26, 2012, at the National Academies of Science, MOOC “courses are ‘designed to be challenges,’ not lectures, and the amount of data generated from these assessments can be evaluated ‘massively using machine learning’ at work behind the scenes”. “This approach”, he said, dispels ‘the medieval set of myths’ guiding teacher efficacy and student outcomes, and replaces it with evidence-based, ‘modern, data-driven’ educational methodologies that may be the instruments responsible for a ‘fundamental transformation of education’ itself” (Bohle, 2013).

Although the fact those MOOCs are relatively recent, in the last 5 years millions of people followed them. In October 2014 the number of courses offered under this format (or at least designated as MOOC) was more than 2200 (Cf. https://www.mooc-list.com/). The providers offering the highest number of MOOC were Coursera with 683, followed by Saylor.org (284 courses), edx (215 courses) and Canvas.net (166 courses). The number of MOOC providers was, at that date, 57.

These courses were so successful in terms of being so attractive and innovative that in 2012 the New York Times designated that year as the “Year of MOOC”. All Universities, a little bit all over the World, wanted to offer a MOOC or at least be connected with this way of providing education. Furthermore,
when these courses appeared, they were full of promises that would “revolutionize higher education”. The areas that were carrying more promises included increased options for accessibility, increased potential for student engagement, and expanded lifelong learning opportunities (Carr, 2012; Duderstadt, 2012).

**BENEFITS OF MOOCs**

In crafting an institutional strategy around MOOCs there are a number of benefits that those institutions involved have already discovered. Such as:

- Consistent with institutional goals
- Allow institutional exposure and positioning
- Serve current students
- Attract students
- Ready for learning revolution
- Represent opportunities for public service
- Represent opportunities for research

These courses can contribute for the educational level of population. According to Lindsay (2014) they do provide some benefits in the educational arena - primarily in the realm of continuing education, and as educational outreach that has potential to reach wider audiences than are possible with traditional courses. Beyond MOOCs conventional lifelong learning experiences, educational opportunities exist for underprivileged populations as a way to encourage lifelong learning. In addition, employers can utilize MOOCs to keep employees abreast of the competitive labor market throughout their lifetime and in a way that is cost-effective (Chen, Barnett, and Stephens 2013:6).

So far, however, the financial justification in hard dollars is illusive and unlikely to be realized in the near future. But the power of MOOCs generally resides in the fact that they are at the cutting edge of a number of opportunities for institutions to extend their reach and influence. It will be a challenge to translate these “soft” benefits into “hard” dollars in terms of the investments that must be made in MOOCs.

The emergent, self-defined nature of the MOOC capitalizes on the strengths that individuals bring to it in terms of their experiences, knowledge, skills with a range of collaborative software environments and perhaps most importantly, with the “soft skills” essential for successful negotiation and collaboration. In all these dimensions, successful participation in a MOOC parallels and scaffolds successful participation in the larger digital economy. Web 2.0 capacities to connect, share, collaborate, and network have given rise to social media platforms such as Twitter, Flickr, Facebook, LinkedIn, blogs, wikis, podcasts, and countless others. These platforms, which all involve the capacity to build and leverage both financial and social capital, are a part of the digital economy and of many people’s regular lives. The digital realm is no longer the sole purview of the ICT sector.

**CHALLENGES OF MOOCs**

Although the attractiveness and motivation to enroll in a MOOC, these courses also face some challenges. Since they are massive by definition, they are able to attract a variety of students with different
learning style from all over the world. This represents a challenge for instructors to engage students, maintain their interest in the course, and tailor the learning environment to fit the need of each student (Chen, Barnett, and Stephens, 2013). Besides this, the fact that they are massive signifies that lecturers / instructors do not have the time to grade everyone’s work and provide a customized approach. This means that the task of assessments must be outsourced to either machines or peers. Computers are good at objective-based questions with fixed answers, but beyond that, they are prone to error (Mori, 2013). However if computers and machines can be a good solution for more objective topics, what about art and poetry? And creativity? One possible solution could be a combined system where instructors can adapt and assign MOOC content (lectures and objective-based questions) much in the same way they currently assign textbook readings and problem sets. They themselves can then grade subjective content and give personal feedback (Mori, 2013).

Other challenge is the assessment of student performance (Rodriguez, 2012). Cheating presents a major challenge of online education (Carr, 2012) and one of the questions widely discussed is how to validate original work to prevent or detect plagiarism.

Moreover, MOOCs are plagued with low completion rates (Liyanagunawardena et al, 2013; Goral, 2013) and little evidence that they help the neediest, underserved populations they were supposed to most benefit. When looking at MOOCs more broadly, one study gathered publicly reported data from 29 MOOCs and found an average completion rate of 6.8 percent (with range of 0.8 percent to 19.2 percent in the different courses). Another study by the University of Pennsylvania looked at 16 of their MOOCs and found course completion rates averaging 4 percent (with a range of 2 percent-14 percent). In general, higher completion rates were found in courses that only utilized automatically graded assessments without requiring peer assessment and had a lower workload, and fewer homework assignments (Lindsay, 2014).

Another challenge concerns the target of MOOC. In fact the question is: who is actually enrolling in the classes? A study by Christensen et al. (2013) examined 32 MOOCs offered by the University of Pennsylvania and reported that “83.0 percent of students have a post-secondary degree (2 or 4 years), 79.4 percent of students have a Bachelor’s degree or higher and 44.2 percent report education beyond a Bachelor’s degree” (op.cit.: 4).

This kind of courses also requires rigorous attention to detail, with long hours of preparation and instruction (Kellog, 2013). Another problem concerns accreditation. MOOC providers such as Coursera, edX, and Udacity typically provide certificates of achievement rather than college credit, although this scenario might change as more and more courses seek accreditation (Goral, 2013). Coursera, currently partnered with 70 institutions, announced in 2013 that it would work with the American Council on Education (ACE) to evaluate credit equivalency for its courses. Georgia Tech announced in May 2013 that it would offer the first accredited MOOC-based master’s degree in computer science via a partnership with Udacity and AT&T (Goral, 2013).

Motivation is also identified as an important contributor to student engagement in a MOOC. One may ask what is the motivation to participate? This is a problem since not all people is intrinsically motivated or can find the right motivation to complete MOOC. From the perspective of the institution, one of the biggest problems is revenue and sustainability (Goral, 2013). Since these courses and materials are typically provided free to students, the question of how these programs will sustain themselves may be a big problem.

Other concerns are related for instance, with technology, since there is a need of good internet connection, the language since the majority of MOOC are in English (which is not spoken and understood by all potential clients), copyright issues, the need for teacher training and pedagogical innovation, the
need for support for teachers helping them to develop new competences, the need for support and tutoring students since it is difficult if not impossible to provide customized feedback for such big classes. Other questions may be: who owns the data that is in the platform, how quality assurance is provided? What business model to adopt?

All these factors might have contributed to some disillusion that exists now when we refer or discuss MOOC. In fact if we take a closer look at the Gartner hype cycle concerning MOOC we realize that while in 2012 MOOCs were almost at the top of the curve, in ascending position, nowadays they occupy the descending curve, still without the perspective of inverting the situation. Taking into consideration that the number of providers increases everyday as well as the number of attendees, we believe that MOOC will remain in the market. Probably a lot of things will change – the way they are offered, if they will remain massive or not and even open, the business model, the pedagogical approach, the quality and certification of courses, just to mention a few concerns.

Of course the discussion about MOOCs does not end here. A lot of questions emerge as we reflect about this new approach of education and training. In fact, MOOCs will shift from degree-based courses to curricula (groups of courses) designed for non-degree seeking audiences. They will form the basis for learning communities organized in a way to popular informal book clubs.

The reasons presented above constituted the basis to invite some authors to reflect about this topic.

In this book, readers will find a set of papers reflecting and discussing the role of MOOC, the business model that should or could be adopted, the pedagogical approaches that should be used and even the role of MOOC in traditional and face-to-face courses. The offer of a MOOC solution always involves technology but also new pedagogical methodologies. The characteristics of these courses lead us to reflect on business model and quality framework used. In this book, readers will be emerged in a deep discussion regarding MOOCs: What do they mean, how do they will change the learning process, the role of teachers, the concept of classroom, the educational market as well as an useful support to those wishing to create and promote a MOOC for a higher education institution.

**THIS BOOK**

In this book readers will find a set of MOOC experiences including the discussion of the enablers and constraints that may arise while developing and implementing those kinds of solutions.

This book is organized in 4 sections, each one covering a specific topic concerning MOOC.

**Section 1: Reflection on the Role of MOOCs**

MOOCs are a phenomena that demands an answer from higher education institutions. This issue is discussed in the first chapter of the book, *MOOCs - a Challenge or an Opportunity for Existing Traditional and Online Programmes*? It presents a discussion on whether universities should create MOOCs, create MOOCs by themselves or use existing ones. It presents also a debate on how MOOCs can be embedded in a current course and how they can be used to create learning networks that can be suitable to students’ preferences (adaptive learning) and cultural differences. This reflection may reveal a fracture, or disaggregation, in the current higher educating system. MOOCs environments will allow learners to have a greater choice and reduce the costs of obtaining accredited degrees.
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The second chapter Redemption through MOOCs?: Valuing Aggregation and Pricing Disaggregation in Higher Education Markets explores the opportunities and challenges presented by MOOCs and the economic and educational implications of a proposed disaggregation in the higher education system.

Often, higher education is a first step for lifelong learning, thus it is also important to reflect on how MOOCs can support continuing education. The chapter The use of MOOCs in the Continuing Education of Individuals and Organizations examines the use of MOOCs in the continuing education of engineers and scientists in knowledge-intensive workplaces, as well as, their possible contribution to organisations in the knowledge economy. The value and need of informal and continuing education is discussed, followed by the discussion of learning in this modern, networked and globalised landscape created by the evolution of Information and Communication Technology.

In parallel to these different approaches of how to use MOOCs systems, it is also important to reflect on the financial explorations. Thus, in the chapter MOOCs Business Models various business models being used by different MOOCs are provided along with some future monetization strategies for MOOC providers.

Section 2: Pedagogical Concerns in MOOCs

In the equation of MOOC or not to MOOC many requirements should be taken into account. The chapter Requirements Capture Analysis for MOOCS in Higher Education invites to reflect on how MOOCs can become main stream and considers the requirements that such systems should meet, both for students and for Higher Education (tertiary) institutions. This chapter considers requirements for students of Open and Free Access and the need for high quality materials. Furthermore, it considers how computer science approaches for requirements capture can be used to identify features for MOOC and shows how these platforms can fit into blended learning.

As a course, MOOC should offer a structure of learning supported on different learning theories. As a disruptive phenomenon, several challenges remain to be tackled to enable materializing the promise of inclusiveness and equality in access to learning that is brought by MOOCs, including learner autonomy, presence (cognitive, social and teacher’s) and critical literacies, as well as recognition, validation and accreditation. These issues are discussed in the chapter Learning Theories Supporting Massive Open Online Courses.

The pedagogical structure of a MOOC may also rely on the availability of high quality learning objects or Open Educational resources (OERs). Thus, the chapter Learning Objects in MOOC provides a background to learning objects and MOOC and looks at good practices in the design, development and management of learning objects in MOOC.

Beyond learning objects, most online courses, includes learning activities. The chapter Assessment Activities in MOOCs presents an analysis of different implications of the new MOOC paradigm in assessment activities, emphasizing the differences with respect to other non MOOC educational technology environments and giving an insight about the redesign of assessment activities for MOOCs. The chapter also compares the different assessment activities that are available in some of the most used MOOC platforms at present. In addition, the process of design of MOOC assessment activities is examined. Specific examples are given about how to design and create different types of assessment activities. The
Genghis authoring tool as a solution for the creation of some types of exercises in the Khan Academy platform is presented. Finally, there is an analysis of the learning analytics features related to assessment activities that are present in MOOCs. Moreover, some guidelines are provided about how to interpret and take advantage of this information.

The big step ahead in linking OER and low cost higher education is making the connection between open content and academic credit. Many parts of this puzzle are on the table. There are many open “channels” for open course and curricula. These channels include YouTube, iTunesU, Coursera, Udacity, edX, and individual institutional OCW sites. This is the beginning of how these open educational resources can be used by students to gain credit. The first step is to create learning assessments that can be administered to students in order to verify that they have mastered the subject. Allied with the assessment is student authentication issue—how can institutions verify that there is no cheating on the assessments? The first connections were made between individual institutions and particular sets of open material.

Still in this section, the last chapter Using Visualization to Understand Transformations in Learning and Design in MOOCs presents an approach to research, and on how to use visualization for reflection (which serves the learner but can feed research). It provides one way to support, scaffold, and open up the potential for learners (and others) to explore a range of participants’ reactions and strategies for making the most of emergent and transformative learning in MOOCs. In the process it gives voice to learners on their own terms – to explore and articulate the fascinating but difficult aspects of such learning.

Section 3: Case Studies about MOOC

In order to promote the inductive process of knowledge creation, this book also presents some specific case studies. Thus, the chapter MOOC Bullying in schools: The First Experience in a Portuguese Tertiary Institution describes the first experience of MOOC performed in a Portuguese tertiary institution. This case study reflects on the classification of readers in origin and typology concept; the construction of the course in its pedagogical aspect, the connectivist exploration and inspiration; the presentation and discussion of results of the evaluation performed by the participants; strengths and weaknesses that allow taking important lessons to be applied in future MOOCs.

Another case study is presented on the special field of learning language. The chapter Toward Mobile Assisted Language MOOCs introduces the novel field of Mobile Assisted Language MOOCs (or what the authors define as MALMOOCs). Authors present the application of MOOCs in the development of foreign language capabilities and its suitability to the main principles of modern foreign language pedagogy. MALMOOCs are presented as a novel form of these courses that is argued to have an enormous potential to enhance foreign language learning, based upon the inherently mobile nature of modern life in combination with the affordances of mobile devices for language learning.

These cases demonstrate that the essential role of teachers in online learning is lead by autonomy. Teachers have to choose the pedagogical model. Learners may follow the same path for the same goal, have the same learning resources defined by teacher or learners may develop skills and autonomy. This is the MOOC pedagogical model where students decide what to learn, their learning path, their learning resources and competences to be developed. The role of the tutor is key to ensuring an effective educational experience in online learning.
Section 4: Bridge between MOOC and Work

The last chapter Massive Open Online Courses Assisted Mechatronics Learning: A Hybrid Approach presents a MOOC as an assistant platform to rebuild a particular course structure in order to tie education more closely to work.

This book, prepared for researchers, practitioners and those interested in participating in a MOOC, addresses a very new and emergent way of using technologies in learning. MOOCs represent a challenge for all the factors and aspects of the teaching and learning process. And so far there are more questions than answers in the literature. In this book editors selected some prominent works dealing with some of the aspects involved and discuss their impact in the process.

As a final comment we would like to say that it was a challenge for the editors to compile these articles and we hope that readers will enjoy reading it as much we enjoyed organizing these reflections.

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