

## Evaluation of Massive Open Online Courses (MOOCs) From the Learner's Perspective

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**Abstract:** *Massive Open Online Courses (MOOCs)* is one of the most debated topics in the field of education. The polemic on MOOCs was sparked by the emergence of extension MOOCs (xMOOCs) in late 2011. Highly disputed issues about MOOCs range from their quality to the potential impact of the courses on higher education in both developed and developing countries. This paper discusses, from the learner's perspective, the quality of MOOCs and their potential contribution to widening participation and improving quality in Rwandan higher education. To gain first-hand experience as a learner, I enrolled in one cMOOC and three xMOOCs. I compared and contrasted the four MOOCs with my previous radio, online and face-to-face courses and learning with institutions across five continents. I conducted a cross-case analysis of the four MOOCs and six categories under which my previous courses fall. Through this analysis, I identified the recurring patterns and organised them into five themes: openness, availability, diversity, delivery and interactivity. I argue that MOOCs are currently among the most open courses and can lead to meaningful learning. Face-to-face and other kinds of online courses provide more interaction with the tutor than MOOCs do. Face-to-face course also provide the campus experience with peers which is absent in online courses. However, MOOCs and other online courses are superior to face-to-face courses in terms of flexible delivery and the 24 hour per day availability. Some MOOCs are also more diverse in terms of participants, activities and assessment. Despite various constraints, xMOOCs can mitigate financial difficulties and the shortage of higher education teachers in Rwanda. They can also trigger the empowerment among Rwandan students and learners. Both xMOOCs and cMOOCs can enable network creation and maintenance, multicultural educational experience and lifelong learning in that country. The paper closes with an argument that MOOCs can contribute to widening access and improving quality in higher education globally, and specifically in Rwanda.

**Key words:** MOOCs, higher education, online learning, face-to-face learning, radio learning, Rwanda

### Introduction

The exponential proliferation of Massive Open Online Courses (MOOCs) has ignited heated debates in the last two years. One of these controversial debates about MOOCs is on the issue of quality. On the one hand, MOOCs are hailed for their fit within a knowledge society (Levy and Schrire n.d.). According to Koller (2012) MOOCs provide each individual learner with opportunities to engage with the materials via formative assessments and the ability to personalise their learning environment. At Stanford University, students preferred taking *Artificial Intelligence* as a MOOC rather than face-to-face (Thrun 2012). On the other hand, MOOCs are criticized for their assessment methods that lack constructive feedback (Daniel 2012, Armstrong 2012) and for their low level of comprehensibility (Mazoue 2013, Edmundson 2012). The lack of critical, creative and original thinking (Bates 2012) and students' low completion rates (Daniel 2012) have also been noted. Equally, the contribution of MOOCs to better access to higher education in developing countries is disputed (Thrun 2012, Koller 2012, Bates 2012 and Daniel 2012). Briefly, the dispute on MOOCs is ongoing.

The acronym MOOC (Massive Open Online Course) was created in 2007 by Dave Cormier and Bryan Alexander to define *Connectivism and Connective Knowledge*, the open online course developed at the University of Manitoba by George Siemens and Stephen Downes (Daniel 2012). Anderson (2013) refines the definition of MOOC by exploring the four aspects of the acronym notably the massiveness, openness, the online nature and course features. He notes that MOOCs' massiveness refers more to the scalability rather than a specific number of students. He also acknowledges the massiveness in terms of the number of students, but recommends a careful use of students' numbers at the registration, course start, first assignment/quiz completion and course completion phases in the discussion of MOOCs' completion rates. Anderson (2013) identifies six types of openness:

- expansion of education beyond geographical barriers,

- freedom of speech,
- removal of restrictions on the learning content,
- enrolment without prerequisite,
- the freedom to determine the learning pace,
- the provision of a course free of charge.

Concerning the online aspect, he points out that MOOCs are not necessarily entirely online since some students in the same geographical location can meet face-to-face for mutual support and meet-ups are encouraged in some courses. As for the course aspect, he highlights that MOOCs run for a specific time (p.3). MOOCs can be defined as online, non-selective and tuition-free courses that are usually addressed to a global audience of students.

Among the MOOCs offered since the delivery of *Connectivism and Connective Knowledge* are *Personal Learning Environments and Networks and Knowledge (PLENK)* delivered in 2010, *Online Learning for Today and Tomorrow (EduMOOC)* provided in 2011, *Education, Learning and Technology (Change11)* offered in 2011/2012 and *Learning Analytics (LAK12)* taught in 2012 (Rodriguez 2012). All these MOOCs were categorized as connectivist MOOCs (cMOOCs) and are based on connectivist learning principles (Siemens, 2005).

In late 2011, three MOOCs were offered at Stanford University. *Artificial Intelligence, Machine Learning and Introduction to Databases* ran concurrently (Rodriguez 2012). The first enrolled more students than the other two MOOCs, and more importantly, it became more famous, because of its instructor's post-course reaction. After co-tutoring the course with Peter Norvig and graduating 20,000 students, Professor Sebastian Thrun resigned from Stanford. He launched Udacity (<https://www.udacity.com/>), a private MOOC provider, in January 2012. This move triggered a response from his colleagues, Daphne Koller and Andrew Ng who co-founded Coursera (<https://www.coursera.org/>) in April 2012. Unlike Udacity, Coursera focused on working in partnership with prestigious universities. This enabled Coursera to grow fast to over 4,000,000 students, 396 courses and 83 partnering institutions as it was published on the company's MOOC platform homepage early July 2013. Five languages (English, Spanish, French, Chinese and Italian) and 25 fields of study were represented in Coursera courses. A few weeks after Coursera was started, Harvard and MIT launched edX (<https://www.edx.org/>). By this time, the MOOC competition was already intense.

The three MOOCs taught at Stanford University mark the beginning of the extension MOOC (xMOOC) era. These MOOCs are essentially based on a didactic pedagogy. They are characterised by high student-multimedia content and student-student interactions, but student-teacher interaction is very low. As the name suggest, the goal of these MOOCs is to expand higher education beyond universities' physical campuses. Many universities involved in the xMOOC movement hope to attract students to their paid courses through MOOCs. For this reason, xMOOCs resemble, in many respects, university courses offered for various qualifications. Many of them include lectures, reading materials, quizzes, assignments, exams and forum discussions. Students who successfully complete them are awarded certificate. However, these MOOCs are criticized for relying on either cognitive-behaviourism (Rodriguez 2012) or behaviourism (Daniel 2012, Bates 2012). Briefly, the three MOOCs at Stanford University defined a new turn in online education.

American universities monopolized the emerging xMOOC industry for only a few months before British ones reacted. In December 2012, the plan to launch FutureLearn (<http://futurelearn.com/about/>) was revealed. By May 2013, 21 British universities, the British Library, the British Council and the British Museum were partners in FutureLearn. In March 2013, Open2Study (<https://www.open2study.com/>), an Australia MOOC platform was launched. This platform was quickly followed by the OpenUpEd (<http://www.openuped.eu/>), a pan-European MOOC initiative launched in April 2013, and NovoEd (<http://novoed.com/>) was announced at approximately the same time at Stanford University. NovoEd claims that its unique contribution to the xMOOC industry is social interaction.

### **The controversial MOOC debate**

The debate on MOOCs was polarized after the surge of xMOOCs. The founders of xMOOC platforms claim that MOOCs are high quality courses provided free to learners all over the world (Koller 2012, Shaw 2012, FutureLearn 2013, Thrun 2012). Equally, Ripley (2012) commends opportunities opened by xMOOCs to learners who are unable to attend higher education in existing systems. The quality of xMOOCs' content is so high that some universities have made agreements with Coursera to use its

courses for their accredited programmes (Kolowich 2012). There has also been recognition of both strengths and shortcomings of xMOOCs (Mazoue 2013, Pérez-Peña 2012). Similarly, Mackness et al. (2010) found that some *Connectivism and Connective Knowledge* students were positive and satisfied while others were negative and frustrated (p. 267). These authors also note that the overwhelming number of participants hinders meaningful connectedness and interactivity.

There have also been more negative criticisms about xMOOCs. Daniel (2012) and Bates (2012) highlight that these courses rely on the transmission of information, computer-marked assignments and peer assessment. These courses are criticized for lack of constructive feedback (Daniel 2012, Armstrong 2012), their low level of comprehensibility (Mazoue 2013, Edmundson 2012), their lack of critical, creative and original thinking (Bates 2012) and their low completion rates (Daniel 2012). However, Anderson (2013) argues against criticisms on MOOC completion rates that are based on figures that include enrollees who are not interested in completing the course. Likewise, Fini (2009) contends that using the concepts of attrition and drop out for such students is inappropriate. Hence, the way MOOC completion rates are calculated needs to be revisited.

Another source of dispute about MOOCs is their potential to improve access to higher education in developing countries. While Thrun (2012) and Koller (2012) are optimistic about this contribution, Bates (2012) and Daniel (2012) see such optimism as erroneous. They argue that widening participation in developing countries depends on both the provision of free courses and the accreditation of the learning achieved. In other words, open courses and open accreditation are equally important ingredients for widening participation in developing countries.

## **Methodology**

This present research was designed as a case study. To learn about MOOCs' quality and their potential contribution to Rwandan higher education, I enrolled in four courses. The first course, *Open Content Licensing for Educator (OCL4Ed)*, was a cMOOC offered by the Open Educational Resources Foundation (OERF) in partnership with the Commonwealth of Learning (COL) chair in OER at Otago Polytechnic, the UNESCO-COL chair in OER at Athabasca University and the Creative Commons Aotearoa New Zealand. It ran 3-14 December 2012 and attracted 328 participants from 60 countries. The other three courses were Coursera xMOOCs: *Artificial Intelligence Planning (AIP)* from University of Edinburgh, *Internet History, Technology and Security (IHTS)* from University of Michigan and *Leading Strategic Innovation in Organizations (LSIO)* from Vanderbilt University. *OCL4Ed*, *IHTS* and *LSIO* were selected based on my personal interest in the courses. As for *AIP*, my enrolment was triggered by my curiosity to learn how xMOOCs work and my inability to wait for five weeks before the start of the other courses I was interested in. There were various levels of course completion in each of the xMOOCs. The *AIP* could be completed at the awareness, foundation and performance levels which required achieving a grade of 37 percent, 60 percent and 75 percent respectively. The *LSIO* could be taken within the standard track awarded with a statement of accomplishment and the studio mastery track awarded with a statement of accomplishment with distinction. As for the *IHTS*, a statement of accomplishment and a statement of accomplishment with distinction were awarded to students who scored 90/120 and 105/120 respectively. These four MOOCs constitute four case units in my analysis.

I also grouped into six categories the radio, face-to-face and online courses that I have taken. The first two categories are my British Broadcasting Corporation (BBC) and Voice of America (VOA) English learning and represent my experience of learning by radio. The next two categories represent my face-to-face learning experience: my undergraduate education with the National University of Rwanda (NUR) and my graduate education with Eastern Michigan University (EMU). As for the last two categories, my post graduate education (graduate in the American system) with the UK Open University (OU) and the eLearning Skills with the e-Academy in collaboration with the University of the Philippines Open University (UPOU) represent my online non-MOOC learning experience. Adding these six categories to the four MOOCs gives me a total of ten cases for the current study.

I undertook a cross-case analysis. Firstly, I identified recurring patterns across the ten cases. Secondly, I organised those patterns into five themes: openness, availability, diversity, delivery and interactivity. Then, I established a chain of evidence related to the five themes across the ten cases. In discussing findings, I linked pieces of evidence to the related literature and various sections of this research paper. Finally, the discussion fed into the conclusion, which summarises major findings of my study.

## **Openness**

The four MOOCs' openness may be considered in the light of Anderson's (2013) six features of openness plus interoperability, the concept used to refer to compatibility across various types of technology such as computers, mobile phones and radio. These MOOCs were open in terms of entry requirements and everyone could enrol in and take the courses free of charge. They were partially open in terms of geographical boundaries since they were only accessible in areas with Internet connectivity. Based on the Miniwatts Marketing Group's (2012) statistics on Internet penetration, MOOCs in general can be open, at present, to only about 35 percent of the world population. Of the four MOOCs, only OCL4Ed was open in terms of licensing. Overall, VOA English courses (which are in the public domain) were the most open of my ten cases. In terms of geographical location, learning pace and interoperability, the four MOOCs' openness is the same as that of other online courses. However, the non-MOOC courses were not available free of charge and had selective entry requirements and closed licensing. MOOCs' availability for free and unconditional admission presents an opportunity for widening access to education. However, open licensing and interoperability is still needed to expand this opportunity globally.

## **Availability**

The concept of availability refers to both how many hours per day the courses are available to the students as well as the timely availability of the courses, teachers and facilities such as books and classrooms. MOOCs and other online courses were available 24 hours a day during their run time. However, the huge number of MOOCs' students hinders tutors' responsiveness. In *LSIO*, for instance, a wrong link to assignment submission was posted. Despite the forum discussion on this issue, the course team could not notice this mistake before the submission deadline. Fortunately, the course team offered a new deadline to students who had not submitted their work. This difficulty did not occur in *e-Academy*, *UKOU* and *EMU* courses. However, the shortage of teachers and facilities caused many irregularities in the *NUR* courses. We sometimes walked for 40 minutes to the classroom for sessions that were eventually cancelled because teachers or classrooms were not available. The experience was similar when it came to getting a book from the university library. Hopefully, open licensing is globalising the access to learning materials but the digital divide still needs to be addressed.

## **Diversity**

A course's diversity refers to variety in settings of practices covered in the learning materials, course participants, learning activities and assessment. In terms of the settings in the course content, the *VOA* and *BBC* learning was globalised, thanks to content that referred to practices and events from various parts of the world. The *UKOU*, *e-Academy* courses and *OCL4Ed* content also covered practices in many parts of the world. The content of the *AIP* and *IHTS* covered practices in Europe and the USA. As for *LSIO* and most *EMU* courses, the contents were set in North American context alone. The massive number of MOOC participants includes those from diversified origins, expertise and experience. The contribution of these students alleviates the shortcomings in MOOCs' diversity of settings of practices. In the three xMOOCs I analysed, students formed virtual study groups based on their geographical locations and discussed the content and related practices from their cultural perspectives. This opportunity may be absent for students who are taking online or face-to-face classes in a dominant cultural setting. In terms of the variety of activities, *LSIO* leads with activities that included watching videos, forum discussion, reading materials, weekly innovation constraint diagnosis, reflection on innovation constraints, quizzes, peer grading and group projects. All these activities contributed to the course assessment. Learning activities were also diverse in the *UKOU*, *e-Academy* and *EMU* courses since learning could happen via course reading, discussion with peers, course lectures and writing various assignments.

## **Delivery**

I analysed course delivery in terms of the quality of lectures, assessment and empowerment (Lane 2009, Lane and Van-Dorp 2011). The quality of xMOOC lectures was high and some of these MOOCs are as engaging as the *UKOU*, *EMU* and *e-Academy* courses. While many critics argue against xMOOCs by claiming that these courses are based on the behaviouristic approach, the forum discussion and critical writing opportunities were offered in *IHTS* as optional and required in *LSIO*. *LSIO* was the most social constructivist of all the ten cases and included reflection and peer feedback. Unlike many of my previous face-to-face and online courses, the student's freedom to choose how and when to engage with the course is not undermined in MOOCs. In these courses, students decide at which level they engage with

the courses and when they work on their various learning activities. This makes MOOCs more flexible than other courses.

Assessment in AIP and IHTS consisted mainly of multiple choice questions (MCQs) except for those students who pursued the performance track in the former MOOC and those who wrote essays for extra-credit in the latter. MCQs also dominated formative in-lecture quizzes in all three xMOOCs. Feedback to students was automated. LSIO tried to incorporate in-lecture questions that would allow students to write their thoughts but anything submitted received a “correct!” response even when it was meaningless and unrelated. Nevertheless, quizzes that contributed to the course final grade did not suffer from this problem. Most of the assignments that counted for the final grade were peer-assessed in the light of a rubric developed by the instructor. Using this rubric provided a common yardstick, which minimized divergence that could be caused by cultural and grading system differences. Feedback in xMOOC assessment was speedy and timely. Despite limitations in the three xMOOCs’ assessment and related feedback, these courses were much better assessed than the NUR ones. It could take up to two months to get exam results and the only feedback was a grade for each answer and a total score in “15/20” format. In some NUR course, we received no feedback and knew our grades only when final results were posted on the faculty or department notice boards or windows. The feedback on EMU, UKOU and e-Academy course assignments and exams was not instant but it was timely and meaningful.

IHTS and LSIO lead in terms of student empowerment. This empowerment relates to the course’s ability to restore the student’s self-confidence that had been distorted by factors such as geographical remoteness, various filters used for students’ admission in selective education, students’ social economic disadvantages and the digital divide (Lane 2009, Lane and Van-Dorp 2011). These authors argue that those factors lead to students’ self-perception as being not good enough for a course. The empowerment occurs in student admission, course delivery and assessment. The IHTS and LSIO were highly empowering since it was possible to score 10 out of 10 in quizzes. While the quiz grades are not more important than learning, the “I can make it!” or “epiphany” feeling triggered by a high score encourages less confident students to stick with learning instead of dropping out. Other highly empowering courses were from the BBC, the VOA and the e-Academy. The AIP’s final grade was entirely based on the end-of-course summative exam for the awareness and foundation levels, which made the course disempowering. The admission process for EMU, NUR and other selective courses is greatly disempowering. However, EMU courses’ delivery was empowering because all courses ran as planned and provided study guides as well as assignment guides. The delivery of NUR courses was disempowering because there were neither study guides nor assessment guides and class sessions were sometimes cancelled without notice.

## **Interaction**

I compared interaction in the four MOOCs with that in the other six case units in the light of Moore’s (1989) discussion of student-teacher, student-student and student-content interactions. Interaction with the teacher is minimal in both the cMOOC and xMOOCs and was completely absent in my radio learning. It was maximized in the EMU courses but relatively low in the NUR ones due to a huge class size and overwhelming teachers’ workload that hampered their contact with individual students. Interaction with peers was optional in the xMOOCs with the exception of LSIO which required and graded participation in the forum discussion for all students and group work for those students enrolled in the studio mastery track. As for OCL4Ed, interaction with peers could be maximized, but was quite difficult to handle and time consuming due to a vast number of posts. I had to spend twice as much time as the time suggested by the facilitators to follow the logical flow of the discussion. I had already dropped this course in its earlier offering after noticing that the actual course workload is far beyond the facilitators’ estimate. This time, I was ready to spend much more time to avoid dropping the course the second time. This is similar to xMOOCs forum discussion, but these courses enable maximising learning through other channels such watching lecture videos, engaging with required and recommended readings, course assignments and other activities. For a better orientation in the forum discussion, various threads were linked to specific course sections in some xMOOCs. This practice saved students’ time that would otherwise be wasted trying to identify which thread relate to a specific course chapter. Interaction with content was also maximized in the radio learning. However, the limited access to content at NUR hindered the maximal benefit from this type of interaction. A significant amount of time was lost in attempting to access the content.

## **MOOCs' potential contribution to education improvement in Rwanda**

Various aspects of xMOOCs can be built on to widen participation and reinvigorate quality in Rwandan higher education. First, these courses are open in terms of being free and accepting students without entry requirements. In this way, they can alleviate the financial constraints that restrict accessibility and quality of Rwandan higher education. Second, xMOOCs are more scalable than conventional higher education courses. This scalability offers an opportunity for mitigating the shortage of higher education teachers in Rwanda. Third, xMOOC participants are from various corners of the globe and have a diversity of expertise and experience. This aspect could help Rwandan students develop their multicultural literacy. Fourth, the assessment method used in many xMOOCs is empowering, which might encourage less confident students to stick with the courses. For this reason, xMOOCs could help restore Rwandan students' self-confidence vis-à-vis western education. Finally, interaction with content can be maximized in xMOOCs and that can lead to meaningful learning as Anderson (2003) argues. Maximizing interaction with MOOC content can improve the learning of Rwandan tertiary education students who do not have adequate access to educational content. Since cMOOCs are not based on a didactic pedagogy as are other courses in Rwandan higher education, they do not fit in the current formal system of this level of education. However, they can contribute to network creation and development for academic staff and advanced students. This would enable them to share their learning and professional practices globally and to engage in lifelong learning.

However, there are constraints alongside the MOOC opportunities. Reliable broadband connectivity which is essential for taking MOOCs is not available to most Rwandans. Miniwatts Marketing Group (2012) estimates the Internet penetration in this country at around 7 percent. Most of those Rwandans who access the Internet only do via poor connectivity that cannot handle the xMOOC lecture videos. Internet failure was the biggest constraint during my UKOU and e-Academy courses, which were not as heavily loaded with videos as xMOOCs are. While most Rwandan learners have access to radio and mobile phones, the xMOOCs content is not compatible with these technologies. Moreover, the licensing of most xMOOC contents does not allow the reuse, remix, repurposing and redistribution. All these constraints are coupled with the lack of open educational practices in Rwanda which would enable appropriate assessment, certification and accreditation for MOOC students.

## **Conclusion**

In this paper, I have attempted to compare and contrast MOOCs with my own radio, online and face-to-face learning experience. I have also discussed, briefly, MOOCs' potential in improving the quality of and access to higher education in Rwanda. I found MOOCs to be the most open courses although they are not open in all respects. MOOCs are flexible and available 24 hour a day during their run time but the tutors' availability to their students is very low. The recruitment, delivery and assessment modes in xMOOCs are empowering. Interaction with xMOOC contents can be maximal and supplemented with interaction with peers to lead to meaningful learning. LSIO, an xMOOC, was the most social constructivist course of all the ten cases I analysed in this study. xMOOCs can contribute to mitigating financial constraints and the shortage of higher education teachers in Rwanda. They can also help in the development of multicultural literacy and empower students and learners in Rwanda. As for cMOOCs, they can help academic and advanced students develop networks with their global counterparts. However, various constraints still stand in the way, notably the low level of Internet ubiquity and reliability. MOOCs also lack interoperability with technologies that are widely available in Rwanda, and enabling open educational practices are not yet adopted in that country.

The findings in this study should not be generalized in any way since learning experience is unique to each individual learner and the four MOOCs cannot be considered representative of all courses in this category. I must take into account my personal bias toward interaction with the content. However, I acknowledge that an exclusive focus on any single type of interaction restricts the learning achievement. Maximizing learner-content interaction and supplementing or balancing it with other types of interaction that are possible in each context could help open up education opportunities globally and more specifically in Rwanda. Academics and educational decision makers in Rwanda could themselves experience xMOOCs and, through them, possibly create opportunities for learners who wish to study but are not served by the current higher education system. This could help in the development of a socio-economically inclusive higher education to transform the country into a knowledge-based society.

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