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## Leveraging MOOCs in the Community College

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### Abstract

Massive Open Online Courses (MOOCs) have potential for utilization in the community college setting for a variety of purposes. The authors reviewed current literature examining whether MOOCs could act as a substitute for remedial education. They also reviewed literature exploring the cost effectiveness of implementation, the effects on persistence rate and content mastery, and how community colleges are currently using MOOCs in their curricula.

### Introduction

This paper reviews current literature investigating whether MOOCs, or Massive Open Online Courses, could be used in the community college setting as a direct form of remedial education. The authors determined that MOOCs are not yet ready to replace current forms of remedial education in their current format; however, many institutions are utilizing them in unique ways to meet the remedial education needs of their students.

### What is a MOOC?

MOOCs are online courses garnering almost unlimited participant access on a variety of educational topics. These typically free, non-credit bearing courses taught by a university professor were deemed the first serious threat to the brick and mortar university as soon as news media became aware of their presence (Pappano, 2012; Wetterstrom, 2014). Although introduced prior to 2012, these courses gained wide popularity when *The New York Times* declared 2012 the year of the MOOC (Pappano, 2012). Young (2016) described the early period of these classes as “an unprecedented giveaway of what had traditionally been the most expensive education in the world” (para. 1). This interest boom catalyzed partnerships between high-profile higher education institutions and private companies offering online learning management systems and corporate marketing tactics. Although it appears that these courses will not dismantle current education systems, they have contributed to an influx of online learning in higher education as a whole and provided alternative pathways to student learning and success (Hill, 2016; Lawson, 2016).

Platform providers such as Coursera, Udacity, and the non-profit edX, out of Harvard and Massachusetts Institute of Technology, are currently working together to determine the most effective method of course delivery (Pappano, 2012). Dr. Daphne Koller, co-founder of Coursera, explained that students are “looking for shorter, more-to-the-point modules of knowledge” (Young, 2016, para. 27). The most vital component of a MOOC is the video lecture (Guo, Kim, & Rubin, 2014). While many lectures tend to be eight to 12 minutes in length (Pappano, 2012), an empirical study of lecture videos found that engagement drops after only six minutes regardless of length (Guo et al., 2014). One key component of measuring the learning occurring is the one to two breaks in the video lectures for a quiz. Additionally, these in-video quizzes allow every student to participate and attempt to answer questions, unlike in a traditional classroom (PBS Newshour, 2013).

The open systems utilized by the providers make it simple for almost any individual to access courses without a formal application process required at higher education institutions (Lawson, 2016). Additionally, these students now have access to learning from some of the top faculty members at top universities. Of the Top 100 ranked National Universities by U.S. News and World Report, 20% of massive open online courses were offered by the top five universities on that list (Online Course Report, 2016). In regards to ease of access, Udacity, allows users to connect and log in to their course work using their Facebook accounts (Lawson, 2016). Although no college credit is typically earned by completing a course, a student might receive a Certificate of Achievement or digital badge (Pappano, 2012). If an individual is interested in earning credit or a degree there are a few options (Lawson, 2016). Georgia Tech, for example, offers a complete MOOC based Masters of Computer Science for \$7,000. While the content is available to anyone for free, those registered to Georgia Tech will earn both the credit and degree.

In 2015, enrollment doubled from 2014, with the total number of students signing up for at least one course reaching 35 million (Shah, 2015). Despite this fact, the completion rate of MOOCs remains extremely low. According to a study conducted by the University of Pennsylvania, the average completion rate is only four percent across all courses and can range from two percent to 14% depending on the course and measure of completion (Stein, 2013). Completion rates improve when courses are offered in an on demand format instead of a traditional course schedule (Young, 2016).

### **MOOCs and Higher Education Access**

MOOCs provide for greater access to higher education courses than ever before. Koller, of Coursera, stated:

I think by opening up education for free to everyone around the world, we're going to turn education, high-quality education, from a privilege to a basic human right, so that anyone, no matter their social, economic or family circumstances, has access to the best education. (PBS Newshour, 2013, para. 12)

Joshua Jarrett, Deputy Director for Postsecondary Success at the Bill and Melinda Gates foundation, described MOOCs as an alternative way to get a jump-start on college, similar to AP courses (Young, 2012). Jarrett explained, "We think in the short term the blended, flip-the-classroom model is going to be the one that's most effective for first-generation, low-income students, the kind of students that we work for" (Young, para. 20). According to the American Association of Community Colleges (2016), 36% of community college students are first generation college students and 36% are Pell Grant recipients.

In fact, the Gates foundation provided a \$1,440,900 grant to a research group to study the “effectiveness of MOOCs used in a ‘flipped classroom’ model” (Young, 2012, para. 18). Researchers found that the flipped model produced equal results to traditional face-to-face learning in 25% less time (Bowen, Chingos, Lack, & Nygren, 2012). This is congruent with research conducted by Means, Toyama, Murphy, Bakia, and Jones (2010) who found that a blended learning approach to teaching was more effective than either face-to-face or purely online learning.

Many are quick to note the potential for institutional cost savings as well. Jarrett (2012) declared, “The very notion of free, high-quality courses has some prognosticators pronouncing MOOCs as a game changer that will drive down the cost of college while driving up student learning” (para. 2). Fain (2013) stated that the cost of producing one MOOC-style course at Bossier Parish Community College was only \$23,000—\$20,000 to cover its instructors’ design time and \$3,000 for the hardware and software costs. Despite the affordability of course creation, institutions, especially community colleges, may be hesitant to divert resources from other offices on campus (Straumsheim, 2016).

### **Barriers to MOOC Implementation**

Perhaps on the surface, these courses appear primed to sweep the higher education market and provide a low-cost alternative to a brick and mortar institution. In reality, however, there are many complex issues that must be addressed before they can be fully integrated into a community college curriculum. A partnership between San Jose State University (SJSU) and Udacity founder, Sebastian Thrun, was created to offer three online remedial and entry-level math and statistics courses for college credit (Kamenetz, 2013; Lewin, 2013). Each course would cost a student \$150. Thrun, who was unhappy with low completion rates in MOOCs, hired online mentors to simulate the personal connection similar to a traditional classroom (Kamenetz, 2013). The students enrolled in this pilot course included half SJSU students and half students from nearby charter schools and community colleges. The samples were then split again, and half of each population participated in either the online or face-to-face course. Despite the addition of the mentors, the students in the online course did far worse than the students who took the class on campus. Potential explanations for the disappointing outcome include lack of access to computers and a lack of preparedness for the course content.

Another major concern surrounding MOOCs is that the format almost entirely removes the student/faculty interaction (Jacobs, 2013). Despite the fact that a professor hosts the video lectures Jacobs stated, “It creates a strange paradox: these professors are simultaneously the most and least accessible teachers in history” (para. 7). This lack of interaction is speculated to contribute to the low completion rate (Stein, 2013). Jill Silos-Rooney (2013), a community college professor, worried that a model consisting only of online interaction would not work for many of her students. She stated, “The idea of a flipped MOOC taking the place of a live lecturer could pose problems for millions of students who require more direct guidance and interaction” (para. 3). Additionally, Silos-Rooney illustrated that soft skills and interpersonal skills may be lost and underdeveloped by the lack of physical interaction. She posed the question, “Will we lose an already tenuous sense of community and connection in our society if we further atomize education?” (para. 15).

Unlike the blended or flipped classroom model, many students do not learn or perform in purely online classes at the same rate as a face-to-face course. Traditional MOOCs offered from Coursera, Udacity, and edX fall into this purely online format. Xu and Jaggars (2013) found that participation in an online class had a significantly negative relationship with course persistence and grades; they indicated students had difficulty in adjusting to the online course environment. The effect of online courses is exacerbated in community colleges and students enrolled in them are less likely to persist than their peers in face-to-face classes (Brown, 2013).

Finally, there is no evidence that online learning systems will be adaptable to all campuses across the nation. Bowen et al. (2012) explained that not even highly interactive learning management systems can “deliver improved educational outcomes across the board, at scale, on campuses other than the one where the system was born, and on a sustainable basis” (p. 27). This is congruent with Xu and Jaggars’ (2013) research wherein they described how students adapt differently to different subject areas. Essentially, each institution—and potentially each individual instructor—would have to customize a course site to cater to the needs of their students.

### **MOOC-Style Courses**

One proposed solution for the utilization of MOOCs is as a form of supplemental education in community colleges, targeted toward students in need of remedial courses. These courses could reach high-need students in subject areas of math and English—subjects that typically present barriers to students starting degree programs (Roach, 2013). Nationwide, 44% of first-time community college students enroll between one and three developmental courses, and 14% take more than three (Cohen, Brawer, & Kisker, 2014). Additionally, only one in four students who place into a remedial course will earn a college degree or transfer to a four-year institution (Fain, 2013). At most institutions, students placing into remedial courses must pay for them and do not typically earn credit towards degree completion (Rivera, 2012).

While MOOCs are not ready in their current form to replace remedial education, they can be used successfully in conjunction with other resources for improved student success. Koller, of Coursera, iterated her interest in partnering with existing academic institutions and explained that MOOC content can be used as a supplementary, online component to many classes (Roach, 2013). Institutions have begun implementing these hybrid, MOOC-style courses to meet the needs of individual students and subjects. These supplements create another layer in the remedial education process, essentially becoming a precursor to the course. Providing an online, basic skills course could save students thousands of dollars and prepare them to place into a higher-level course from the start of their college career (Lawson, 2016). Dr. Barbara Illowsky, a liaison to the California Community Colleges Chancellor’s Office in Sacramento, stated:

I’d like to look at it as a way to save taxpayer dollars, a way for students to take ownership, and a way for us as community college faculty to develop courses to offer them in a pre-assessment way, so that students can have a shorter time to completion. (Roach, 2013, para. 5)

### **Current Partnerships**

The Bill and Melinda Gates Foundation also saw the opportunity for to offer remedial and introductory online courses opposed to their traditional advanced topics (Mangan, 2012). In the fall of 2012 the Gates Foundation awarded \$550,000 in grant money to 10 institutions to explore

and develop content for “high-enrollment, low-success introductory-level courses” (para. 3). Three such institutions were Bunker Hill Community College in Charlestown, Massachusetts, Wake Technical Community College in Raleigh, North Carolina, and Cuyahoga Community College in Cleveland, Ohio. Additionally, Bossier Parish Community College has created an “in-house” MOOC-style course.

In 2012, MIT approached Bunker Hill Community College (BHCC) to participate in a new edX course, Introduction to Computer Science and Programming, creating the first partnership between the platform and a community college (Fifield, 2013). In this hybrid iteration, MIT faculty generated course content, and students met with BHCC faculty twice a week. This flipped-classroom model allowed students to engage in the online material outside of class and participate in “communal course problem-solving” (para. 5) to aid students in completing course assignments. Unlike traditional MOOCs, students register for this course through BHCC and receive credit upon completion.

In 2013, Wake Technical Community College (Wake Tech) became the first in the State of North Carolina and one of the first in the country to launch a MOOC as a supplement to developmental math courses (Wake Technical Community College, 2013). The Introductory Algebra Review is free and open to anyone, including non-Wake Tech students, and is positioned to help students prepare for the North Carolina diagnostic math exam. Laura Kalbaugh, Dean of Academic and Transition Resources at Wake Tech explained, “More than half of the students who apply for admission to Wake Tech are not ready for college-level math. This MOOC will help them perform better on math placement tests and in some cases place into college-level math courses” (para. 2). Wake Tech partnered with Udacity to create the content, which covers the first five modules of developmental math curriculum set forward by the North Carolina Community College System.

Cuyahoga Community College (Tri-C) has similarly developed a self-paced course with content compared to their two-week summer bridge course (Cuyahoga Community College, 2015). This course is four-weeks long and is on the College’s Blackboard page. Half of the course content is from Khan Academy’s database and half from TeacherTube and Multimedia Education Resource for Learning and Online Teaching (MERLOT) (Fain, 2013). This course allows for partnership between local K-12 districts (Cuyahoga Community College, 2015, para. 4). Although this MOOC-style course is open to anyone, Tri-C specifically targets high school students, encouraging them to refresh their math skills before going to campus (Fain, 2013).

Bossier Parish Community College has created nine free online courses without the aid of grants. Each course costs approximately \$23,000 each to develop (Fain, 2013). All the courses align with traditional, remedial courses in subject areas of math, English and reading, as well as an Introduction to Science, and a College Success Skills course. Unlike other institutions where content development is the responsibility of the platform provider, Bossier Parish faculty were the sole developers. Additionally, this independently operated system allows Bossier Parish to cater to their own population of students in developmental courses.

Bossier Parish’s decision to keep their courses homegrown came from the desire to foster relationships between students and faculty (Fain, 2013). Knowing their student population, administrators wanted the students to see the same professor online and in the classroom. Jim

Henderson, the college chancellor, explained, “They’ve got to be able to see that face and know that ‘this is a person I can talk to’” (Fain, 2013, para. 18). Additionally, Bossier Parish is using the MOOC as extra content for students who are currently in remediation courses, as well as marketing information to students who take the placement tests in the summer. Administrators hope to see an increased number of students placed directly into credit-bearing courses when they enter the institution.

Gamification is the process of using game design elements in non-game contexts, such as in an educational course (Stansbury, 2014). Three game elements that can be easily incorporated into a MOOC-style course are progression, investment, and cascading information. Progression involves students visualizing their success through increasing levels of difficulty and unlocked content. Investment builds through earned, in-content achievements, and cascading information helps unlock information continuously through bonuses, countdowns, and synthesis.

Both the Tri-C and Bossier Parish courses are grounded in gamification. Fain (2013) explained that they are competency based and build one module on top of the previous. Sasha Thackaberry, Tri-C’s Director of eLearning Technologies, explained that this low-risk environment, “actually teaches persistence and resilience” (Fain, 2013, para. 21). Fain explained that most students are familiar with gaming to some degree and that nontraditional students thrive on the positive feedback from progressing levels.

## **Conclusion**

Although the traditional MOOC is not ready to be seamlessly integrated into the community college, similar-style, online courses can provide substantial enrichment to remedial coursework. Investment in the platform, courses, and faculty training will be necessary for these courses to become fully developed to meet students’ needs. Depending on which resources an institution uses to develop and provide their course, they can be cost effective options for presenting targeted concepts to many students. Despite the low persistence rates for traditional MOOCs, MOOC-style courses do not have the same objectives, and cannot be evaluated on the same basis. Current iterations of these courses may require students to master one particular concept from the presented material, or may simply provide a review of basic material. Additionally, they present an enhanced opportunity for evaluating content mastery when students arrive to their physical class sessions. Some community colleges have already begun implementation, and these courses have the potential to contribute to high-quality online learning and become a low-cost, efficacious supplement to face-to-face instruction.

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