# Do MOOCs pose a threat to higher education?

Todd A. Finkle Gonzaga University

Evan Masters Gonzaga University

### **ABSTRACT**

Higher education is facing several obstacles, one of which is the prolific rise in Massive Open Online Courses (MOOCs). This article examines the history of online education and also provides a background of the current organizations that are competing in the MOOC industry. The success of MOOCs and the current hurdles they have to overcome are examined. The article also discusses the current and future potential impact of MOOCs on higher education. Finally, the authors make recommendations to schools of higher education on how to deal with this potential threat.

Keywords: MOOCs, Higher Education, Massive Open Online Courses, Online Education, Technology, Universities

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### INTRODUCTION

Higher education (e.g., colleges, universities, community colleges and technical schools) have been around for centuries. Today, higher education is facing a huge dilemma: cost. Students are coming out of schools with an enormous debt burden. According to *CnnMoney.com*, the average amount of student loan debt for those leaving college with an undergraduate degree in 2012 was \$29,400 (Ellis, 2013). Mitchell (2014) reported that the median debt for graduate students at the end of 2012 was \$57,600, 43% higher than 2004. As of April, 2014 the US debt clock (see <a href="http://www.usdebtclock.org/">http://www.usdebtclock.org/</a>) showed that the total amount of student loan debt owed in the US was approximately \$1.2 trillion and increasing at an average rate of \$55 billion a month or \$660 billion annually. Student loan debt has surpassed the combination of auto and credit card debt in the U.S. Furthermore, state funding for higher education has decreased by 28% from 2008 to 2013.

The traditional educational model is ripe for disruption. Traditional colleges are facing an increasing threat from the disruptive technology of online education. Blockbuster, Borders, Circuit City, Tower Records were all forced to shut down their bricks-and-mortar stores due to start-ups and their low cost strategy of shopping online. The disruptive technology that has ravaged the retail sector over the past decade has garnered the attention of higher education. Some have forecasted that traditional brick and mortar colleges, notorious for adopting change at a bureaucratic pace, will lose out to those institutions who are able to adapt quicker and who offer both hybrid and fully online degrees. This forecast has some members of academia predicting that a number of institutions will fail as a result. Clayton M. Christensen, a Harvard professor of business strategy, stated in a *New York Times* that the "bottom 25 percent of every tier" of colleges will disappear or merge in the next 10 to 15 years" (Selingo, 2013). More recently, Richard Lyons, Dean of the University of California-Berkeley School of Business, stated that if the top MBA programs were to put their programs online, up to 50% of all business schools could fail within 5-10 years (Clark, 2014).

These are significant challenges that face higher education in the world today. No longer is doing business the same way acceptable. It is adapt, innovate, or die. But can traditional academia deal with the potential threat of innovative online education like Massive Open Online Courses (MOOCs) and other newly developed online models at universities? Harvard University just introduced their own online platform and bypassed MOOCs altogether.

The timing of this article is extremely important to administrators and educators at schools of higher education throughout the world. The article answers the following research questions: (1) What are MOOCs and who is competing within the industry? (2) What impact are MOOCs and other recent online innovations having on higher education? (3) What does the future hold for MOOCs and other recent online innovations and (4) What strategies can higher education use to deal with the threat of MOOCs?

#### HISTORY OF ONLINE EDUCATION

Online education has been around for a long time. The Electronic University Network was founded in 1984 and launched the first online courses in 1986. A PhD program was available at the Electronic University Network in 1992. The first fully virtual university, Jones International University, was founded by Glen R. Jones in 1993. Since then, technology and innovations have increased the proliferation of online learning.

During the '90's, online learning was limited to asynchronous technologies or delivery methods where the content was setup ahead of time, and the student accessed the materials when their schedules allowed. The content could be delivered via email, message boards, or prerecorded videos and audio files. One of the most notable examples of an asynchronous technology is the learning management system, BlackBoard, formed in 1997, which allows educators to centralize course content and make materials available to students as the course progresses.

The '90's was also a prosperous time for one of the most well know online course offering universities like The University of Phoenix. In 1997 it became the largest private university in the US. The University of Phoenix has continued to use technological advances to further its mission of providing higher education to working adults by offering flexible class times to fit into busy schedules. It is still one of the largest universities in North America, with many of its 249,500 enrolled students seeking online degrees.

Not all news regarding online education in the '90's was good news, however. In 1992, Congress discontinued offering federal student aid to universities and institutions where the majority of the courses offered were online. This ban stemmed in part from a large amount of online education-based fraud that was happening at the time. This ban was overturned in 2006 due to the high demand for online education.

The 2000's saw the advent of synchronous technologies, such as VoIP, web conferencing with video, and Internet Radio, which allowed educators and students to interact in real time. These configurations more closely resembled the traditional classroom setting, but without the geographical limitations. In addition to meeting in real time, educators retained the asynchronous technologies – those giving them the ability to provide additional material outside of the allotted 'meeting' time. These advances resulted in more and more students taking online courses which, in turn, resulted in universities offering more and more online courses.

In the 2000's a number of new companies and initiatives transformed online learning. In 2001, the open source web site, Wikipedia, was created which allowed for information about subjects to be shared with the world. In 2002, MIT's OpenCourseWare (MIT OCW) program gave access to lecture notes, exams, and videos from actual MIT courses to anyone with an internet connection. These materials were (and still are) available at no charge and with no registration required. YouTube was founded in 2005 and provided numerous free educational videos to the world.

OpenLearn iTunes U (iTunes U) was founded in 2006 and is a section of Apple's iTunes Music Store that features educational audio and video files from universities, museums and public media organizations for free download to PCs and mobile devices. iTunes U allows people to search, download and play educational content in the same way that they can manipulate songs, podcasts, television shows and movies. Participating institutions include Stanford, UC Berkeley, University of Melbourne, Texas A&M, MIT, Yale, Trinity College Dublin and many more.

Founded in 2006, the Khan Academy is a non-profit that provides free online educational lessons. Over 300 million lessons have been delivered with a video library of over 4500 videos. Peer2Peer University (Now P2PU) was founded in 2009 and is a nonprofit online open learning community that allows users to organize and participate in courses and study groups to learn about specific topics. The courses are not accredited; however students can achieve badges, which recognize their achievement.

### MOOC INDUSTRY

Over the past few years a new form of online education has been created by a few major players. Built on the format of the Kahn Academy, a few startups out of universities have created MOOCs for people all over the world to learn about a variety of topics.

MOOCs are a form of online education. A MOOC is an online course aimed at large-scale interactive participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for the students, professors, and teaching assistants (TAs). MOOCs are a recent development in distance education (Lewin, 2013).

According to a 2013 Survey of Online Learning Report from the Babson Survey Research Group, the number of higher education institutions offering MOOCs grew slightly from 2.6 percent in 2012 to 5 percent in 2013. Fifty three percent of higher education institutions report that they are undecided about MOOCs and only 23 percent of academic leaders believe MOOCs are a sustainable method of online education, which decreased from 28 percent in 2012. Perhaps the most important result of this report is that 64 percent of academic leaders are concerned that the credentials for completing a MOOC will cause confusion about higher education degrees. This number is up from 55 percent in 2012. The University of Wisconsin-Madison is part of the 5 percent of academic institutions offering MOOCs and is currently in phase two of the MOOC integration process (Becker, 2014).

MOOCs are an innovation of previous courses offered online. These courses have been successful in terms of the relatively high numbers of student enrollment. However, there has been criticism of the effectiveness and low rate of students finishing and passing the courses. An argument against the effectiveness of MOOCs is that it targets students at the bottom of the economic tier who require the most one-on-one interaction with professors. That kind of personal assistance is hard to obtain through online courses.

There are three major competitors within the MOOC industry: Coursera, Udacity, and EdX. Another entity will soon be offering classes called MOOC.org, a joint venture between Google and edX. EdX is a non-profit and Udacity and Coursera are for profit entities. The following is a discussion on these companies as well as an online educational initiative called CORe, which was created by Harvard University in 2014.

#### Coursera

Coursera was founded by two Stanford professors, Daphne Koller and Andrew Ng, and is a for-profit business. Coursera has received investment infusions of \$85 million in venture capital. As of March 2014, Coursera hosts 108 educational institutions in 19 countries, and offers more than 600 free courses to 7 million learners from every country in the world (Conroy, 2014). In March 2014, the company announced that Yale University's former President, Dr. Rick Levin an economist, will take over as CEO. The company has stated that it has made \$1 million last fall.

By bringing on Levin, Coursera hopes to legitimize their course offerings so they can gain accreditation for courses, certificates and degrees. The company currently makes \$30-\$90 for a certificate but is hoping that with accreditation, it can increase the cost per course to \$300. In order to scale, Coursera will need to increase revenue as it is estimated that it costs \$50,000 to

create a course. The current business model has schools getting 15% of the revenue. Schools main benefit is one of marketing and branding for right now.

The success of Coursera and other MOOCs will reside with accreditation. Currently, The American Council on Education, the US' most visible and influential higher education association, has recommended five Coursera courses for accreditation: (1) Introduction to Genetics and Evolution and (2) Bioelectricity: A Quantitative Approach from Duke University; (3) Pre-Calculus and (4) Algebra from the University of California at Irvine and (5) Calculus: Single-Variable from the University of Pennsylvania. Despite this, only a few students have taken the courses.

Coursera's original partners were Stanford, Princeton, Michigan and Pennsylvania. Within just four months of launching, Coursera had over 1 million students. By October 2013, Coursera had 5.2 million users, a five-fold increase in just over one year (Vinayak, 2014).

Ng and Koller created Coursera because they saw a learning gap in their classrooms. When a professor asked a question, they realized a majority of the students were not listening. Some were too busy taking notes to hear, let alone process and answer the question, while others surfed the web or day-dreamed. When one student answered the question correctly, the professor moved on, leaving the other students absent of accountability. The interactive layering built into each lesson was a major strength of Coursera. They called it "retrieval" and "mastery learning." By frequently asking questions, the student could proceed at their own pace, while being held accountable for the lectured material. Mastery learning has been shown to improve students' performances by 34%, or a standard deviation.

From the beginning, Koller and Ng were interested in online learning, and how to get a good education to students that could not afford to go to a school like Stanford. Teaching at Stanford laid the groundwork for what would become Coursera. In 2008, Ng posted online 10 of Stanford's most popular engineering courses for free. Later that same year, Koller began to experiment in video clips and embedded quizzes to improve online learning. Eventually, she would use this in her actual class and make attendance optional. In 2012, they received \$16 million of venture capitalist money to get their company going.

Coursera was the result of the growing popularity of online classes. Roughly 10% of students enrolled in at least one online course in 2003. In 2009, 30% of students were enrolled in an online course. By 2014, that percentage is expected to reach 50%. Coursera's aim is to focus on the pedagogical potential of online courses in an attempt to reach hundreds of thousands of students across the globe. The hope is that these students, now educated by the top professors in the world, will be able to apply what they learn and improve the world around them.

Coursera allows students to customize their education. It gives them the flexibility to take what they want rather than at a set time every week. This customization gives Coursera a competitive advantage versus traditional universities. Perhaps the biggest draw to Coursera is the quality of professors as they tend to be from the top universities in the world.

Coursera can set up relationships between students and employers and perform a kind of matchmaking service that is beneficial to both parties. However, the company faces the stigma associated with not learning in a classroom. Coursera does not provide a learning environment like a college provides, and a student could possibly get distracted with the lack of structure compared to traditional schools of higher education. Another fear is that Coursera cannot always meet the need of the individual student because the courses are open to thousands of students, and students might desire a more personal interaction with the professor. One reported problem with Coursera is their network, which has been known to crash during lectures or assignments

because of the number of people trying to gain access to it. Also, some people might just want to take classes on Coursera to say they are educated rather than actually trying to get an education. Finally, Coursera has some credibility issues because, although they have great partnerships with universities, they currently do not have a strong reputation for their classes to become eligible for college credit.

Coursera has opportunities to continue its growth with other universities, which will increase the number of courses offered. To enhance its revenue model, it could also start advertising. They could also lead a research study on psychological or cognitive learning studies to help increase their credibility and get rid of the stigma associated with online learning. Corporate training is also another niche they could penetrate.

Some threats that are facing Coursera are their direct competition from other MOOCs and individual universities (traditional models and online courses and degrees). Coursera needs to overcome the course credit problem. It needs to legitimize its course offerings so they can turn into course credits and degrees to fully become a viable company.

### **Udacity**

Udacity is a for profit company that was founded by Sebastian Thrun, David Stavens, and Mike Sokolsky from Stanford University. Over 1.6 million students have taken courses. The company's start-up capital came from Thrun's savings of \$300,000 and Charles River Ventures, a venture capital firm located in Cambridge, MA. In October 2012, the venture capital firm Andreessen Horowitz led the investment of another \$15 million (Clark, 2012). In November 2013, Thrun announced in a *Fast Company* article that Udacity was a "lousy product" and that the company was pivoting to focus more on vocational courses for professionals (Chafkin, 2013).

### EdX

EdX is a non-profit based in Cambridge, Massachusetts. It was created by a Massachusetts Institute of Technology (MIT) professor, Anant Agarwal, in May of 2012 and is currently a joint platform with Harvard University. Each school has put \$30 million into the venture. Over 1.6 million students have taken courses. As of January 2014 there were 30 institutions involved in EdX.

## **MOOC.org**

MOOC.org is a new venture that will be created by Google and edX. It will be owned and operated by edX. The site will go live in the first half of 2014 and host the Open edX learning platform to allow instructors at non-edX-affiliated universities to develop and publish courses online. Google has agreed that any improvements it makes to the Open edX software in the process will be donated back to the open source code base so that ALL edX users can benefit. While they have not announced pricing, if history is any guide, courses with small enrollments may be free to publish and consume, whereas courses with larger enrollments may require payment (Fox, 2013).

MOOC.org could give an opportunity to teachers who might have gone undiscovered. Schools will need some type of agreement with their faculty on the relationship between faculty-

authored content for their campus courses and the availability of that content in a MOOC or mini-MOOC (Fox, 2013).

Google's commitment to collaborate with edX gives a boost of credibility to not-for-profit open education generally and to edX in particular that may be a win for everyone involved, not just Google and edX, but the soon-to-be-thousands of instructors and millions of students who will be the primary beneficiaries of this technology (Fox, 2013).

### HARVARD BUSINESS SCHOOL'S CORe

In January 2013, Harvard Business School (HBS) developed its own digital learning initiative called HBX. HBX is the name for their innovative educational platform. The new HBS-originated business offerings debut with: CORe (the acronym for Credential of Readiness), a two-month suite of three fundamental courses aimed at a new audience—college liberal-arts students, non-business graduate students pursuing other professions (law, engineering, etc.), and people early in their careers—for whom familiarity with basic business concepts may prove helpful in their work or subsequent career decisions. HBX Live, a virtual classroom built in partnership with public broadcaster WGBH, which enables direct, real-time interaction among 60 participants dispersed worldwide and with a faculty member, as if they were all located within a campus classroom; anticipated early users include HBS alumni and executive-education matriculates (*Harvard Magazine*, 2014).

Harvard has two dozen online-based experiences on topics ranging from history to neurosciences to national security, all developed by HarvardX, a University-wide initiative that enables faculty to build and create online learning experiences and to conduct groundbreaking research in this rapidly evolving area. According to Harvard Provost Alan M. Garber, "The lessons we learn from HBX will be deeply interwoven with other efforts such as HarvardX and edX, informing best practices in blended and online teaching and offering world-class educational materials beyond our campus" (Kenny, 2014).

### **SUCCESS OF MOOCS**

In 2013, Sebastion Thrun, the co-founder of Udacity stated that their MOOC courses are often a "lousy product". He expressed that their experiment failed at San Jose State University (Schuman, 2013). Udacity put its program with San Jose State University on hiatus after more than half of the participating students failed the program's initial courses. Thrun announced that Udacity would be switching to corporate training. To combat the challenges from MOOCs, more and more colleges and universities are creating their own online programs. Harvard is a great example.

### **HIGHER EDUCATION AND MOOCS**

The MOOC industry is in the introductory stage of its life cycle. In the future there will be significantly more course offerings, certificates, degrees offered, and involvement of universities within these organizations. The authors project that in the future there will be more competency based evaluations of students. As a result, the sole reliance on degrees will become less paramount.

MOOCs are forcing universities to become more entrepreneurial in their approaches to education. Online programs like the College for America and Southern New Hampshire University have been approved by the Department of Education to receive federal financial aid for its students.

A MOOC bill became law in Florida in June of 2013 that allows college transfer credits to be earned by students through their completion of MOOCs. There is also a pending MOOC bill in California that would allow its state universities to provide students with academic credit for MOOCs.

Former Tufts University President, Lawrence S. Bacow, voiced that online education will soon be incorporated into undergraduate programs at traditional universities, but that will not mean the current traditional method of education will fail in the future. Many universities are already beginning to do this, with traditional classroom lectures and discussions coupled with online course tools for students.

### **CONCLUSION/SUMMARY**

Despite the high cost of higher education, it is projected that MOOCs will exist alongside traditional academic settings just as many older institutions and technologies continue to thrive despite challenges. According to a recent study by Columbia University, MOOCs will not fundamentally reshape higher education, nor will they disappear altogether (Kolowich, 2014). The researchers state that MOOCs will not disappear but will move towards traditional online courses where some elements like one-on-one tutoring, estimable credentials, and qualitative feedback on assignments come at a price.

For example, during the dot.com boom in the late 1990s, there was online grocery shopping. However, this did not destroy traditional grocery stores. In fact today, online grocery shopping is a small niche within the industry. People like shopping for groceries and choosing their food in person. Likewise, some people are too busy to attend school in person so they opt for online education while others will choose the traditional on-campus method. For the foreseeable future, MOOCs will remain a niche player.

At this juncture schools and professors need not worry about the threat of MOOCs. There are just too many problems with MOOCs; finish rate, testing, cheating, and most importantly the ability to measure the effectiveness of MOOCs. The MOOC organizations also lack legitimacy and have not proven their effectiveness.

### **Strategies to Deal with MOOCs**

While it appears that there is no immediate threat from MOOCs, some schools of higher education may want to be proactive in their strategies to deal with them. Here are a few options that schools of higher education can do to compete with MOOCs.

For example, San Jose State University has passed a policy where departments must approve whether a MOOC can be used. Furthermore, schools should focus on their core competencies and sustain their niche in this area. Some schools may want to invest in more online and/or hybrid classes to compete with MOOCs, however, they must reinforce their core competencies. Some schools may want to develop deep educational alliances with other institutions. Through these alignments, schools can share curriculums, either physically or virtually. This approach may allow them to reduce entire academic departments, putting most of

their resources toward making a few degree programs distinctive while leaving the rest to their partners. The resulting partnership may result in a stronger brand for the schools. Additionally, some schools may need to formulate cost-reduction strategies.

Another possible option is to form strategic alliances with industry. For example, the University of Maryland and Northrup Grumman are creating a brand new cyber security concentration, which includes a new dorm and curriculum. Ohio State University and IBM have created a new alliance focused on significant data analysis and Murray State University has formed alliances with local companies to focus on retooling their engineering programs.

Education models over the next 5 to 10 years may be based on competency exams. Some schools, that are using this form o education include: Southern New Hampshire University, Western Governors University, and Excelsior College. Competency based education is a whole new way of looking at education. This can have a positive impact on people that do not necessarily have the funding for a four year degree, but can find alternative forms of education that they can have access to for free or at a reduced price. From a student's perspective, the movement towards MOCCs can be extremely beneficial, especially if the students are located in other countries and/or are from disadvantaged economic backgrounds. Furthermore, universities are becoming increasingly innovative to capture market share. For example, the University of Wisconsin public online education system has a new strategy to deliver online education. Students pay a flat fee \$2,200, and can take as many classes as they can in a set period of time. This experiment started in January, 2014.

Student access to education will only increase due to technological advances. This can come at a benefit for all society as not only do students receive top of the line instruction at a fraction of the cost, but the whole world has access to some of the best educators in the world. However, the traditional in-person method of instruction at universities will not go away. MOOCs will only complement the existing traditional model of higher education.

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