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Justin Redona
Berglund Student Fellow

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Rights

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by Justin Redona

Student Fellow, The Berglund Center for Internet Studies

During high school, I utilized a vast amount of open educational resources (OERs) available on the Internet to aid my learning of various subjects such as biology, chemistry, calculus, and literature. Whenever I had difficulty understanding a concept in any subject, the Internet made it easy to find helpful, relevant information. This recurring process led me to discover many video lectures offered on YouTube, Khan Academy, and AcademicEarth; along with countless online self-quizzes and premade digital flashcard sets. I later discovered a plethora of OERs through websites. Among them were the Open Learning Initiative at Carnegie Mellon, OpenCourseWare by MIT, and University of California College Prep. There was no doubt that online learning through OERs was happening with the advent of Web 2.0 and that students like me were probably using them to their advantage. Without giving much thought to OERs and their implications for higher education, I continued to pursue a college degree, after receiving my high school diploma, in hopes of obtaining a job or moving on to graduate school in the future. My idea of success originated after the Second World War; it was an institutionalized view that a college degree was a ticket to prosperity. [1]

Four years later, now that I am months away from earning a bachelor's degree at a small private university, I am beginning to notice how recent developments in online learning (i.e. e-learning) may alter the role of a traditional undergraduate degree in ultimately obtaining a job. Through my casual perusal of interesting TED Talks, I came across Daphne Koller's compelling talk entitled: "What we're learning from online education." [2] In it, she presents on the phenomenon of massive open online courses (MOOCs) and their implications to life-long learning and open access to education. Through Coursera, a for-profit venture established by Koller in 2012, Koller demonstrated the amazing capability of MOOCs to allow access to higher education in places where education is not readily accessible. Aside from their philanthropic potential, MOOCs may also be useful for undergraduate students by enhancing their education and supplementing their studies beyond college for the sake of acquiring meaningful knowledge. According to Rob Bencini [3], a Certified Economic Developer (CEcD) and economic futurist from North Carolina, "A college de-

gree is no longer an absolute necessity to make intellectual contributions to the economy." It seems that MOOCs may change how prospective college students pursue higher education if some employers are seeking knowledgeable workers regardless of having a diploma. For those of us who are currently enrolled in a college or university, MOOCs raise concerns as to how we may compare to employers' expectations once we enter the job market. Of course, although this issue does depend on the type of desired job, the ultimate implication of MOOCs accessibility with no financial obligations for the student drastically changes our traditional view of higher education for students, educators, and employers. Ultimately, major tuition-free (or nearly free) MOOC platforms such as Coursera, edX, and Udacity have given students another option for higher education over costly academic institutions. This article will provide a brief introduction into the MOOC phenomenon and its implications for higher education.

What is a MOOC?

A MOOC is an online course that has a global reach (i.e., massive) and is accessible (i.e., open) to anyone with an Internet connection. It can be characterized as providing a structured means of facilitating learning between students and an expert or experts. [4] In 2008, George Siemens and Stephen Downes offered the first MOOC through the University of Manitoba's Learning Technologies Centre and Extended Education. [5] Since then, MOOC offerings have expanded and are causing a stir in higher education.

Currently, typical MOOC lectures have similar components of traditional college lecture courses, such as quizzes, assessments, and assignment deadlines, except that more people can "see" the course, take the assessments, engage in discussion with fellow classmates, and obtain statements of accomplishments. [6] [7] This traditional model of teaching, however, may change as the current state of MOOCs and online learning lack a pedagogy that ensures learning outcomes can be reached. [8] As Joseph Harris, a writing professor at Duke University recently remarked in The Chronicle of Higher Education, a MOOC cannot be viewed as "much more than a digitized textbook." [9] With many interactive technologies already in existence to supplement video presentations [10] and room for pedagogical innovation in making online learning effective, MOOC platforms will undoubtedly refine the way they disseminate knowledge to online masses. Until then, research on the effectiveness of MOOCs and the pedagogy facilitated by its major platforms is currently lacking and, therefore, invites further investigation. [11] [12] [13]

What makes MOOCs unique compared to other forms of e-learning is the lack of prerequisites, costs, formal accreditations, and defined levels of

required participation. [14] [15] [16] In this sense, MOOCs can be seen as an extension of e-learning, popularizing the phenomenon, probably through effective marketing strategies, with appealing topics and prestigious professors from top-notch institutions. [17] Prior to MOOCs, elite universities, on a global scale, offered no structured form of free, online learning, disregarding OERs. And now that this method of acquiring knowledge is available, young minds that are prepping for college or eager to enter the workforce may think twice before subjecting themselves to student loans, as MOOCs pervade the higher educational landscape.

Although motivations—intrinsic and extrinsic—for subscribing to MOOCs may vary, I propose that career-oriented rationales may be the predominant basis for utilizing these resources. Research conducted by Penn's Graduate School of Education has shown that students of MOOCs, termed here "MOOC subscribers," have unexplained disparities in participation and engagement behaviors, with an average of four percent of enrollees completing their courses. [18] More research has to be done to discern actual motivations among MOOC subscribers, the frequency of MOOC subscribers with such motivations, and their varying associations with particular courses, disciplines, or platforms. [19] Certainly, this touches upon only one aspect of MOOCs that provide research opportunities. According to Sarah Pritchard, Dean of Libraries at Northwestern University, aside from the struggles of logistics, technology, pedagogical and policy issues, we should consider large research opportunities:

The timing is such that could be tested by comparing the outcomes of varied models of delivery (Coursera, 2U, edX, Udacity), the possible impact of different home institutional characteristics, and the effectiveness of MOOCs in different disciplines or levels of courses. The critical important step is – start now to gather data and test effectiveness in the traditional or "control" setting. [20]

Certainly, there is a need to perform before-and-after or cross-institutional studies to gain insights into the MOOC phenomenon and education. The demand for such research suggests that there is insufficient evidence to support any conclusions describing implications for students, employers, and academic institutions. Therefore, it seems that most considerations are based on suggestive pieces of evidence that are anecdotal or isolated to one MOOC delivered by a single MOOC platform. Large-scale research will enable critical questions surrounding the MOOC-phenomenon to be elucidated, whereby consumers of education (i.e. students) can make informed decisions about their method of higher education.

Although MOOC creators and their proponents have expressed that "MOOCs would break down economic, geographic, racial and gender barriers

to higher education," [21] such a vision will not significantly materialize if retention and participation among MOOC-subscribers remains dismal. I foresee that immediate major effects of the MOOC phenomenon will be seen among an educated demographic comprised of digital natives and immigrants in developed countries. An additional study indicates that some 80% of subscribers already have an advanced degree, suggesting post-graduate-based rationales for taking a MOOC, such as fostering general curiosities, obtaining professional development, or working towards occupational promotions. [22] Furthermore, this finding does not support the philanthropic, idealistic view of what MOOCs were proposed to accomplish. Instead, the majority of current MOOC-subscribers are already well-educated, Westernized, and, most likely, financially stable. With MOOCs being offered as a free service, those 80% of subscribers are invested in expanding their skill or knowledge base in hopes of advancing their career. It seems that MOOCs will have to gain more popularity among its intended audiences, who lack access to traditional methods of higher education, in order for the idealistic vision of MOOC creators to appreciably materialize. But for now, current MOOC subscriber trends suggest this matter is secondary.

Until we see retention rates rise and the intended, underserved demographic significantly engaged, implications for higher education and degree-pursuing students will be the main focus of this article. My commentary stems from an undergraduate perspective along with current views surrounding the MOOC phenomenon; I do not have information science nor education expertise.

Implications for Undergraduate Students

MOOCs present another means of obtaining higher education at little or no cost, enhancing preexisting education, and acquiring desired career-related skills. Therefore, considerations for current undergraduates include how much they are willing to pay, what quality of education they want, and the type of knowledge or skills their desired jobs require.

Attending college is already costly. Public college tuition this year rose 4.6 percent to an average of $16,510 according to the College Board [23] and not all college students graduate within four years or make it to graduation. Likely due to money and debt, only 56 percent of US students graduate in six years, according to a study conducted by Harvard. [24] If students are not willing to pay or cannot afford a college education, then MOOCs may be the next best option to obtain a higher education. To address the problem of rising college tuition, a novel type of MOOC, offered by the online platform Education Portal, has been created in allowing students to earn low-cost, transferable credit—in

some cases, paying less than $100 for three credits—that can be applied toward their degrees. [25] Some students, however, may still prefer a traditional educational setting that is face-to-face versus online.

A genuine liberal arts college experience is characterized by close relationships with professors and fellow students; the daily challenge of critical thinking; discussion-based courses; and meaningful encounters with peers from different backgrounds. [26] This form of education has its worth, as our knowledge based society requires higher order skills of critical thinking, creativity, and originality, all of which are difficult, if not impossible to teach, using the behaviorist pedagogy that most MOOCs use. [27] In this sense, there is notable value in having a college experience, even if tuition is expensive. Contrary to massive online educational settings, getting individualized attention and being mentored on a personal level may be of paramount importance to a liberal arts college experience. However, a major academic analysis by the Babson Survey Research Group provides preliminary evidence that e-learning is comparable, if not better, than traditional college instruction in terms of quality and outcomes: "more than three-quarters of academic leaders rated learning outcomes in online education as the same as or superior to face-to-face instruction." [28] Yet, some educators who are skeptical about the quality of learning online, emphasize the importance of learning in brick-and-mortar classrooms and argue that learning by doing is better. [29] If we are reducing education to "learning outcomes," then MOOCs seem to fit this model. On the other hand, if we are focusing on a holistic view of education, then attending brick-and-mortar institutions seems more suitable. Which method students choose is likely to be determined by cost. And cost reduction, in choosing MOOCs over college, is done at the expense of having quality faculty members, who are the heart of an educational process, and respond to individual learning needs of students, lead classes through enlightening discussions, and serve as student mentors. [30] For now, MOOCs and the college experience seem to be on opposite sides of the quality education spectrum.

Hybrid or "flipped" classrooms may bridge this gap in quality by incorporating MOOCs into the classroom. If professors are not already implementing this strategy, then students have the opportunity to do it themselves by supplementing their current studies with MOOC material in addition to the copious amount of OERs on the Internet—that is, if students even have the time to do so. Howard Horton, president of New England College of Business and Finance, wrote in the New England Journal of Higher Education that MOOCs might be the new "textbook" of modern day college courses:

> *As sourceware, MOOCs can be a major advancement over standard textbooks because they preserve the use of exceptional content ex-*

perts and expand the concept of the textbook by including internal assessment mechanisms and student-to-student interaction. Building on this concept, edX, the Harvard/MIT venture, is now saying its on-line courses will "improve" rather than "replace" campus-based education, and it has arrangements with Bunker Hill and other community colleges to teach courses around the MOOC content as one might similarly teach a class around a textbook. [31]

The step that edX is taking towards integration in traditional educational settings represents initial advancements among MOOC platforms to be included in the "flipped" classroom model. In efforts to make physically attending universities more attractive, according to an article by The Economist, edX is also selling its MOOC technology to universities like Stanford, to augment existing teaching. [32] If higher education is to respond to the MOOC phenomenon with its integration into "flipped" classrooms, then more work needs to be done on how MOOCs can augment or potentially improve education, along with how to best utilize class time. [33] For now, undergraduates can take advantage of this resource independently to aid or expand their knowledge base that will be intrinsically or extrinsically meaningful to them. As most testimonials on the value of online learning come from motivated students, MOOCs may benefit undergraduates with clear goals and confidence in their abilities, even after graduation, to build upon what they have learned in traditional educational settings. [34] For prospective undergraduates, however, in addition to worries of college debt, MOOCs will inevitably impact their educational choices in hopes of getting a job or going to graduate school.

In terms of getting a job, future college graduates may have to enhance their resume even further and adapt to the MOOC phenomenon. In a job climate that demands knowledgeable employees with many traditional experiences, such as formal postsecondary education, internships, summer jobs, and life experiences, many existing MOOC-subscribers appear to be potential job seekers, who use MOOCs as a resource to gain technical knowledge, while bypassing college credits and fees. [35] In fact, according to an article published by The Economist, Udacity, a MOOC platform, is working with companies to train future employees having established partnerships with several firms, including Google, AT&T, and Georgia Tech. [36] This could compensate for employers' common observation that many graduates lack the proper pool of knowledge to contribute immediately, if employed, compared to existing personnel. [37] Almost half of the employers surveyed in 2011 by the Accrediting Council for Independent Colleges and Schools complained about the skills gap and argued that specific workplace training rather than broad-based education should be emphasized. [38] Furthermore, employers' hiring behaviors indicate

that knowledge takes precedence over educational expertise. [39] In the end, people, who already have traditional college degrees, may be equally qualified or less qualified job candidates compared to non-degree-seeking people who have completed targeted MOOCs . [40] Unless professional or graduate school is the student's goal after undergraduate studies, it seems that they will immediately face a more competitive job market that looks for well-suited, credentialed candidates. Indeed, the market of online learning through for-profit and non-profit ventures has reaffirmed the thought that any college degree is the ticket to prosperity. [41]

This competitive scenario between degree-holding and non-degree job-seekers will likely play out, as long as MOOCs remain accessible and massive, but may not be an issue just yet for professional school applicants. For instance, MOOCs could prepare undergraduates for medical or nursing school, but will not impact professional education overall, as face-to-face, hands-on components are essential. [42, 43] To date, no pre-medical program is offering academic credit for taking a course through a MOOC. [44] However, the American Council on Education has certified required and recommended pre-medical courses offered by Coursera and Udacity. These include "Introduction to Physics," "Introduction to Statistics," "Introduction to Genetics and Evolution," and "Calculus: Single Variable" to be taken for credit upon successful completion of a Credit Final Exam. [48] This encourages universities to grant credit to undergraduate students who complete these courses. Nonetheless, for these professions and other related fields such as law, degrees are still required in order to matriculate into professional school. However, the trend of pursuing knowledge over a degree presents critical questions in regards to professional organizations and the consumers of their services. The focus on knowledge, rather than a degree may ultimately undermine the "insured," "bonded," or "legal" process of professional work, and lead to complacency with the creation of a new role: the legal "laymen." [45] The concept of earning a MOOC education is still in its early stages and society will have to adapt quickly as we still predominantly rely on credentials as a hallmark of professionalism and expertise in a particular field.

Overall, MOOCs offer a cost-effective opportunity for undergraduates, as potential MOOC subscribers, to further their knowledge, enhance their resume, and, perhaps, provide a competitive edge against non-degree seekers under the higher education, credential-seeking paradigm in hopes of prosperity. Failure to realize that MOOCs offer career-related training may leave future college graduates inadequate in the eyes of employers compared to qualified job applicants, who completed targeted MOOCs. It is worth mentioning that this may apply to certain technical fields and not professional fields such as Medicine or Law. Undergraduates must be aware of what it means to achieve a

higher education, in regards to MOOCs and their career goals. These implications are according to the current state of MOOC offerings, and will undoubtedly change as MOOCs continue to develop in the market of higher education. After all, major MOOC platforms have been around for less than a decade. Therefore, the points I have made so far beg validation through research findings, which are currently insufficient. [46, 47] Ultimately, current MOOCs have the potential to supplement or augment learning in the classroom whether independently on the part of the student or through classrooms flipped on the part of professors.

Conclusion

Like many undergraduate students, I held the predominant view that obtaining a degree is synonymous with being on a path to prosperity, or at least financial stability. However, MOOCs are now in the market of higher education and encourage a greater emphasis on knowledge seeking than degree seeking. I have suggested that career-oriented rationales may be the main basis for utilizing MOOCs as more than simply an OER. In general, MOOCs are in their early stages and society will have to quickly adapt to their implications for higher education. Nonetheless, as a cost-effective opportunity for undergraduates, MOOCs are beneficial tools to further knowledge, enhance resumes, and, perhaps, provide a competitive edge against non-degree seekers. The quantity of published literature pertaining to MOOCs will surely expand as time progresses, as the experimentation between MOOC platforms, colleges, and universities unfolds under the current pressures of soaring tuition and increasing enrollments at institutions across the US. An area of interest to investigate further includes an assessment of whether learning is really happening across MOOC platforms and whether MOOCs can successfully facilitate different types of learning.

Notes

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[10] Cooper & Sahami (2013)

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[12] Pritchard, S. M. (2013). MOOCs: An Opportunity for Innovation and Research. Portal: Libraries and the Academy, 13(2), 127–129. doi:10.1353/pla.2013.0015

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[24] Grossman (2013).

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