The MOOC Model and Graduate Education: Will it Work?

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The *New York Times* has declared 2012 the year of the MOOCs (Massive Open Online Courses) and the phenomenon seems to be keeping its extraordinary expansion in 2013. Whereas MOOCs have mostly been associated with undergraduate education, there is evidence that graduate education, lifelong learning, professional development and transferable skills development are taking a growing place in this ecological niche.

A MOOC Master's Degree
Udacity, a Silicon Valley based MOOC provider, the Georgia Institute of Technology (Georgia Tech) and AT&T announced last May a partnership to offer in 2014 an online Master's degree in Computer Science through MOOCs ("Online Master of Science," n.d.). Access to courses included in the program will be free through Udacity, but students who wish to obtain a degree will have to apply for admission and pay modest tuition fees of less than $7,000, as compared with the $45,000 on-campus fees. AT&T will provide a $2 million jump start for the program, providing technology access, connectivity and products at inception, as well as evolving service and platform support. Concerns have been raised, namely by Russell Poulin from WICHE Cooperative for Educational Technologies to Jeffrey R. Young for the *Chronicle of Higher Education,* as to whether this will be a training program for AT&T and how much influence AT&T will have on the curriculum (Young, 2013, May 14). Rafael L. Bras, the university provost assured critics that the program will use the university's curriculum, approved at every level of the University System of Georgia, including the Board of Regents, and that AT&T employees will get no special consideration through the admission process. However, according to the program FAQ section, AT&T will have access into the program to train its own employees and will recruit graduates ("OMS CS Public FAQ," n.d.).

According to Sebastian Thrun, Udacity CEO, interviewed by David F. Carr for *InformationWeek,* what Udacity is creating is an

> online version of education that really works, that has a great retention, great outcomes of education and really reaches people, not just the world's most motivated 1%, but can be made to work for many more people […] I think we've found the magic formula (Carr, 2013, August 19).

For those admitted in the program to obtain the master's degree, the "magic formula" integrates proctored exams and learner support through tutoring, online office hours and other types of support services, in addition to the online class comprising videos and Web-based assessment. It remains to be seen whether students following the program for free through Udacity will display higher rates of completion and success compared to MOOCs where massive non-completion rates are observed. According to Dr. S. James Gates Jr., interviewed by Tamar Lewin for the *New York Times*, "this is the first deliberate and thoughtful attempt to apply education technology to bringing instruction to scale. If it really works, it could begin the process of

lowering the cost of education, and lowering the barrier for millions of Americans" (Lewin, 2013, August 17). Russell Poulin agrees, writing in *the Chronicle* that the program at Georgia Tech "is unique in that it is trying to reduce costs by adapting teaching for an online setting rather than simply transferring traditional methods online" (Young, 2013, May 14). This will be an interesting story to follow. The future will also tell whether the model is suitable for disciplines outside Science, Technology, Engineering and Mathematics (STEM).

MOOCs for Lifelong Learning, Professional Development and Transferable Skills Development
In a comment posted in June 2013 on e-Literate, Phil Hill reports that data obtained by universities offering MOOCs through Coursera or by edX, two major US MOOC providers, show that approximately 70% of the students registered in a MOOC and answering the survey had at least a bachelor degree (Hill, 2013, June 4). Belanger and Thornton realized that a survey for Duke University in February showed that student motivations for enrolling in a MOOC on Bioelectricity were (1) for the general interest in the topic (87%), (2) to extend current knowledge of the topic (53%) and (3) for professional development (44%) (Duke University, 2013, February 15). Similar observations were made by University of Edinburgh on six different courses offered through Coursera (MOOCs@Edinburgh Group, 2013 May 15). The MOOC learner aspirations were (1) to learn more about the subject area (96%), (2) to try online education (78%), (3) to get a certificate (62%) and (4) to improve career prospects (49%). These data strongly suggest that professional development is an important motivation for enrolling in MOOCs. This phenomenon is further evidenced by the fact that several MOOCs to be offered by August 2013 and aggregated by Class Central are indeed designed for professional development (Class Central, n.d.).

From a graduate education perspective, the development of transferable skills is now considered essential for our graduates to enter into the workforce. Vitae, a group from the UK supporting professional and career development of postgraduate researchers has proposed, in consultation with academic and non-academic employers, a thorough list of skills to develop in order to enhance a career as a researcher (Vitae, n.d.). Whereas several skills are developed during research training and through graduate program curriculum— such as research methods, information seeking or subject knowledge— others are normally not covered by graduate program curricula, such as skills in project planning and delivery, financial management, or people management. MOOCs might thus help to complement program curricula. MOOCs starting in September 2013, in Creativity, Innovation, and Change, offered through Coursera or Principles of Project Management, offered though Open2study, an Australian MOOC provider, are good examples of such courses ("Creativity, Innovation and Change," n.d.).

While interviewing colleagues from Laval University last fall, in order to know their need to better prepare students for employment or to succeed in their graduate studies, we heard, among other things, concerns about the need to improve their written and oral communication skills. In a comment posted on MOOC News and Reviews, Robert Connolly, the director of the C.H. Nash Museum at Chucalissa and Associate Professor at the Department of Anthropology at the University of Memphis, shares the rewarding experience of graduate students with shortcomings in written skills who enrolled in a MOOC on "Writing in the Sciences" through Coursera. Graduate committees overseeing students' progression often find shortcomings in argument construction, a skill to be developed earlier during their formation. To this, Connolly answers: "there is a MOOC for that," paraphrasing "there is an app for that" (Connolly, 2013, May 6). And indeed, a MOOC entitled "Think Again: How to Reason and Argue" may meet the

need ("Think Again," n.d.). There are several other examples of MOOCs that may increase graduate students' learning experience.

How to Adjust MOOC Model to Better Advance the Distinctive Features of Graduate Education
Dr. Tony Bates, a specialist of e-learning and distance education from Vancouver, Canada, proposed during the 2013 LINC meeting held at MIT some avenues to improve MOOCs, and among them, the importance of using more constructivist approaches (Bates, 2013, June). Indeed, Bates and other specialists in higher education agree on the importance of knowledge construction as opposed to knowledge transmission, and MOOCs have been criticized for largely being vehicles of knowledge transmission. However, a MOOC typology has set in, proposed by Stephen Downes and George Siemens, making a distinction between "xMOOCs" characterized by knowledge transmission through videos and quiz, and "cMOOCs" or "connectivist" MOOCs that rely on knowledge construction by the learners (Siemens, 2012, July 25). cMOOCs provide opportunities to use new teaching approaches where students learn from each other and construct knowledge together.

Graduate training might improve through the use of cMOOCs, or xMOOCs, integrating cMOOC features such as social networking of learners and experiential learning, or even through in-class activities. For instance, Mohamed Noor, a biology professor from Duke University, who taught his Genetics and Evolution class in MOOC form, used it with a new flipped classroom version for on-campus students. His experience is discussed in an interviewed posted by Robert McGuire. This flipped classroom approach, where undergraduate students first learn new contents online through a MOOC, and then discuss in class to deepen their understanding and discuss problem solving, may very well be transposed at the graduate level.

Conclusion
The MOOC phenomenon is viewed as a disruptive innovation in higher education. It brings a different perspective to knowledge dissemination as it has been traditionally conceived in university contexts. MOOC is about knowledge sharing through no or low-cost (for now) courses offered by prestigious universities. The model will evolve as well as modes of delivery, but knowledge sharing will always be the cornerstone of the phenomenon.

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