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## **Role of the success of cloud computing in MOOC in online education environment**

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**Abstract:** Massive open online courses (MOOC) has witnessed a huge demand among students, with majority of Indian students enrolling into courses offered by non-Indian universities. When elite colleges are offering courses free of cost to students, it is definitely an offer hard to resist. As Coursera, a major player in the MOOC sector gets second highest enrolments from India. This paper proposes a framework for the success of cloud computing-based MOOC in India to revolutionise the current education sector. Implementing cloud computing platform for MOOC will provide solution to the problems of the students with maximum dropouts. So with the present trend of changing dynamics for education followed in India, provides an insight to the enthusiasm behind the MOOC woven into blanket of MOOC for Indian students getting placed from different industry. The objective of the paper will be focused on providing framework for identifying the key dimensions in the impact of cloud computing for MOOC among the learner, trainer, university and industry. The study will help in creating impact to enhance the e-learning environment with the implementation of cloud computing for MOOC in India.

**Keywords:** massive open online courses; MOOC; collaborative learning; flip classroom; higher education system; HES; gross enrolment ratio; GEC.

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## 1 Introduction

Information technology is playing an important role in developing countries like, India transforming from traditional form of education towards online learning methodology. In India, a lot of old and new engineering colleges are not able to cope with changing technology. Therefore, mushrooming of engineering colleges in India has raised the question of survival in the long run to transform from the traditional chalk-and-talk method to the online method.

“India has about 5,000 engineering colleges today, a 25 times increase from just about 200 colleges 30 years ago. Annual enrolment of students in these colleges is now over 1,250,000. The number of qualified and experienced teachers is highly inadequate. As India moves to increase the GER (gross enrolment ratio) in coming years, the need for quality teachers will increase, and the supply-demand gaps will widen” (Deepak, 2014). Therefore, the study proposes to implement online education system to resolve the issue of demand for qualified and experienced teachers. But in year 2017, another issue cropped up with the survival of engineering colleges in India.

“In year 2017, 122 private engineering colleges have opted for progressive closure due to the decline in the admission (Khurana, 2017).” Therefore, to address the present issue of enrolment the study proposes for introducing e-learning through MOOC.

A massive open online course (MOOC) is a free web-based distance learning program that is designed for the participation of large numbers of geographically dispersed students.

“In year 2011, when free artificial intelligence course offered through MOOC platform by Stanford University in California attracted around 160,000 students from different parts of the world. So science, engineering and technology courses have been in the vanguard of the movement, but offerings in management, humanities and the arts are growing in popularity.” “In 25 years of observing higher education, I’ve never seen anything move this fast, says Mitchell Stevens, a sociologist at Stanford and one of the leaders of an ongoing, campus-wide discussion series known as Education’s Digital Future” (Mitchell, 2013).

In this study, would like to focus on the challenges of adopting MOOC in higher education from University and student perspective, and also to identify the major issues related to the implementation of MOOC from student’s response analysis. Followed with the possible recommendation based on the challenges and issues to exploit the potential of MOOC through cloud computing.

### 1.1 Objectives of the study

- 1 To assess the possible challenges and issues of adopting MOOC in higher education institutions.
- 2 To recommend how to exploit the potential in MOOC.

### 1.2 Research issue

“Over the years, internet has played a tremendous role in providing information to the people around the world in just a click of a button. In present generation world, people are so busy with their work and stress out life style that they do not get enough time to do

their full time college or university to upgrade their skills and knowledge due to fear of losing their present full time job.” (Naganathan, 2014). “Introduction of MOOC by top rated universities has created a huge volume of students to pursue their learning at their own pace of time through online learning, since it is provided by some free of cost as well.” (Venkatesh, 2014). Considering the spread of MOOC as an online learning medium, authentication of the user is an issue. As in online learning system assessments cannot be monitored whether the assignment done by the person who registered in the course or someone else did it for him/her. Other issue of concern is the quality of courses and the instruction of delivery is different from the traditional education system of content-based approaches to the outcome-based approaches. The study depicts the issues and challenges for having a sustainable model for MOOC in online education system.

### *1.3 Research questions*

- 1 What is the extent of MOOC adoption in India?
- 2 What are the issues to be resolved for adopting MOOC from institutional perspective?
- 3 What are the issues to be resolved for adopting MOOC from learner’s perspective?

### *1.4 Research gap*

The goal of this research is to address a number of gaps in the scholarly understanding of MOOC and present a comprehensive picture of the literature by examining the past publications and citations.

“Although Stanford’s president mentioned in his speech about a digital tsunami threatening to sweep aside conventional university education” (Boxall, 2012). “John Mitchell, the vice-provost – online learning mentioned – “I think everyone agrees there’s something very exciting going on here. So how do we as a university participate in that? What can we learn about teaching and learning through experimenting with different forms of technology? So I think we’re going to treat this as an intellectual question and an academic investigation in some sense” (Weissmann, 2012). “Elsewhere he observed: we really want to see what works. We’ve started out in one direction with Coursera – which is a great company and its great working with them – but it’s not clear that the current mode of producing courses is where we’re going to end up in five years” (Lewin, 2013). “Following on from the development of Open Education Resources and the Open Education movement” (Yuan et al., 2013), “the term MOOC was first used in 2008 by Dave Cormier to describe Siemens and Downes as Connectivism and Connective Knowledge course” (Thille, 2014).

“Early in 2012 Stanford University offered a free, chunked course on Artificial Intelligence online and about 160,000 people signed up. One of the faculty members involved, Sebastian Thrun, went on to found Udacity, a commercial start-up that helps other universities to offer xMOOC key purpose of MOOC was to provide education free and to reach out to as many students as possible by giving them free admission to university education through online teaching; and should not have any constraint with regards to demographic or economic.” (Meyer, 2012)

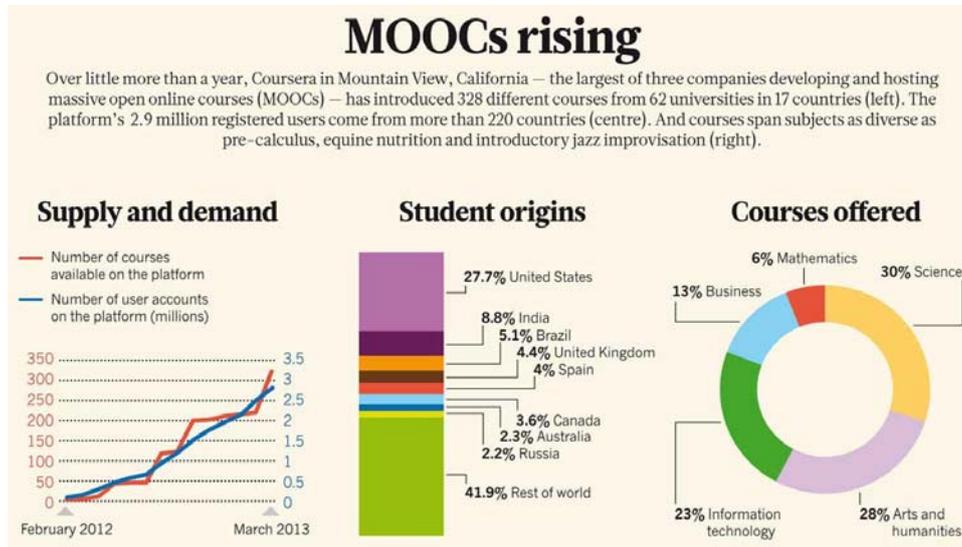
Wiley (2012) pointed out that “the ambiguities in the concept of MOOC may pose a threat to the future development of open educational resources and open courses in India, when it is free.” “This raises questions about the licensing and permissions of current MOOC provision and how it relates to the creative commons licenses promoted by the open educational resource (OER) community” (Wiley, 2012). “In cMOOC setting the applicants in the course enrolled in the course will take both role of a teachers and students, by engaging and sharing their knowledge through constant interchange and interaction using technology.”

“Whereas on the other hand, the instructional model (xMOOCs) is essentially an extension of the pedagogical models practiced within the institutions themselves, which is arguably dominated by the ‘drill and grill’ instructional methods with video presentations, short quizzes and testing” (Venkatesh, 2014). Figure 1 depicts how Coursera in Mountain View, California one of the top 3 companies developing and hosting MOOC with different courses in universities and countries.

“The ferment is attributable in part to MOOC hitting at exactly the right time. Bricks-and-mortar campuses are unlikely to keep up with the demand for advanced education: according to one widely quoted calculation, the world would have to construct more than four new 30,000-student universities per week to accommodate the children who will reach enrolment age by 2025.” (Waldrop, 2013)

The previous studies are based on conceptual but present study identify the gap to focus on the evidence based keeping in view from student’s perspective. This study attempts to identify some of the possible issues and challenges from universities and students point of view for the developing sustainable MOOC model in different universities.

**Figure 1** MOOC rising (see online version for colours)

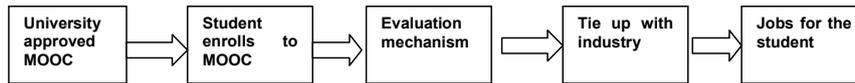


Source: <http://www.scientificamerican.com/article/massive-open-online-courses-transform-higher-education-and-science/>

## 2 Challenges

The present study suggests a linear model for the implementation of MOOC.

**Figure 2** A linear implementation model



The factors which pose as challenges required to be taken into consideration along with implementation of MOOC.

- **University approved MOOC**  
Universities need to upgrade with technical infrastructure to implement MOOC. Beside universities has to have approved MOOC courses for students to register.
- **Students enrolling to MOOC**  
Awareness of MOOC needs to be spread appropriately using the social media sites, blogs along with traditional methods.
- **Evaluation mechanism**  
MOOC needs to adopt authentic assessment mechanism to be built up to justify the course objectives.
- **Finances**  
Initial cost is high due to the technical infrastructure up-gradation and fees for expert professors. Universities need meet the cost burden with less fees and large number of student's enrolment.
- **Trainers**  
Students need to be provided with study materials prior to the commencement of the online course. So that during the lecture session with the help of webinar or video-conferencing mode would improve the decision making skills of student through enhancing practical knowledge with flip classroom.
- **Student perspective**  
The student centric nature of MOOC gives the learner an upper hand. But self-learning cannot be done without self-motivation and dedication of the students. The study proposes above model from approved MOOC courses by the university to reduce the rate of students drop out of the courses will be reduced.

### 2.1 Research methodology

#### 2.1.1 Methodology

“The methodology combines a philosophy theory with the suitable research methods and links a philosophical viewpoint into actual and appropriate research strategies to increase the validity of research” (Cresswell, 2007). According to the philosophical research

paradigm, although there are many types of research methodology applied for identifying the consumer selection behaviour research, they all divided into two general levels – quantitative or qualitative research. Given that this study will be descriptive research as well, applying both qualitative and quantitative research methods will be used. The study deals with quantitative research method to analyse the possible realisation of MOOC and future students, academicians, corporate behaviour on a broader scale survey. The research findings are statistic number, data, percentage, and the number of subjects that are used for comparative purposes, which is to find a relationship between empirical phenomenon and quantitative expression, also it is known as empirical methods that come from philosophical positivism and objectivism.

## *2.2 Research design*

Before getting to know what research design is all about, one must know what type of research one is going to use in the study; whether it is going to be descriptive or explanatory research. People think that descriptive means more theoretical nature of study; but this gives the greater advantage of knowing ‘why’ a good description can be more important for further explanatory nature of research. To collect facts about the people’s mind set descriptive mechanism always been the first choice for researchers.

The example when one ask questions why people fight with each other and the crime rate is increased in the cities for the past few years, this means the explanatory view of what is taking place and why it is taken place. So in a researcher mind it is always important to know how one frames the questions and design the survey form, questionnaires’, etc. related to the area of research to be undertaken. Since the study will be based on India implication of MOOC, the data’s are collected from university professors, students and corporate clients. Sample size will be 100 in total. The respondent’s targeted numbers are (professors 80, students 100 and corporate 20 people from different colleges/companies from India).

The major intention for this research is to find out the accurate view of the respondents what they think about MOOC and its trends of implication on their lives and the society. The questionnaire has been designed using both the approach of open and closed ended questions to test the respondent’s views and to gain the output of what they think about MOOC through both approaches by which quantitative and qualitative data have been collected. Data’s collected through different sources such, i.e., e-mail as it can be collected and make it flexible for the respondents to give their opinion if responders could not get their time to fill in the survey forms. The questionnaire is prepared in such a manner to find the opinions from institutional and learner’s perspective in regard to the future adaptation of MOOC in higher education system.

## **3 Primary data collection**

### *3.1 Questionnaire*

The research deals with questionnaire of close-ended and open-ended questions for collecting the primary data. The open-ended question is adapt to qualitative research question, because if the respondent is allowed to answer without any limitations in the open-ended question, it can offer more accurate and detailed personal thoughts and

feelings for gathering the information for MOOC challenges and its future what the respondents think about it and the researcher will also gain an expanded result in a short time.

### *3.2 Secondary data source*

In this research, secondary data are taken from official website of the university that is opted to MOOC, and the rest from Journals, Articles and Educational Expert in online education and their opinions etc. Therefore secondary data are obtained quickly and at a cheap price based on different needs for measuring respondent's opinion. It will be taken care that the validity and its reliability of secondary data's are at most accurate as far as possible and will be taken from highly reliable sources.

### *3.3 Sampling*

The questionnaires have been circulated in different ways to the respondents in this study. Distribution of the questionnaires have be done on case by case basis depend upon the situation and the respondents wiliness to respond accordingly. For example university professor meet them in person and got their feedbacks, but some time due to their busy schedule it may not be possible to get their timing. So e-mails were used as a medium of information gathering at that point of time. As mentioned survey have also been conducted face to face interview with the respondents if they are willing to spare time to do the same. As mentioned earlier due to time constraints and availability of limited resources the sample size taken was 200 in total. A detail questionnaire for the survey is done and the findings consolidated and illustrated in Table 1.

### *3.4 Validity/reliability of data*

Therefore the data collected from the respondents are reliable in nature considered from the beginning of study. Feedback was collected from the respondents includes Professor, corporate and students of different institutes and universities in India through personal meeting or mail with identical source of addresses for data validity.

### *3.5 Findings and recommendation*

This section analyses the feedback from the respondent in depicting some of the findings with recommendation for the above study. The findings depicts with a brief overview of the current phenomenon on the present issues of MOOCs and its impact on the future e-learning education system in India. Present education system has drastically going through lot of development in respect to the implementation of MOOC in comparison to the traditional learning system. From the responses it is clear that 82% have favoured and said the research in MOOC is going on and lot of research is published and still it is moving on. MOOC has been new jargon for students in today's education scenario; still traditional academic approach cannot be ignored as an accepted standard approach of education to most of the students around the world. In order free initiatives to translate the materials for easy access with world's common languages spoken (Melinda-Gates, 2012).

**Table 1** Survey results – respondents opinion on MOOCs

Research questions	Survey results	
	Male: 65	Female: 35
1 What is your gender?	18–29	55
2 Which age group you belong too?	30–49	20
	50–64	20
	65 and above	5
3 Your education background that you have completed?	Less than high school	1
	High school	10
	Diploma/Higher diploma	15
	Degree	34
	Master's degree	30
	Doctoral degree	10
4 What is your profession?	Executive/Manager	7
	Government/Military	6
	Teacher/Professor	17
	Professional/Technical	5
	Businessmen	33
	A student	15
	Unemployed	3
	Retired	4
5 Are you aware of MOOC?	A homemaker	45
	Somewhat aware off	30
	Well aware off	25
	Don't know	23
	Yes	37
	No	40
6 Are you a student of any MOOCs courses?	Planning to take up later	65
	Yes	10
	No	25
7 Is there any learning/research is going on in MOOCs compare to the regular academic/University education system?	No comments	35
	Free and affordable	15
	No perquisite required	23
8 What are the key reasons for doing MOOCs courses?	Flexible timing	15
	Update knowledge	15
	Others	12

**Table 1** Survey results – respondents opinion on MOOCs (continued)

<i>Research questions</i>		<i>Survey results</i>
9	Please rate your experience in MOOCs learning process	
9a	Easy of assessing the course information?	Among the worst 0 Below average 0 Average 3 Above the average 7 Among the best 13 Don't know 77
9b	Availability of student support service /helpline if any query?	Among the worst 0 Below average 2 Average 6 Above the average 7 Among the best 8 Don't know 77
9c	Easy of doing the course on the schedule time slot provided?	Among the worst 0 Below average 3 Average 3 Above the average 9 Among the best 8 Don't Know 77
9d	Quality of the course material provided?	Excellent 4 Good 15 Fair 2 Poor 2
9e	Quality of the online tutor?	No opinion 77 Excellent 2 Good 17 Fair 4 Poor 0
10	Is there any learning research is going on in MOOC compare to the regular academic /university education system?	No opinion 77 Yes 65 No 10
11	Whether the assessment mode of MOOCs conducted by the provider are authentic on accessing the student's credentials?	No comments 25 Is authentic 14 Somewhat authentic 40 Not authentic 30 No comments 16

**Table 1** Survey results – respondents opinion on MOOCs (continued)

<i>Research questions</i>	<i>Survey results</i>
12 Is the certification issued by the MOOCs provider are valid in the job market?	Strongly agree 5 Agree 20 Somewhat agree 24 Disagree 40 No comments 11
13 Do you feel the certificate issued by MOOCs provider are equivalent to the traditional university and that can lead to the exemption of few module in main stream degree programmes conducted by traditional university?	Strongly agree 2 Agree 15 Somewhat agree 30 Disagree 30 No comments 23
14 Course materials are available freely online in MOOCs model of education provided by the providers? Do you agree they Adhere to copyright laws?	Strongly agree 5 Agree 15 Somewhat agree 40 Disagree 20 No comments 20
15 Do you prefer MOOCs over traditional university learning process?	Yes 18 No 32 Prefer both 43 No comments 7
16 Is online education is taking its lead into day's mainstream education system?	Strongly agree 11 Agree 8 Somewhat agree 28 Disagree 38
17 Is MOOCs is hype or a reality for the future online education system?	No comments 15 Yes 30 No 41 No comments 29 Strongly agree 3 Agree 10
18 Will MOOC's destroy academia?	Somewhat agree 21 Disagree 52 No comments 14 Strongly agree 11 Agree 18 Somewhat agree 28 Disagree 30
19 Do higher education system need to improve to be competitive with the fast moving trend of MOOCs to stay competitive?	No comments 13 Strongly agree 1 Agree 5 Somewhat agree 10 Disagree 74 No comments 10
20 Will MOOCs model of study will leave the role of academic staff in the University jobless in course of time?	

As the number of Coursera students from India have reached to 1.3 million (an increase of 70% from last year), with more MOOC initiatives helping in reaching to the maximum population through e-learning platform. NIIT has partnered with edX to use MOOC to train half a million people in technology based skills in India, with Indian IT firm Infosys has partnered with Udacity, edX and Coursera to train its 194,000 employees.

From the survey question it was found that 16% respondents feel that MOOC is hype but on the contrary respondents have favour 70% say that it is not hype and it is the future for online education system. Roughly 14% has adopted for no comments.

16% feel that academic education or the traditional education system cannot be taken over by MOOC whatsoever the trends or popularity builds upon the MOOC and their easier approach of doing the course will not have any major impact on it. On the other side 9% agree that MOOC will be next form of education from traditional, whereas 71% responders are in dilemma in respect to the MOOC substitution to the traditional education system with 4% did not respond. When we look into the passing rate of MOOC students from different university providers it is very bad compare to the traditional university passing rate. Overall passing rate is hardly 10% only whereas the enrolment for MOOCs or in thousands. [Note: for more courses of MOOCs and passing rate view the <http://www.katyjordan.com/MOOCproject.html>].

So overall academic way of education cannot be destroyed overnight nor MOOCs can improve its passing rate drastically in a short period of time. Each ways of education has its advantage as well its disadvantage also, so which way of education system can suit individual; accordingly they need to select their option to pursue their career and improve on their skills. Let us look the data from the survey; 5% strongly agree that higher education system (HES) need to improve to be competitive with the fast moving trend of MOOC to stay competitive, followed by 9% saying agreed; disagree numbers need to be looked into, 65% disagree on this. Competitiveness of the HES over the MOOC was asked to the respondent to suggest what they feel about in person.

Respondent general view was that improvement with respect to course material, infrastructure with flexible timing and last but not the least they want the fee should be reduced in the regular stream/academic university courses so that everyone will be benefited a lot. Since mainly due to heavy fee some of the top students cannot do the courses in the reputed university due to lack of financial support.

Every HES around the world need to improve on a constant basis to be competitive to match the global scenario. Improvement should be on the ground of how they govern and fund higher education, expand access to higher education, create effective accountability standards and set bold goals for achievement. The last question in the survey is very interesting; what will be the position of academic staff working in the university – do they lose their jobs due to MOOC popularity taking over the regular stream of education system. Survey results shows that only 20% strongly agree on the stance; followed by 15% has given agree status; and 5% from somewhat agree on it. On an average 5% only on the agreeing side; whereas majority feels disagree with it. 55% respondents disagree that no way the academic staff will lose their job due to MOOC; since when we see the courses that are conducted by the course providers are basically done by the university staff of their respective colleges only so most of it are part and parcel of the system itself, in turn rather loosing job they enhance their job skills and get extra paid for their services. MOOC will certainly change the e-learning platform with technology through centralised courseware and providing transparency in the assessment.

#### 4 Conclusions

E-learning trend will be the new buzzword for education community with role of MOOC. In future MOOC will develop new learning atmosphere for student opting for online mode of learning. So institutions in India should gear up for transforming traditional classroom into virtual classroom environment for students with the help of cloud computing. Cloud computing and MOOCs are portrayed in this article as new disruptive (and servitised) innovations. The cloud has servitised the IT industry by enabling the scalable delivery of IT services (both hardware and software-related) remotely through the medium of the internet. MOOC can really change the present scenario of HE industry in India through e-learning method of study with cloud computing enabler.

Current evidence suggests that servitising the IT and educational industries is an innovation that has the potential to create impact in the present educational system through cloud computing enabler to coup up with the present global economic scenario of cost cutting and austerity. The success of MOOC will depend on the adoptability of the current technology trend in e-learning methodology through virtual learning platform in India. So education community need to understand the present cultural changes happening should be matched with technological innovation to sustain in the long run.

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