Letter from the Editor-in-Chief:
MOOCs - How Are They Doing?

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In the September 2012 issue we looked into MOOCs, Massive Open Online Courses (Herman, 2012). These are open, free to many, courses delivered online, ideally with no requirements or prerequisites to join, taken by thousands of students at a time from all over the globe. The year 2012 was referred to as the “Year of the MOOC” (Pappano, 2012; Siemens, 2012), and some had predicted that MOOCs would lead to the decline of “brick and mortar” institutions (Jordan, 2014). A year and a half later, we ask, “how are these courses doing?”

The number of MOOCs and the extent of coverage has been steadily increasing. Coursera, the largest provider, has over 6.8 million students, 625 courses, and 108 partners. In 2012 we reported that Coursera had 1,502,351 students, 195 courses, and 33 partners. According to their blog, as of 2/14/14 they have 22 classes in French and 46 mathematics classes. Following the numbers reported at the Coursera website for 24 hours, we see a steady number of enrollments at a rate of 523 per hour. (See Figure 1.)

![Graph](image.png)

**Figure 1.** A plot of the number of students registered at Coursera during a period on March 6-7, 2014 as a function of time.

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1 Author's email: hermanr@uncw.edu
2 In January 2013, a year after Coursera began, the enrollment was 2.5 million (Koller & Ng, 2013).
In 2012, the typical Coursera course enrolled between 40,000 and 60,000 students, of whom 50-60% attended the first lecture. In classes with required programming or peer-graded assignments, around 15-20% submitted an assignment for grading. Of this group, approximately 45% successfully completed the course. Overall, about 5% percent of students who signed up for a Coursera MOOC completed the course. (Koller, Ng, Do, & Chen, 2013a, 2013b)

As a comparison, edX, a nonprofit provider, has over 150 courses have granted over 100 certificates for completion of coursework. There have been several reports released with initial data on the performance of MOOCs (Ho, et al. 2014; Jordan, 2014; Kolowich, 2013, Stein, 2013). Ho, et al. (2014) describe the first 17 MOOCs given by HarvardX and MITx with 841,687 registrations resulting in 43,196 (5%) earning certificates. Many of the reports describe the numbers and demographics of students and what had been learned to date.

Rayyan, Seaton, Belcher, Pritchard, and Chuang (2013) describe the first physics MOOC from MITx, which ran for sixteen weeks in Spring 2013. The course was based on the lectures of Walter Lewin on electricity and magnetism for calculus-based physics. The videos were broken into smaller chunks and the course was supplemented by machine graded questions and homework, simulations, problem solving sessions, exams, and threaded discussions. The initial enrollment was 43,758 of which 1878 (4.3%) completed the final. They found that 84% of surveyed enrollees were male, 40% were from the U.S., and consisted mostly of high school and undergraduate students. The rate of retention dropped exponentially throughout the course, a trend typically seen with many MOOCs.

Duke University also reported on their first MOOC (Belanger & Thornton, 2013). In that course, which used the Coursera platform, 12,000 students enrolled from over 100 countries. This dropped to 8,000 who logged on the first week and 313 (2.6%) students successfully completed the course. The report describes the development and delivery of the course, the types of students participating, learning outcomes, student and faculty experience, and the barriers to completion. The most common of these barriers were lack of time and mathematics background.

The findings of these reports are similar to those noted in other reports, such as the recent report from the Penn Graduate School of Education (Stein, 2013). Jordan (2014) conducted a study of enrollment trends in MOOCs based on data aggregated from class-central.com. The study was confined to the big three providers, Coursera, edX, and Udacity. This included 91 courses with enrollments of 45,000 to 276,652. It was found that the average MOOC had 42,844 students enrolled with a completion rate of 6.5%. Noting from Koller and Ng (2013), a majority of students already had degrees. They had reported 42.8% had bachelors, 36.7% had masters, and 5.4% doctoral degrees (Jordan, 2014).

A study of 103 professors who had taught a MOOC at that time was published in the Chronicle of Higher Education (Kolowich, 2013). In that study, the mean number of students enrolled in a MOOC was 33,000 with a 7.5% completion rate. This study went further to discuss the attitudes of the professors teaching these courses. Typically, an in-
structor spent 100 hours in preparation for the course and spent 8 hours a week during the course. Most do not require students to purchase materials, including textbooks. They found that 55% of the professors noted that time was taken away from their academic responsibilities to run the course and many did this on top of their usual course loads. Before running the class, a third of them were skeptical about MOOCs, but afterwards 90% were enthusiastic. 79% believe that MOOCs are worth the hype, but 77% do not believe that students should get credit for the course from their university.

There are still many things to be learned from MOOCs. For example, Koller, Ng, Do, and Chen (2013a) have written about peer assessment models. In particular, they investigated how large scale peer grading can be made more accurate, dependable, and efficient.

For a more detailed discussion about peer assessment and MOOCs, NPR’s Math Guy, Keith Devlin, has offered his thoughts based on his course, “Introduction to Mathematical Thinking” in interviews (Lederman, 2013) and blogs (Devlin 2013a, 2013b) and at a panel discussion at the AMS-MAA Joint Mathematics Meetings in Baltimore this year. In these he discusses MOOCs and how they are more about the success of the students who complete the classes, as opposed to focusing on the dropouts. A traditional class reaches only 25 students, of which one worries about the few who drop the course. However, if only a few thousand complete the course, those are students who you would never have reached otherwise.

His course is even more challenging as it is important for students to learn to fail in doing mathematics in order to learn mathematics. This is part of the process - learning does not stop at turning in assignments, but also in giving students the opportunity to recognize correct mathematics by looking at the work of others. Thus, he sees peer grading as an important component of the course. He recalls that even though he was an A student in calculus, he never really understood calculus until he was a graduate TA looking at other students’ work and trying to explain it to them. In the same way, he sees peer grading as an important part of the learning process. The challenge is to design this process on a mass scale. He has found that students have found this as the most important part of the course, claiming to have learned the most during this phase of his course and he is working on improving this part of his course.

From these reports on the first MOOCs we are getting a glimpse of how students learn and what motivates them to succeed in online classes. However, there are many questions still to be answered: Will MOOCs lead to a transformation of traditional education? Will students still prefer face-to-face learning in an intimate seminar setting, or will they favor the social networking model of MOOCs? Will universities find a way to grant credit to MOOCs and eventually include them in some programs? Will MOOCs help to remove remedial work from campuses?

References


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