

Teaching a Species-Specific Massive Open Online Course (MOOC): Lessons from the Horse Course

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Abstract

The Horse Course massive open online course (MOOC) was first offered through the Coursera platform in 2014. The course is a basic introduction to equine physiology, care, and use. It was offered over 6 weeks as an instructor-paced course in 2014, and again in 2015. Beginning in 2016, the course was offered as self-paced (on demand). To date, a total of 36,737 learners have joined the course from 164 different countries. Of these, 20,722 learners visited the course and 17,296 viewed one lecture. Total lectures viewed have reached 490,552. A total of 57,977 weekly quizzes were taken with 65,184 submitted exercises. In the course message board, a total of 18,798 forum posts were made and viewed a total of 108,953 times. Of the students that enrolled, a total of 3,154 (9%) went on to pass (>70%) all the quizzes and assignments to earn a course certificate. Of those learners that viewed at least one lecture, completion rates increased by 18%. Current data for the on-demand model indicates a sustained enrollment of $1,196 \pm 35.5$ new learners per month. These data would indicate an elevated level of interest and sustained enrollment in an equine-focused MOOC.

Introduction

The New York Times proclaimed 2012 as the “Year of the MOOC” (Pappano, 2012). Since, MOOCs (massive open online course) have gained in popularity. These types of college-level courses are offered online at no cost for participants through many different platforms (Coursera, edX, Udacity and many others). One of the largest MOOC platforms, Coursera, initially only offered a handful of courses in 2012, and in 2016 offered over 1,800 courses in 11 different languages. What gains the most attention with MOOCs are the large numbers of students enrolled in any course. In 2011, Stanford University’s Introduction to Artificial Intelligence MOOC attracted over 160,000 enrollees (Cooper and Sahami, 2013). Data from Coursera indicated for the year 2015

the platform reached over 18 million learners (45% from the United States) with an enrollment of over 500,000 new learners per month (Coursera, 2016). Currently, there are over 60 different platforms offering MOOCs in many different disciplines and languages.

Education for equine enthusiasts has evolved across many platforms around the world. My Horse University was first established at Michigan State University in 2006 and one of the first to offer online equine-oriented education to the masses, albeit with a fee-based system. Other schools and private enterprise have followed the demand for knowledge about horses and other livestock species. The first free equine-related MOOC was offered in 2013 by the University of Edinburgh titled *Equine Nutrition*. This paper will discuss a second equine-oriented MOOC offered for free titled *The Horse Course: Introduction to Basic Care and Management* (THC). It was taught beginning in 2014 through the Coursera learning platform.

Data from Coursera for 2015 indicated a continued growth of interest in students enrolling in MOOCs with over 18 million learners enrolled for the year, with an average of 500,000 new learners per month (Coursera, 2016). While enrollment continues to grow, those students that persist to complete the course to earn a passing grade remain very low. Indeed, many sources cite average completion rates of 10% or less (Alrami et al., 2015; Hone and Said, 2016). The reasoning for these low completion rates remains unknown and others cite the lack of transparency in reporting course data across disciplines as a major obstacle in better understanding the MOOC learning environment (Ebben and Murphy, 2014; Reich, 2015). Therefore, the major aims of this study are to report student engagement data for THC and share feedback from these students on the course and their general opinions of the MOOC learning environment.

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Materials and Methods

Data collected for this paper were provided by Coursera through its analytics platform and approved by the University of Florida Institutional Review Board. All enrollment and engagement data provided by Coursera was collected in May 2016. Anonymous online surveys were emailed to all participants in THC using Qualtrics.

In 2014, THC was first offered through Coursera as an instructor-paced 6-week course. A second 6-week iteration of the course was offered in 2015. Beginning in 2016, THC was changed to be on-demand, where students had the ability to complete the course at their own pace rather than being guided by an instructor over 6 weeks. To qualify to take the course, enrollees simply had to create an account through Coursera and click the enroll button. The Coursera platform is designed to allow access to online lectures, weekly quizzes or exams, weekly assignments, discussion posts, and other activities. For THC, students were expected to view weekly online lectures, take a weekly quiz (automatically graded), post in the course discussion forum (non-graded), and complete a weekly assignment (graded) beginning in Week 2 of the course. Furthermore, to be able to grade potentially thousands of weekly assignments, students were asked to peer-review at least three assignments of other learners enrolled in the course. At no time did the instructor grade weekly assignments, and students' scores were an average of their peer evaluations. Quizzes and assignments were worth 10 points each. Completion of THC MOOC with a passing grade of greater than 65% earned the student a Statement of Accomplishment. A grade of greater than 80% earned the student a Statement of Accomplishment with distinction.

Finally, pre- and post-course surveys were emailed to any participant that voluntary enrolled into THC through the Coursera platform. In 2016, another survey was created with a focus on gauging students' opinions on MOOCs. The survey link was sent to the email address of all students registered for THC since it first opened in 2014, with the survey being open for 30 days. All surveys were voluntary and anonymous.

Results and Discussion

Since their first inception, MOOCs have only grown in popularity throughout the world. The global reach of MOOCs continues to increase with development of language specific MOOC platforms such as Rwaq for Arabic speaking peoples (Adham, 2015), which has thought to benefit women in that region of the world (Macleod et al., 2015). MOOC platforms are also seeing higher enrollment from countries such as China and India with crowd-sourced translation of English-spoken MOOCs (Hone and

Said, 2016; Piao et al., 2015). As stated, data from 2015 provided by Coursera indicated enrollment of over 18 million students (Coursera, 2015). Of these, the United States had the highest enrollment with over 4.4 million students, followed by 3.8 million for European Union countries, 1.4 million greater China, 1.4 million from India and 800,000 from Brazil.

The Horse Course Enrollment

Data for enrollment and completion rates of THC are depicted in Table 1. The 36,696 enrolled learners hailed from 164 countries. The top 5 countries for enrollment in THC were the United States 38% (13,980), United Kingdom 12% (4,285), Canada 8% (3,029), Australia 4% (1,576), and Spain 2% (856). When broken down by regions of the world for THC enrollment, 47% live in North America, 33% Europe, 8% Asia, 5% Oceania, 5% South America and 2% Africa. These data support the premise that most MOOC learners originate from more developed nations with high enrollment of well-educated students (Macleod, 2015). However, the growth of MOOCs is increasing at a rapid pace and as mentioned above, language specific MOOCs and the inclusion of China and India is only increasing enrollment. Data from 2016 in THC supports this trend as enrollment from China increased from less than 2% enrollment (India 1%) in 2014 to an 8% enrollment rate in 2016 (India 3%). High enrollment from such diverse populations as observed here has been a primary generator for much of the excitement behind MOOCs. This coupled with the increased diversity of students is leading to many positive opportunities for global teaching and learning.

As mentioned above, in 2014 and 2015 the course was taught one time during the year as a 6-week instructor paced course. Beginning in 2016, the course has been offered on demand, and learners completed the course at their own pace. Course completion rates of THC are like what has been reported in other MOOCs, with many sources citing average completion rates of 10% or less (Alrami et al., 2015; Breselow et al., 2013; Hone and Said, 2016; Rai and Chunaro, 2016). Indeed, much of the criticisms directed toward MOOCs stem from these low completion rates.

Rai and Chunaro (2016) stated success rates in MOOCs are less than 7%, which they base on reported

Table 1. Data on Learners Enrolled in The Horse Course MOOC Offered Through Coursera

Year	Total Enrolled	Different Countries	Emerging Economies	Course Completion
2014	21,484	164	3,424 (16%)	1,852 (11%)
2015	6,980	130	1,137 (16%)	785 (9%)
2016*	8,273	146	na	517 (6%)
Total	36,737	-	4,561	3,154 (9%)

* Data collected from January to August 1, 2016
na = not available

Table 2. MOOC Student Taxonomy of Engagement. Adopted from Anderson et al., 2014

Type	Description
Viewer	Watch lectures, handing in few if any assignments
Solver	Watch few lectures, hand in graded assignments
All Rounder	Balanced with viewing lectures and completing assignments
Collector	Download lectures for later viewing, hand in few if any assignments
Bystander	Registered for the course but very low interactions with course content

completion rates. However, others disagree and argue that completion rates do not equate success of a MOOC. Hood et al. (2015) explained that not all MOOC learners are motivated to complete a course. Recent research suggests we currently do not have quality data on self-learning qualities of MOOC students (Milligen et al., 2013). Park et al. (2015) explained participants in MOOCs have very different learning outcomes compared to traditional students, and some may only wish to acquire some basic knowledge or skills without earning credit (or certificate). Anderson et al. (2014) described five types of MOOC learners (Table 2): Viewers, Solvers, All-rounders, Collectors, and Bystanders. In their study, the authors classify a high proportion of MOOC students (80-90%) in their courses as less engaged (Bystander, Viewer, Collector), or those that will not go on to complete all the course material like an All-rounder or Solver (Anderson et al., 2014). While data is not available on these types of learners in THC, future research into learning and student behavior should explore these, and other self-learning regulated qualities of students, to better understand the MOOC learning environment.

Data reported on MOOC completion rates may be misleading as both Reich (2015) and Ebben and Murphy (2014) have stated that much of current research data collected for MOOCs is not being shared. When student completion rates of THC are viewed in the context that a student viewed at least one lecture, completion rates greatly increased (Table 3). Other studies have only viewed completion rates from the perspective of students enrolled compared to students that complete all the course material. For example, Breslow et al. (2013) reported of the 154,763 students enrolled in their *Circuits and Electronics* course through edX, only 7,157 students (4.6%) went on to earn a certificate and complete all the course material. No mention is made of how many students started the course or began viewing lectures. While these MOOC completion rates would still be considered extremely low for any traditional course, it does highlight the need for more in-depth studies on identifying students' learning patterns and efficacy for learning in the MOOC environment.

The Horse Course Engagement

Of the almost 37,000 students enrolled in THC, an elevated level of engagement was observed (Table 4). A total of 41 lectures were offered for THC with mean running times of 12 min 52 sec; which were viewed over 490,552 times by the students. During the course, students were asked to take a weekly 10-point quiz and submit weekly exercises beginning in week 2. The weekly exercises asked students to compose management plans for a hypothetically owned horse or donkey. For

Table 3. Data on Learners Enrolled and Interacted with Content for The Horse Course MOOC Offered through Coursera. (Course completion rate are those who watched at least one lecture and completed the material.)

Year	Total Enrolled	Actually Visited Course	Watched 1+ Lecture	Browsed Course Forums	Completed 1+ Assignment	Course Completion
2014	21,484	10,332	8,116	4,479	4,569	1,852 (23%)
2015	6,980	4,831	3,621	1,905	1,938	785 (22%)
2016*	8,232	5,559	5,559	na	na	517 (10%) [§]
Total	36,696	20,722	17,296	5,784	6,507	3,154 (18%)

* Data collected from January to August 1, 2016

§ Enrollment ongoing; average completion rate for the first 90 days of the course was at 22%

na = not available

Table 4. Data on Engagement of Learners Enrolled for The Horse Course MOOC Offered through Coursera.

Year	Lectures Viewed	Exercised Submitted	Quizzes Taken	Peer Assessments	Forum Posts Viewed	Forum Posts Made
2014	228,317	36,540	31,164	40,030	78,459	12,706
2015	99,462	15,795	13,711	17,894	30,494	4,594
2016*	162,773	12,849	13,102	15,860	na	1,498
Total	490,552	65,184	57,977	73,784	108,953	18,798

* Data collected from January to August 1, 2016

na = not available

example, the lecture topic in week 4 of THC was equine nutrition, and learners were asked to compose and submit a feeding plan for their horse or donkey. Each exercise was worth 10 points and to facilitate the grading of the 65,184 exercises submitted, students were asked to complete three peer evaluations, with their personal scores being an average of their peers' grades.

Siemens (2005) defined learning as a lasting changed state (emotional, mental, physiological) brought about as a result of experiences and interactions with content or other people. The high level of activity observed in THC, coupled with only an approximate 20% completion rate, begs the question of if the other 80% of students are actually learning. Drachsler and Kalz (2016) stated that we cannot transfer the concept of dropout rate from the formal classroom to one in a non-formal MOOC, and critiques about dropout rates in MOOCs are ungrounded and under-researched. While the cause of high attrition rates in MOOCs are still unclear (Ebben and Murphy, 2014), what is known is MOOC students do not necessarily enroll in these types of courses with the intention of completing all the course material (Hood et al., 2015). Pursel et al. (2016) stated MOOCs are unlike traditional online courses, where they attract many students with little to no prerequisite knowledge, and these students' expectations differ greatly compared to traditional students'. We would argue that low completion rates in MOOCs do not necessarily equate to a large proportion of students not learning. The high level of engagement of students in THC would lend evidence that a large portion of participants are learning some portions of the topics covered. If data is viewed from the standpoint of students who viewed at least one lecture (17,296) compared to lectures viewed (490,552), this population averaged 28.4 lectures viewed of the 41 offered per student. Furthermore, the high level of engagement observed in THC would suggest many of our students' most likely fall into the Viewer, Collector, or Bystander taxonomy of engagement styles as described by Anderson et al. (2014). Future work will investigate

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these and other student self-regulated learning qualities of our MOOC students.

The Horse Course Student Feedback

Pre-surveys were posted on the course webpage and emailed to enrolled students in THC. Topics of interest pertaining to THC were asked of the students and depicted in Figure 1. Students (n=2,635) indicated the most interest in topics related to equine behavior and health and the least interest in equine reproduction. When asked if they planned on using the information presented in THC MOOC in their daily life, 93% (2,435) indicated yes, and only 7% (194) indicated no. When asked of their anticipated course participation, 81% (2,136) indicated they planned on completing all the course material; 13% (330) indicated they would watch the videos, take the quizzes but not finish the assignments; 4% (93) indicated they would only watch videos that interested them; and 2% (52) indicated they wanted to browse course content. Finally, once the course was completed, students were asked to evaluate their experience in THC. Of the 307 respondents, 82% (251) indicated they were very satisfied, 16% (48) satisfied, 2% (6) neither satisfied nor dissatisfied, and less than 1% (2) dissatisfied.

From these results, it is interesting that most students indicated they planned on completing all the

course material. Yet, even when taking into consideration those students that at least viewed one lecture, course completion rates for THC remained 22 to 23%. Data from 2016 indicated a completion rate of 23% for new students enrolled over a 90-day period. Of the 2,635 respondents to the pre-survey, 905 are learners in the on-demand THC option, and therefore may still be enrolled or engaged in the course material. If data is isolated to just the instructor-paced 6-week options given in 2014 and 2015, 79% (1,360) of those polled still indicated they intended to complete all the course materials

Figure 1. Mean Response from The Horse Course Students (n = 565) when Asked to Rank by Importance the Weekly Topics Presented to Them During the MOOC

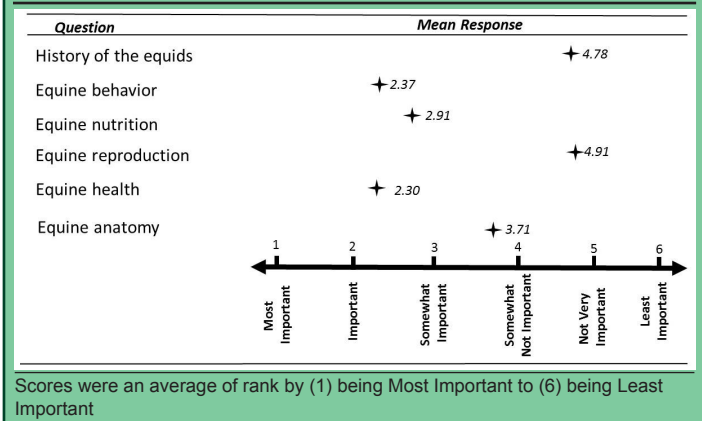
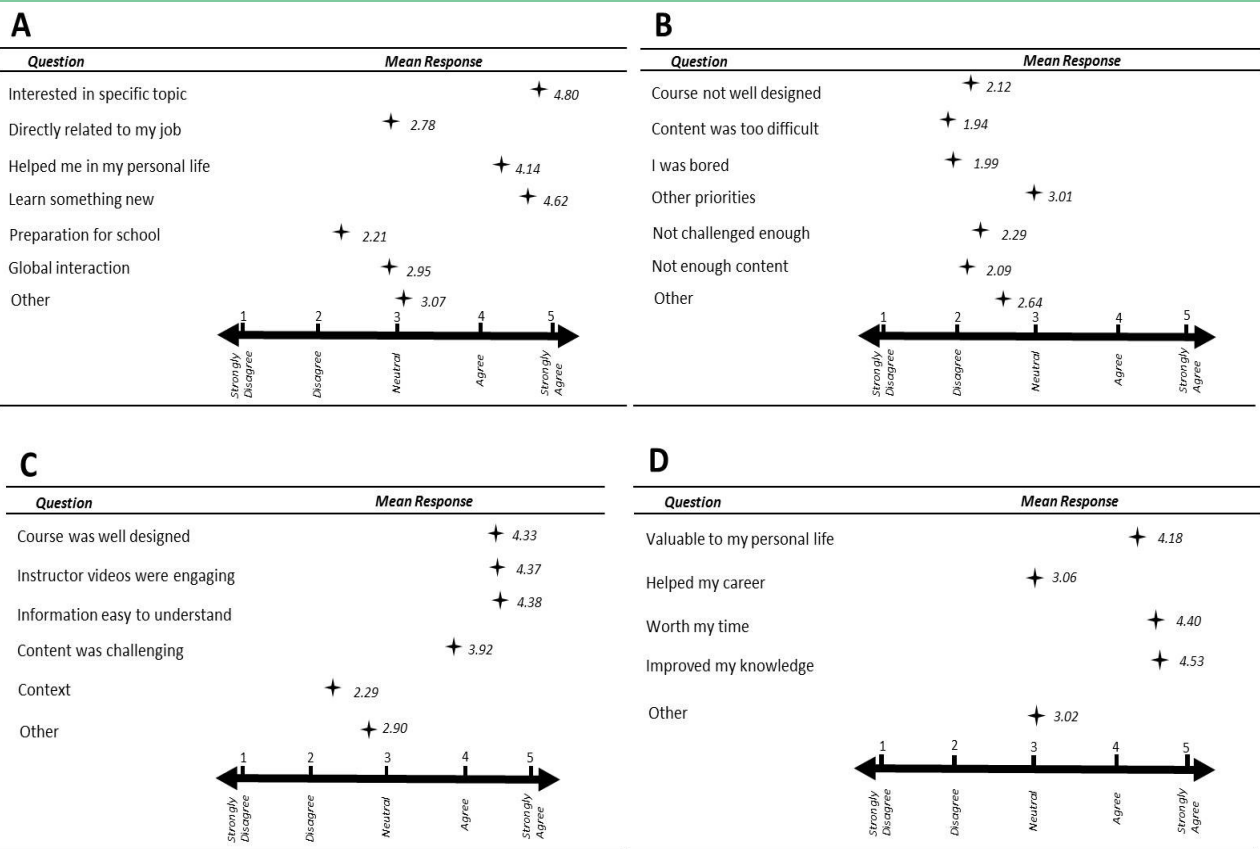


Figure 2. Post Survey Responses from Students Enrolled in The Horse Course MOOC



Responses were averaged from a 5-point Likert scale from (1) being Strongly Disagree to (5) being Strongly Agree. Panel A: mean response from students (n = 723) when asked about their motivations for taking a MOOC. Panel B: mean response from students (n = 441) when asked about why they did not finish a MOOC. Panel C: mean response from students (n = 565) when asked why they finished a MOOC. Panel D: mean response from students (n = 696) when asked about their experiences in taking a MOOC.

to earn a certificate. We only observed completion rates of 9% for those that enrolled and potentially completed the survey. This may lend support to the idea that enrolling in a MOOC presents no educational or financial risk to the student. Therefore, students may feel no need to complete the course and only engage in the material that they are interested in (Anderson et al., 2014; Park et al., 2015; Rai and Chunaro, 2016).

Post-course surveys were sent to all students in THC, where they were asked to evaluate their MOOC learning experience. When asked about their motivations for taking a MOOC or THC (Figure 2A), survey participants strongly agreed the course topic interested them, they wanted to learn something new, and the MOOC helped them in their personal life. When trying to uncover why students do not complete MOOCs (Figure 2B), the highest response was other priorities took over. Conversely, when asked why they completed a MOOC (Figure 2C), most agreed the course was well designed, the instructor was engaging, and the information was easy to understand. Finally, when students were asked to rank their experiences in taking a MOOC (Figure 2D), most agreed the course was worth their time and it improved their knowledge.

Summary

These results indicated that we still need solid research into MOOC student learning and the MOOC learning environment. Others are calling for research in MOOCs to evaluate: learning behaviors of individuals within a MOOC (Gasevic et al., 2014; Hood et al., 2015), investigate pedagogical underpinnings of the many MOOCs offered (Cabiria, 2012; Ebben and Murphy, 2014), experimental designs within a MOOC to evaluate instructional approaches (Reich, 2015), greater understanding of student experiences and retention (Hone and Said, 2016), and strategies to increase underrepresented groups (Macleod et al., 2015).

What these data do indicate is a large interest in learning more about equine science, and the potential for interest in other courses about livestock production. Current data in 2016 indicates a sustained mean 1,196 ± 35.5 of new learners enrolling in THC per month. Other Coursera courses in livestock production are already being offered such as *The Meat We Eat* (University of Florida), *Sustainable Food Production through Livestock Health Management* (University of Illinois at Urbana-Champaign), *Dairy Production and Management* (The Pennsylvania State University), and the already mentioned *Equine Nutrition* (University of Edinburgh). With the global reach of MOOCs only increasing, and the large growth observed across MOOC platforms, it appears this type of learning environment will persist for years to come. However, more focused studies on MOOC student learning are needed, with special emphasis into more effective student engagement using MOOC models of learning. There is a need for deeper investigations into development of MOOC learning

assessments. Educators should consider shying away from measuring a MOOC's "success" with completion rates, and instead measure the amount of actual content learned.

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