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Courses beyond borders: A case study of MOOC platform Coursera

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Abstract

Purpose: *The study assesses the participation of different institutions in online learning environment of Coursera. Collaborative efforts, involvement of instructors and the mode of course instruction were also looked at.*

Design/Methodology: *Data were harvested from the official website of Coursera. Through its various features, information pertaining to courses being offered, subject categorization, institutions and instructors involved was collected, tabulated and analyzed.*

Findings: *As of February 2016, 138 institutions from 28 countries offered 1765 courses through Coursera with the aid of 1903 instructors. Institutions were mainly from high economic zone countries. Nearly 59 percent courses were from USA based institutions and at institutional level University of Pennsylvania (USA) offered a maximum of 84 courses. Collaboration at institutional level was observed in 32 courses with instructors from different institutions, within & outside the same country. 25 percent courses were related to Business and 33 percent courses provided flexibility (on-demand) to people to learn and enrich their skills at their own pace.*

Implications: *Further research needs to be done to evaluate the efficacy of such platforms and explore best practices to reframe the position of traditional universities.*

Originality/Value: *The study is first of its kind to assess online learning environment with respect to participation of institutions to offer various courses and involvement of instructors from all over the globe to make such a courseware a success.*

Keywords: Online courses, Massive Open Online Courses, Online Learning, Coursera, Libraries, Learning Hub.

1. Introduction

Online learning has revolutionized the world of educational community in the recent past as being more cost effective and convenient for learners in comparison to traditional educational system. Online learning has become a boon for more and more learners to get associated with it and continue their educations. Earlier studies have defined online learning as an environment where at least some part of student curriculum is offered via online course delivery mode, or as a transfer of information via internet where students and educators need not to be present at the same time and same place (**Berge and Collins, 1995**). Similarly, **Harasim et al. (1995)**

define online learning more clearly as such an environment where student's entire curriculum is offered via online course delivery mode, thereby eliminating various limitations like geographical barriers, time, etc. In short, online learning has opened the doors for both educators and learners where they do not need to be bound to four walls of a room in order to provide face-to face instructions (**Richardson and Swan, 2003**). Likewise, **Keegan (1996)** defines online learning as a form of distance education with basic feature being no face-to-face interaction between teacher and student. Some studies state that online learning is that education where teaching as well as document delivery to students is done through internet in the first place (**Cavanaugh, Barbour and Clark, 2009; Watson, Winograd and Kalmon, 2004**).

Now-a-days, these courses are termed as Massive Open Online Courses (MOOCs). The year 2012 is regarded as 'the year of MOOCs' as most of the developments in the field of MOOCs has been chronicled in 2012 (**Pappano, 2012; Siemens, 2012**). Thrun, as cited in **Leckart (2012)**, also denotes it as a significant year which lays down the basis for MOOCs to shape the future of higher education by offering full degrees and thus declining 'brick and mortar' type institutions. Several well-known MOOCs have already developed over the years paving the way for MOOCs to enter into the mainstream e.g. Coursera (www.coursera.org), Udacity (www.udacity.com), EdX (www.edx.org), etc. These MOOCs in association with various elite institutions offer online courses to students (**Daniel, 2012**). The future of education as such belongs to MOOCs and related and improved or more evolved versions of the phenomenon. The world population is increasing at a very drastic rate which human civilization has not witnessed before. Therefore, besides food and shelter education is paramount for the people. So this new way of learning like MOOCs can address the issue to great extent and will help knowledge seekers from across the globe to learn from some of the best teachers and scholars in the world.

In this context, the present study makes an endeavor to assess Coursera with respect to courses offered, institutional participation and involvement of educationists towards sustenance and growth of Coursera. The study can be helpful for library professionals, knowledge seekers and policy makers in education sector globally to know the current status and growth, opportunities and options available with regard to MOOCs. The study has deliberately chosen Coursera as this is one of the largest platforms and gives better understanding of the overall sector.

2. COURSERA: An Overview

Coursera is an online distance education platform offering online courses to any person desirous to learn, having partners across the world from various top universities and organizations with a mission to create collaborative programs. These programs make an endeavor to make education a basic right of every person. It was founded in 2012 by Daphne Kollar and Andrew Ng, Computer Science Professors from Stanford University and was officially launched in April 2012 (**Coursera, 2016a**). As on February 24, 2016, Coursera offered *1765 courses* through *138 partners* from *28 countries* with more than *17.5 million learners* registered.

Coursera has been designed on the basis of proven teaching methods confirmed by top researchers. It lays its foundation on following four ideas:

i. Effective Learning:

Online learning is more effective as revealed by the U.S. Department of Education's recent report that students taking online classes produce better results than those taking face-to-face instructions.

ii. Mastery Learning:

It provides its learners Mastery Learning, an approach developed by an educational psychologist Benjamin Bloom. This approach helps learners understand a topic completely before moving to the next. Whenever learners have some difficulty with any concept, Coursera helps them with instant feedback. Most of the times, Coursera provide various versions of assignments to its learners regarding such concepts in which they face difficulty so that learners keep studying till they master such concepts.

iii. Peer Assessments:

Assignments submitted by learners to online courses are often assessed by computer systems. However in many cases, the most meaningful assignments cannot be graded by computers as per their quality. To avoid this, Coursera uses peer assessments of assignments where fellow learners evaluate each other's work and provide feedback about those works helping both learners to gain valuable experiences.

iv. Blended Learning:

There are 138 partner institutions associated with Coursera and many of these institutions use Coursera to provide their on-campus students with an experience of improved learning. Such blended model of learning helps learners to get more involved in their work improving their performance as well as attendance (**Coursera, 2016b**).

3. Features of Coursera:

The prominent features of Coursera are:

1. *Coursera Learning Hubs* is a global initiative which helps building a community along with blended learning with the help of establishing physical networks of space, instructors and learners globally (**Coursera, 2016c**).
2. Connect via Social Networking Sites (Google+, Twitter, Facebook, Blog)
3. *Alerts*: Once learners have registered to Coursera, it sends alerts to their personal mailing addresses whenever any new course is being added.
4. It allows users to watch short video lectures, complete assessments prepared by various peers, participate in interactive quizzes, and get connected to other fellow learners as well as tutors (**Coursera, 2016b**).
5. By the end of the course, Coursera provides a formal recognition to each learner for their achievements along with an optional course certificate (**Coursera, 2016b**).
6. Multi-lingual (English, Chinese, French, Russian, Spanish, Portuguese, Turkish, Ukrainian, German, Arabic, Italian, Japanese, Hebrew, Italian) (**Coursera, 2016d**).
7. *Global Translator Community (GTC)* is a community of volunteers and partner organizations across the globe who help in reducing the barriers of language and geography by making educational content accessible and understandable to everyone (**Coursera, 2016c, Coursera, 2016e**).
8. *Directory* acts as an index for the learners to choose their fields of interests for taking up a course. It provides seven different headings under which available courses are categorized making it easier for the learners to search (**Coursera, 2016f**).

4. Review of Literature

With the advent of information and communication technology (ICT) open online learning opportunities are provided in education giving rise to the development of massive open online courses (MOOCs) (**Barclay and Logan, 2013**). MOOC is the novel advance utilizing modern technology in offering distance education brought together in the year 2008 and emerged as a popular mode of learning in 2012. The term was coined by Stephen Downes and George Siemens, where number of learners can join in from anywhere across the world. MOOCs have reformed the education sector to a large extent by providing numerous online courses to learners (**Johnson and Becker, 2014**). Massive Online Open Courses (MOOC) came into existence on smaller scale, but with many leading institutions offering online courses, they have developed to the extent of being treated at par with mainstream courses. There has been

huge response to such courses and students are found to be highly motivated to enroll in online courses (**Breslow et al., 2013; Koller et al., 2013**). One such example is the enrolled of 150000 students with Stanford Artificial Intelligence (<http://ai.stanford.edu/>) when it started in 2011 (**Rodriguez, 2012**). In United States, a survey of higher education in 2005 reports that in fall 2004, more than 2.35 million students enrolled to online courses (**Allen and Seaman, 2005**). Ease of use, mass acceptance and economical sustainability had led to the introduction of different web technologies in teaching and learning processes. Various educational institutions make use online learning tools and there has been an increase in the use of such tools. Many studies highlight how to make use of internet tools like blogs for student participation and learning (**Baggaley, 2003; Martindale and Wiley, 2005; Oravec, 2003**), wikis for learners to collaborate (**Lamb, 2004**) while podcasting in gathering the attention of both educators as well as learners (**Sloan, 2005**). **Lee and Hirumi (2004); Varvel, Lindeman and Stovall (2003)** observed positive impact on teaching as it transitioned from face-to-face instructions to online set up. Studies have highlighted a number of benefits of online learning environment (**Jiang and Ting, 2000; Rourke et al., 2001; Simonson et al., 2000; Ward and Newlands, 1998**), in particularly their flexibility and convenience of use (**Berge, 1997; Harasim, 1990; Harasim et al., 1995; Jiang, 1998; Matthews, 1999; Swan et al., 2000**). Students enrolled in online learning environment have 24/7 accessibility to course material. Unlike traditional set up, these allows learners to comment upon the views of other fellow learners or even instructors (**Berge, 1997; Harasim, 1990; Matthews, 1999; Simonson et al., 2000**). Personal identities of learner remain masked from each other and thus have equal learning opportunities irrespective of caste, creed, color, gender, etc. (**Simonson et al., 2000**). Furthermore, online courses provide numerous illustrations of various specialists for each concept making the resultant information for learners more effective and same can be retrieved and saved by every student at his/her own place (**Kozma, 1987; Paivio, 1986**). On gauging the instructional design quality of MOOCs by **Margaryan, Bianco and Littlejohn (2015)**, most of the MOOCs were found to be good about the organization and presentation of the course material but scored below par on instructional design policy.

Though there has been active participation and enrollment in online courses but studies have shown minimum number of learners who earn certificate at the end. A study conducted by *The Chronicle of Higher Education* in February 2013, found an average of 7.5 percent students who completed MOOC courses at the end. (**Kolowich, 2013**). In another study about trends in enrolment and completion of MOOCs, it is found that a median average of student enrolment to MOOCs is 42500+, and it keeps on decreasing with the increase in number of courses.

Furthermore, the study reveals that the total percentage of enrolled students who fulfilled the criteria to earn a course certificate, i.e. completion rate of MOOCs is less than 10% with a median average of only 6.5% (**Jordan, 2014**).

Though online learning environment provides equal opportunities for all, studies have witness that such courses are mainly preferred by those who are already educated. **Koller and Ng (2013)** in their study on Coursera reveal that majority of the learners enrolled to Coursera are already educated with 42.8% holding bachelor's degree, 36.7% with masters and 5.4% with doctoral degrees. Similarly, **Emanuel (2013)** while studying the students of Coursera enrolled in courses offered by the University of Pennsylvania shows much greater dominance of educated students revealing that 83% of learners are graduates and 44.2% hold postgraduate degrees.

5. Objectives

The objectives of the study are:

1. To identify institutions that offer courses through Coursera.
2. To highlight collaborative participation of institutions to offer different courses
3. To determine the subject-wise distribution of courses.
4. To assess the involvement of instructors with respect to their gender & institutional affiliation.

6. Methodology

In order to achieve the set objectives, the methodology employed comprises of following steps.

Step – I

The relevant data was harvested from official website of Coursera between February 18, 2016 to February 24, 2016 the (<https://www.coursera.org/>). The website was browsed through the feature - "Partners" (reflected at the bottom of its homepage), enlisting countries and regions whose institutions offer courses. Each country was further checked to determine the participation of its different institutions. Under each institution, information about the courses offered and the involvement of instructors was gathered. Coursera maintains the records of all the courses that institutions offered through its platform. It was observed that Stanford University (USA) offers a number of online courses on its own platform in addition to through the platform of Coursera. Therefore, the study has taken into account only those courses which

are offered through Coursera. The study has adopted the classification of Coursera to categorize the data into different parameters of this study.

Step – II

The data as such collected was rigorously sifted and tabulated as per the set objectives.

Step – III

The data as such analyzed is interpreted and discussed for drawing logical conclusions.

7. Results & Discussion

7.1 Institutions and Courses: Geographical distribution

As of 24 February 2016, 138 institutions from 28 different countries were found to offer 1765 courses through the platform of Coursera. As evident from Table 1, institutions are mostly from USA as it accounts to 45% of total institutional participation. There are nine French institutions and six each from China and Russia. From India, there is only one institution offering a single course via Coursera. When talking about course distribution, a maximum number of courses are again offered by USA (58.49%) followed by China (5.10%) and Russia (4.59%) while the least number of courses are offered by India and Belgium (0.06% each) followed by South Africa (0.11%). While examining for the average courses per institution, it is seen that Mexico is leading with 34 courses per institution followed by Taiwan with 28 and USA with 17 while India and Belgium are again on the lower end of the scale each offering 1 course per institution. When viewed from the economic status of countries (as per World Bank Status), 75% institutions belong to *High* economic zone countries followed by 21.43% institutions from *Upper Middle* economic zone and 3.57% are from *Low Middle* economic zone, thus showing that the *High* economic zone countries are contributing a maximum share.

Table 1: Institutions and Courses: Geographical distribution

| Country | Economic Level* | No. of Institutions N = 163 | No. of Courses N = 1765 | Average courses per Institution** |
|-------------|-----------------|--------------------------------|----------------------------|--------------------------------------|
| USA | High | 62 (44.93%) | 1033 (58.49%) | 17 |
| France | High | 9 (6.52%) | 49 (2.77%) | 5 |
| China | Upper Middle | 6 (4.35%) | 90 (5.10%) | 15 |
| Russia | High | 6 (4.35%) | 81 (4.59%) | 14 |
| Spain | High | 5 (3.62%) | 33 (1.87%) | 7 |
| Australia | High | 4 (2.90%) | 30 (1.70%) | 8 |
| Brazil | Upper Middle | 4 (2.90%) | 20 (1.13%) | 5 |
| Netherlands | High | 4 (2.90%) | 25 (1.42%) | 6 |

| | | | | |
|--------------|--------------|-----------|------------|----|
| Switzerland | High | 4 (2.90%) | 62 (3.51%) | 16 |
| UK | High | 4 (2.90%) | 64 (3.62%) | 16 |
| Canada | High | 3 (2.17%) | 27 (1.53%) | 9 |
| Denmark | High | 3 (2.17%) | 21 (1.19%) | 7 |
| Israel | High | 3 (2.17%) | 28 (1.59%) | 9 |
| Germany | High | 2 (1.45%) | 12 (0.68%) | 6 |
| Hong Kong | High | 2 (1.45%) | 25 (1.42%) | 13 |
| Italy | High | 2 (1.45%) | 9 (0.51%) | 5 |
| Mexico | Upper Middle | 2 (1.45%) | 67 (3.79%) | 34 |
| Singapore | High | 2 (1.45%) | 18 (1.02%) | 9 |
| South Korea | High | 2 (1.45%) | 19 (1.08%) | 10 |
| Belgium | High | 1 (0.72%) | 1 (0.06%) | 1 |
| Chile | High | 1 (0.72%) | 8 (0.45%) | 8 |
| Colombia | Upper Middle | 1 (0.72%) | 15 (0.85%) | 15 |
| India | Low Middle | 1 (0.72%) | 1 (0.06%) | 1 |
| Japan | High | 1 (0.72%) | 4 (0.23%) | 4 |
| South Africa | Upper Middle | 1 (0.72%) | 2 (0.11%) | 2 |
| Sweden | High | 1 (0.72%) | 4 (0.23%) | 4 |
| Taiwan | High | 1 (0.72%) | 28 (1.59%) | 28 |
| Turkey | Upper Middle | 1 (0.72%) | 6 (0.34%) | 6 |

* AS per World Bank Statistics (<http://data.worldbank.org/>)

** Rounding off done at ones place

Table 2: Top 15 institutions offering maximum no. of courses

| S.No. | Institution | Courses |
|-------|--|---------|
| 1 | University of Pennsylvania (USA) | 84 |
| 2 | University of California, Irvine (USA) | 66 |
| 3 | Johns Hopkins University (USA) | 58 |
| 4 | University of Illinois at Urbana-Champaign (USA) | 51 |
| 5 | University of California, San Diego (USA) | 47 |
| 6 | Duke University (USA) | 46 |
| 7 | Peking University (China) | 44 |
| 8 | Higher School of Economics (Russia) | 42 |
| 9 | University of Michigan (USA) | 42 |
| 10 | Universidad Nacional Autónoma de México (Mexico) | 34 |
| 11 | Tecnológico de Monterrey (Mexico) | 33 |
| 12 | Stanford University (USA) | 32 |
| 13 | University of Washington (USA) | 32 |
| 14 | École Polytechnique Fédérale de Lausanne (Switzerland) | 31 |
| 15 | Georgia Institute of Technology (USA) | 31 |

7.2 Inter-institutional Collaborative Courses: National & International

Since online courses have bridged the gap of time and space barriers, people from different institutions are observed to have teamed up to offer courses in collaboration. At Coursera, 33 courses are offered as a result of inter-institutional collaboration. In 17 courses, institutions of the same country have teamed up and in other 16 courses collaborative institutions are from different countries.

There are three courses in which instructors were from three different institutions (*An Introduction to Evidence-Based Undergraduate STEM Teaching; Copyright for Educators & Librarians; and Copyright for Multimedia*) and in the remaining 30 collaborative courses instructors are from two different institutions.

Further, 31 institutions from nine countries [(Denmark (3); France (2); Mexico (2); Netherlands (1); Russia (1); Spain (1); Switzerland (1); United Kingdom (1); and USA (19)] are only observed to offer inter-institutional collaborative courses. *University of Colorado Boulder (USA)* has collaborated in a maximum of seven courses with other institutions, followed respectively by *University of Colorado System (USA)* in six courses. *Higher School of Economics (Russia)*, *University of California, Irvine (USA)*, and *University of California, San Diego (USA)* have collaborated in five courses each. On the other end, 17 institutions have collaborated in one course each and four institutions have collaborated in two courses each.

7.3 Subject-wise Courses

Amongst the ten broader subject fields (as classified by Coursera), majority of courses are offered in *Business* with 442 courses accounting 25.03 percent of total courses count. *Social Sciences* and *Computer Sciences* followed the list with 305 and 295 courses respectively. As evident from Table 3, minimum number of courses are offered in *Math & Logic*, and *Language Learning subjects*.

Table 3: Subject wise Course Count

| Rank | Subject Field | No. of Courses | Percentage |
|------|----------------------------------|----------------|------------|
| 1 | Business | 442 | 25.03 |
| 2 | Social Sciences | 305 | 17.27 |
| 3 | Computer Science | 295 | 16.70 |
| 4 | Physical Science and Engineering | 231 | 13.08 |
| 5 | Life Sciences | 217 | 12.29 |
| 6 | Arts and Humanities | 192 | 10.87 |
| 7 | Data Science | 155 | 8.78 |
| 8 | Personal Development | 100 | 5.66 |
| 9 | Math and Logic | 82 | 4.64 |
| 10 | Language Learning | 39 | 2.21 |

Cumulative sum of percentage exceeds 100 as some courses are classified in more than one category

7.4 Instructors: Gender Diversity

A total of 1903 people are involved as instructors with different courses at Coursera. These include 1326 males (69.68%) and 577 females (30.32%). A maximum of 80 instructors are from University of Pennsylvania (USA) followed respectively by 68 instructors from The University of Edinburgh (UK) and 53 from Johns Hopkins University (USA). Maximum number of male instructors (65) are from University of Pennsylvania (USA) and maximum number of female instructors (38) are from The University of Edinburgh (UK). Though the overall male-female ratio of instructors at top 10 institutions (having instructor count greater than 35) is found to be 2:1 (approx.), yet as evident from Table 4, proportion of female instructors at five institutions is better than observed gender ratio. These institutions are: Johns Hopkins University (USA); Peking University (China); Universitat Autònoma de Barcelona (Spain); and The University of Melbourne (Australia)

Table 4: Gender-wise breakup of instructors at institutions having Instructors count > 35

| S.No. | Institution | Count | Male | Female | Total |
|-------|--|-----------------|------------|------------|------------|
| 1 | University of Pennsylvania (USA) | Observed | 65 | 16 | 81 |
| | | Expected | 55 | 26 | |
| 2 | The University of Edinburgh (UK) | Observed | 30 | 38 | 68 |
| | | Expected | 46 | 22 | |
| 3 | Johns Hopkins University (USA) | Observed | 33 | 20 | 53 |
| | | Expected | 36 | 17 | |
| 4 | Peking University (China) | Observed | 30 | 22 | 52 |
| | | Expected | 35 | 17 | |
| 5 | University of Geneva (France) | Observed | 40 | 12 | 52 |
| | | Expected | 35 | 17 | |
| 6 | Higher School of Economics (Russia) | Observed | 32 | 10 | 42 |
| | | Expected | 28 | 14 | |
| 7 | University of Illinois at Urbana-Champaign (USA) | Observed | 36 | 5 | 41 |
| | | Expected | 28 | 13 | |
| 8 | Universitat Autònoma de Barcelona (Spain) | Observed | 24 | 14 | 38 |
| | | Expected | 26 | 12 | |
| 9 | Duke University (USA) | Observed | 25 | 12 | 37 |
| | | Expected | 25 | 12 | |
| 10 | The University of Melbourne (Australia) | Observed | 24 | 13 | 37 |
| | | Expected | 25 | 12 | |
| | Total | Observed | 339 | 162 | 501 |
| | | Expected | 339 | 162 | |

Pearson Chi-Square = 37.682; df = 9; Asymp. Sig. (2-sided) = .000

7.5 On Demand Courses

On-Demand courses offer flexibility to learners to pursue the courses at their own pace without bothering about predefined deadlines for assignment submissions or completion of courses. People differ in their respective abilities to learn things, where competent or motivated people

need less time to understand, others demand more time to comprehend. Availability of time is also one of the important factors that learners have to grill through while taking a course. It is obvious that professionals working in competitive organizations have less time to enrich their skills. Instead of time-limited course, on-demand courses best suit their busy schedule. As of February 24, 2016, 33.24 percent (587) courses are offered in On-Demand mode.

6. Conclusion

Massive Open Online Courses (MOOCs) are relatively a new concept that have generated much discussion in both professional and popular media. Coursera is one of the MOOC provider that offers online courses across the world from various top universities and organizations with a mission to create collaborative programs. These programs uplift the spirit of making education the fundamental right of every person. Initiatives like on-demand courses have in a way provided ample opportunities for learners to go through end of their courses which otherwise might be the reason for users to leave their courses half way in time-bound situations. Such initiatives of on-demand courses should be encouraged and offered in all possible courses in MOOC environment. Though most of the institutions and courses offered are from developed countries or high economic zone countries (i.e. 75%, as revealed from results of the present study), there are good number of institutions both from developing and other states which have yet to avail such opportunities and offer courses so as to make the world a better place to live for those who desire to learn but lack opportunities. Instead of investing in the development of their own platforms, institutions should take the benefits of already existing platforms. State and institutional policy makers should be approached and made aware of the umpteen benefits of online learning environment. They should be encouraged to propagate and draft a national policy on online education.

Talking about inter-institutional collaborations, the present study reveals only 24% of total courses offered are as a result of inter-institutional collaborations. The Inter-institutional collaborations should be given flip at national and international levels, thereby bringing great minds to collaborate together at one place and spread their knowledge to information seekers from all over the globe. The Inter-institutional collaborations shall produce to better outcome in terms of quality education and skill development. This is an arena in which both developed as well as emerging countries should come forward and synergize their efforts. Besides, developed countries emerging countries also have highly talented and skilled tutors that can add to the USP (Unique selling proposition). However, such tutors and academicians lack

opportunities in terms of state of the art technologies to create robust platforms for MOOCs. Such platforms if offer opportunities to all potential academicians and technocrats can be blessing for the knowledge seekers all over the globe and thereby help to achieve global educational and technological excellence

Furthermore, a vast array of different subject areas are being covered by MOOCs in order to educate students seeking knowledge in different subject fields like Social Sciences, Computer Sciences, Business, Arts and Humanities, etc., yet some subject fields need further focus viz. Mathematics, Personal Development, etc. though many people take great interest in these fields as well and desire to learn more. But due to lack of opportunities for availing further education in said fields, such people remain at bay. Thus, MOOC platforms should update their knowledge setups as well as scope of content at regular intervals in order to fulfil all the information demands of students to their optimum levels keeping in view the present scenario of information overload and information explosion.

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