

Towards Systematic Literature Review of E-learning

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ABSTRACT

Technologies are changing rapidly and so is the education system. The ultimate objective of the education is to produce skilled professionals in various fields who have better qualities than previous skilled groups and par than legitimated competence skill. In the previous decade, it have been observed that all the developed countries/ communities have highly supported information and communication technology (ICT) enabled learning; which is being followed by developing learner groups in present. Various academic communities have introduced e-learning platforms, Massive Open Online Courses (MOOCs), Online Learning Packages etc. These resources are inducing ease for learners for being skilled and hence are very popular in worldwide. Although pedagogy has changed from all dimensions but the impact of e-pedagogy on learners is impregnable. In order to predict the growth in coming days, it is mandatory to spoof the literatures, versions of pedagogy, global objective changes and some more cohorting domains of learning. These streams help to find hidden patterns in growth of ICT enabled learning. This paper is reviewing such literatures and analyzing the pattern of change in pedagogy.

Keywords : ICT, MOOCs, Pedagogy, Online Learning, e-Learning.

I. INTRODUCTION

In this work a review of the e-learning and its subdomains has been done. The selected literatures selected for study are categorized in three categories as research papers from journal, books and some other literatures. The paper is aiming to analyses the ICT enabled learning pattern in past and how it is motivating the academics in today's era. This behaviour mining will be done by stirring the literatures; since literatures are the chief witness of advancement is teaching and learning. As all the developing countries are stepping forward in order to motivate e-learning. E-learning has changed dramatically the scenario of academics. Some issues still exist; and are disabling us to gain higher accuracy and efficiency from ICT enabled learning.

Some of these issues are directly affiliated with the execution of e-learning plans and models; while some indirectly affect e-learning. In order to propose corrections, adaption, perfection and other bettering policies it become very crucial to understand the system first, for that review is expected to be. Integration of ICT and academics has given excellent results. Exponential growth in academic plan execution can be achieved if competence has been retained. Teachers' lack of confidence in using e-learning platforms is on of key reason found as a demotivating factor for ICT supported learning. Some other factors like age, education level and gender have been affecting e-pedagogy from earlier days of ICT era [1]. In consecutive days study was widen towards scientific epistemological beliefs and conceptions of teaching and learning [2].

The success of any system depends upon both the acceptance level of consumers and executer. Hence every phase of execution becomes very crucial, so do the stakeholders. Any learning model should be tested on sufficient population set. Therefore, the impact of both best and worst nature types will be identified [3]. The comfort level of student and academicians both affect pedagogy fundamentally. Acceptability may be the type of any among resource acceptance, technology acceptance, environmental and cultural factors etc. This paper is reviewing the literatures for finding the patterns of development in ICT. The expected inference from this study is behavioural estimation of e-learning.

II. METHODS AND MATERIAL

The approach followed for review is optimistic and well organized. In the study initially a set of literatures were filtered from various resources. These resources are publishing journals, books and some other online-libraries, articles etc. After the collection of these literatures a selection mechanism has been performed by which the population set become smaller. This filtering mechanism has certain steps based on special features for optimizing sample space.

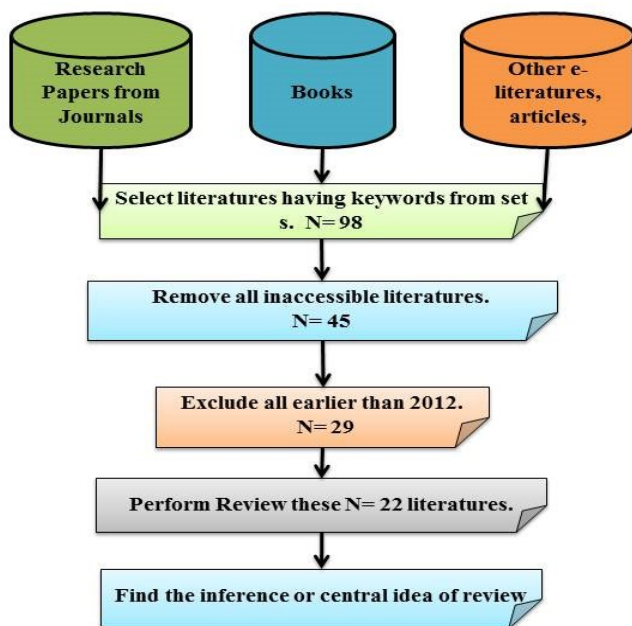


Figure 1: Flowchart of Methodology followed

The same approach has been followed which is mentioned in the figure 1. Here total 22 articles were reviewed in study.

Some organizations who were using e-learning upto a marginal extent, were taken as benchmark source of experiment. The learners groups from such organizations were interviewed; which was aided by certain documents and exposition to e-learning products. It was found that for smaller organisations it was harder to legitimize the expenses while due to resource availability bigger organisations tends for better e-learning approaches. A combined learning approach was followed by different organisation with different blend keeping in mind the audience and content. E-learning minimizes cost and separation from work. While implementing e-learning it needs to consider learning pattern, age and access to computer of employee, if learner had?[4]

A successful e-learning implementation requires strong support including proficient, IT personnel and budget proprietor . It is needed to decide the objectives with resultant and stick to them in order to avoid stalls. Delays in approval and information required may cause e-learning expensive.[5]

This article throws light on Distance Education (DE) Pedagogy and Open Online Courses (OOC) through comparison between MOOCs and AI Stanford [6] –

1. AI is based on cognitive behaviourist and offers courses like Udacity.com, AI-Stanford Courses.
2. MOOCs is assigned a connectivist pedagogy. Some of its online courses are CCK08, PLENK2010 , MobiMOOC, EduMOOC, Change11, DS106 and LAK12.
3. The geographical terrain of both DE expands across the Earth.
4. The literature compares dropout rates and luker.
5. It underlines the role of a tutor/ teacher/ educator in the development of the participants.
6. It also highlights the system of accreditation of participants.

Older people and employees who are serving for long are reluctant for e-learning as they find difficulty in using these systems due to insufficiency in technical knowledge. Other important factors are credibility, efficaciousness, time constraint. By ensuring the effectiveness, benefits and utility of e-learning to users its acceptability and success can be increased [7].

Defining the requirements for training, Designing the events, resource development, delivery and determining the way for achieving all the requirements mentioned above through e-learning are the 5 Ds that can assure e-learning quality. The strong effects of e-learning can be evaluated by focusing at individual and organizational level. The assessment of e-learning can be performed on the basis of -how worthy it was for the organisation, impact on the organisational results, behavioral change in employee and their achievements, feedback of employee [8].

Key Providers of e-learning are reduced travelling cost, evenness in training, employee desertion etc. The obstacles could be designing and technological issues, added cost, insufficiency of synergy. Employee's Stimulation and capability towards technology usage along with organizational support are the key factors to be considered [9]. Based on previous research the author has formulated statements to encourage e-learning attempts

1. Refrain from behavioural change is reluctance for e-learning benefits.
2. Material for learning with its associated favour leads towards resource utilization and behavioural changes.
3. Utilization of e-learning can be increased by minimizing the workload.
4. Conception regarding utility and ease of technology, both have great impact on acceptance on e-learning.

This literature emphasized that Bloom's taxonomy works as basis for measuring the worth of outmoded print electronic books. It is also has been discussed to assess cognitive quality of students

during e-learning. Literature supported that the Bloom's taxonomy has given a direction for e-learning tools development for assessment and teaching for biology subject [10]. This literature emphasized that Bloom's taxonomy works as basis for measuring the worth of outmoded print electronic books. It is also has been discussed to assess cognitive quality of students during e-learning. Literature supported that the Bloom's taxonomy has given a direction for e-learning tools development for assessment and teaching for biology subject [10].

MOOCs are beneficial for company and employee both as the company need not to develop the program and the certificate worths for the employee. Private MOOCs for learning are also being accomplished. MOOCs blended with traditional delivery provides an ease of join and end as per partners convenience. The facilitator or instructor greets. The wheels while learners are provided with videos and instructional aids. To adopt MOOCs, problem identification and developing MOOC for solution is the foremost recommendation. Plan for design, learning requirements, case, guidelines is another step. Contents needs to be relevant with practice and application oriented as well. Correct technology selection, Regular content updation, feedback, input from experts strengthen the integrated MOOC solutions [11].

Staff of 103 companies from diversified sectors were surveyed and interviewed. Stimulation, prevalence, career advancement were the main advantages of using MOOCs by employees for their professional progress. MOOCs were also useful for the organisation who required specific professional development. It is cost effective. MOOCs are not much efficient for growing management skills and leadership. Usage of MOOCs would increase with their quality, completion and contribution in improved performance [12].

E-learning has shown a rapid growth in the past few years and estimates show that it will increase drastically in the next three years. This report aims at bringing out the feasibility of online

learning in various aspects. It helps the employees keep track of the changing trends and gain knowledge to help them progress in their works. The worldwide market for e-learning in 2011 was \$35.6 billion and with the present growth rate it is expected to be \$51.5 billion in 2016. E-learning is a strategic way for qualitative and continuous learning process [13].

The paper draws attention towards overheads originated due to text-book based learning approaches. The authors have underlined the significant decrement of motivation over the time during writing a book. According to them a prearranged textbook fixes the perimeter of academicians' inventiveness [14].

MOOC or Massive Online Open Source helps facilitate learning for more and more people and low costs. These may include various videos, blogs and exercise. It can play a major role in higher education even for the developing countries. But it also has some drawbacks like it cannot provide practical experiments and practices. The cost and man work required to develop MOOC can be high. Furthermore, the students have to pay for certification, examination and other facilities which have turned it from free source to a premium model [15].

Technology has touched all the aspects of life and so the education. Dramatically Intergating learning with ICT is creating a new era. Utilization of videos, images, interactive sessions, discussion with subject expert can make lesson and complex concepts more simpler and attractive. The role of teacher turns as a pacifier and facilitator. Open Embellishment of Educational Resources(OERs) and integration of ICT with teaching learning increases the accessibility of education to all .Strong technical support, trained and updated personnel, policy making are important pre-requisites for it. Revision of contents, novel use of ICT, training courses for teacher educator and activity designing according to contents are some of the major challenges. E-Learning experience to teachers can aid in acquiring

knowledge about content, learning and technology [16].

The paper is enticing attentions towards technical paradigm of e-learning. A systematic review was done having 80 research papers in primary study. These 80 were reduced by 26 because of delicacy; then remaining 54 were forwarded for the next level of filtration. Among these 54, just 40 had been shifted for the next level as 14 were not accessible. Again a filter was applied by hence 24 more papers excluded thus at the end 16 papers were taken part in study. While in other for systematic review among 41 papers some exclusion were done thus for study only 17 papers were taken part [17].

Kate S.Honea, Ghada R.El Saidb repoted a study conducted on 379 participants out of which 122 opted to completed the course. After the course in a survey it was found that course content and synergy with instructor are the indicative augur of MOOC confinement [18].

This literature lay emphasis on Online Education and it effective practices as:

1. Discovering the history of online education. Emphasising the factors, which lead to the rise of online learning community
2. Significance of technology for effective implementation of online education Influence of various socio-economic crisis which promoted synchronous learning.
3. Pedagogical practises and modifications in courses of online higher education
4. Dynamic environment which promotes cognitive and social presence ,interactivity, collaboration between tutors and learners which formed an online learning community of all genders and age groups [19].

Study [20] concluded that there is need of studies that assess both practical and theoretical pitch, model for education in order to knowledge production and technical development as well. The research states that e-learning cannot be bounded with platforms, devices, mobile applications without taking care of other influencing parameters like

relational, cultural, environmental and material etc [20].

Authors have elaborated about Online Course Applicability assessment. A model was designed by authors on OCAA. They concluded their work by stating that style of learning; prior knowledge and learning behavioural types are the main factors that affect blended learning hence have significant impact on e-pedagogy. The research was based on Java Programing courses taken as benchmark courses for study and sample space was also very limited; that supports the possibility of a little erroneous scope in the work [21].

Summary: The paper attract attention for Bloom's taxonomy by which it was proposed that most of the sampled learning resources especially textbooks are highly suitable for primary and middle class studies. Bloom's taxonomy consists of three intersecting domains: cognitive, affective and psychomotor. These all categories are further divided into subcategories [22].

This literature has done quality assessment of blended learning under certain parameters and highlighted some influencing factors as well. Authors mandate that for measuring the effectiveness of blended learning is grades, success, results of assessment and student testimony for the learning that they have made. The crux was in support of blended learning [23].

There are many aspects for educational development, which can be enhanced by various ICTs. Lifelong learning, e-training at work, teacher's professional improvement are brighter side of ICT. Use of conceivable technology to fulfill the learning objectives utilizes the ICT more efficiently. Moreover a careful selection for guidelines or framework with necessary prerequisites is required for ICT potential acquisition [24].

III. RESULTS AND DISCUSSION

The study is calculating the frequencies of some special keywords, since these words have made

admirable changes and are performing as catalyst in academics. The frequencies of these words help us to estimate the works have been done on e-academics in well-defined duration. We have count frequency as one, if a keyword mentioned in the Table 1 has a perfect string and/ or partial string match with it. The frequencies have been taken from total 22 literatures. Here is Table 1 showing the selected keywords and their frequencies.

Table 1: Frequency of keywords

Keywords	Frequency	No of papers with key words	Frequency factor
MOOCs	296	15	19.73
e-Learning	342	24	14.25
Blended learning	127	12	10.58
e-pedagogy	176	8	22
Teaching	543	25	21.72
e-academics	112	14	8
Computer	569	25	22.76
e-assessment	205	9	22.77
e-content	341	23	14.82
Online learning	327	22	14.86

Here table 1 is representing the frequency factor of each keywords. It is the ratio of frequency and number of papers having respective keywords; and is proportional to the frequency factor.

$$F.F = \frac{\text{Frequency of Keyword}}{\text{Number of papers having keyword}}$$

A comparative graphical notation among these keywords and frequency is shown below in figure 1, derived from table 1.

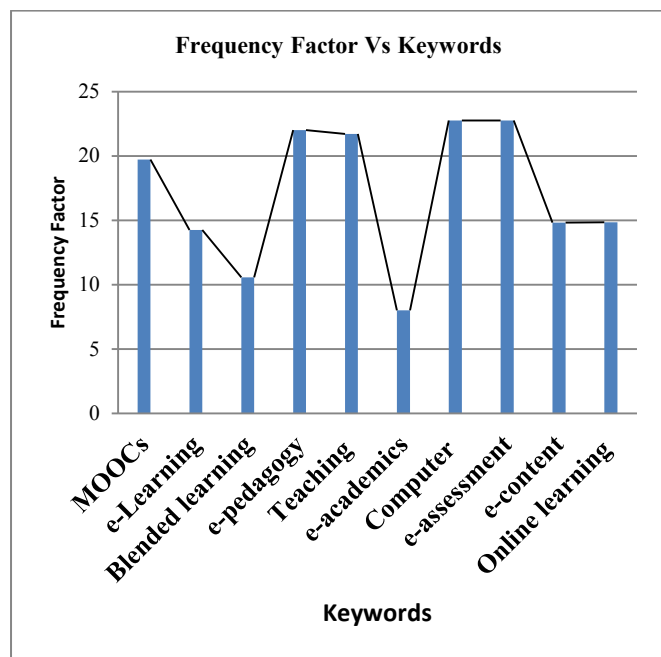


Figure 2: Frequency factor for keywords

Pedagogy has been changed a lot since 2012. The MOOCs and promotion for e-learning have made the learning easier and increased its reach as well. EdX, Coursera, Alison and some other e-learning platforms have become very popular among the audience; hence in coming days course providers are looking towards the betterment of course curricular and for more involvement of learners during the course so that fully duplex communication can be accomplished. It increases the motivation of learners during the course following. Above literature review has identified few time dependent characteristics of pedagogy over the time. These behavioural changes are shown in figure 2.

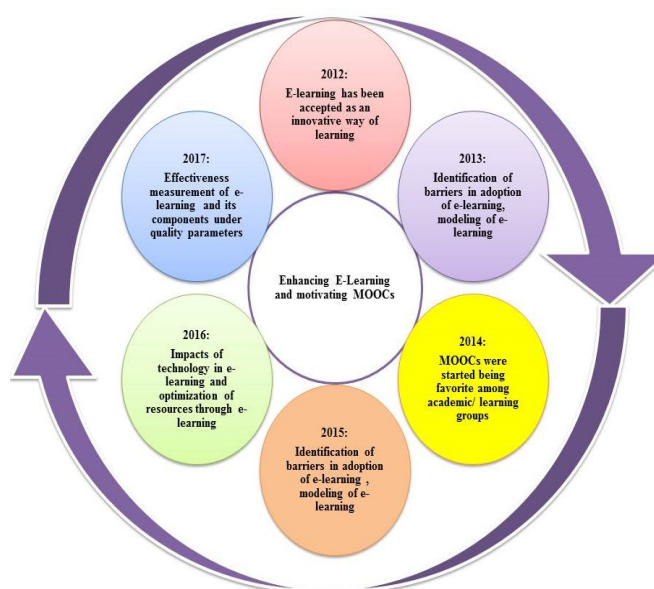


Figure 3: Development of e-learning from 2012 to 2018

In coming days the number of learners following the e-learning has been increased exponentially. Here table 2 depicts the number of learners in various e-learning platforms with respect to time. Growth index has been measured by

$$(G.I.) = \frac{\text{Growth in Million}}{\text{Base count of users in initial year}}$$

Name of Platform	Number of Users in 2012-13	Number of Users in 2017-Jan 2018	Growth Index (G.I.)
Coursera	10.5 M	30 M	1.85
edX	3 M	33 M	10
Udacity	1.5 M	9 M	5
Future Learner	800K	7.1 M	7.87
MiriadaX	1 M	21 M	20

Figure 3 is representing growth index pictorially. Here MiriadaX has highest growth rate among all.

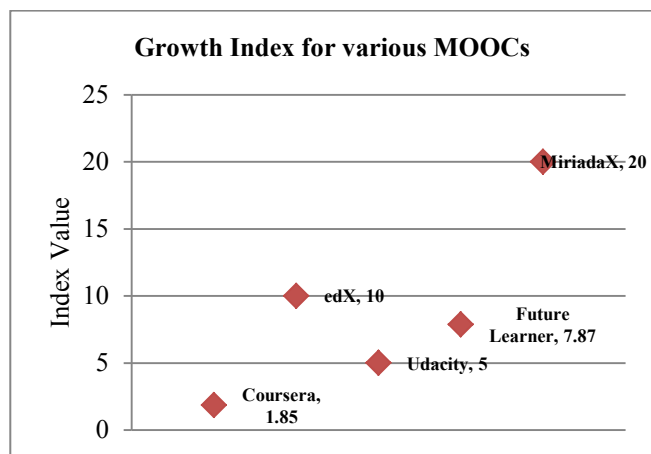


Figure 3: Growth index for popular MOOCs

The highest number of registered users is in edX; while Future learner has lowest number of registered learners.

IV. CONCLUSION

The study is concluding that the MOOCs have become very popular among learners. The starting phase of study i.e. 2012 was the year when community felt need of disruption/ innovation in pedagogy. Later on barriers in front of e-learning were identified, although those were for rejection or finding out the consequences of e-learning. 2014-15 was the duration in which MOOCs have started increasing its global reach. The coming years have shown their interest towards e-learning hence technical advancement and efficient approaches for e-learning were started coming in front. Current era is focusing towards MOOCs on MOOCs where betterment of MOOCs has been aimed to be done. There are several e-learning platforms supporting course content of various disciplines. Then all learning groups have started shifting towards e-learning as it is any type any place kind of learning.

After analysing the current scenario of learning system and increasing popularity of e-learning, it can be estimated that at the end of this decade a huge crowd will be in the favour of e-pedagogy. The rate of global reach and adoption of e-learning is rapid as it is supported by ICT, which is itself very famous in world wide.

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