**Are MOOCS an Effective Replacement to The Traditional Classroom Setting?**

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Abstract: Massive Open Online Courses (MOOCS) are online courses that allows anyone from anywhere to have access to free course materials from several universities/colleges. Journalist and academics claim MOOCS could potentially replace universities/colleges as a means of getting an education. We conducted this study to conclude whether this was truly possible. We gather information from a variety of sources that pertained to our three topics: Resource Requirements, Completion rate of MOOCS, and advantages/disadvantages of MOOCS and traditional classrooms. Our findings conclude that MOOCS are very expensive to create because of their high personnel cost and they have a very low completion rate. We found some advantages that MOOCS have over traditional classrooms like being more assessable to upcoming students, but this is changing with each passing year as MOOC providers focus more on profit. In the end we concluded that MOOCS won’t replace universities/colleges anytime soon.

**Introduction:**

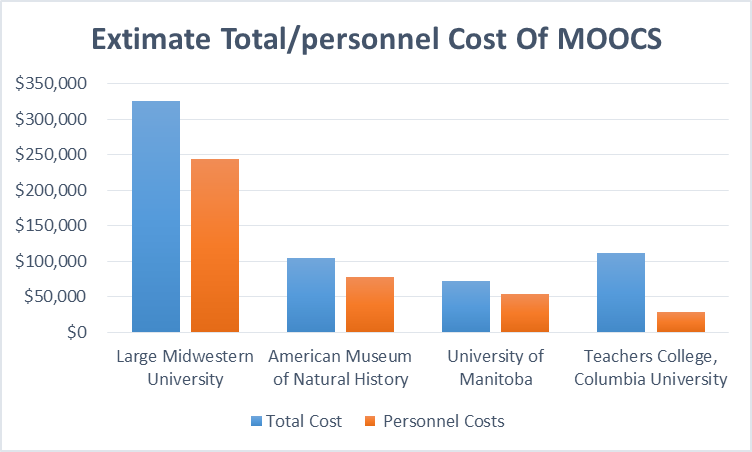
Ever since the popularity of MOOC’S surged in 2012 many journalist and academics believe this new medium of acquiring higher education will either eventually replace the traditional institutions, or they will become a fierce competitor in the education market. People are drawn to the idea of giving high school graduates an opportunity to receive skills for a particular market without putting themselves in massive debt. MOOC’S also allows people from anywhere in the world with an internet connection the chance to receive higher education. MOOC providers like Coursera have pledge to provide educational content at a fraction of the price of universities, or completely free to the user. In this study we would like to determine whether it would be possible for MOOCS to replace universities/colleges. This study will consist of five sections: Resource Requirements, MOOCS Business Models, MOOCS Completion Rate, Advantages/Disadvantages of MOOCS and traditional classrooms, and our conclusions.

**Resource Requirements:**

When the professor and/or the school decide to develop a MOOC much of the professors’ time is spent creating lecture videos for the course. Unlike traditional courses lectures are presented in video format where the instructor explains the course content to their students without any interactions from them. Because of this instructors may need to perform multiple video reshoots because they didn’t explain the material very well, or they made multiple mistakes during the shoot. Instructors like Dr. Cima, a professor who teaches at Massachusetts Institute of Technology, have spent several hours/days creating 330 lecture videos and only used 65 (Cima, 2013). This is typical as most instructors spend many days/months developing material for their course. This doesn’t give them much time to fully develop a MOOC, which is why they receive outside help. Unlike traditional courses where they typically are manage by one instructor MOOC’S requires a team of individuals to not only manage the course but to also create any new MOOC’S. This team typically consist of programmers, videographers, administrators, instructional designers, project managers, instructional technologists, and faculty members and teaching assistants (Hollands and Tirthali, 2014).

Devayani Tirthali, and Fiona M. Hollands, the authors of MOOCs: Expectations and Reality, conducted a study in 2014 to find out the production cost of MOOC’S. They interviewed 83 individuals from 62 different institutions. They concluded that the average cost was between $38,980 and $325,330: most of which was derived from the personnel cost. Below is a graph that displays the high end estimate total and personal cost of MOOCS that the two anthers have gathered from four institutions.

The University of Manitoba develop and delivered a MOOC with a personal cost of $53,800, and a total cost of $71,800. It took the team 100-150 hours (two months) to develop and design their MOOC. At an anonymous University in the Midwestern part of the United Sates the cost to develop their MOOC was $244,000 for personal, and $325,330 for the total cost. On average the team spent in total between 1,140 and 2,245 hours preparing their MOOC. The American Museum of Natural History created a MOOC with a personal cost of $78,470, and total cost of $104,620, which took the team 1,348 hours to develop. The Teachers College, Columbia University production cost was $29,238 for personal cost, and $110,950 for total cost. This took the team 176 hours (10 months) to develop their MOOC.

 Fig. 1. Estimate cost of MOOCS. Data gathered from Devayani Tirthali, and Fiona M. Hollands, MOOCs: Expectations and Reality, (Teachers College, Columbia University: May, 2014. Web. 14, Sep 2018) 138 - 151 Web.

The above data demonstrate the potential for MOOCS to become very expensive, and the MOOC providers realize this fact. Below is a chart that gives an example of why the personnel cost is so high. This chart displays the estimate cost of 10 hour worth of video for one course. This chart was taken from Devayani Tirthali, and Fiona M. Hollands report.

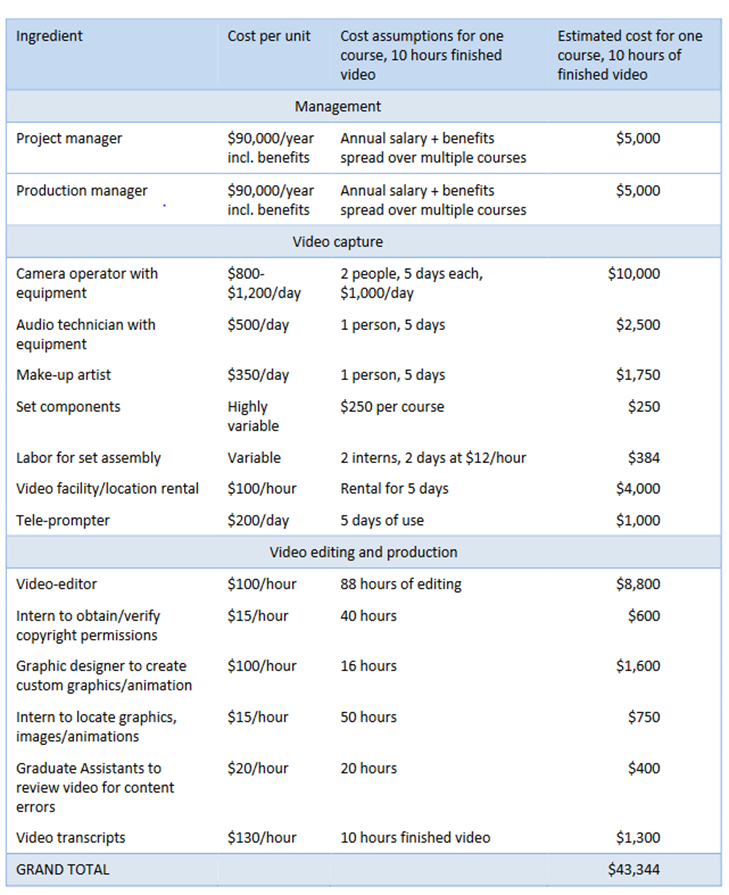


Fig. 2. Online video cost for 10 hours of film. Chart from Devayani Tirthali, and Fiona M. Hollands, MOOCs: Expectations and Reality, (Teachers College, Columbia University: May, 2014. Web. 14, Sep 2018) 197 Web.

Coursera, Udacity, and EdX provide services that will help reduce the production cost. The MOOC providers understand that MOOC’S have a high production cost, so over the years they have tried to create a sustainable business model. The next section will discuss the business models that Coursera, Udacity, and EdX have adopted.

**Business Models:**

Coursera was founded in 2012 by two computer science professors from Stanford University. The companies’ mission was simple; they wanted to provide universal access to higher education from anywhere in the world (!). They allowed users to access course material for free and receive certificates after completing the course with no additional charge. The company claims that users can give these certificates to employers to prove they have acquired the necessary skills for their job position (Mcintyre, 2018). In 2014 the site stopped giving out certificates for free, so users now have to pay a fee. (!).If users chooses not to pay then can still receive all course material and graded assignments free of charge. With this model Coursera’s profits primarily comes from donations and certificates. This year alone they earned $1 million in revenue from certificates (Heussner, 2018). A few years later the company introduce Specializations. Dhawal Shah is the CEO and founder of Class Central, a site that evaluates and post news about online course. In his article A Guide on How to Sign up for Coursera Courses for Free describes Specializations as “a sequence of online courses designed to enable you to master a particular topic” (Shah, 2017).

Specializations allow users to pay and enroll in multiple courses for one price. They also have Specializations subscriptions where users can pay a monthly fee to access course material that ranges from $39 - $89 dollars (Shah, 2016). In 2016 Coursera increased the number of Specializations and introduces paid only courses. They added Coursera for Business, a plan where companies pay a monthly fee to give its employees access to course material (Shah, 2016). In 2017 they again increase the number of Specializations and have primarily release technology and business courses because of their high monetization. And finally they included a 7 day free trial for their Specializations subscription (Shah, 2017). In summary their business model amounts to placing course material behind a paywall and encourage more of their users to pay for the subscription. They also primarily release courses with high monetarily gains. Although many of their courses are free to enroll this however is usually only true for their older courses.

EdX was founded by The Massachusetts Institute of Technology and Harvard University in 2012. Just like Coursera the site provided users with free online courses and certificates from top universities like MIT and Harvard (Gannes, 2012). In 2013 EdX launch their X-Series programs. These programs have the same properties as Coursera’s Specialization program. In 2015 they launch the MicroMasters program which grants credits toward a Master’s Degree, if the user is currently enrolled into the university’s program (Shah, 2015). For example if a user completed a MicroMaster for one of Stanford’s MOOCs, then they cannot use the credits if they are not currently enrolled in one of Stanford’s Master programs. A few months after this inclusion they announce they will not continue to issue anymore free certificates (Shah, 2015). Between 2016 and 2017 they release two more programs: Professional Certificate and Professional Education. Professional Certificate is a rebranding of their X-Series, and Professional Education are paid only courses (Shah, 2017). Despite the many programs users still have the option to view course material for free, but this may not last for long. In May, 2018 the CEO of EdX announce they are in the process of developing a support fee model, so they will gradually stop offering course contain for free (Shah, 2018). So far their model resembles Coursera’s.

Udacity was launch in 2012 by two Stanford professors who wanted to democratize education and make it affordable for anyone anywhere (Mitra, 2016). Just like Coursera and EdX the site provided users with free online courses and certificates. In 2014 they partnered with AT&T and Georgia Tech to launch their Nanodegree program (Mitra, 2016). This program is design to teach users basic programing skills that could land them an entry level position at companies like AT&T. This was the same year Udacity stop offering free certificates (Shah, 2015). Udacity still allowed its users to access course material for free, but with each passing year the company tries to push their users to buy Nanodegrees. For example like Coursera users can pay a monthly fee to access course material in the Nanodegree (Shah, 2015). Currently most of Udacity’s content is behind a paywall and just like Coursera most of their free course are primarily older courses.

The three MOOC’S all at first wanted to provided anyone from anywhere with an opportunity to receive affordable and/or free higher education. Over the years this goal has shifted to accruing as much profit as possible. We believe the main cause for this shift stims from the high production cost of MOOC’S and high volume of users that use their services. In 2017 Coursera had 30 million learners, EdX had 14 million learners, and Udacity had 8 million learners (Shah, 2017). Only a small percentage of their user base actually use their course programs; for example in 2017 Coursera only had approximately 0.2% (about 60k) of their entire user base use their Specializations programs. These low numbers could have influence their decision to change their business model. Another possibility is that the MOOC providers have lost faith and ultimately abandon the idea behind MOOC’S.

One of the founders of Udacity Sebastian Thrun left the company in 2013. He believed that he created a lousy product because of the low turnout rate of students passing the course with high marks (Chafkin, 2013). In 2017 Udacity vice president Clarissa Shen in an interview stated that MOOC’S were dead and that they were a failed product (Young, 2017). Regardless it is evident that MOOC’S will become less free in the near future.

**MOOC Completion Rate:**

One of the greatest challenges faced by those who have developed MOOCS is the rate at which students complete their courses. Completion rate statistics are determined by the number of students who complete the course, the number of students who partially complete the course, and the number of students who enroll in the course but fail to start the course. Official statistics are not published for all MOOCS. However, the overall completion rate for those that are published are not very high. While this information may not seem promising, one may think a little differently when studying the completion rates of individual MOOCS rather than summing them up.

Katy Jordan, an Educational Researcher, reported that the overall average completion rate for MOOCS is listed as approximately 15%. In an article written by Tomas Franceschin titled *Completion Rates Are the Greatest Challenge for MOOCs*, he states that Jordan gathered this information from public blogs, data, and other news sources. This approximation was concluded in June of 2015 and includes data from American and European courses. In Amy Ahearn’s article *The Flip Side of Abysmal MOOC Completion Rates? Discovering the Most Tenacious Learners*, she talks about Usman Khaliq and his experiences with MOOCS. The author says that Khaliq took his first MOOC in Pakistan where he was an engineering student. Khaliq wanted to add to his education by taking MOOCS in his spare time. He quickly fulfilled his wishes by starting with courses from Stanford and Carnegie Mellon. Within two years Usman had earned 21 verified certificates from Coursera and is considered a “power user” after completing 11 social entrepreneurship courses with Acumen+. Ahearn also stated that HarvardX and MITx reported that out of the many students that enroll in their courses, only 5.5% go on to earn the certificate upon completion.

In Franceschin’s article he states that the founder of Udacity, a platform for MOOCs, report that completion rates were below 8% for his platform in the year of 2013. The author also stated that in the same year a university reported completion rates averaging at 4% for their courses offer through Coursera. While these numbers are very low, there are individual MOOCs that show very promising completion rates. For example, Franceschin talks about a French MOOC platform for “project management” that showed between 52 and 60 percent completion rates. The he also mentioned a platform called “Platzi” that’s showed high completion rates. The company’s founder, Freddy Vega, reported that completion rates average at about 70%. Franceschin also states that Udacity was able to reach completion rates at 87% or above by “reshuffling” the structure of its courses.

One other issue surrounding MOOC completion rates is Activation rate. Most people don’t complete MOOCs. In fact, some never start the course. In Franceschin’s article he states that a study conducted by Harvard University and MIT yielded results showing that over 50% of those who enroll in their courses drop out within the first week. Studies also show that the further an individual makes it into the course, the more likely he/she is to complete and earn the certificate for that course. While overall MOOC completion rates do not seem very promising, individual MOOC completion rates offer some hope to those looking to create MOOCs or enroll in them. MOOCs are certainly an advantage to those who go on to complete and earn certificates from them. With several teams in the MOOC field looking to find new ways to achieve higher completion rates, there may be much success with MOOC completion rates in the future.

**Advantage/Disadvantage of MOOCS and Traditional Classrooms:**

**Advantage/Disadvantage of MOOCS:**

To know just how MOOCs can benefit students, we first have to ask the question, what are the advantages? For starters, courses are, for the most part, are offered for free, all though these courses are often non-accredited(generally true), is still a plus, because not everybody has the economic status to enroll and afford all the expenses that come with going to college and you can still get viable information on topics taught in a classroom. Courses offered in MOOCs are opened up by professors who teach at top schools. MOOCs are open to any and everyone no matter the location or background. During the start of the course, performance based on user understanding, is monitored closely to give feedback on if the user is performing at a high level [26].

This study will help further enhance professors to know what techniques are working or not working to give future users better education going forward. It can also be used as a tool to give users more access to information then you could in a traditional classroom. According to an article by The Harvard Gazette, a research in 2012-2014 was conducted by Andrew Ho, a professor at the Harvard Graduate School of Education and chair of the HarvardX research committee. His research contained 68 certificate-granting courses, 1.7 million participants, 10 million participant-hours, and 1.1 billion participant-logged events. His main objective for his research was to see what users’ main intentions were for enrolling into MOOCS by conducting a survey [12].

According to his research, a third of the users that responded to his survey, 57 percent specified their intentions were to earn a certificate and nearly a quarter of those users went on to do so. Based on a sample part of his research, across 12 courses, users who paid for certified MOOCS (about $50-$250) earned a certificate at a higher rate than other users and appeared to have a stronger impact on users to complete these courses (59 percent on average compared to 5 percent, to be precise). Ho emphasized his findings are quote, “phenomenal opportunities for millions of learners… but equity cannot be increased just by opening doors. We hope that our data help teachers and institutions to think about their intended audiences, and serve as a baseline for charting progress.” To paraphrase, Ho is saying professors need to realize who their target audience is and emphasize the need for professors to be more involved with their users to see increase in user enrollments and for MOOCS to grow and be a part of a society that his is so heavily dependent on technology now [12].

Even though MOOCS seems to be a positive trend, like everything, it has faults. MOOCS can’t provide for personalized courseware and attention from a tutor. Basically, it’s all up to the user to be disciplined enough to make sure they are getting and processing the information being taught to them. It is difficult to keep track of students’ assignments and involvement. Even though it mostly depends on user interaction, professors have a responsibility to keep track of students and grading especially, which can be hard to do if professors are teaching in classrooms and online. Learners with disabilities and poor internet connection will have an increase difficulty using MOOCS respectively [26].

Language can be a difficulty as well, because if you have multiple ethnicities enrolled it can be difficult to interpret to an audience if they were in need of help from a professor. Also MOOCS, generally cannot be used as a credit earning course at a university [26]. Though MOOCS are on the rise, it has some professors questioning whether it will actually be impactful going forward. In an Article by MIT Technology Review, a study conducted in 2014 by David Pritchard, an MIT Physicist and other professors’ at Penn University, contradicts the positive impact of MOOCS. MOOCS are criticized heavily on their dropout rates [16].

On average about 90 percent of users who sign up usually don’t make it all the way through. According to Pritchard’s study, at Penn the dropout rate for MOOCS are at 96 percent. Half of the students at Penn dropped out before the first class. Out of the 17,000 who signed up for Pritchard’s class, 10 percent made it to his second assignment (1,700 users). Out of those 1,700 users, a little over half earned a certificate of completion. Pritchard doesn’t question MOOCS relevancy, but doesn’t see how users can sustain a business model for themselves on their own and questions students’ legitimacy for enrolling into MOOCS in the future by saying, “Most who sign up for a class aren’t serious students; they’re window shoppers who face no cost barrier to trying a lecture or two [16].”

In conclusion, MOOCS can be very valuable in the education system and may very well be a thing of the future, but I feel Pritchard is basically raising the question, will it be worth it in the long run? If students are dropping out at an increase rate after enrolling, then how could it possibly be a better form of education than that of a traditional classroom? Sure MOOCS are low costing, but the courses themselves are user dependent. It all depends on the user to get all the information needed to make it in the work force and trust the user is doing what is asked of them without the guidance of a professor to be their when needed, compared to being in a classroom where you can get questions answered at an earlier convenience or even get step by step help.

If drop rates are like that, think about if we replace traditional classrooms with MOOCS, how will job markets look if they only have limited candidates to choose from? Both researches have respectable outlooks on how we view and can improve MOOCS if universities try to involve them in their degree programs to better help everyone get the education in the form they wish to pursue. However, when conducting research, we need to see an increase in graduation rates and lower dropout rates going forward if MOOCS are ever going to make a compelling case in replacing traditional classrooms.

**Advantage/Disadvantage of Traditional Classrooms:**

We have discussed MOOCs and their advantages and disadvantages compared to traditional classrooms, but you might be wandering, how does traditional classrooms compare to MOOCs? It’s a valid statement due to technology being as powerful as it is now and classrooms having to compete and question the significance of online class learning over traditional learning. Even though it costs less to do online courses and more convenient, does that mean traditional classrooms will be a thing of the past in the near future? Well, to make a conclusion lets first look at the advantages of traditional classrooms.

Traditional classrooms are more interactive. By interactive, I mean, students have more interaction between the teachers, which helps with getting one on one help if needed and immediate feedback on answers based off questions being asked from the students. Also, students get interaction with other students, which helps with sociability skills and they learn cooperative skills when working with groups as well. Accessibility is another advantage. Traditional classrooms are accessible, for the majority, to any and every one. Not everyone has technology or very tech savvy, so the best way to learn for those students are to have access to a classroom and learn from a teacher by. For the students that have gone to a traditional classroom their entire school career, taking them away from that environment can throw off their motivation to succeed [1][10][15].

Sure, being in the comfort of your home is nice, but like the saying goes, don’t get too comfortable. A classroom is a place you know you have to succeed at in order to be prepared for the “real world.” The class work is still there while you’re at your house, but the environment has changed and you’re no longer in a place that requires the same amount of focus. When you’re in a place of comfortability, procrastination, motivation, and lack of understanding occurs. Traditional classrooms are also organized. Students have a set schedule dedicated specifically for learning, so once students get comfortable following a set routine, focusing on the topic at hand becomes natural instead of forcing yourself to learn the material at different points in time. It’s good for students to be interactive with their teachers and classmates, to be focused and motivated and to have a schedule that allows them to set aside time to actually learn the material [1][10][15]. These things are essential for every student. So if traditional classrooms are so effective in providing such a rich foundation for learning, can MOOCs really be an effective replacement?

To put this question in perspective, we need to look at the disadvantages of traditional classrooms as well. For starters, traditional classrooms are very cost demanding. Tuition is pretty high and not to mention the textbooks and other school supplies that are needed for the classes’ students have to also pay for. After graduation students are usually faced with debt and have to work towards paying it off, which could take years to do. It provides no flexibility for students and their schedules. Students have to shape their personal schedules to accommodate for their school schedules. Many students have jobs and have to balance work and school, which can be an issue for students who need to pay for other expenses (car payments, cell phone bills, etc.) [1][10][15].

With school consuming so much time, especially with having to go to class and finding time to study outside of class, students have to balance the amount of time spent focusing on school and going to work. It also effects the company students are working for, because they have to work around other employees’ schedules to accommodate the students’ schedule. Generalized education is a problem. Generalized education keeps students from actually learning the material they are interested in. One of the big problems with school is the need for students to learn subjects that are not related to their major [1][10][15]. It’s like students become a “jack of all trade, but a master of none”, so to speak. If a student is majoring in math, then what’s the need for a student to pay for a class focusing on History? There’s not really mush correlation between the 2 subjects, but yet students are required to take classes that are not related in order to get a degree.

Lastly, in a classroom sources are limited. Teachers and textbooks are the only source of information in a classroom, which limits the amount of information a student can gather at one time. Compared to online classes, where you have the internet as well as the course material in the palm of your hands. The internet is home to a lot of valuable information and students could possibly be missing out on good learning opportunities by sitting in a classroom [1][10][15]. At the end of the day it really comes down to the student and how they like to learn. Some students may like to be anti-social and learn on their own, whereas, other students may like the one on one interaction with a teacher. Not everyone is the same and not everyone learns the same way. So, if we replace MOOCs with classrooms can we say every student will maximize their learning potential?

**Conclusions:**

MOOCS were a very promising idea of given free access to education to anyone anywhere. The unfortunate reality is that they are very expensive to produce and they are increasingly becoming less open as providers push users to purchase their courses/programs. MOOCS overall produce low retention/completion rates and this has made founders like Sebastian Thrun to completely drop the ideal of MOOCS. We however believe that MOOCS shouldn’t be abandoned, instead MOOCS should complement but not replace Universities. Universities can host MOOCS that are accessible to currently enrolled students and individuals with an internet connection. Donations and tuition fees can help subsidies the production cost, which will ensure that MOOCS remain free to access. Regardless of whether this would actually work the idea behind MOOCS should be pursued, whether it be through MOOCS or some means.

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