

Chapter 2

Lessons Learned Through Massive Open Online Courses

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Abstract Despite being a relatively modern educational phenomenon, massive open online courses (MOOCs) are garnering considerable attention in the media, with universities in particular paying heed to these courses because of the opportunity they present.

Broadly speaking, MOOCs are an extension of current long-distance learning courses, and pave the way for new business models that include elements of open education, separating the concepts of teaching and assessment.

Key considerations for the deployment of a MOOC at an educational institution are the course's value proposition, the implementation of an adequate technological platform, the choice of a teaching model to ensure learning, care in maintaining the quality of the course material, recognition of learning acquired by students, and a sustainable business model.

The proliferation of courses run by prestigious institutions offering high-quality open learning material is giving rise to the “universalisation” of knowledge; a scenario in which institutions with lesser reputation will increasingly encounter difficulties to compete. Granting students a pivotal role in the education process, and welcoming their influence on the design and orientation of course contents as well as the way

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educators adapt learning approaches, may represent a valid strategy in the quest for differentiation in a highly competitive environment.

2.1 Introduction

Massive open online courses (MOOCs) embody an educational process that serves a huge number of people worldwide, and that has sparked massive interest from governments, educational institutions, and commercial enterprises. Following their boom in popularity some years ago, a large number of platforms offering university-affiliated and unaffiliated MOOCs have sprung up. More and more institutions are beginning to experiment with MOOCs, with the aim of widening access, promoting the institution and its brand, and discovering a way of augmenting sources of financing for the future (Yuan and Powell 2013).

MOOCs are defined as long-distance courses devised for a large number of students (in theory, unlimited), that are open, global, and participative.

The term “open” is a key concept nowadays. The two most important aspects of the open concept have to do with making content fully available over the Internet, and imposing the fewest possible restrictions on students in terms of requiring technical, legal, and financial resources (OECD 2008).

In general, these courses are free of charge. Nonetheless, in the medium term, institutions can generate some kind of income if, for instance, students wish to obtain certificates recognising their participation in these courses.

For students, the lure of learning in dynamic surroundings from top academics, together with these courses’ backing from renowned educational institutions, gives MOOCs a strong value proposition that is worthy of further examination. Meanwhile, for institutions, the chance of gaining direct access to a group of students who have already demonstrated a sufficient degree of involvement during the course offers numerous advantages associated with cross-selling to this collective and the value of these students’ feedback to help plan subsequent editions of the course.

2.1.1 *History and Key Features of MOOCs*

The term massive open online course (MOOC) was coined in 2008 by Dave Cormier (2008) to refer to the course, “Connectivism and Connective Knowledge [CCK08]”, at the University of Manitoba (Canada), led by the lecturers George Siemens and Stephen Downes. This course was offered to 25 official students, and some 2,300 additional students participated free of charge on an open basis.

Some time afterwards, Sebastian Thrun and his colleagues at Stanford University provided open access to the standard university course, “Introduction to Artificial Intelligence”, on which 160,000 students from 190 countries enrolled.

Since then, many higher education institutions that wish to keep pace with other prestigious establishments and emulate them as they ride the popularity wave of this educational phenomenon have adopted MOOCs.

MOOCs are free to access, open to an unlimited number of participants, generally offer no qualification for participants paying no fee, and run from a technological platform that enables the distribution of course material and appraisal of students.

On the other hand, connective MOOCs (cMOOCs), such as that of Siemens and Downes, consist of an instructional design that seeks to create discussion and participation amongst students. This approach places the student and the connections made during the course at the centre of the learning process, which means that enrollees can follow their own learning roadmap and are in fact responsible for creating the majority of the course material.

Conversely, Thurn's (Udacity, Coursera, Edx, etc.) non-connectivist MOOCs, or xMOOCs, rely on contents that have the backing of the host institution, and that essentially consist of self-study and self-assessment material, which somewhat restricts students' freedom to determine which direction the course will take.

2.2 Implementing MOOCs at an Educational Institution

Institutions wishing to implement a MOOCs project must devise a strategy that covers six main areas:

1. *Implementation strategy and value proposition*: What is the underlying strategic aim of an institutions' decision to implement a MOOCs project, and what value do these courses add for the student?
2. *Technology platform*: What are the features and functionalities offered by the technology platform for these courses?
3. *Teaching model*: What is the underlying teaching model that guarantees the best learning experience for students of the course?
4. *Quality of course material*: How does the institution ensure the quality of the courses they offer, and how does it plan to update and continually improve the course material? What communication strategy does the institution wish to implement to keep students informed?
5. *Accreditation and recognition*: What are the assessment procedures to evaluate knowledge acquired, and what type of recognition do the course qualifications hold? How does the university verify the identity of users?
6. *Financing model*: How does the institution ensure long-term sustainability of the project without comprising the premise of free access for users?

2.2.1 Implementation Strategy and Value Proposition

The implementation of a series of MOOCs may serve as a brand-placement strategy—especially for public institutions and non-profit organisations—that stresses the idea of a commitment to society and advanced technological capabilities. Nevertheless, once the project is in motion and has achieved its initial impact, the financing model must undergo a re-evaluation to ensure the project's long-term sustainability.

For students, free access to high-quality courses and course content, and the permanent acquisition of new skills that are necessary for personal and professional development make up one of the fundamental value propositions. The following factors may also be combined with the above value proposal:

- “One-click” access to free, high-quality long-distance learning.
- Sharing or granting certain firms access to the profiles of students from all over the world who have knowledge in a specific area. This process boosts employment.
- Leading institutions’ recognition of the training or competencies acquired (following some kind of specific assessment method).
- Access, in the user’s own language, to courses from leading institutions.

For the institution, in addition to the aforementioned potential for brand placement, the implementation of MOOCs yields the following opportunities:

- Use of data about students to carry out studies of demand and consumer trends in the areas where they are most necessary.
- Improvement of the virtual platform, and creation and contextualisation of course contents based on students’ feedback.
- Students’ awareness of the institution and its teaching methodology as a potential destination for subsequent (paying) study.

This steady universalisation of knowledge through courses run by renowned institutions will create a tipping point within the market and a reduction in the academic offer, in the sense that less well-known institutions will encounter difficulties in attracting students to the courses they offer. At this point, it will be crucial for institutions to establish differentiated value propositions and blue ocean strategies for their survival in such a competitive market.

2.2.2 Technology Platform

When deciding on a technology platform to deploy MOOCs, institutions may opt to develop or use their own platform, or offer their course via an external platform that maintains the identity of the host institution. In any event, the technology platform must have, amongst others, the following features:

- The platform must be robust enough to allow efficient access to large numbers of students simultaneously, autonomously, and at any time of day or night.
- The interface must be user-friendly to encourage learning and retention on the part of the students.
- The platform should have an advertising and client-capture system, based on viral systems that operate via social networks, online marketing, web placement, and the like, to ensure growth in the number of users.
- The platform should include student–student and student–lecturer forums and areas to post comments, as well as automatic self-assessment systems (both amongst peers and through personal assessment from the tutor).

- Security measures to control access to contents and personal details of the participants. Definition and use of different licensing options (e.g., creative commons) for content sharing and source verification.
- Personalised tools to monitor students' individual learning progress.

2.2.3 Teaching Model

To attract and retain users, institutions offering MOOCs should take the following strategic actions:

- Establishment of templates and guidelines for the production of materials, along with the quality, duration, and size of videos, presentations, and documents, and their review and appraisal.
- Implementation of user interaction functionalities, for both the educator and other users, through forums, chat rooms, video tutorials, meeting points for local groups, wikis, and so forth.
- Development of tools for lecturers to assign marks to students. This may involve either implementing peer-assessment systems, or automatic appraisal systems (intelligent tutoring) based on statistical tracking of students' responses to assessment exercises.
- Evolution of the teaching model from a single, standard model for all students to a connective, cooperative model that each student can customise as he or she sees fit.

2.2.4 Quality of Course Material

To ensure the quality and relevance of the course contents, institutions should pay heed to the following considerations:

- Initial review of the contents for the MOOCs on offer and the level of eminence of the associated academic faculty.
- Setting up appropriate user assessment systems to obtain students' feedback, using end-of-course questionnaires, complaints and suggestions boxes, forums with specific questions, and other such tools.
- Incentives for lecturers to update and improve course contents on a regular basis. Attempts to engage in the program faculty members with international standing.
- International accreditation of courses, if applicable.
- Detection of the real market needs to allow institutions to channel, adjust, and extend their offer.
- Implementation of access to sources, databases and open resources on the world stage to support the promotion of the courses.

Table 2.1 Costs associated with the implementation of MOOCs

	Technology	Curriculum
Set-up costs	Cost of implementing the platform to offer MOOCs and monitor students' progress	Cost of production of new materials
Operating costs	Cost of maintenance and upkeep of the platform	Cost of delivering courses and assessing enrolees Cost of updating course material Cost of distributing course material

Source: Authors' own work

2.2.5 Accreditation and Recognition

Institutions should consider the following issues relating to the accreditation and recognition of their MOOCs students:

- Design of robust learning assessment systems that allow easy identification of competencies acquired. Establishing mechanisms for checking and correcting unclear or borderline progress tests.
- Establishing procedures that allow the verification of the identity of students in progress tests that are academically or institutionally well recognised.
- Setting up institutional alliances that allow students to receive accreditation for learning even if it takes place outside the classroom, bridging the gap between formal, non-formal, and informal education.

2.2.6 Financing Model

More than “free” education, MOOCs are about education that, in reality, is “free, but not free”. In education, as in other sectors where firms are developing a supply of free goods and services, surviving enterprises and institutions look for indirect ways of covering the costs that always underlie this type of venture (Cusumano 2013).

To ensure a long-term, sustainable supply of free courses, it is important to bear in mind that such a venture induces certain costs, as Table 2.1 shows.

2.2.6.1 Set-up Costs

The costs of setting up a robust platform for running MOOCs along with the production of long-distance course materials is a considerable barrier to entry for institutions without the existing infrastructure and material, especially given that MOOCs are essentially free for enrolment. At this juncture, and depending on the

Table 2.2 Set-up costs

Cost of setting up the platform to offer MOOCs and monitoring students' progress
<ul style="list-style-type: none">• Institutional or endowment: the sponsor institution makes the initial investment (e.g., EdX)• Governmental: support from the government if this is a strategically important area• Strategic alliance: the institution forms a strategic alliance with an existing platform that possesses the necessary technological capability and wishes to expand its range of services (e.g., collaboration with the MiriadaX on the Universia platform)
Cost of producing new material for long-distance learning courses
<ul style="list-style-type: none">• Institutional or endowment: the host institution makes an investment in support teams who help faculty prepare material for the courses. In some cases, the institution also offers financial compensation for experts who produce course material• Governmental: (Ever decreasing) government subsidies for producing study material for long-distance courses• Model "paid for" by the producer: the lecturer invests his time into the production (without generating expert costs), normally either expecting to recover the investment through subsequent leveraging of the course, or because of altruism. Lecturers may receive intangible benefits such as a reduction in their teaching workload, taking into account the final assessment and promotion, etc.
<i>Source:</i> Author's own work, drawing on de Langen and Bitter-Rijkema (2012), Dholakia et al. (2006), Downes (2007), and Herrera (2010)

particular case, the institution must decide between implementing or using its own platform, and whether to produce new contents for the courses or to re-use existing material (Table 2.2).

2.2.6.2 Operating Costs

The operating costs, albeit lower than set-up costs, are significant and exert a considerable influence on the end satisfaction of the users, as well as their retention and the sustainability of the project. Table 2.3 presents an overview of the main ways of raising funds to cover these costs.

It is no longer simply a case of covering costs, but rather an opportunity for the institution to exploit an additional income stream.

2.3 Key Examples of Implementation of Open Resources and MOOCs

Table 2.4 shows a summary of the analysis of some leading institutions that implement MOOCs, their financing models (Benkler 2005, 2006) and the way they conduct the courses (Downes 2007), as well as their chosen financing model (OECD 2008):

Table 2.3 Operating costs

Cost of platform maintenance and updates

- Institutional: the sponsor institution continues to provide support to the project for strategic reasons (e.g., EdX)
- Membership model: certain institutions pay regular fees for the maintenance of the portal. This may be the case for portals developed to host courses from several institutions (e.g., universities' membership in Universia)
- Alliances and exchanges: with the use of open platforms, volunteers from all over the world can collaborate and contribute to the free development of new functionalities on the platform, and thus achieve systematic maintenance of the system

Cost of delivering courses and monitoring students' progress

Cost of updating contents

Cost of distributing course material

- Endowment model: through donations from those who are interested in maintaining the project (e.g., Khan Academy). This model has limited penetration in Spain
 - Conversion model: the first module of a course is available free of charge, in the hope that subscribers will pay the inscription fee for additional courses
 - Substitution model: this is a cost reduction model more than a financing model. For example, this model avoids the costs of transport for lecturers of long-distance learning courses with global scope
 - "Self-Paid" model: Faculty members seek other non-monetary advantages to giving up their time for this initiative (e.g., publicity and international exposure)
 - Segmentation model: courses are free but additional services have a charge (e.g., certificate, consultancy services, book sales, etc.)
 - Alliances and exchanges: collaboration with other entities in the production and exchange of resources maintains or extends the range of courses on offer
 - Sponsorship model: once the course achieves a large user base, the platform can integrate advertisements into the course contents, or seek out a sponsor interested in the courses on offer (e.g., Universia and Santander Bank)
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Source: Author's own work, drawing on de Langen and Bitter-Rijkema (2012), Dholakia et al. (2006), Downes (2007), and Herrera (2010)

2.4 Conclusions

Online education, technology capable of disseminating large quantities of knowledge in multiple formats, and the possibility of handling mass course inscriptions have all been ready for deployment for many years. Only with the rise in popularity of MOOCs, however, have these advances begun to receive serious attention.

The proliferation of MOOCs has left the market wide open, breaking down the barriers of distance and the institutional hurdles to bring high-quality, global knowledge sharing (institutional backing) to a large audience (massive), without access restrictions (open), and for next to no cost (free). This will bring about, "a genuine transformation of the system, stemming from a greater impact of the principle of supply and demand in an increasingly globalised environment" (Leal 2008).

For students, the chance to gain free, open access to the top academics from prestigious institutions in a dynamic environment, and share experiences with other students from all four corners of the world represents huge value added.

Table 2.4 Implementation models of relevant institutions

	Type of institution	Provider of course	Role of the student as a contributor	Financing model
MIT OCW. ocw.mit.edu/index.htm	Non-profit	Institution	Producer–consumer	Institutional donation
Khan Academy. www.khanacademy.org	Non-profit	Institution	Producer–consumer	Donation
Udacity. www.udacity.com	For-profit	Institution	Producer–consumer	Segmentation (charge for certificates) Donation
Coursera. www.coursera.org	For-profit	Institution	Producer–consumer	Segmentation (charge for certificates)
EdX. www.edx.org	Non-profit	Institution	Producer–consumer	Institutional Alliances and exchanges (maintaining the open platform with collaborators)
TED. www.ted.com		Institution Donation	Producer–consumer Donation	Annual membership
TED-ED. Ed.ted.com		Community Donation	Producer–consumer	Annual membership
Udemy. www.udemy.com	For-profit	Community	Producer–consumer	Segmentation
iTunes U. www.apple.com/es/education/itunes-u/	For-profit	Community	Producer–consumer	Institutional
P2PU. p2pu.org/en	Non-profit	Community	Co-producer	
The University of the people. www.uopeople.org	Non-profit	Community	Co-producer	Institutional donation Segmentation (charge for student's file and exams)

Source: Authors' own work

For an institution, on the other hand, making contact with highly motivated, participative international students, presents a huge opportunity to extend its brand on the world stage, capture new students, and, additionally, test and develop innovative learning initiatives in virtual environments.

To implement a MOOCs project, an institution must set a clear strategy in the following areas: (a) implementation and value proposition; (b) capabilities of the technology platform; (c) underlying educational model; (d) quality of the course material; (e) assessment and accreditation model; and (f) a business financing model that ensures the sustainability of the project.

In this scenario, knowledge is becoming “universal”, and prominent institutions are developing high-quality open contents. Therefore, it will be difficult to compete and find a niche in the market without offering services with differentiated value propositions. In this battle, the reputation of the institution will be of the utmost importance. It is highly probable that non-elite educational institutions will be unable to survive in this new environment (Cusumano 2013).

Currently, possibilities still exist to offer non-English courses, but the ease of translating course material weakens this advantage.

Another unresolved area has to do with the universalisation of knowledge. This process somewhat overlooks the effect of the multicultural nature of the global student body in terms of considering diverse habits and customs in different parts of the world. Thus, the contextualisation of course material is a pending issue.

The large potential for development lies in the innovation in learning processes, placing students at the centre of the learning process as the determiners and co-creators of their own learning roadmap (Benkler 2005, 2006).

In this sense, the tendency to move away from xMOOCs towards cMOOCs is one of the areas in which prestigious institutions are deploying their strategies. In these cases, therefore, learning grows continuously with reference to other experts, other cultures, other experiences, and other communities with the same interests.

Recognition, by institutions or businesses, of the competencies and skills acquired by each student and the adaptation of the learning channels leads to a more individual and customised education. The support of technology in MOOCs makes it possible to carry out a personal assessment of each student's progress (Cooper and Sahami 2013).

Educational institutions must evolve from their current form—centres where teachers merely impart knowledge—by adopting a role as the student's partner. This partnership means guiding students on how to develop their knowledge of a subject, and teaching students to pick out relevant, reliable sources to conduct their own learning.

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