Massive Open Online Courses and E-learning in Higher Education

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Abstract

The main objective of this is to review the literature to know about MOOCs and its role in Higher Education. It explains briefly about how internet is becoming an integral part of Higher Education in the current scenario. Effectiveness of E-learning with help of case studies, collaborative learning, student's satisfaction, comparative study of MOOCs around the world, understanding MOOCs, its history and evolution in detail, types of MOOCs in detail and drawbacks of MOOCs has been discussed in this review article.

Keywords: cMOOC, Coursera, E-learning, Ethics, MOOCs, Udacity, xMOOC, Vygotskian

1. Introduction

Internet helps in democratization of education, by facilitating everyone to access knowledge that has been accumulated by mankind[1]. Internet gives a very flexible access to any kind of data, based on the needs of the learner. It can be knowledge-based, skill-based or attitude-based learning and learning through internet can have impact on all these[2]. This has resulted in a facility, wherein learners can access any content at any time, place and pace, based on their convenience. Many educational organizations have begun offering various courses *via* web in different formats[1].

Modular Object Oriented Dynamic Learning Environment (MOODLE) is an important learning management system through which Massive Open Online Courses (MOOCs) are structured. An e-conference through MOODLE facilitates group discussion. It also helps to update assignments and hence proves to be effective for interaction and comprehension. The usual problems of group meetings can be avoided through MOODLE, but it does have a drawback, wherein nuances in speech and body language are missing. In spite of this, it still serves as a good tool for effective communication[3].

Electronic books also help the academic purpose to a large extent. E-books extend easy accessibility and good search options. These e-books and other digital materials are embedded in the Virtual Learning Platforms (VLE) like MOODLE and MOOCs[4]. However, due to lack of empirical research, the annotative and sharing capabilities of e-books need evaluation. The assessment of the Next-Generation e-Book (NG-eBook) with annotative and sharing capabilities has been reported. The intention is to promote student learning students by sharing of ideas and reflection. The findings show that the use of NG-eBook leads to considerable engagement and interactions among students[5].

2. E-learning and Higher Education

E-learning has created a huge breakthrough in the human capital development. It is a means by which humans can sustain in this fast expanding global environment. In India, we find that at the University level, opportunities for E-learning have increased comparably. Globalization with modern trends and developments are forcing the conventional education system to review and amend

the procedures and policies that are currently existing[6]. Professors and students are attracted towards it due to its flexibility of learning anytime and anywhere at one's own pace. A study carried out for a software engineering course to evaluate the E-learning effectiveness in relation to the performance of conventional learning indicated that E-learning is as effective as the conventional method of learning[7]. As a part of a new strategy in E-learning in tertiary polytechnic education, the E-team supported the E-learning and m-learning[8]. Use of mobiles in m-learning makes it easy to use and had positive impact on learners due to its ease in usage as well as satisfaction among users[9]. This served as a catalyst to the entire institution for the adoption of social constructivist pedagogy. It also facilitated lecturers to move from non-engagement to full participation within the E-learning community, thus enabling the constructivist learning environment among students. Similar models can be applied to other contexts of higher education[8]. Similarly, Garrison has explored extensively and expressed the pedagogical, technological and organizational implications of E-learning in his book "E-learning in the 21st Century." Apart from guidance, this provides various practical models that can be used by researchers, educators and senior administrators appropriately to adopt E-learning in their institutions[10]. There are many such models available and hence the moot point is about the authenticity and reliability of these models. A practical, working example to engage the learners with authentic tasks in E-learning has been described in "A Guide to Authentic E-learning." This book traverses through the real-life knowledge application design models and implementation process. It also elaborates on the case studies on realistic scenario, producing realistic results using these authentic E-learning tasks. It is more suitable for online teaching professionals in higher education[11]. This information, along with students' experiences of E-learning in higher education will be an added advantage for educators and senior administrators that will help them to understand how E-learning impacts students, so that it can be integrated effectively into online programs. It will definitely lead to a better understanding of the student experiences of learning. The book "Students' Experiences of E-learning in Higher Education" gives an insight into how students interpret the challenges, their approach and conception towards learning, their interpretation on task requirements etc. This includes students from United States, Europe and Australia etc. along with key themes in latest

international research and their implications for teachers and managers[12]. To quote a similar example, is the development of a computer-aided system that provides meaningful and customized feedback on performance to students and on the quality of MCQ items to teaching staff. Evaluation of student and staff perception has been carried out on the effectiveness and on the value of the feedback to learning. The student experiences pointed out that the feedback was timely, well organized, easy to follow and helped in revision for further study. Simultaneously, this also helped teachers in getting feedback on students' progress, thus enabling them to make modifications in their teaching, so that better student learning support system can be evolved[13]. In spite of all the above mentioned potentials of E-learning, there are some important issues waiting for solution like; Quality, cost effectiveness, dropout rate etc[14].

2.1 Collaborative E-Learning

Another appealing pedagogical approach is the collaborative E-learning. It comprises of a didactic model integrating multimedia, collaborative tools and assessment. It involves educational activities given in two sets. Set one is proposed by the teacher, and students need to review the multimedia. Set two invites the students to create their own multimedia resources and also assess the ones created by their peers. This obviously brings out collaborative communication among students. It also leads to dynamism, motivation, creativity and enhanced learning for students and teachers[15]. One of the drawbacks of collaborative E-learning is that, it stresses on group work and group discussion, due to which individual learner support is neglected as a whole. This is overcome by cloud computing technology, where all the documents are stored in cloud storage. This can be accessed by others who are interested[16].

2.2 Student's Satisfaction

When a lot of technology enhanced learning is presented to students, whether they satisfied with E-learning, is the immediate question. Students motivation and satisfaction levels are crucial factors that helps in evaluating the success and effectiveness of any E-learning program[17.] A study that involved 1114 university students from Southern Spain was conducted to determine and analyze the satisfaction level of students with E-learning. Findings showed that the course design and contents,

facility for accessing and visualizing information on the teaching platform, along with the possibility of interactions were the key aspects for their satisfaction. The study also showed the perception of the professor as a motivational image. Successful completion of the course taken by the students relied largely on the professors[18]. Another study to determine the quality of E-learning course was carried out in Singapore to get answers to questions like, are the E-learning programs meeting the learning objectives, do students like E-learning, were their learning objectives met and did they use the knowledge. To ascertain the effectiveness and quality of E-learning programmes quickly, a simple framework has been proposed[19].

2.3 Case Studies

ICT policy in education is gaining significance, as educational stakeholders have started to acknowledge the same[20]. Few case studies of E-learning includes a collaborative venture between UK and Chinese universities that has resulted in the production of E-learning modules for Master's level programmes for in-service high school teachers in China. This has provided transformative learning. The investigation facilitates teacher transformation from 'knowledge-centered' 'learner-centered' and "community-centered" perspective. It has been concluded that though E-learning has some caveats, it is still a feasible solution for the training needs of Chinese teachers[21].

A qualitative investigation in England, studying the experiences of educational practitioners, focused on the subjective and perceptual aspects of the E-learners experience. It aimed to investigate the evaluation strategy that is built in the course design. The study identified opportunities for meta-learning as central to the teachers' adaptation to collaborative E-learning processes[22]. Instructors teaching tertiary education from North America (USA and Canada) and New Zealand were requested to share their thoughts about effective E-learning methodologies. Comparison of the responses to primary research questions pointed that both similarities and differences existed, while similarities far outweighed the differences[23]. A study to know the attitudes of student and teaching staff of tourism education towards E-learning has been conducted in Egypt. A questionnaire was designed for students, semi-structured interviews were conducted with academic staff of tourism and hotels at Helwan and Menoufia University. Results showed that the students and academic staff have a good positive attitude towards E-learning in the faculties of tourism and hotels in Egypt[24].

2.4 Comparative Study

A study in Korea to compare the learning outcomes in face-to-face lectures and E-learning has been conducted. Eighty-five Korean agricultural high school students were randomly assigned to face-to-face lecture and video-based E-learning. E-learning resulted in better learning outcomes than face-to-face lecturing. This proved that well designed E-learning is worth in agricultural education that involves lots of lab activities[25]. A study involving the use of ICTs in Japanese Higher Education Institutions reveals that, as an institute for collaborative use of information technology by national universities, National Institute of Interactive Multimedia (NIME) focuses on research and development[26]. The new mandatory policy in China by the College English Curriculum Requirements (CECR) needed to modernize and improve the quality of English teaching at the tertiary level in China through student-centered approaches and use of computer based multimedia. The report analyses as, how lecturers in higher education in China have been oriented towards pedagogical change. The research expresses the existence of a gap between the mandatory policy and reality in terms of computer-based pedagogy in China's tertiary English teaching status[27]. Distance education has a history of over four decades in India. Open and distance education has found to be a workable alternative strategy in India, as there are several constraints in the traditional educational sector. Evolution and diversification has lead to success of open learning in India. This, like any other education system, is not totally free from problems[28].

3. Understanding MOOCs

Massive Open Online Courses, MOOCs are free courses. They are accessible and flexible. They are delivered through third party platforms, utilizing distributed peer learning and broadcast. This creates a new relationship between students, institutions, academics and educational technology firms[29]. Higher Education experienced the first MOOC in 2008 and this offered virtual education option to those who were interested[30,31]. MOOCs and ordinary courses do have similarities as both have timelines that are predefined with topics being broken

down on a weekly basis. However, MOOCs do not charge any fee, have no other prerequisites than internet access, no any expectations predefined for participation and no accreditations that mean no credit or certificate is offered on completion[32].

Popular MOOCs like Coursera, Udacity and edX nurtures collaboration in learners[33]. MOOC topics vary widely like "Digital Story telling", "Game Theory", "Jazz Appreciation", "Health and Society" etc. In place of attending live lectures, that happens traditionally, MOOC students watch the pre-recorded lectures in videos, quizzes etc. and participate in online discussion forums for clarifications. Students can discuss, put forth their thoughts, build a kind of community similar to traditional classrooms. MOOCs are put forth by the instructors and usually they are hosted by the MOOC provider. The providers handle the user registration, content management, testing and all other "back-end" services. Initial MOOC courses had no prerequisites or admission requirements. It was offered free of cost, had negligible direct faculty interaction and did not carry any academic credit. It was designed for a lifelong-learning. In a reported study, about 88 percent of students, enrolled in Coursera's MOOCs, had already earned one or more degrees. Students seemed to be "experimenting" the subjects that interested them and did not have the intention of getting more degrees and the completion rates were only 9-10% only[34].

3.1 History and Evolution of MOOCs

MOOCs evolution dates back to 2001-2002 when William and Flora Hewlett founded the Carnegie Mellon University Open Learning Initiative and the MIT Open Courseware project. This project freely offered course materials from these institutions online under Creative Commons licenses (Open Learning Initiative, 2013). It was Cormier and Alexander who coined the term MOOC in 2008 at the University of Manitoba, Canada and they were also the first that offered MOOC online course in the year 2008[32]. This course enrolled a small number of paying students and also "auditors" who participated for free. Unexpectedly over 2000 auditors enrolled. University of Illinois, Springfield in 2011 offered the first MOOC in United States. It was called "Online Learning Today and Tomorrow". This had an enrolment of over 2500 students. At the same time, programmes from Khan Academy, iTunesU and TED increased at this time too. These viewers were given educationally oriented video content. In 2012,

Evolution of MOOCs	
Year	Course
2000-2007	Open Education
2008	Connectivst MOOC cMOOC)
2011	Stanford xMOOCs
2011-2012	MITx
2012	Udacity, Coursera
2012-2013	Futurelearn, Edx

(Universities UK. (2013, May). Massive open online courses: Higher education's digital moment? London, England: Author.)

MOOCs captured good public attention. Silicon Valley start-ups, Udacity and Coursera were led by Stanford University professors as for-profit. MOOC from edX was a non-profit consortium led by MIT professors. All these courses included video lectures, exercises and discussion. They had more than 100,000 students who had a good level of enthusiasm[34].

3.2 Types of MOOCs

3.2.1 cMOOC

Initially, MOOCs were guided based on specific pedagogical approach. Later this phenomenon started spreading out without following the pedagogy. This lead Siemens in 2012 to distinguish between connectivist massive open online courses, viz. (cMOOCs) and Coursera and edX massive open online courses, viz. xMOOCs. Thus cMOOCs were developed with aim of exploring the pedagogy that takes the advantage of Web 2.0 for learning. The pioneers of cMOOCs, viz. Siemens and Downes articulated some psychological assumptions that were known to be a new learning theory called connectivism. This led to the proposal of the pedagogy in 2008 that gave birth to the first MOOC[35]. Thus cMOOCs represent highly distributed peer learning and is a part of the open educational resource movement. cMOOCs are based on connectivist ideals. It is less structured and influenced by learners' empowerment. It provided access to learning materials to individuals who might wish to learn[31]. The cMOOC is an independent start-up set up by academics. Various online resources are the focal point for specialists with shared interest. The course has intermittent lectures

and assignments. The main principal mode is through peer networks. These networks share knowledge and experience through a range of online resources.

3.2.2 Drawbacks of cMOOCs

In spite of connectivism, addressing the challenges thrown by Web 2.0 for learning needs to be met, it lacks some crucial aspects of learning by not providing adequate explanation. Connectivism looks into the problems put forth by Web 2.0 for learning, despite not providing sufficient inputs, due to its negligence in certain important aspects. The three important concerns of connectivists assumptions can be put forth[35].

The first concern is the "Learning inconsistency," For example, how is one able to recognise a pattern if they is not aware of a specific configuration of connections in a pattern? If a pattern is connected for the first time, then why are the nodes connected in that specific way and why is that configuration seen as a pattern? Connectivism does not answer this question that causes theoretical problem while learning in cMOOCs. Beginners who lack in self-regulation skills get lost without any guidance and support in cMOOCs[35].

The second concern is that, connectivism is not clear with the concepts of interaction and dialogue. It understands as a learner's connection to a human node in the network. A connectivist understands this connection to a human node as binary (on-off) and static. The human node is seen as part of the external connective pattern constitutive of knowledge that is in clear contradiction with the evidence put forth by the scientists by their decades of observation. This is applicable even to online learning situations too. The other one becomes important in a learning process without being part of what is learnt, but by being the assistant of this learning. It is also well known that interaction is a process (not a state) that evolves and is a part of the learning process-like, in a well-documented interactional process of transfer of responsibility. Interaction cannot be characterized as a binomial-like interaction-no interaction (on-off) because of its dynamic nature. This serious under conceptulization creates another important learning problem in cMOOCs - many learners have problems in finding the right method and have a successful learning dialogue with others. The third problem is that connectivism is unable to explain concept development. It is an established fact that concepts evolve. For example, a 5 year old child understanding a particular concept will not be the same as when he is a 12 year old[35].

3.2.3 Vygotskian Tradition

The connectivism problem finds parallelism with association in psychology. This is one of the key reasons that led to abandonment of associationism in the 20th century. The connectivist problems can be as follows: If a concept consists of a specific pattern of associations, how can it be explained as the concept develops and the association pattern remains the same? From our point of view, this problem inevitably leads to abandonment of the connectivist idea of knowledge as associative patterns. This means abandoning the entire theoretical assumption of connectivism. As a result, connectivist proposals may look appealing initially but does not provide enough explanation of learning phenomena in Web 2.0 and hence it is unable to provide sufficient pedagogy for MOOCs. The Vygotskian tradition of cultural psychology and the genealogy of the Vygotskian psychological tradition is quite complex to trace[35].

3.2.4 xMOOC

The second type called xMOOCs is given mainly by campus-based Stanford University or Massachusetts Institute of Technology. This has come up as an evolution of institutional strategy towards digital technology and on-campus teaching[31]. These courses have automated assessment, video lectures, supporting message boards and resources. Both cMOOC and xMOOC accommodate their growth by limiting synchronous learning opportunities and personalized academic feedback to students. Though the courses have a weekly structure, the management system permits to allow the students and educators to share and complete their exercises at their own pace. Both models provide feedback and assessments and emphasizes on participation in the course. Automated peer assessment exercises are made available. Specifically xMOOCs uses automated multiple choice quizzes as exercises at the end of short video exercises. This helps in knowledge retention and in final assessment. Peer learning is highly made use of, by both the models for course delivery. cMOOCs consciously restructures the bond between course leader and students resulting in good feedback from participants who have good professional knowledge and creativity. In xMOOC, it is a hierarchial relationship wherein an expert dissipates knowledge to a relatively inert class. However, xMOOC also considers the personalized feedback from the peer groups[29].

Both models differ in emphases in educational objectives. xMOOC is of broadcast type that allows the advanced learners to understand and move ahead in a particular field. It does this by helping the learners gain all the propositional knowledge that is needed to move ahead. This might not be suitable to all and also not be representing pedagogical practice, but is very much flexible, accessible and scalable to vast diverse students. cMOOC is of distributed type that is more suitable for creative subjects or advanced professional fields wherein sharing of professional practice is encouraged. This model stresses on skills required for professions that has been attained through digital technologies[29].

xMOOCs are not pedagogically driven and they are mainly based on behaviourist psychology[35]. xMOOCs is more unidirectional in approach. They are structured around conventional lecture formats and are delivered through proprietary learning management platforms[34]. In other words, xMOOCs are also called Ivy League-type, university-run, venture capital-funded MOOCs with comparatively fixed and prescriptive curricula. Some common examples are Coursera, Udacity and edX MOOCs[29].

Coursera (http://www.coursera.org) provides over 300 courses with quizzes, assignments, videos and opportunities to interact with fellow students. Subjects offered are computer science, life sciences, biology, humanities, economics, finance, business and management, food and nutrition and social sciences. It is funded by Kleiner Perkins Caufield and Byers and New Enterprise Associates. Proctored examinations are provided in partnership with Pearson VUE[29]. Coursera has more than one million participants as learners. Learners are offered with explanations of online learning concepts and include peer assessment and mastery learning[30]. It is a for-profit company run in collaboration with Universities. Coursera contributes providing hosting and user services and Universities provide content. The profits are divided. Profits are mainly from selling verifiable certificates of completion and course transcripts. The cost for this is around 50 dollars per course.

Udacity (http://www.udacity.com) is a free "digital university." It has been set up by Thrun, Research Professor of Computer Science, Stanford University and Vice President of Google. It is a for-profit company funded by Andreessen Horowitz, Steve Blank and Charles River Ventures. Proctored examinations are provided in partnership with Pearson VUE[29]. It offers 22 courses as beginner, intermediate and advanced courses in statistics, physics and computer science. No assignments or deadlines are given. Participants complete the courses at their own pace and will be eligible to receive a certificate of completion after the final course[30]. This is also a for-profit that works directly with instructors. Course content is developed by academics. Production and presentation of the material in a uniform and refined style is done by Udacity. Money coming from charges on certificates of completion is the profit that is earned[1].

EdX (http://www.edx.org) also gives free online courses from Massachusetts Institute of Technology, Harvard University, University of California Berkeley and the University of Texas System. It offers 33 courses in subjects like social sciences, humanities, natural and physical sciences, law, health and computer science. It is funded by Harvard and MIT. Proctored examinations are provided in partnership with Pearson VUE[29]. Once completed, participants are eligible to get a certificate from the University from where the course originated. This learning platform features the learning spaces designed for the web, including online discussion boards[30]. It is a non-profit company. More than 25 universities outside United States are involved in providing 80 courses. Edx also has plans to open source their platform and use the data to study the learning patterns in students[1].

There also exists an interesting subfamily of MOOCs platforms entirely outside of the university system. (eg. the Khan Academy - https://www.khanacademy.org). This is a MOOC-like site created for middle and high-school students covering math, science, art and computer programming subjects. Students are given virtual badges once tasks are completed. All courses are free. Udemy (https://www.udemy.com/) covers topics from academics, business, music and game design. It offers free courses as well as courses that are charged[1]. Others offering similar calendar-based or complete-at-your-own-timeline courses are Peer-to-Peer University and Future learn[31]. Future learn has been set up by Open University in partnership with around 21 Universities including Queen's University Belfast, University, King's College London, Bristol, Southampton, Exeter. Future learn delivers an engaging and entertaining learning experience and allows people to fit learning wherever and whenever it suits them. It is a for-profit third party company owned and funded by the Open University[29]. Most recent new forms of MOOCs are used by and integrated into traditional institutions. Thus we are into a new era of hybrid MOOC which is called MOOC 3.0 or "hMOOCs" [34].

3.3 Background of the Learners

MOOCs have attracted high international enrolments. Learners can be categorized as higher education students, educators and researchers, vocational learners, hobby learners and prospective students. Higher education students utilize video lectures, reading lists and other open educational resources. Educators and researchers use resources in their own or other academic fields for reuse and remixing in their own work with students. Vocational learners are professionals interested in maintaining their knowledge in a specific field or exploring new ideas to grow in their careers through flexible and low cost independent learning models. Hobby learners are engaged in their own self-directed programs of study and who are interested in knowing more. Prospective students are the ones who want to explore different course options to asses if it could be a potential fit. High enrolments are from India in technology and science courses. For example, after US, the largest enrolment for the Artificial Intelligence Planning MOOC offered in 2013 by University of Edinburgh came from India, backed up by Brazil, Spain, the UK and Russia[29].

3.4 MOOCs in Medical Field

Medical schools seem to be more cautious towards the MOOCs courses. Till date no pre-medical program or medical school seem to have opted to give academic credit for a MOOC. Lecture style didactics or content delivery using web is just one small part of overall learning experience in medicine, as medicine is more about relating to patients that cannot be taught through MOOCs. Teaching relationship skills with video lectures and discussions would be very difficult. One beneficial area affected by MOOC is Continuing Medical Education, that is a need for most physicians and it is helpful for them to participate in MOOCS at their convenience. Also the industry funding for CME activities has declined and fewer physicians have budget to travel. So MOOCs seems to be a replacement for a regular CME courses. Another area of benefit of MOOCs in medicine is the patient education by helping patients to observe videos before physicians' appointment. This makes the patient encounter to be more fruitful in clarifying their doubts and questions and help in making informed decisions. Patient education materials through MOOCs helps in standardizing what patients are being taught and so help in eradicating variations among providers. Another advantage of MOOCs in medical field is that it helps to build a support community. With good amount of confidentiality, discussions forums will help patients to find support from others in the group. MOOCs will also provide useful method for updating patients about latest research and intimating reminders[1].

3.5 The Emerging MOOC 3.0 Era

As a large amount of near-immediate student behavioural data has been collected specifically by the MOOCs, lots of innovation in online pedagogy has been implemented. There has been a great innovation in integrating hMOOCs into academic programs. The Universities in UK and MOOCs in US follow four major credentialing models such as recognition of prior learning, articulation and credit recognition, content licensing and reciprocal arrangements[34].

3.6 Credit Recognition and Prior Learning Recognition

As MOOCs started to grow, many individual colleges and universities have began accepting MOOCs for credit. This has been done with faculty approval and or assessments given by the University. The first University to adopt this model was the University of Helsinki in Finland during 2012. During January 2013, Georgia State University announced its consideration to grant credits for MOOCs. Other Universities have followed suit. A form of credit called "Special Recognition" has been awarded by edX for some of its courses. For this, students are required to pay a fee. For students who pay for an authentication of identity, Coursera offers special upgraded certificates. In the interest of Universities, identity authentication and exam proctoring might be of interest for considering acceptance of a MOOC for credit transfer. Not much data exists about pre admission consideration of MOOCs. A possible scenario is to use MOOC completion as additional information in any university admission process[34].

3.7 Content Licensing

Among different forms of MOOC integration, this has the greatest acceptance. Many Universities have taken initiatives to license MOOC content to be included in campus-based courses that are eligible for credit. San Jose State University (CA) has taken the lead in piloting MOOCs with edX and Udacity. Antioch University

has done the same with Coursera courses. This form of integration is attracting more acceptance than others, as it helps the campus faculty to have high degree of control over course content and credit granting. However, this had some objections from some faculty[34].

3.8 Reciprocal Arrangements

In this form of integration, institutions agree to accept each others MOOCs for degree credit. This is still developing. These arrangements are mediated by third-party providers, for example, for-profit ventures 2U and Academic Partnerships. Another model called "distributed flip" includes sharing best practices for hybrid and flipped classroom exercises[34].

3.9 MOOC Evaluation

Research has shown that MOOC students project good learning and prefer studying in groups. This gives a social facilitation in the study groups and helps learning difficult concepts in a pleasing manner. A study has been carried with on-campus flipped classroom environment, where students watched and studied MOOC videos together. Findings showed high level overall satisfaction in this environment. Students liked being synchronized in the group. However, a balance between video interaction, degree of conversation and synchronization was important and added to effectiveness of learning in such groups[33].

Universities around the world accepted MOOCs during 2012-2013. This was in collaboration with the companies that provided infrastructure. MOOC trend show enthusiastic reactions. MOOCs and its types seem to be varying in its openness and massiveness. Online teachers who have studied reactions of the students to online education for a decade or more have some surprises. There are over 60 evaluation studies by students of the pros and cons of online techniques done by The International Research Review of Online and Distance Learning. Due to the increasing costs of infrastructure with diminishing resources faced by policy-makers and educators, such a circumstance is created wherein data are simply dumped into communication channels. It is noticed that technology is maximized while human contact is minimized along with amplification of isolation and psychological distance. The most disturbing fact is that major MOOC providers have not hired people trained in instructional design, sciences, educational technology or other educational specialties to design the courses[36].

3.10 Ethics in MOOCs

With the advent of MOOCs through use of technology, it has been an exciting and a long-awaited opportunity in the field of Universal Higher Education. Though MOOCs have huge positive outcomes in the developmental process, ethical concerns also need to be taken care that might be arising from various initiatives[37]. IP spoofing must be detected and blocked in order to provide E-learning as a service to authenticate users[38].

The American Association of University Professors (AAUP) has provided the "Statement on Professional Ethics" that makes available the general principles in the academic work and behaviour in the context of the institution. E-learning researchers identify three areas facing ethical challenges – avoiding harm to the subjects, obtaining participant consent and respecting individual identity, their privacy or anonymity[37].

3.10.1 Avoiding Harm

This according to AAUP is the call for intellectual honesty. This implies that trivial activities need to be avoided so that intellect and energy is consumed for significant activities. MOOC should be positioned such that its design of content and assessment are inline and effective with the course that will be available to students and society. Some features of MOOC are such that it will not be covering every detail of complex topics as well not focus on areas that are not fundamental to a good grounding for the subjects that are introduced. Academics need to be aware that introducing MOOCs on subjects that have not been successful in traditional programs, will be like introducing a personal bias. This needs to be carefully considered by potential students. In terms of direct financial terms, MOOCs are free to students, but they have an opportunity cost, as the time spend on a MOOC is taken from activities such as family responsibilities, employment or other forms of education. Academics need to maintain the pedagogical integrity by creating educational experiences that will result in student success. Thus promoting a poor learning model is not ethical in MOOCs[37].

3.10.2 Consent

In MOOC, students get access to educational materials and experiences in return for the agreement to be a subject in a research experience. He or she might also find the research aspects interesting and helpful. In any kind of MOOC, participants must be informed well in advance

of the research and all the data collected and data on how it will be used. Students should be given complete and accurate knowledge on this. Consent is needed not only for any kind of direct involvement of the student in any research activity, but also for indirect involvement like how many times a student connects or how many attempts have been made in data mining etc. An example of communicating effectively to MOOC participants can be has from the United Kingdom JISC-funded MOOC. It clearly informs how the MOOC is funded and how it uses those funds. Students are given options to give further data in line with standard research survey processes. This information given before the start of MOOC will be adequate[37].

3.10.3 Privacy, Identity and Anonymity

Generally when students enter a MOOC, they recognize that they will be easily identified by other teachers and other students. Students in this context are rarely able to be anonymous. As MOOCs are increasingly associated with certification and qualification, the need for student's identity will definitely grow. The only aspect that students do not expect is that their use of MOOC will translate into other activities like marketing services by commercial partners of the academics. A set of heuristics have been developed and offered as a guide to the students using MOOCs. It is a collective responsibility of educators to maintain the highest ethical standards. Only then MOOCs can attain the "golden age"[37].

4. Conclusion

E-learning is greeted all over the world, especially for academics, as the benefits are very satisfying. Compared with face-to-face learning, E-learning is very effective due to its benefits like Moodle, NG-eBook, collaborative E-learning, m-learning, cloud computing etc. Almost all the countries are involved in developing, implementing and upgrading E-learning, at various segments of education and at various levels of development. The sharing of ideas and exchange of E-learning programs between countries is not gaining momentum to a greater extent. This will definitely save time, energy and money for all the countries. The errors can be avoided and good ideas can be implemented. The above studies show that each country has concentrated in improving different fields of higher education and so when these ideas are exchanged,

definitely there is a considerable, overall, fruitful growth and benefit for all. The International E-learning Association (iELA), New York and other new organizations need to come forward and take the world together in E-learning. They can create numerous opportunities and provide a platform so that E-learning ideas gets culminated to grow higher and higher. MOODLE is a good learning management system that supports the MOOCs to be structured. MOOCs have evolved and developed through these years as Coursera, Edx, Udacity, Future learn etc. Understanding the learner background is a very important aspect of MOOC. Continuous feedback from these students is also crucial in creating much more effective MOOCs. Universities in UK and US have introduced MOOCs to support some of their University teachings. MOOCs seem to be having the power to redefine education and can attain a "golden age," by following strict ethical rules for all involved in it. A developing country like India should deliberate into all these aspects before adopting this technology.

5. Acknowledgement

6. References

1. Hoy MB. MOOCs 101: An introduction to massive open online courses. Medical Reference Services Quarterly. 2014; 33(1):85–91.
2. Samuel RS, Subhashini A. E-learning, the next big name in education. Indian Journal of Science and Technology. 2011 Mar; 4(3):173–6.
3. Chinyio E, Morton N. The effectiveness of E-learning. Architectural Engineering and Design Management. 2011; 2(1):3–86.
4. Camilleri F. Towards the study of actor training in an age of globalized digital technology. Theatre, Dance and Performance Training. 2015; 6(1):16–29.
5. Lim E, Hew KF. Students' perceptions of the usefulness of an E-book with annotative and sharing capabilities as a tool for learning: A case study. Innovations in Education and Teaching International. 2014; 51(1):34–45.
6. Venkataramanan M, Prema TS, Nandini SV. Knowledge management through distance education. Indian Journal of Science and Technology. 2011 Mar; 4(3):223–5.
7. Leung HKN. Evaluating the effectiveness of E-learning. Computer Science Education. 2003; 13(2):23–36.

8. Cochrane T, Black B, Lee M, Narayan V, Verswijvelen M. Rethinking E-learning support strategies. International Journal of Academic Development. 2013; 8(3):276–93.

9. Hwayeol C, Woonhan K, Hyejin C. Effects of smart phone-based learning properties on user satisfaction and recommendation intention. Indian Journal of Science and Technology. 2015 Oct; 8(26):1–7. Doi: 10.17485/ijst/2015/v8i26/80990.

10. Garrison DR. E-learning in the 21st Century. London; 2011.

11. Herrington J, Reeves TC, Oliver R. A guide to authentic E-learning. New York: Routledge; 2010.

12. Ellis R, Goodyear P. Students' experiences of E-learning in Higher Education: The Ecology of Sustainable Innovation (Open and Flexible Learning Series). UK. 2009.

13. Aduli MBS, Assenheimer D, Lundberg CD, Zimitat C. Using computer-based technology to improve feedback to staff and students on MCQ assessments. Innovations in Education and Teaching International. 2014; 51(5):510–22.

14. Sheeja SR. Major trends and issues in the field of distance education. Indian Journal of Science and Technology. 2011 Mar; 4(3):201–3.

15. Barra E, Herrera SA, Cano JYP, Vives JQ. Using multimedia and peer assessment to promote collaborative E-learning. New Review of Hypermedia and Multimedia. 2014; 20(2):103–21.

16. Liao J, Wang M, Ran W, Yang SJH. Collaborative cloud: a new model for E-learning. Innovations in Education and Teaching International. 2014; 51(3):338–51.

17. Arunachalam AR. Bringing out the effective learning process by analyzing of E-learning methodologies. Indian Journal of Science and Technology. 2014 Jun; 7(S5):41–3.

18. Rodriquez MO, Molina FJC, Alonso MMA, Gomez GF. The main components of satisfaction with E-learning. Technology, Pedagogy and Education. 2015; 24(2):267–77.

19. Lim KC. Addressing some quality and effectiveness issues in E-learning. Enhancing Learning through Technology. Springer. 2011; 177:167–76.

20. Shuaibu B, Saud MSB, Bello H, Kamin Y, Buntat Y. Modeling the determinants of ICTs policy formulation in technical and vocational education in Nigerian Institution of Higher Learning. Indian Journal of Science and Technology. 2013 Apr; 6(4):4273–81.

21. Forrester G, Motteram G, Bangxiang L. Transforming Chinese teachers' thinking, learning and understanding via E-learning. Journal of Education for Teaching International Research and Pedagogy. 2006; 32(2):197–212.

22. Daly C, Pachler N, Pickering J, Bezemer J. Teachers as E-learners: Exploring the experiences of teachers in an online professional master's programme. Journal of In-Service Education. 2007 Dec; 33(4):443–61.

23. Lim DH, Ripley D, O'Steen B. E-learning methodologies in practice: Similarities and differences between North American countries and New Zealand. Human Resource Development International. 2009; 12(2):209–24.

24. Eraqi MI, Alam AW, Belal M, Fahmi T. Attitudes of under-graduate students toward E-learning in tourism. The case of Egypt. Journal of Teaching in Travel and Tourism. 2011; 11(4):325–48.

25. Park SY, Kim S, Cha S, Nam M. Comparing learning outcomes of video-based E-learning with face-to-face lectures of agricultural engineering courses in Korean agricultural high schools. Interactive Learning Environment. 2014; 22(4):418–28.

26. Sakamoto T. E-learning and educational innovation in Higher Education in Japan. Educational Media International. 2010; 39(1):9–16.

27. Gao L. Digital technologies and English instruction in China's higher education system. Teacher Development: An International Journal of Teachers' Professional Development. 2012; 6(2):161–79.

28. Sharma RC. Open learning in India: Evolution, diversification and reaching out. Open Learning: The Journal of Open, Distance and e-learning. 2005; 20(3):227–41.

29. Universities UK, Massive Open Online Courses: Higher Education's digital moment? London. 2013.

30. Mallon M. MOOCs. Public Services Quarterly. 2013; 9(1):46–53.

31. Zutshi S, O'Hare S, Rodafinos A. Experiences in MOOCs: The perspective of students. American Journal of Distance Education. 2013; 27(4):218–27.

32. Shatnawi S, Gaber MM, Cocea M. Text stream mining for Massive Open Online Courses: Review and perspectives. Systems Science and Control Engineering: An Open Access Journal. 2014; 2(1):664–76.

33. Li N, Verma H, Skevi A, Zufferey G, Blom J, Dillenbourg P. Watching MOOCs together: Investigating co-located MOOC study groups. Distance Education. 2014; 35(2):217–33.

34. Sandeen C. Integrating MOOCs into traditional higher education: The emerging "MOOC 3.0" era. Change: The Magazine of Higher Education. 2013; 45(6):34–9.

35. Clara M, Barbera E. Learning online: Massive Open Online Courses (MOOCs), Connectivism and Cultural Psychology. Distance Education. 2013; 34(1):129–36.

36. Baggaley J. MOOC rampant. Distance Education. 2013; 34(3):368–78.

37. Marshall S. Exploring the ethical implications of MOOCs. Distance Education. 2014; 35(2):250–62.

38. Shyamala K, Shantha Visalakshi. Mitigating IP spoofing to enhance security in multi-agent based E-learning environment. Indian Journal of Science and Technology. 2015 Aug; 8(17):1–5.