UWS UNIVERSITY OF THE WEST *of* SCOTLAND

How can online learning platforms use mobile technology to expand their market and generate new revenue?

Part 1

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1 Introduction

(800 words)

Electronic Learning (E-learning) is instruction delivered on a digital device that is intended to support learning (Clark and Mayer, 2016). Most of the people would think of digital devices as being personal computers, smartphones or tablets but in its primary form the e-learning started with televison/radio broadcasting educational programs or accessing information through mainframe computers in the 1950s. Nowdays, this field comprises Web-based learning, Webinars, Virtual Classoom (online portals - video conferencing between learners and teachers) or Mobile Learning . E-learning aids business to deliver training to their employees and even degrees from accredited universities around the world or invididuals to acquire knowledge and skills.

New opportunities arose for educational institutions and private companies, namely to use digital devices to provide *Distance Learning*. Distance Learning has been around for more than 100 years now through the help of televeson and radio that broadcasted occasionally courses. However, they were not that popular; all this has changed with the rise of Internet and the multimedia systems that made courses available all the time, no matter the location of the learner. In other words, an evolution occured in education. Nowadays, there are a lot of online learning platforms like *Coursera*, *edX* or *XuetangX* that seem so appealing compared to traditional education due to low-cost, accessibility and flexibility. All the above mentioned online platforms provide **M**assive **O**pen **O**nline **C**ourses (MOOCs) that represent a postindustrial model of teaching and have great success in an industry with 101 milion learners online, 900+ universities involved and around 11 thousand courses (By The Numbers: Moocs In 2018 — Class Central, 2018) . Online courses are tailored for different levels of understanding of a subject (e.g. basic, intermediate or advanced) and aim to help solving the problem of access to education world-wide. Moreover, the learner has the option to choose from a wide range of courses teaching a particular subject (e.g. machine learning) often on the same platform (e.g. different institutions publish they course variant on Coursera), whereas when studying on-site the learner (or student, in this case) does not have this possibility. Despite of the mentioned benefits that these online platforms bring, all of them face one big issue, namely the credibility of the courses they provide. In order to solve this problem some of the online platforms accept courses created only by accredited universities and individuals, though, this is not a practice that all the online platforms follow. As a result, addressing this problem of quality is very important for their credibility and mass adoption by the public.

Next, in general the online courses are, as mentioned above, tailored on different levels (e.g. basic, intermediate, advanced), whereas most of the times there is a need to adapt the course to each individual learner as was demonstrated by Bloom (1984). In face-to-face education a teacher can adapt the content of the course to better suit the vast majority of a class or provide extra help for some individuals. However, over time this situation can change since it is easy to embbed new research findings into the online platform to best enable learning.

Lastly, on-site learning has an advantage over online/distance learning because it provides on-campus opportunities to socialize and build up a network. Along this line of thinking, traditional institutions might survive to the Internet disruption because they do not provide only information to learners (Wessel and Christensen, 2012).

Figure 1: Overview of the online learning industry (By The Numbers: MOOCs in 2018, 2018)

Until this point we discussed about online learning that is performed through the help of websites but in recent years this field has shifted towards the use of mobile technology. Mobile technologies are a part of our daily life and we are deeply reliant on them; Ray Kurzweil, an American inventor and futurist, even sees them as "brain extenders". There has been coined a term for learning using mobile technology, namely *Mobile Learning* (M-Learning), which essentially is a type of e-learning that refers to the aquisition of knowledge and skills by using mobile technologies such as smartphones, audio players or tablets. However, the most popular technology is the smartphone due to the fact that it provides other services like Internet browsing, photography, GPS, and others. Online learning through the help of online portals brings flexibility compared to traditional teaching, however, porting this online portals to mobile through native mobile applications takes flexibility a step further since the mobile device can be carried everywhere by the learner. According to Thornton and Houser (2005) a mobile learning environment increase the transfer of knowledge and feedback. Nonetheless, some suggest that mobile learning aims to improve the learning experience but should not be used as the primary method to provide a course (Wang et al. 2009). M-Learning has its own challenges which are summarized in Table 1.

Table 1: Challenges faced by M-Learning

Challenge	Note
Lack of motivation	Even if a company buys courses for employees they might pass them by searching answers to tests on forums and not by engaging with the course material
Security of user	The device needs to be carried and the individual is not fully aware of what is happening around him
Self-directed learning	General concern in online learning, some of users are autodidacts or advanced learners and can find our own route in e-environment while others not
Absence of social interaction	Peer mentoring plays an important role in traditional education and it is hard to create this in an online environment

2   Analysis of mobile technologies in online learning

(minimum: 1000 words - max: 1400 words) All the online learning platforms have developed their mobile applications in order to increase the number of learners they can reach. In order to teach a course they make use of videos and subtitles, quizzes, projects and presentation slides. Also the content can be downloaded so offline access of it is possible.

2.1   Sources of monetization

3   Case studies: Coursera and edX

(1400 words)

3.1   Coursera

Coursera is an online for-profit learning platform that provides courses, specializations and online degrees (see Figure 2) for different domains like engineering, medicine or business. To create learning materials it works with an impressive number of universities (190+) and accredited individuals; the fact that it works with academia assures a high-quality of the learning materials. It was founded in 2012 by two computer scientist from Standford University, namely, Andrew Ng and Daphne Koller. The founders were inspired to create this platform because one year before founding Coursera, in 2011, they had provided online courses and managed to teach more learners than they could have had taught in an entire life in an on-campus setting. Up to this point in time the company has managed to raise $210 millions funds from different organizations. Currently Coursera is leading the field of online learning from the perspective of registered users, having more than double compared to the next competitor (see Table 2). Things are good when it comes to revenue as well, Coursera's revenue for 2018 was estimated to be $140 million and was listed in The Next-Bilion Dollar Startups (2018) by Forbes. Initially, courses on Coursera were session based, namely they had start and end date (often coinciding with fall/spring university semesters) and had deadlines for assignments. This model has several drawbacks like learners not knowing when a specific course will be offered again or the fact that different learners have different schedules. In order to address this issue in 2014 Coursera borrowed Udacity's (another online provider) idea and started to provide self-paced courses or *On Demand* as they call them. The self-paced courses do not have any type of start/end date or deadlines, which allows every learner to take the course whenever they want, thus providing flexibility. However, the problem with this approach is that there are no other learners who study the same material at the same time to have peer-discussions. Moreover, the absence of deadlines seems to disourage some learners from actively engaging with course material. Overall, the shift towards *On-Demand* coureses better suits Coursera because the vast majority of its learners (users) are professionals or "life-long learners" who look for career growth but in the same time have a busy schedule. In the past they have tried an experiment to make all the courses available for a monthly subscription but it failed so now the users pay per service.

In 2014, Coursera launched it's Android and iOS application in order to be able to expand their market. One of the main functionalities which the mobile application brings is the offline mode which allows one to download course content an access it while on the train or in area without internet connectivity. Without the mobile application the learner is strictly dependent on internet access and his computer. The content of the app is well structured using tab bars with the following bar items: Explore, Recommended, Learn, Downloads and Profile. When viewing the materials for aspecific course the content is organized the same using tab bars, providing the following tab items: Home, Forums, Resources, Grades and Messages. The application will be analyzed in detail in the part 2 of this report.

In my opinion, Coursera has managed to become the leader of MOOCs industry, despite of other competitors which have been around for longer like *lynda.com* founded in 1995, due to several reasons which I am going to detail. The first one it is the close tie with the academia, for exmple, always expanding the number of partnerships with universities (190+). The tie with academia has allowed them to tap in the knowelege of teaching accumulated by the traditional institutions for centuries. Essentially, this results in a high-quality product - the online course. The second reason is the fact that it is a dynamic company, they always try to improve (as was exemplified above with the *On Demand* courses) which is absolutely necessary in the

competitive online environment. Finally, the webpage is very well designed with an intuitive flow and works in good synchronization with the mobile application. In all, Coursera deserves it's leading place because it provides excellent services.

Figure 2: Coursera logo

#	Online Provider	# of users
1	Coursera	37 million
2	edX	18 million
3	XuetangX	14 million
4	Udacity	10 million
5	FutureLearn	8.7 million

Table 2: Top 5 online platforms based on number of registered user (By The Numbers: MOOCs in 2018, 2018)

3.1.1 Monetization

The source of revenue for Coursera has mostly switched from charging per course to charge for getting certification for completion of a course, nowadays, auditing a course is (mostly) free of charge. However, there are still courses where the learner has to pay to access course materials. Other sources of revenue are specializations, online degrees and corporate training (see Table 3). Specializations are groups of courses aimed to master a specific skill , they take between 4-6 months to complete and are priced per month (price range: $39 USD - $79 USD). A specialization, to give an example, like *Deep Learning* is comprised of the following five courses: i) Neural Networks, ii) Improving Deep Neural Networks, iii) Structuring Machine Learning Project, iv) Convolutional Neural Networks and v) Sequence Models. Online degrees are just like traditional degrees a form of education which typically takes between 1-3 years and are taught entirely online in our case. The learner has the possibility to study for a bachelor or master degree, provided that he can afford it. These online degrees do not stick to the initial ideal of MOOCs of providing knowledge and skills at an affordable price since they are just a bit cheaper than the tuition fees that the universities charge for on-campus study; the online degrees cost between $15 000 USD and $25 000 USD. Like in the traditional case to enroll for an online degree the learner has to go through an admission process. To name but a few universities who provide online degrees on Coursera: University of London, Arizona State University, HEC Paris or Imperial College London.

Product	Price Range	Total # products	Note
Online courses	i) Free to audit* ii) $29 USD - $99 USD	2900+	Two types of courses: i) assignments not free ii) subscription fee
Specializations	$39 USD - $79 USD per month	250+	
Online Degrees	$15 000 USD - $ 25 000 USD	12	
Corporate training	i) $400 USD /user/year - **s**mall **o**rganization (so) ii) custom pricing - **l**arge **o**rganization	1700 client employers	i)so: 5 - 100 employees ii)lo: over 100 employees

Table 3: Sources of revenue for Coursera (About Coursera, n.d)

3.2 edX

The second largest online learning platform on the market is *edX* (see Table 2), a non-profit organization founded in 2012 with the mission to offer high-quality courses to learners around the world (see Figure 3). It was developed by two prestigious universities from America, namely, Massachusetts Institute of Technology (MIT) and Harvard University. In contrast to Coursera's approach where a learner has to pay for coursework or quizzes, the majority of the courses on edX provide all the materials for free and only for certification (if wanted) is perceived a fee. The organization was created with the core initiative to conduct research on learning based on how the online platform is used. The first research paper regarding learning using edX was published in 2013 once the data for the first online course,"Circuits and Electronics", was analyzed. To mention but a few of the outcomes of this research: i) it is unlikely that higher education will not be affected by MOOCs, ii) only 4% of the enrolled learners passed the course and managed to get a certificate (high droprate), iii) high access of the course on weekends and others (Breslow et al., 2013). There are around 130 universities that are partners with edX and a total number of 2200 online courses. The company has created a business plan for corporate training which in comparison with other competitors gives analytics tools to employer to measure employee learning engagement.

In 2014, edX launched it's Android and iOS application in order to be able to provide flexibility to the users since they might not have access to a personal computer all the time. The main feature of this app is the offline mode which allows the user to download the material content and use it on the go. The app provides access to all the features that the website provides (unlike Coursera's app that doesn't provide access to the forum). The content of the app is well structured using tab bars with the following bar items: i) Courses, ii) Programs and iii) Discovery. When viewing the. When viewing the content of a course the information is structured using the following tab items: Home, Videos, Discussion, Important Dates, Handouts and Announcements. The application will be analyzed in detail in the part 2 of this report.

To sum it app, edX provides a more affordable approach to MOOCs than Coursera while still delivering high quality courses.

Figure 3: edX company logo

Product	Price Range	Total # products	Note
Online courses	i) Free to audit ii) $50 USD - $300 USD	2200	i) Everything 100% free ii) certification fee
Online master degree	$ 10 000 USD - $ 21 000 USD	8	
MicroMaster	$ 540 USD - $ 1400 USD	52	
Professional Certificate	$ 120 USD - $ 350 USD	100	

Table 4: Sources of revenue for edX

3.2.1 Monetization

Taking a different approach to most of the online learning platforms, namely, being a non-profit organization edX needs to find ways to sustain their organization. In 2018 they tried to enter a support fee for their services but it did not work well so starting from 2019 they require a payment tax for grading assignments. The main source of revenue for edX is the possiblity to get a certification after finishing a course, the fees for a certification range between $50 USD and $300 USD. Apart from providing courses, just like Coursera, they provide 8 online master degrees with prices that range from $ 10 000 USD to $ 21 000 USD. The online master degrees are comprised on average of 10 courses and they account usually to 25% - 50% of credits neccessary for an on-site master degree. To mention but a few universities providing online masters on edX: Georgia Tech, Univesity of Queensland or Indiana University. Another program that edX offers is *MicroMaster* which provides a bundle of courses equivalent to a first term of a on-campus master programme. The good part about MicroMaster certification is that it can be used to speed up a on-campus master degree program; a MicroMaster costs between $540 USD and $1400 USD . Another source of revenue for edX are *Professional Certificates* which are a group of courses that develop a specific skill needed in industry. Business Writing is a Professional Certificate comprised of the following courses: i) The Writing Process, ii) Effective Business Writing and iii) Writing for Social Media. Professional Certificates usually cost between $120 USD and $350 USD. Please see Table 4 for an overview of some of the sources of revenue of edX.

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