

The Higher Education Challenge in Africa and Asia

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Higher Education is one of the most important challenges of the 21st century in Asia and Africa. Reports say that one should open one university every day! Moreover these countries face a critical shortage of quality professors but also of governance and management. Funding is very limited and their capacity to answer successfully to this challenge is doubtful. Modern technologies by themselves will never replace good quality teachers. However, when adapted to the local cultures and social environment they may be of great help to go in the right direction.

The growing availability, everywhere, of smartphones and tablets together with fast air communication lines (Saenz 2011) shall allow transferring to remote students masses of information, including videos and textbooks.

The appearance, since a few years, of MOOCs, a new method, both technological and pedagogic, is a means to disseminate knowledge at a very low price. As we will explain it in this paper, investments in building and staff are no more directly linked to the number of students, thus are the solution to part of the critical difficulties mentioned earlier.

In this paper we will first recall the idea behind the MOOC approach to learning and teaching. In a second part we will explain how it can be used to solve the challenges of the Higher Education for masses of students in countries with limited possibilities. We will then briefly suggest some directions about a Higher Education development in these countries.

MOOC, a short introduction

Since the beginning of this century and the emergence of the Web technologies, Information technology has been considered as a strong means to revolutionize the old way of teaching and learning. Online courses have become a reality and a new concept, MOOC (Massive Open Online Courses), has emerged. Its aim is to provide a comprehensive education to any public, at world scale, and to deliver an attestation (certification) of completion of study to those who had followed successfully the full course. The concept of distance learning is quite old. It has been evolving with the technology and the economic conditions. Are the MOOC a breakthrough in education or a new avatar of an old concept? An excellent review about this issue, has been written by Hill2012.

¹ This paper is an adaptation of the presentation at a conference organized by AEMDDE (Association Euro Méditerranée pour le Développement Durable en Egypte) held in Paris, December 15th.

MOOC promoters distinguish two kinds of MOOC (Tracey2013) : xMOOC which is the extension and adaptation of the classical way of knowledge transmission and learning, adapted to a massive number of apprentices and the connectivist MOOC,c-MOOC, which is intended for active learners who, primary want to build a network to learn together on a given subject. The student is supposed to discuss, to debate and to share his/her knowledge with his fellow learners. He is also encouraged to discover teaching materials in the immensity of the web. c-MOOC are more based about connectivity: everybody brings his/her own knowledge and references. Social tools are of primary importance giving the ability to reach everyone in the entire world regardless of geographical location.

MOOC is the evolution of an old concept. As in conventional distance learning courses, learners study alone but, through the use of social media, exchange and help each other. They assembled by affinity, language, community ... to exchange, share and solve all the difficulties they encounter in their learning. The other novelty is that it is open to everybody, without preliminary control of the level of the students. In this concept the number of participants can be very large. It even reaches 150,000 or more for some courses! At this scale it is no longer possible to envisage a direct interaction with teachers because it would require an incredible large staff and would increase tremendously the cost. Automatic tests allow participants to check their understanding and assess what they have learned. Teachers are involved but not at personal face to face level, giving only general directions through the social tools that are implemented to allow exchanges between learners. An important part of the support comes from the students themselves, exchanging through the social Web2.0 tools available in the platform. People who achieve the course are awarded a certificate. The failure rate is very high, above 80% reaching 90%; the promoters of MOOC reply that, due to the high number of participants, the number of certified students remain honorable. One may also object that nobody really know the meaning of this failure rate. Among the many people, who do not succeed a number comes as lurkers, to retrieve some knowledge on some part of the course. Studies have revealed that some people just watch the videos, other read the texts only and they are many ways to use the MOOC according to the desire of the participant. No study exists on this subject. Another reason is that everybody is entitled to register in a course, without any control of the basic knowledge required to follow it. The same difficulty is encountered in countries where no selection is made at the entrance in the first year: for instance, in France 50% of the students fail in their primary year, 30% only obtain a bachelor in the US.

MOOC promoters come from the digital world, thus the common idea is to consider MOOCs as an emerging technology. However MOOCs are not a technology but a bouquet of technologies. They are based on a Learning Management System (LMS), technology which exist since the end of the 90's, plus a number of other technologies arising from the latest developments: social media now popular through Facebook and other social tools, videos now available due to the increasing bandwidth of the Internet (Khan 2006), mobility... MOOCs will aggregate a number of new tools now emerging from research and forget some older ones, now in use.

The trends of emerging technologies are to raise gigantic hopes and to revolutionize the society, in their beginning, then, later, to fall back to the reality. They follow the well known Gartner hype cycle (Gartner2015). In the case of MOOCs, three years ago, a

number of authors predicted a “tsunami” to come for Higher Education and the disappearance of the classical universities (see for instance Harden2012 or The Economist2013). A number of people disagree today (Tapson2013) and MOOC have fallen down along the hype curve very rapidly.

Our opinion is that universities will not disappear, or at least the main ones. MOOC, through different shapes and uses will complement them. MOOC do not belong to technology. They are a means to acquire knowledge and thus belong to the world of pedagogy not technology. They are the singularity, which is putting out of balance, the old way of learning and teaching and they will introduce a new dynamics, which will help in solving the difficulties encountered today.

One of the major challenges nowadays is the education of the young generation. In Africa and Asia, one should open a new university everyday to answer to this challenge. Opening Higher Education is also a concern for Egypt. MOOCs can help in solving this impossible challenge. This has already started in Arabic countries with EDRAAK (EDRAAK2014), the Massive Open Online Courses in Arabic initiative from Queen Rania Foundation.

MOOC learning

MOOC pedagogy is based on a few basic principles, which replace the classical approach in the university: the flipped classroom, distance assessments and social exchanges.

The flipped classroom

A MOOC contains a number of short videos (5-10mn), which are complemented by textual documents. The LMS guides the students, week after week, to progress in their study, alternating videos and texts. Students work by themselves. Tutors may intervene in the forums to drive the discussion but, in its massive form, students solve their difficulties, mainly through exchanges, using the social tools provided by the LMS.

When used in the context of a university, for groups of students of the size of an amphitheater, MOOCs are called SPOCs (Small Online Private Courses). They replace the main lectures in the theater. Practical and applied lectures, in small groups, become the place of face-to-face exchange with the teachers. This approach is the most important feature of the MOOC approach: it is quite revolutionary because students must learn the lecture *prior* to their venue in the class. SPOCs retain the classical face-to-face exchanges between the teachers and the students, in the applied lectures. The final examination remains the same as for classical studies i.e. in groups with a visual control of the students and the registration is only opened to students with the required knowledge (and belonging to the institution). SPOCs use the same technological environment as MOOCs, thus a MOOC can be played as a SPOC and vice-versa.

Assessments

In its massive form teachers cannot judge all assessments from all the students and this is replaced by pair review. When giving back his/her copy each student receives the copies from a few others and he/she is supposed to correct them, following a grid provided by the teachers. Pair to pair assessments is an important feature for MOOCs. It is of less interest for SPOCs, where the number of students is limited. However a number

of teachers continue to use pair assessment for its pedagogical value: everybody is at the same time judge and evaluated and is more concerned by his/her own study

Certification and grades are a critical problem: how to control individually great masses of students? Coursera (Coursera2015), the leader of the MOOC agencies (for data about MOOCs and agencies see Shah2014), has introduced a variety of solutions from the simple certification of participation up to real remote controls through distance watching. An alternative method, as introduced by the MOOC GdP (Gestion de Projet) from Ecole Centrale Lille in France (Bachelet2015) is to organize classical examinations nearby the students: an number of locations were established in Black Africa with the help of AUF (AUF2015) (Agence Universitaire de la Francophonie), a French agency for Higher Education in French speaking countries.

Social Exchanges

Social exchanges among the students are one of the basic and new concepts in MOOCs. As an important part of the pedagogical approach students must participate to forums. In some MOOCs their activity is taken into account for the final certification. It is assumed that each participant is willing to help and teach the others. The idea is that students are more involved in their study when they become more active. Thus social tools are not only used to replace the distant teachers as explained before but also to make them responsible of their learning. Practice shows that forums are more popular for MOOCs than for SPOCs: when face-to-face meetings still exist the need for a web approach to exchange is less required.

Webinars

Some MOOCs complement the forums through synchronous webinars using such tools as Google hangouts. Once a week, for instance, it gives them the opportunity to see their teachers, and sometimes to directly start a direct exchange. The webinar can be replayed for those who cannot attend it in real time. This gives the teachers the opportunity to clarify some points about the course in real time.

Choosing a strategy

There are many reasons to invest in MOOCs but building a MOOC is costly. It is a team project where teachers and many specialists of education are involved. Technical skills in video and information technologies are also required. Typically the mean cost of a 8 weeks MOOC is of the order of 50 000 €, when all the skills are available in house (Epelboin2014a). Thus, when investing in MOOCs, it is of the uttermost importance to first define a strategy. Taking all expenses into account, from building cost to staff training, the cost may rise up to 15 000 €.

MOOCs and SPOCs can be used for free acquisition of knowledge opened to everybody and, at the same time, inside a university for various purposes, which fit its strategy. The following table (Epelboin2014b) mentions some of possible uses of interests for Egyptian Higher Education.

	Objective	MOOC	SPOC	Level	Remark
1	Educational transformation,	opt	X	B1, minors	All levels. Priority for larges groups of students
2	Remediation	opt	X	B1, B2, B3	Failed modules from past semesters
3	Entrance in university	X	-	B1, High School	Evaluation and initiation courses
4	Long life learning	-	X	All levels	
5	Distance education	X	X	All levels	
6	Knowledge sharing	X	opt	All levels	

Opt: optional

B1, B2, B3: bachelor levels.

Objectives 1 and 2 are intended primarily for undergraduates and for internal use, thus as SPOCs, to enhance the quality of teaching and learning. Objective 1 concerns the willingness to build a 21st century pedagogy, objective 2 to help students who fail an examination, to give them better chances for their next attempt.

Category 3 covers several purposes: the first one is to offer to the students the possibility to test their level before entering the university. The second one is to help them to discover a discipline before they engage and to understand what lectures must be followed: dreaming about astronomy and discovering the need to pursue courses of higher mathematics may convince young people to think about their motivation! More generally MOOCs can be used to train the students to achieve the required level to begin their higher education studies.

Category 4 is quite explicit: it is intended for people, already engaged in their professional life, who need to acquire new competencies.

MOOCs for category 5 are the same, to a certain extends, than the ones of categories 1 and 2. They are intended for distance education. It is the only means to educate massive numbers of students without building new universities and with a limited number of skilled teachers. We will come back later on this important use, which is the main one that we suggest for Egypt.

Category 6 may be called prestige MOOCs. Their aim is to promote the excellence of the institution. They must correspond to areas of excellence of the university.

Full explanations about the concept of MOOCs and their design can be found in Pomerol201) in French and Pomerol2015 in English.

Virtual universities with MOOCs

Education is certainly one of the main objectives, in any country, for a better future. This requires huge capital investments; it is not only a question of finances. Most countries in Africa and Asia do not possess the number of required teachers and their training will take years. They do not have the capacity, in capital investment and in human resources, to build classical universities. A special form of MOOCs, if adapted to the local environment and local culture, is the only solution. Teaching through MOOCs will lower

the number of required teachers and the capital investments to teach a huge number of students. Quality can be preserved, as we will explain.

Higher Education with MOOCs

Blended learning, i.e. a mix of face-to-face teaching and distance learning is the most efficient means of learning (Graham2008). The solution shall be to massively use MOOCs to remotely teach large numbers of students who shall stay home. A group of teachers shall move from town to town, where they shall encounter regularly their students.

One shall imagine a new kind of virtual university:

- Students shall be registered for the distance courses (MOOCs) as in a conventional university. They shall follow the same regulations to be registered: the courses are modules of defined curricula and the students shall fulfill the prerequisites, i.e. they must have passed their previous grades with success. This is an important difference with classical MOOCs where everybody is entitled to register in any course.
- MOOCs shall be complemented with meetings between the students and groups of mobile teachers shall come regularly to local antennas, nearby the places where the students live. This face-to-face exchange shall complement the remote learning so that distance courses can be rapidly adapted to the reality of the students. A certain level of individual relationship shall be preserved and it shall avoid the anonymity of MOOCs.

The number of buildings shall be reduces to a minimum since large amphitheatres and most conventional classrooms shall be useless. A wise distribution of local antennas shall suffice to accommodate the exchanges between the students and their teachers. These secondary locations shall also be used to encourage a social activity around the courses, following the scheme of the city of Boston (EdX2013), which has signed an agreement with EdX to provide locations where MOOCs followers can meet. These local buildings shall also be used as cyber-locations to provide computers for the students, when needed.

Final assessments and examinations shall be organized as usual in these local buildings, enabling the university to deliver “true” grades.

Education and Culture

Some people believe that educational resources are neutral and that it suffices to translate the courses of the “best professors” in the local language to achieve the best education. This is completely untrue.

First of all, “best professor” has no meaning. Depending on his/her own sensitivity and personal background, each student will appreciate differently the same teacher. Everybody has fond memories of some teachers, who led a special impression on him/her and may have decided for his/her future and carrier, but not all students, attending the same class, shall receive the same impact.

Teaching is a social exchange between human beings. Education is strongly linked to the culture of the country. Ways of teaching, ways of learning vary profoundly from one country to another. Using foreign resources is always of interest to have a different

vision about a given subject and may complement the learning. However most of them must be adapted to the local culture, otherwise they will not be well received by the majority of students. The solution shall be:

- To organize an institute with the best teachers, whose job will be to build locally some of the resources needed for distance education through MOOCs.
- To use external resources, from other countries, translated into their own language, when available, and ask local professors to review the documents to adapt them to the local way of teaching and learning. The final documents will then become local Educational Resources. UNESCO might be of help for this important work (UNESCO2015)
- To invite neighboring countries, sharing the same culture, to participate in this huge and ambitious work. To cover all the fields of science required in all fields of Higher Education is a very ambitious project: cooperation, whenever possible, is the only means to achieve it in a reasonable time.

Conclusion

Asia and Africa have, today, a unique opportunity to solve its problem of access to education for a massive number of young people. Using the latest technologies allow to educate more people with less professors for a lower expense. Costly building can be avoided, fewer dormitories are necessary since the students stay home and do not come everyday on a campus. The required network and the devices are now available through the explosion of the number of smartphones.

At the same time, MOOCs also permit to adapt the pedagogy to the student of the 21st century, making him/her actor of his own learning. The university becomes centered on the students.

This is a big chance for Asia and Africa to build their university on the grounds of their own culture and history. Do not miss it.

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