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# The New Generation of Massive Open Online Course (MOOCS) and Entrepreneurship Education

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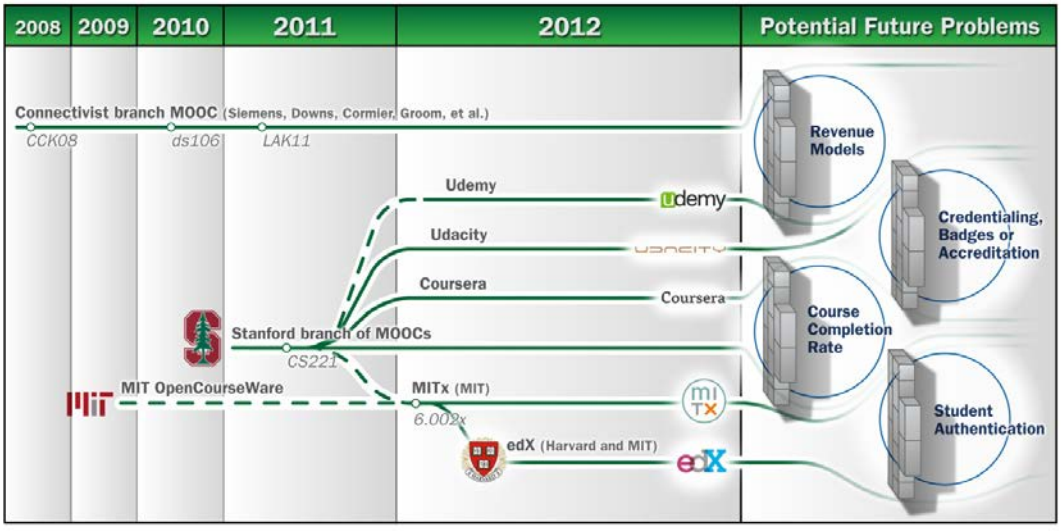
Learners all over the world, including rising entrepreneurs, have increased educational opportunities due to the internet's affordance of connectivity. This study examines the rapid shift and evolution in online education by Massive Open Online Courses (MOOC). We focus on what is being called xMOOCs, the second generation, providers of free, worldwide online courses from the world's most renowned professors and universities. The implications of MOOCs on higher and entrepreneurial education are explored and effective strategies for future implementation are discussed.

Higher Economic Institutions (HEI) are in the middle of "transformative changes" both at the conceptual (new models of education, advancement of theories of social learning) and technological levels (eLearning, mobile devices, learning networks) because of upheavals globally, socially, politically, and technologically. Likewise, entrepreneurship education has advanced as a means to educate the new 21st Century workforce by giving them the skills to take any area of study or discipline and be creative, innovative, and entrepreneurial. Through entrepreneurship education, flexibility, adaptability, and resilience are taught and applied so that success can be achieved as workforce demands change over time. Online opportunities in entrepreneurship education are leading to increased educational opportunities (Siemens & Tittenberger, 2009) with practically no geographical or time boundaries.

Online courses, offered for years by many universities, were mainly designed according to the traditional lecture format, which might explain, at least partly, their lack of success. While the Fathom for-profit online platform at Columbia University enrolled 65,000 students (2000-2003) (Redmon, 2012), the latest emerging massive online courses (MOOCs) are registering learners in the millions in less than a year at no cost. The movement toward MOOCs is quickly amplifying and intensifying, as more and more "actors" have been announcing their entrance during the last five years, as captured in Figure 1 below (Hill, 2012a).

Figure 1: *MOOCs Fast Pace Evolution*




Source: Hill, 2012a

The new platforms launched in 2012 include Udacity, Coursera, edX, and offer free top quality MOOCs, with huge enrollment levels. Some of the most renowned U.S. universities, including Stanford, Harvard, and MIT, among others, have begun this endeavor of opening the digital doors to the masses. This phenomenon marks a major shift in the digital learning's expansion. In the context of a slow economy and rising tuition fees associated with unprecedented U.S. student debt, MOOCs have the potential to permanently change the education landscape, particularly entrepreneurship education that is not readily available around the world in developing economies.

This paper examines entrepreneurship education in light of the MOOC phenomenon. We outline the history, strengths and weakness, and explore MOOCs' potential impact on higher and entrepreneurial education (EE), including those in developing countries. Effective strategies to embrace these major changes are also provided. Further research implications are discussed.

## ENTREPRENEURSHIP EDUCATION

There is no question that entrepreneurship has had a major impact on society. Entrepreneurial education is a relatively new field in higher education which has proliferated since the 1970s but really took off in the 1980s (Katz, 2003), with over 2,200 courses at over 1,600 institutions of higher learning offering classes in entrepreneurship , over 100 funded centers, 277 endowed chairs, and 44 refereed academic journals (Finkle, Kuratko, & Goldsby, 2006). Membership in the Global Consortium of Entrepreneurship Centers now numbers 200 plus (www.globalentrepreneurshipconsortium.org). While the development of the field of entrepreneurship education is still being debated by scholars as to whether it is fully accepted by the academic community as a whole and if it has reached maturity (Katz, 2008; Kuratko, 2005); there is no question that there has been a major impact on the next generation of entrepreneurs by getting the basic skills needed to start and grow a business, and in many cases, funding by venture capitalists, angels, and competitions ran through entrepreneurship centers and their community connections. The changing role of the university in economic development as an active particpant has spurred universities to develop new kinds of learning by aligning curricula more closely with the needs of the workforce. Students today "want a job-focused education," according to a recent article by Justin Pope of The Associated Press (2012). Entreprenuership education is the sweet spot.

*On the Road to an Entrepreneurial Economy: A Research and Policy Guide* published in 2007 by the Kauffman Foundation, the largest foundation supporting Entrepreneurship worldwide, the document outlined that the Entrepreneurship "process is impossible without the highly creative and highly educated individuals who will be tomorrow's high-impact entrepreneurs. Equally important, are the innovative and skilled individuals who will work for these entrepreneurs."(p. 8). According to an SBA study (Acs, Parsons, & Tracy, 2008), "High-Impact Firms: Gazelles Revisited," the fastest growing firms are on average 25 years old. All companies need innovation. Graduates need to possess the knowledge, skills, and motivation necessary to create organizations as well as advance in these organizations. Research supports the contention that entrepreneurship education has had an impact on student entrepreneurial propensity and intentions (Pittaway & Cope, 2007). However, the measurement of entrepreneurial propensity, in online entrepreneurship education, let alone in traditional Entrepreneurship programs, has been lacking (Athayde, 2009).

Entrepreneurship knowledge is increasingly cited as a critical factor for success. Carl Schramm, former President and CEO of the Kauffman Foundation, in a speech to students of Stanford University upon the inauguration of Entrepreneurship Week USA in February of 2007, said "It could be as common for an American college student to start a business as it is to anticipate marriage or parenthood" (p.1). Graduates must also be prepared to pursue graduate study in Entrepreneurship, an MBA, or a specific area of education. This is predicted to further enhance scientific research, innovation, and knowledge generation as well as cultural and social thinking. Online entrepreneurship education offers a solution to

this pressing need by providing access to almost anyone around the world. The purpose of this paper is to examine online education and its application to entrepreneurship education. We begin by explaining the history of MOOCs, where they are going, the challenges and benefits, one author's direct experience taking an online entrepreneurship course, and what the future holds.

**HISTORY OF MOOCs**

According to the short time span MOOCs have existed outlined in, "Connectivism and Connective Knowledge" (CCK08), by George Siemens and Stephen Downes, Manitoba University in Canada is considered to be the first free global MOOC (Downes, 2011). It was preceded by Wiley Wiki, who pioneered the idea of open online content, as part of the open education movement that included the component of editing by participants (Iiyoshi & Kumar, 2008).

Udemy started in 2010, offering on-demand hybrid (free or charged) short online courses (5000 to date), taught not only by professors, but also by practitioners (CEOs, industry experts, consultants, etc.) (www.udemy.com/static/faq). The new platforms – *Udacity, Coursera, and edX* - launched in 2012, use an integrated experiential and interpersonal approach, and mark a real shift in the field of MOOCs. These new platforms are backed by highly ranked universities with the latest technological advances. This has resulted in revolutionary improved quality of online delivery platforms. The new wave of MOOCs is attracting millions of people from all over the world. *Udacity, Coursera, and edX are the* leading competitors in the race to take the lead in online delivery. Information is still scarce, but the main features of these entrepreneurial businesses are outlined below.

The defining milestone in the current redefined MOOC outreach, partly inspired by Khan Academy (www.khanacademy.org), was the Stanford University course taught by Sebastian Thrun and Peter Norvig. The experiment was a spin-off of two different projects: *Udacity and Coursera*.

*Udacity* is a private educational organization founded by Sebastian Thrun along with David Stavens, and Mike Sokolsky. Its mission is "to bring accessible, engaging, and effective higher education to the world; we believe that higher education is a basic human right, and we seek to empower our students to develop their skills in order to advance their careers" (www.udacity.com). There are to date 22 classes in four areas, including Business courses, offered for free online. Testing is available online (for free) or, face-to-face (for a fee). Upon completing a course, students receive a certificate of completion (sent by e-mail, as a PDF file) indicating their level of achievement, signed by the instructors, at no cost. Udacity claims to have had more than 160,000 students enrolled (www.udacity.com).

The online platform called *"Coursera"* (www.coursera.org) was initiated by two Stanford University professors, Daphne Koller and Andrew Ng, who founded a social entrepreneurship company in Mountain View, California with $22 million in venture funding, and quickly partnered with their university. Their aim is to make the best higher education available to as many people as possible, "Our mission is to teach the world and make higher education available for everyone" (Mitchell, 2012). The number of actual top universities joining the project is continuously rising, reaching 62 as of February, 2013. Twenty-seven of the 62 universities are international, encompassing 19 countries (www.coursera.org/#universities). Since Coursera's launch, more than three million people have signed up for one or more of the 329 offered courses (each with a definitive start date, and comprehension testing), in 24 categories, out of which three are EE related (details provided below), ranging from five to 12 weeks in length. English is the main language used (302 courses), but courses are now offered also in Spanish (11 courses), French (9 courses), Chinese (5 courses) and Italian (1 course) as of February, 2013. Multiple language offerings open access to an even larger number of learners (www.coursera.org/#courses). Statements of accomplishment are issued upon graduation.

Willing to be part of the MOOC race, Harvard University and the Massachusetts Institute of Technology (MIT), considered "late adopters" (Lewin, 2012a), decided to partner to form *edX* (www.edX.org), a not-for-profit venture (based in Cambridge, Massachusetts), with a joint funding of $60 million ($30 million each). The edX starting point was an online course, launched in spring of 2012 by MIT professor Anant Agarwal (now the first edX President), with an identical curricula to that of the classroom-based course. The primary goal of edX is to "improve teaching and learning on campus by experimenting with blended models of learning and by supporting faculty in conducting significant research on how students learn" (www.edx.org/faq). To the existing three top U.S. universities in the partnership (including University of California, Berkeley), six other U.S.-based universities and six U.S. health institutions will be added beginning in the fall 2013 and four international universities in 2014 (www.edX.org/faq). The edX currently offers 26 courses. Graduates can earn a certificate of completion, after successfully completing a free, proctored exam, issued under the name of the providing university. More than 900 thousand have registered. A much smaller competitor, that could be considered a niche platform, is *Codecademy* (launched in late 2011), provides computer programming courses (with no deadlines), for free. Its stated mission is "to turn a world of tech consumers into one of empowered builders" (www.codecademy.com/about).

This latest generation of MOOCs is ideologically different compared to the previous one. In that sense, Siemens (2012) identifies two types of MOOCs:

- cMOOCs-the first generation started in 2008, focusing on knowledge creation and generation (e.g., CCK08); learners' creativity, autonomy, and networking are encouraged; learners are expected to enrich the course's content.

- xMOOCs- the second generation started in 2012, are based on a more traditional format, with fixed structured content, centralized discussion forum support, and automated or peer-graded evaluation (e.g., Coursera and edX); students are required to master what they are taught.

We believe xMOOCs will probably tend to have a greater impact on higher education due to their main strengths: high quality content provided by leading partnering universities, existence of deadlines and grades, the attribute of being no cost, and consistent financial support for development. The new top generation of xMOOCs, induces undeniable positive outcomes for learners. However, there is a question revenue models and how to sustain being no cost to those being educated.

**BENEFITS**

Since 2010, the U.S. Department of Education concluded in the study, "Meta-Analysis and Review of Online Learning Studies," that students learning online performed, on average, modestly better than those learning the same material through traditional face-to-face instruction, further enhancing online learning development. xMOOCs might be the final stage in the process, and they are expected to draw millions of students and adult learners globally, due to their indisputable benefits. These include:

The free xMOOCs can reach a high number of students, including aspiring and established entrepreneurs, all over the world, with no time boundaries. No discrimination due to age, nationality, occupation, health, or financial resources exist, each person with access to the internet is eligible. The emergence of the xMOOCs mark a unique educational opportunity for people living in developing countries, people with low incomes, people with disabilities, regardless of the reason for their online endeavor-to learn new job skills, to adapt to new demands at an existing job, to become an entrepreneur, or simply for knowledge enrichment.

Especially with xMOOCs, students can benefit professionally and personally from free and high quality course content, that follows the same rigorous standards as classroom-based courses. Competing platforms, Coursera and edX, have officially claimed to maintain similar quality standards and requirements. As the edX President points out, "the reach changes exponentially, but the rigor remains the same" (www.edx.org/faq). In fact, on average, less than 10% of MOOCs students are passing the final exams.

Students can also engage in a free high quality learning experience. xMOOCs' designed formats, based on the advanced technology and using strict deadlines and grades, have strong pedagogical foundations that assist students to understand new concepts quickly and effectively ensuring their engagement and improve long-term retention. xMOOCs provide students with high flexibility, through the possibility of accessing the same content multiple times, anywhere and anytime. Students can feel free to pause, speed through the content, rewind, and repeat questions and/or answers without the fear of being judged or patronized. They can afford multiple attempts to demonstrate their new knowledge. Feedback is even more frequent than in the traditional classroom format, favoring an accurate self-monitoring of each student's own progress.

Personalization is another dimension of xMOOCs that students notice. During the learning process, additional preparatory or enrichment materials are available, according to each student's background and desire. Each student can have his/her own trajectory in engaging, understanding, and mastering the knowledge provided by the course. With instant feedback, "no student can move on without knowing the answer compared to traditional classroom lecture" (Koller, 2012). Also, by analyzing the recorded data on the platform, students' misconceptions on a certain concept can be identified and a targeted error message can be sent.

Learners have the opportunity to experience the high interactivity of xMOOC format, not only in relation with the computer or smartphone, but also with fellow students. It is about joining a global community of thousands of students while learning alongside them and grading them. Coursera, for example now has the largest peer-grading pipeline ever devised, where tens of thousands of students are grading each other's work successfully (Koller, 2012). Peer grading can add value to the learning experience. The chance to communicate and work on assignments with people from different cultures is, in itself, an uplifting experience. Collaborative learning, as a highly effective method, is also part of xMOOC experience. Students can collaborate in many ways: posing questions and answers on forums, sharing information, and forming virtual or physical study groups. The opportunity to try several domains while not being charged may result in a better self match between ones aptitudes, interests, and professional requirements.

The potential positive outcomes for those who take xMOOCs and successfully complete these classes can result in both positive professional and personal outcomes. Based on completion certificates, students might get credit points from their local on-campus universities and, by speeding up the graduation process, could save time and money. The University of Washington and the University of Helsinki, for example, have already announced that they will offer college credit for Coursera MOOCs (Chea, 2012), just as Antioch University does. There is also encouraging feedback related to future certificate recognition among employers. A. Ng from Coursera says that "faced with a shortage of engineering talent, many tech companies have already asked for introductions to students who successfully completed his online course" (Ferenstein, 2012). Nevertheless, xMOOCs have the potential to transform into reality lifelong learning by offering a valuable body of knowledge, whether "just to expand our minds or to change our lives" (Koller, 2012). The opportunity for older learners to update their knowledge, to acquire new skills according to work place new demands, increases their chances to keep current with their jobs, to get promoted or hired at a higher level, or even consider launching their own small business or be innovative as a corporate entrepreneur.

Undiscovered talents, especially in countries with low access to higher education, could manifest themselves through MOOCs, bringing a "wave of innovation" (Koller, 2012).

In the future, it may become feasible for organizations, both profit and not-for-profit, to outsource some of their training activities, at low or no costs, by simply requiring their employees to obtain xMOOC official certificates of completion on pertinent topics.

At a more general level, xMOOCs can give unparalleled insights into human learning. By tracking all online activity, huge amounts of data are being generated and lead to scientific research on student learning, including the role of technology in facilitating more effective teaching-both on campus and online. This research could give valuable insights into the most effective teaching strategies and revolutionize how we educate. This particularly allows for entrepreneurial educators to experiment with what works best in their environment and change the face of education. In fact, it is those entrepreneurs in all facets of education that are making the difference and MOOCs are a great example of how to make a difference around the world by opening learning opportunities to enable others to reach their full potential. Economic, technological, and social conditions are ripe for higher education to meet the marketplaces' changing education demands through xMOOCs' flexible, effective, and efficient offerings. However, they will all have to overcome several barriers in order to fully succeed.

**OBSTACLES**

Several weaknesses of MOOCs have been pointed out. For example, a new study by Inside Higher Ed and the Babson Survey Research Group shows that two thirds of the inquired professors are reluctant toward online education, considering that its learning outcomes are inferior to those of campus based education (Kolowich, 2012a). Lack of face-to-face communication, lack of frequent feedback from a professor, or irreplaceable classroom experiences are arguments frequently mentioned by skeptics. There were also questions raised regarding students' evaluations, due to the difficulty to check who is really completing the assignments, as well as the value of an online degree. The humanities, social sciences, and business, which require online written work utilizing critical thinking skills, are difficult to assess online. Hill (2012a) summarized the main interrelated barriers: developing revenue models to make the concept self-sustaining, delivering valuable signifiers of completion such as credentials, badges or acceptance into accreditation and authenticating students in a manner to satisfy accrediting institutions or hiring companies that the student's identify is actually known. He also named the low rate of completion (under 10%) as a barrier but we believe this is occurring because of the early phase in the MOOCs lifecycle and will be improved upon quickly. Important steps have already been made to overcome some of these obstacles.

Currently, all competitors have succeeded in raising venture funds, but generating revenues may become critical in the future and require a viable business model. In an attempt to capture the present complex landscape (Hill, 2012b), seven main educational delivery models were identified, according to modality and method of course design criteria: ad hoc online courses and programs, fully online programs, school as a service, educational partnerships, competency based education, blended/hybrid courses and the flipped classroom, and massive open online courses (MOOC). Regarding monetization, one considered option is charging students for the exams and/or completion certificates. Based on a partnership with Pearson Vue, face-to-face testing is already available on Udacity (for a fee of $89, in one of the 4000 testing centers in more than 170 countries) (blog.udacity.com/2012/06/udacity-in-partnership-with-pearson-vue.html)and on edX (for free, in 2013, but for a small fee in the future, in one of the 450 testing centers, in 110 countries). With lower costs (a posted course can run practically on itself) and a significantly larger number of graduates than on campus, fees can be established at very low, affordable levels. A. Ng from Coursera suggested that some schools may sell branded certificates (Weissmann, 2012). Another way toward developing a revenue stream is selling a course or parts of it,

or a customized version to entities (companies, institutions, etc.) for their internal use or licensing. Antioch University, for example, became the first institution of higher education in U.S. to give their students credentials for MOOCs through Coursera based on a licensing contract (Kolowich, 2012b). Another financial source could be to make use of the detailed records on each student's achievements (with permission) by charging employers interested in identifying top students. Both Coursera and edX are exploring this revenue source (Simon, 2012). Udacity is willing to use a "recruiter fee model," retaining a commission for each talented graduate discovered and is in the process of building connections with companies and websites, such as Twitter and Amazon (Redmon, 2012). Hosting targeting online ads might also be considered at some point (Mitchell, 2012). Additionally, we believe a lucrative revenue source may be to charge researchers for the database.

In order to address the credentials issue, Coursera has obtained for five of its courses, based on the recommendation of the American Council on Education (ACE), course credit equivalency that they have offered to more than 2,000 U.S. colleges and universities. This is opening up the possibility for students enrolled at one of these institutions to transfer credit into their degree programs (blog.coursera.org/post/35647313909/american-council-on-education-to-evaluate-credit).

In an effort to lower students' cheating, all platforms developed online have a code of ethics that learners must agree to abide by in order to submit their assignments. To increase the value of their completion certificates, both Udacity and edX, are offering the proctor exam option. Similarly, for those interested in credit equivalence, Coursera recently introduced the "Track Signature" option for 15 of its courses, consisting of an online proctored exam. Other innovative solutions that are being explored and possibly implemented in the near future (Coughlan, 2012) include doing online examinations, considering the rate and the specific way a particular phrase is typed as the learners' personal signature, developing an appropriate webcam that can provide effective invigilation, and iris recognition that could verify a student's identity. Online education is still in its early phases of development and solutions are needed to "soft" aspects, such as the optimal level of reading and writing students should be asked to do, the optimum level of social interaction, and the value of face-to-face learning versus interacting in a forum, among other issues (Mitchell, 2012). Despite their imperfections, xMOOCs have the potential to generate unprecedented impact all over the world, especially through the powerful online platforms of Coursera, edX, and Udacity. Some of the effects on both higher education and entrepreneurial education, including those in developing countries, are addressed in the following sections.

## IMPLICATIONS

In its 2011 survey of online learning results, Babson Survey Research Group shows a growing trend in the proportion of students taking online courses, at the global level (> 6.1 million) as of 2010. Also, one third of all students in Higher Education Institutions (HEI) were involved in at least one online course (Chmura, 2012). According to the same study, the growth of online enrollment was ten percent, while the growth in the overall higher education student population was only two percent. These results do not include the new powerful MOOC phenomenon that offers free access to higher standard education. Even though a vocal minority in the academic community questions the quality of online education, 65 percent of HEIs now say that online learning is a critical part of their long-term strategy (Chmura, 2012). Strong evidence exists that supports the trend of growing interest in MOOCs, as more than 70 top ranked universities from 20 countries have joined in less than a year.

In the U.S., the leading MOOC country, high ranked personalities have already displayed positive attitudes toward the MOOC phenomenon, ranging from "experiment" to "revolution." The President of the American Council on Education, Molly Corbett Broad, said that "[MOOCs] holds the potential for serving many, many hundreds of thousands of students in a way we simply cannot today" (Chea, 2012). The Chancellor of The University of California-Berkeley, Robert Birgeneau, believes that "[MOOCs] will

ultimately revolutionize education" (Chea, 2012). Also, the Director of the Center for 21st Century Universities, Richard DeMillo, a computer science professor from Georgia Institute of Technology said, "We're in the middle of a potentially groundbreaking experiment. Really big things could come out of it" (Chea, 2012). Criticized by many for preserving the same lecture format for hundreds of years, HEIs face what could be considered "disruptive competition." Russ Whitehurst, Director of the Brown Centre on Education Policy at the Brookings Institute said, "MOOCs provide disruptive competition to the status quo" (Lewin, 2012b). On the other side of the spectrum, people like Phil Hanlon, the Provost at the University of Michigan, believes that the new technology would enhance the campus experience by combining video watching with hands-on activities that can't be replicated in cyberspace (Simon, 2012).

xMOOCs will affect very differently higher and entrepreneurial education all over the world. However, in our opinion, all HEIs will have to drastically reshape their strategies. One way that xMOOCs can be judged is by their effects on the position in the ranking of universities. Some of the top ranked universities are highly involved, whether as platform initiators (like Stanford, Harvard, MIT), or joining partners, and this will have the effect of increasing the visibility and prestige of MOOCs by attracting students world-wide. MOOCs are predicted to specifically target students majoring in post-secondary education. The Georgetown Center on Education and Workforce forecasts that "over half of all jobs created that will require post-secondary education of some type will be filled by people with associates degrees or occupational certificates. Small companies need those kinds of workers" (Bolden & Miller, 2012). The effects can be differentiated according to the field of study too. High structured disciplines with easy scalable outputs will be the first affected by their online counterparts.

By researching the data from all tracked activity on the platform, top universities can come up with improved learning techniques for both on campus and online. They can also identify and attract talent from around the world. However, these privileged HEIs will have to deeply reconsider their strategies, including those related to traditionally high tuition fee practices.

Universities that are at the end of the ranking lists, mainly in developing countries, some with major economic issues, including high budgetary constraints, will have to struggle more than those in developed ones. Faced with increased educational opportunities, at higher quality and lower costs, students will choose xMOOCs over face- to-face courses at an increasing rate. Presently, the majority of learners are from outside the U.S. Udacity already reported this findings, with two-thirds of its students (Redmon, 2012) and Coursera for three-fourths of them, with Brazil, Britain, India, and Russia being the most important markets (Kolowich, 2012c). Even though there are language barriers and legal issues that vary by country (i.e., certificate recognition, credit transfer); for now some protection exists for these universities. International students, particularly in developing economies and non-EU countries, will tend to opt for free top quality online courses, drastically reducing the burden of their education costs. Encouraging employers' attitudes toward better educated online graduates will lead to a decline in the number of students attending traditional universities. This will force universities, the ones who survive, to dramatically redesign their strategies.

Successful redesign strategies at universities can then be communicated and replicated. Possible solutions lie in:

- The organizational area-raising awareness among university members toward the impending changes and involving them in the transformation process; encouraging them to sign-up for already existing MOOCs addressing online tools and their effective use; identifying and eliminating organizational cultures that constrain the use of technological innovations, as recently suggested by (Schrire & Levy, 2012).
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- The area of campus-based systems-consistent improvements in the quality of the students' education experiences on campus will become imperative by implementing modern, effective teaching practices and by focusing on discussions and debates that enhance students' creativity. In doing so, the chances of retaining students could improve. Embracing blended learning models or hybrid courses and suggesting students enroll in specific MOOCs to increase their learning experiences would also be actions in a positive direction. Some universities may experiment with developing own evaluation process for credit transfer which could become a model shared by other universities.
- In the area of online teaching-joining an existing elite group of universities' MOOC platform has little chance of success, but forming partnerships with regional universities to build their own platform, with content that captures local and regional specificity might be, for some universities, a good solution.
- In the research area-the options are more numerous, and include developing academic-business partnerships for applied research, and partnering with state institutions for fundamental research.
- In the service area-providing consulting services, renting laboratories and online spaces, renting out equipment for experimentation with experts to operate physically or remotely, and providing recruiting services for local businesses.

All universities will enter a new phase of their evolution that requires a state of the art business model which includes campus and online education. All fields of study have to be reengineered, including business and entrepreneurship.

## FUTURE RESEARCH

It is generally accepted that higher Entrepreneurship Education (EE) is the key to success for many entrepreneurs, business owners, corporate entrepreneurs and social entrepreneurs and their ventures. Americans have a history of continuously raising their educational attainment based on availability and occupational demands (www.gpoaccess.gov/eop/2011/pdf/ERP-2011.pdf). EE is an effective tool that can stimulate the entrepreneurial mindsets of students, encourage innovative business start-ups, grow small- and medium-sized businesses, launch social entrepreneurship ventures, and foster an entrepreneurial culture throughout the population (Welsh & Dragusin, 2011). In this context, the emerging MOOCs represent the latest developments in the complex array of education choices and open up access to quality EE.

MOOCs are becoming a high value component of EE that can contribute to raising the capacity of diverse learners, and enable them to better cope with the myriad of expectations and demands they will face as they are deciding to starting their new ventures. MOOCs can provide quality entrepreneurship-related content for all types of learners, regardless of their background, status, resources, time, or location at a dramatically reduced cost. MOOCs offer its learners the opportunity to join a global community with potentially thousands of digital classmates that could provide cross-national connections opening business collaboration and potential opportunities cross culturally.

The beneficiaries of MOOCs can be undergraduate as well as graduate students, traditional or non-traditional students, aspiring or existing entrepreneurs, but all interested in acquiring or improving their knowledge and skills in:

The field of Entrepreneurship and related areas-the current xMOOCs provide a relatively diverse curricula (See Table 1), ranging from idea generation, the start-up phase, business models, innovation, managing the business, financing, growing the business, and building competitive strategies. The Coursera platform is dominant in the field of Entrepreneurship Education, with 29 out of 32 suitable courses, while there are only two EE edX courses and one Udacity course. There are only two courses offered in a language other than English, which are both in Spanish.

Table 1 *Current xMOOCs offer related to EE*

| Nr. | MOOCs / DOMAIN / OFFERED COURSE NAME: | MOOC PROVIDER: | Taught in: |
|---|---|---|---|
| | **xMOOCs:** | | |
| A. | **Domain - Business and Management:** | | |
| | 1. Developing Innovative Ideas for New Companies | Coursera/ Univ.of Maryland | English |
| | 2. Startup Engineering | Coursera/Stanford Univ. | English |
| | 3. Grow to Greatness: Smart Growth for Private Businesses (Part I + Part II) | Coursera/Univ. of Virginia | English |
| | 4. Law and the Entrepreneur | Coursera/ Northwestern Univ. | English |
| | 5. Foundations of Business Strategy | Coursera/Univ. of Virginia | English |
| | 6. Competitive Strategy | Coursera/Ludwig-Maximilians Univerisat Munchen. | English |
| | 7. Leading Strategic Innovation in Organizations | Coursera/ Vanderbild Univ. | English |
| | 8. Surviving Disruptive Technologies | Coursera/Univ.of Maryland | English |
| | 9. Organizational Analysis | Coursera/ Stanford Univ. | English |
| | 10. Rapid development of innovative products for emerging markets/ Desarrollo rápido de productos innovadores para mercados emergentes | Coursera/ Technologico de Monterrey | Spanish |
| | 11. Continuity and development of the family business/ Continuidad y desarrollo de la empresa familiar | Coursera/ Technologico de Monterrey | Spanish |
| | 12. An Introduction to Operations Management | Coursera/ Univ. of Pennsylvania | English |
| | 13. Introduction to Finance | Coursera/Univ. of Michigan | English |
| | 14.An Introduction to Financial Accounting | Coursera/Univ. of Pennsylvania | English |
| | 15. Healthcare Innovation and Entrepreneurship | Coursera/Duke Univ. | English |
| | 16. International Organizations Management | Coursera/Univ. of Geneva | English |
| | 17. Creativity, innovationn and Change | Coursera/Pennsylvania State Univ. | English |
| | 18. New Models of Business in Society | Coursera/Univ. of Virginia. | English |
| | 19. Design Thinking for Business Innovation | Coursera/Univ. of Virginia. | English |
| | 20. Inspiring Leadership through Emotional Intelligence | Coursera/ Case Western Reserve Univ. | English |
| | 21. How to build a Start-up: The Lean Launch Pad I | Udacity | English |
| | 22. Copyright | edX/ Harvard Univ. | English |
| **B.** | **Domain - Economics and Finance:** | | |
| | 1. Fundamentals of Personal Financial Planning | Coursera/ Univ. of California, Irvine | English |
| | 2. Microeconomics for Managers | Coursera/ Univ. of California, Irvine | English |
| | 3. Property and Liability: An Introduction to Law and Economics | Coursera/ Wesleyan Univ. | English |
| | 4. Principles of Microeconomics | Coursera/ Univ. of Pennsylvania | English |
| | 5. Microeconomics Principles | Coursera/ Univ. of Illinois at Urbana-Champain | English |
| | 6. Networks: Friends, Money and Bytes | Coursera/ Princeton Univ. | English |
| **C** | **Domain - Statistics, Data Analysis** | | |
| | 1. Passion Driven Statistics | Coursera/ Wesleyan Univ. | English |
| | 2. Statistics One | Coursera/ Princeton Univ. | English |
| | 3. Statistics: Making Sense of Data | Coursera/Univ. of Toronto | English |
| | 4. Introduction to Statistics: Descriptive Statistics | edX/ Berkeley Univ. of California | English |

Source: authors' online research on: www.coursera.org; www.edX.org; www.udacity.com

The cMOOCs offerings consists mainly of Udemy's197 short business-related courses with hands-on names, out of which 12 are free entrepreneurship related courses (See Table 2).

Table 2 - *Current cMOOCs offer related to EE*

| Nr. | MOOCs / DOMAIN / OFFERED COURSE NAME: | MOOC PROVIDER: | Taught in: |
|---|---|---|---|
| | **cMOOCs:** | Udemy | English |
| | **Domain - Entrepreneurship:** | | |
| | 1. Buil.Measure.Learn. Lean Startup | | |
| | 2. An Entrepreneurs' Checklist | | |
| | 3. 21 Critical … | | |
| | 4. The Lean Startup at Stanford E-Corner | | |
| | 5. Raising Startup Capital | | |
| | 6. Web Design for Entrepreneurs | | |
| | 7. Foundations of Business Strategy | | |
| | 8. How to Break out of the Pack | | |
| | 9. Founders Pie | | |
| | 10. Social Entrepreneurship: an Introduction | | |
| | 11. Kikstarter Equation | | |

Source: authors' online research on www.udemy.com/courses/search?q=entrepreneurship&price=free/

Related fields (i.e., Computers Systems, IT, Engineering, Health, Design, Art) - that support the discovery of an opportunity, or give a better understanding of an existing evolving business area. There are already hundreds of MOOCs available on platforms like Coursera, Udemy, Udacity, Class2Go (a new Stanford MOOC Platform), Codecademy, among others.

There are several Entrepreneurship Education topics that are not covered or only touched upon, including Family Businesses, Direct Selling, Franchising, and Social Entrepreneurship. A cross-disciplinary approach that blends Entrepreneurship with specific disciplines should be developed to meet the needs of both business and non-business graduates. The growing number of high quality MOOC offerings can supplement many different courses. xMOOCs can become a complementary solution or an alternative for EE in smaller HEIs, in both business and non-business disciplines (Welsh, 2013) . Licensing rights for MOOCs can be a viable solution to grow innovative course development and a generation of entrepreneurs in academia.

The modified EE landscape, with its multiplying channels can be used as a valuable source for feasibility analysis, business plan competitions or for real businesses to benefit from consulting through classes, such as the Small Business Institute's® "Project of the Year" competition. This competition, organized yearly by the Small Business Institute®, awards the best practical consulting project both at the undergraduate and graduate level in three categories: feasibility/business plan, specialized project, and comprehensive project. This would have the effect of spreading the competition globally with MOOCs as an integral part of the total learning experience, lining up entrepreneurs and students to work on real live projects online as well as the potential of multi-cultural student teams. More information can be found at (http://www.smallbusinessinstitute.biz/Default.aspx?pageId=1266007).

The credential issue (courses for university credit) has little importance for a large cadre of learners, seniors, young entrepreneurs, and for many people in developing countries with low or no access to other forms of EE. The main goal for these individuals is learning and developing their knowledge and skills using all available channels.

MOOCs will not replace entirely traditional EE learning but can provide an affordable, viable, flexible, complementary alternative with global reach and can respond, at least partially, to the high demand for entrepreneurship and business knowledge. Evaluating the effectiveness of MOOCs' use in the teaching and learning process in higher and entrepreneurial education will require future in-depth research.

## PERSONAL EXPERIENCE WITH AN ENTREPRENEURSHIP xMOOC

"Developing Innovative Ideas for New Companies" is a six week course available on Coursera- a free xMOOC that one of this paper's author completed from January to March, 2013, in order to experience it first-hand. It was announced that out of over 85,000 learners enrolled from around the world, 63% were taking this EE-related course for the first time and 45% of those enrolled are planning to start a business in the near future. Those enrolled ranged from teenagers to retirees, with the 25 year-old segment being the most common. Sixty-one percent were male and 39% female. The course is offered by The University of Maryland and taught by Dr. James Green, the Director of Entrepreneurship Education at Maryland Technology Enterprise Institute, an award-winning program recognized by the U.S. Association of Small Business & Entrepreneurship (www.usasbe.org). Students were not required to have any prior coursework or knowledge of entrepreneurship. The course covered the basics of how to identify and analyze entrepreneurial opportunities, and covered the main elements of value propositions, customer segments, strategic alliances, business modeling, basic business planning and raising capital.

Every week there were four to six structured videos of eight to twelve minutes each to watch, with interspersed mini-quizzes and assignments, with due dates and hard deadlines. Each segment provided the opportunity to integrate and apply the learning content. Two books were suggested for additional reading. Assignment submissions were accepted only after checking the code of honor box. Peer grading (based on crowd sourcing technology), to enrich the learning experience was used twice. Three options were available worth 0/1/2 points according to each criteria and a comprehensive explanation of each option was provided. Each time, the evaluation by four unknown digital peers' was mandatory in order to have your own work graded. Extra-assessments were encouraged and rewarded if completed. Peer grading was required at the end of week four for the Business Model Canvas to develop your own entrepreneurial idea; nine evaluation criteria were used, corresponding to the model's nine filled-out blocks. At the end of week six, peer grading was mandatory for one business plan evaluation (with a choice from a collection of 500 at http://www.bplans.com/sample_business_plans.php). This required reading at least five business plans, including your own assignment as well as a minimum of four others in order to properly grade the four peer evaluations).

Working ahead was encouraged but not rewarded. The average weekly workload was four hours, probably considerably higher for those less experienced in the field. Feedback was collected at the end of the course through an online survey. If the learner had a total score of higher than 70%, an electronic, printable Statement of Accomplishment was issued with the provider's signature. Interaction between learners was intense and visible on the Forum with six sub-forums, having all up-to-date features. Study groups (over 200) were formed (both virtual and physical), displaying a high diversity among learners (i.e., age, nationality, status) and based on diverse grouping that included the "Spanish Speaking Group," "Customer Discovery," "Tomorrow's Meeting in Barcelona," "Join us in our LinkedIn Group – Ideas Ahead," "Mother CEOs Study Group," "Skype International Study Group," "Web-based Start-up," among others. Even though direct interaction with the instructor was not possible, he proved to closely monitor the course participants' progress. Weekly encouraging and detailed messages were sent out regarding different course aspects ranging from a welcome message, assignments, deadlines, to the percentage of remaining students taking the course.

Most of the previously outlined benefits could be experienced, including the quality of course content, flexibility, high reach and interactivity with a global community leading to an enriching learning experience, and potential business ideas outcomes. However, weaknesses included a slight mismatch of the course title with its content (pointed out on the forums by learners expecting more on innovation); a relatively static image during video presentations, and a high level of opportunity to cheat.

## CONCLUSION

MOOCs are a new and amplifying phenomenon, in the context of shrinking budgets and rising education costs. The xMOOC type, encompassing Coursera, edX, and Udacity advanced online platforms, with their free best quality content, have the potential to generate major changes in both higher education overall and specifically entrepreneurial education all over the world. Universities will need to adjust their online and on-campus education strategies. The most affected will be low ranked universities, situated mainly in developing countries and also regional universities that have the propensity to be combined with other universities in state systems, for example.

Both cMOOCs and xMOOCs are a valuable and rapidly expanding opportunity for complementary Entrepreneurship Education, reaching a large and diverse audience that can enjoy the freedom of self-paced instruction with the social support of the learning network and online peers. Further research is needed in order to identify the amplitude of this phenomenon and evaluate the appropriate time frame for the required changes, as well as the effect of MOOCS on the overall learning environment.

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