RESEARCH ARTICLE OPEN ACCESS

Moocs Impact in Higher Education Institution: A Pilot Study In Indian Context

Asoke Nath, Abhijit Karmakar, Totan Karmakar
Department of Computer Science St. Xavier's College (Autonomous) Kolkata, India
Department of Computer Science St. Xavier's College (Autonomous) Kolkata, India
Department of Computer Sc.St. Xavier's College Kolkata, India

Abstract
Massive Open Online Courses (MOOCs) was developed in 2008 in US. Soon after that in 2011 MOOCs introduced at Stanford University. Year 2011 was a turning point in e-learning methodologies. MOOCs have given an open challenge to all current methods of higher education system such as on-line training, open learning methods, distance education system etc. MOOCs have high potential of acceptability among all kind of learners. MOOCs have become a label for many recent course initiatives from higher education institution. In the present paper the authors have made a through study on MOOCs methods and its impact on higher education institution. The authors have also tried to explore the impact of MOOCs in Indian higher education institution.
Keywords— [MOOCs, e-learning, distance education, higher education institution]

I. INTRODUCTION

Over the past few years, observers of higher education have speculated about dramatic changes that must occur to accommodate more learners at lower costs and to facilitate a shift away from the accumulation of knowledge to the acquisition of a variety of cognitive and non-cognitive skills. All scenarios feature a major role for technology and online learning. Massive open online courses (MOOCs) are the most recent candidates being pushed forward to fulfill these ambitious goals. To date, there has been little evidence collected that would allow an assessment of whether MOOCs do indeed provide a cost-effective mechanism for producing desirable educational outcomes at scale. It is not even clear that these are the goals of those institutions offering MOOCs. This report investigates the actual goals of institutions creating MOOCs or integrating them into their programs, and reviews the current evidence regarding whether and how these goals are being achieved, and at what cost. How and Why are Institutions Engaging with MOOCs? From different faculty members, administrators, faculty members, researchers and from different institutions it is found that colleges and universities have adopted several different stances towards engaging with MOOCs and are using them as vehicles to pursue multiple goals. Some institutions are actively developing MOOCs and may be termed "producers," some are using MOOCs developed by other institutions in their programs and could be termed "consumers," and a few are doing both. Others are adopting a "wait-and-see" approach, or have considered MOOCs and have decided against any form of official engagement. There is no doubt, however, that the beginning of MOOCs has precipitated many institutions to consider or revisit their strategy with respect to online learning, whether at large scale or small. The six major goals for MOOC initiatives are:

1) Extending the reach of the institution and access to education
2) Building and maintaining brand
3) Improving economics by lowering costs or increasing revenues
4) Improving educational outcomes for both MOOC participants and on-campus students
5) Innovation in teaching and learning
6) Conducting research on teaching and learning.

Massive Open Online Courses have the potential to extend access to quality education and workforce development training for millions worldwide. Yet, students in the developing world are not accessing these courses in significant numbers, and those that do are already well-educated, well-off, and well-positioned in the job market. While a number of barriers to the full integration of MOOCs in the developing world exist, a fundamental issue of awareness of what is out there and how to navigate it is a critical starting point. Without knowing where to find courses and how to sequence them in ways meaningful to skills acquisition and workforce outcomes, students cannot begin to realize the promise of MOOCs for the developing world.

II. MOOCs Background

Since exploding onto the higher education scene in 2012, MOOCs have promised to fundamentally transform education as we kow it. Thomas Freidman has written that, "Nothing has more potential to lift

more people out of poverty. Nothing has more potential to unlock a billion more brains to solve the world's biggest problem than massive open online courses." The president of ex. defined MOOCs as "borderless, gender-blind, race-blind, class-blind, and bank-account blind" challenges to the traditional higher education paradigm. At their core, MOOCs are simply academic courses. What makes them innovative and potentially game-changing is the "Massive" and "Open" aspects of their approach. MOOCs are truly massive, with most having enrolments in the tens of thousands enrollment of 100,000+ students. They are also open – anyone can sign up and there are no admission requirements, costs, or prerequisites. While some blended approaches are emerging, MOOCs are almost exclusively "online," they consist typically of a mixture of video lectures, packaged readings, chat-discussions, and periodic computer-scored tests. While online education has existed for some time, it was the massive and open nature of these offerings – and names like Harvard, Stanford, and MIT delivering them – that has a fire of interest in MOOCs by schools, students, governments, corporations, and development agencies. The current MOOC landscape consists of several large platforms such as Coursera (a for profit business working with 100 universities, led by Stanford); edX (a non-profit joint venture of Harvard and MIT); Udemy (a business allowing anyone to create courses, offered for free or a small price); among other large providers, and then smaller offerings by individual institutions, with many universities offering a MOOC or two. Courses across these offerings range from core academic subjects such as micro-economics or statistics, to higher level specializations such as neuro-science and robotics; passing interest or arts/culture classes like Greek philosophy and poetry, to short, workforce or skill related courses like "excel spreadsheets for small business owners" or "public speaking and business communication skills." The promise of MOOCs is that they might democratize higher education, break down historic and well entrenched class and geographical barriers, and tackle woeful higher education access, quality, and relevance outcomes. This will in turn allow people to gain skills that will make them more employable and more productive in their employment or at least more knowledgeable, informed, and connected in the knowledge economy.

The most important question is why MOOCs? Recent data from the University of Pennsylvania (Penn) sheds light on these questions. Based on a survey of one million MOOC registrants in 32 courses offered through Coursera, Penn researchers found that MOOC users are:

1) Well educated: 83% of users already have post-secondary degrees; 44% have a graduate degree.
2) From developed and emerging countries: the top ten countries of origin for users are: U.S., India, Brazil, U.K., Canada, Russia, Spain, China, Germany, and Australia.
3) Wealthy: MOOC users come from the wealthiest 6% of their countries' population.
4) Young: 40% of MOOC users are under 30.
5) Male: Significantly more males (57%) enroll in MOOCs, a percentage that rises to 67% for Brazil, Russia, India, China, and South Africa or the BRICS.
6) Employed or Retired: 63% already have jobs; nearly 15% are retired.

Based on this research, MOOCs do not yet appear to be reaching the developing world and critical target groups such as women and the unemployed categories. A reason for under-utilization of MOOCs in lower-income countries might be that young people simply do not know of them; do not know where to start; or question the relevance of this type of education to the labor market. Once young people know that MOOCs exist and what might be possible through taking them, they are still in need of efficient and effective ways to search the enormous universe of courses and determine which course or sequence of courses is best for them. It is for this reason – making sense of MOOCs – that several MOOC aggregator sites have been launched and are growing. These sites are one-stop shops for searching MOOCs across platforms and providers, similar to searching multiple airlines on a travel aggregator site such as Travelocity or Orbitz. CourseTalk is the leading MOOC aggregator, sourcing more than 16,000 courses from more than 30 platforms and providing state of the art of search, reviews, and community tools. The site experience more than 200,000 unique visitors a month. CourseTalk describes their site as:

The leading search and discovery platform for learners to explore the broadest array of online courses. We connect students with schools, professors, and resources that will help them to succeed and to find the right course from the right source. The site is also an ideal place for professors to get authentic feedback on their online courses and for universities and course providers to reach learners from around the world. The United States Agency for International Development (**USAID**) is the United States federal government agency primarily responsible for administering civilian foreign aid. Course Talk and USAID believe that awareness of MOOCs and exploration of them by learners will not be sustained if the MOOC experience does not pay off. One of the major drivers in MOOC adoption and retention is the promise of building and enhancing professional skill sets that will lead to new or improved career opportunities. To facilitate this goal, several leading MOOC providers such as edX and Coursera have started to offer mastery or

specialization tracks covering high demand topics like Computer Science, Cyber security, Android App Development and Supply Chain Management. It is thought that by sequencing course in bundles or curricula, learners will be able to better signal the breadth and depth of their accomplishments via MOOCs. While still relatively new, MOOCs and MOOC providers, platforms, and aggregators are rapidly changing and improving their approaches. Data still remains spotty, especially in the developing world, as to where, why, what, and how MOOCs might be a meaningful contributor to education and workforce development. This initiative seeks to provide that data and test targeted platform and aggregator changes to advance the field.

III. Advance understanding of MOOC enrolment, completion, utility in target countries.

Data on a wide-range of MOOC enrollment, usage, and completion metrics for developing country young people is currently inadequate for making confident determinations of how MOOCs may contribute to development. While data does exist on some levels, it currently only captures those that enroll and even that data is limited. Through the collection of high quality baseline data on MOOC usage, this initiative will help online education providers tailor their offerings to address the learning styles and educational outcome requirements of target populations in developing or emerging countries. This data will form the baseline for the project's monitoring and evaluation approach, as well as provide data for the assessment needed to accomplish Objective 2. The resource partners will provide access to the data they collect on their sites' users. The implementing partner will analyze this data, in addition to primary data they collect in the target countries (including market and survey research), and other sources of data they deem relevant. To the extent possible, data and reporting under this objective will be made publicly available for use by others in improving their approach to MOOCs for development.

IV. Improve MOOC service provider offerings to increase utility of MOOCs for workforce development in partner countries.

The utility of MOOCs for workforce development is a function of students (a) finding the right/relevant courses; (b) succeeding in the courses they take; (c) being able to sequence multiple courses in a way the add up to a larger curriculum or skill set, and (d) achieving something that is valued or recognized in the job market. The goal of this initiative is to provide evaluation tools, learning paths and student support services that will drive higher enrollment and completion rates and develop demonstrable professional skills in target populations. This will be achieved by enhancing the existing CourseTalk platform through improved search functionality and implementation of vocational course sequences. Further, the partnership will cultivate communities or networks that connect potentially isolated but like-minded students who will benefit from the peer effects on student learning. The response of the job market to online courses and vocational tracks is to be determined, but the implementing partner will collect data on the receptivity of the market to such non-traditional qualifications. The alliance's implementing partner will utilize a Needs Assessment conducted under Objective 1 to advise CourseTalk in developing and refining the site's search functionality for target users. For example, the needs assessment may find that students want to search for courses based on the level of bandwidth or internet connection speed needed to successful participate in a course; or that students would like to search for courses that have been reviewed by others in their particular country or region. Based on the needs assessment and a packaging of such advice, CourseTalk would lead the implementation of site changes through in-kind contributions to the alliance. Likewise, the needs assessment might reveal areas for improvement by online education platforms in the types of courses demanded by the market and/or the way it bundles courses (similar to the "X series" courses offered by edX or "Specializations" offered by Coursera) might be improved. On-line learning platforms that may become a part of the alliance, would then lead changes to their offerings based on this data. As part of meeting this objective, the implementing partner might forge or build on relationships with professional accreditation bodies (U.S. or target country based), such as the Accreditation Board for Engineering and Technology (ABET) or the American Council on Education. These partnerships could lead to a number of outcomes, such as the accreditation body "blessing" certain MOOCs or MOOC sequences as aligned with the standards of that accrediting organization. The benefits of this approach include signaling to both students and employers the professional value of the aligned courses. Students would then be able to filter the CourseTalk catalog by accreditation alignment to more effectively search the platform.

V. Increase key target population MOOC enrollment and completion rates through advanced marketing of MOOCs and the formation of communities of users.

Initial research shows low levels of awareness and usage/completion of MOOCs among developing world populations, particularly key demographics, including young people, women, those lacking education credentials, and under-employed. This program will advance the knowledge and usage/completion of MOOCs by key populations in target countries. A well-structured marketing campaign will drive awareness among target populations of the professional development opportunities available through MOOCs and online education. This initiative will promote the search and discovery functionality of CourseTalk as the means to easily navigate the ever changing universe of online education options. CourseTalk and its partners plan to contribute some in-kind marketing resources to this objective, though the applicant should budget for limited marketing as well.

Beyond enrolling in the appropriate course, the major challenge facing MOOC completion is overcoming the isolating aspect of the online experience. As part of this initiative, the alliance will foster followers of online learners that will improve the connection between students globally and facilitate the sharing of new ideas, research, and project work. There is great demand for these communities, as a recent Coursera poll found that 77% of their students are interested in forming study groups to enhance their MOOC learning. In executing this concept, the implementing partner will use baseline and needs assessment data to inform CourseTalk's site improvements, including possibly:

• Discussion Forums: Build online forums on the CourseTalk platform focused on individual classes, professional development and country/region specific learning. Students will be able to engage on a variety of subjects and build a greater connection to learning cohorts.

• Badging & Gamification: CourseTalk has the ability to issue users various points, badges, and missions (e.g. complete a professional development learning track) and community interaction (e.g. mentoring a fellow student). With this CourseTalk can reward positive community building behaviors with these badges that confer expertise and social status onto the student.

• Educational Portfolio: Many of the STEM and fine - arts oriented courses have practical exercises and projects that students may upload to their CourseTalk student profile to showcase their skill set and expertise. Another benefit of the portfolio is to have a repository of course completion certificates across platforms. Through these profiles, the computer programmer in South Africa will be able to display their work and collaborate with a programmer in Indonesia to the mutual benefit of both parties.

The alliance believes that the advancement of the tools listed above will benefit target audiences through increased connection with the global student community and access to resources that will improve completion rates. The implementing partner will be well positioned to advise the alliance on how best to target these site improvements.

VI. Application of MOOCs in India :

Online courses will help to improve the shortage of faculty and improve education. Digital technologies have the potential to dramatically transform Indian higher education. A new model built around massive open online courses (MOOCs) that are developed locally and combined with those provided by top universities abroad could deliver higher education on a scale and at a quality not possible before.

University enrollment in India is huge and growing. It surpassed the U.S.'s enrollment in 2010 and became second only to China that year. Every day in India 5,000 students enroll at a university and 10 new institutions open their doors.

At more than 3 percent of the country's GDP, India's spending on higher education is one of the highest in the world. Yet per-student spending is among the lowest. While recent expansion has widened access to universities, it has further reduced per-student spending and motivated already acute faculty shortages. As a result, quality has declined.

India must continue to expand access to higher education while preserving quality and reducing costs. This situation is not unique to India, but given its enormous size and unique position, India's challenges are formidable. Digital technologies, particularly the extensive use of MOOCs, could help.

India has experimented with online classes before, but their impact has been marginal. A decade ago the country began using the Internet to distribute video and Web-based courses under a government-funded program, the National Program on Technology Enhanced Learning. Developers created more than 900 courses, focused mainly on science and engineering, with about 40 hours of instruction each. With limited interactivity and uneven quality, these courses failed to attract a large body of students.

MOOCs have given Indian academics a better sense of how a lecture could be restructured into short, self-contained segments with high interactivity to engage students more effectively. MOOCs have given Indian academics a better sense of how a lecture could be restructured into short, self-contained segments with high interactivity to engage students more effectively.

Plans are afoot for the Indian Institutes of Technology, widely considered to be among the world's top engineering schools, to offer three basic IT courses in data structure, programming and algorithms to hundreds of thousands of undergraduates through MOOCs. These courses would award credits and count toward degrees.

It helps that India is full of young people who possess a high comfort level with technology. Indians are among the most aggressive users of MOOCs. Of the 2.9 million registered users of Coursera in March, 2014 more than 250,000 were from India, second only to those from the U.S. Yet we still need to find the right model to use MOOCs in an Indian context. With a decade of experience in this space and a vibrant technology ecosystem, India will most likely find its way soon.

Recently, the Babson Survey Research Group and Pearson released the results of a survey about online learning. The report was based on responses from over 2,800 academic leaders and found that over 7.1 million higher education students are learning online. The study aimed to a number of questions central to the nature and extent of online education:

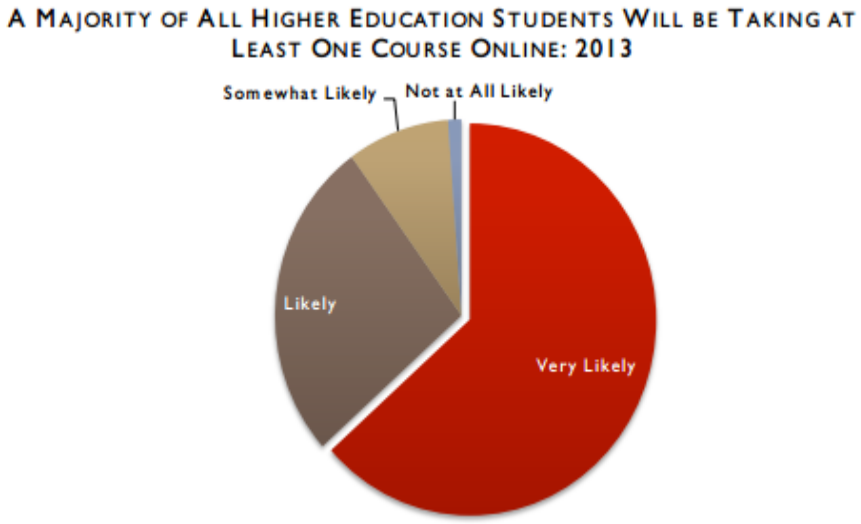
- Is online learning strategic?
- Are learning outcomes comparable in online settings and face to face settings?
- How many students are learning online?
- How are MOOCs faring?
- Do students require more discipline to complete online courses?
- Is retention of students harder in online courses?
- What is the future of online learning?
- Who offers MOOCs?
- What are the objectives of MOOCs?
- What role do MOOCs play for higher education institutions?

VII. Results and Discussions:

The report quantified many things that those involved in education already knew (or at least, suspected). Participation in online learning is increasing. Learning outcomes are largely positive. Interestingly, what this study does show is something that I hadn't quite expected – that many of the numbers that had been continually rising over the past years were starting to show a slight decline. For example, the proportion of chief academic leaders that say online learning is critical to their long-term strategy dropped from 69.1 percent to 65.9 percent. Many believe that MOOCs are not a sustainable form of online learning for higher education institutions to pursue.

TOTAL AND ONLINE ENROLLMENT IN DEGREE-GRANTING POSTSECONDARY INSTITUTIONS – FALL 2002 THROUGH FALL 2012

	Total Enrollment	Annual Growth Rate Total Enrollment	Students Taking at Least One Online Course	Online Enrollment Increase over Previous Year	Annual Growth Rate Online Enrollment	Online Enrollment as a Percent of Total Enrollment
Fall 2002	16,611,710	NA	1,602,970	NA	NA	9.6%
Fall 2003	16,911,481	1.8%	1,971,397	368,427	23.0%	11.7%
Fall 2004	17,272,043	2.1%	2,329,783	358,386	18.2%	13.5%
Fall 2005	17,487,481	1.2%	3,180,050	850,267	36.5%	18.2%
Fall 2006	17,758,872	1.6%	3,488,381	308,331	9.7%	19.6%
Fall 2007	18,248,133	2.8%	3,938,111	449,730	12.9%	21.6%
Fall 2008	19,102,811	4.7%	4,606,353	668,242	16.9%	24.1%
Fall 2009	20,427,711	6.9%	5,579,022	972,669	21.1%	27.3%
Fall 2010	21,016,126	2.9%	6,142,280	563,258	10.1%	29.2%
Fall 2011	20,994,113	-0.1%	6,714,792	572,512	9.3%	32.0%
Fall 2012	21,253,086	1.2%	7,126,549	411,757	6.1%	33.5%



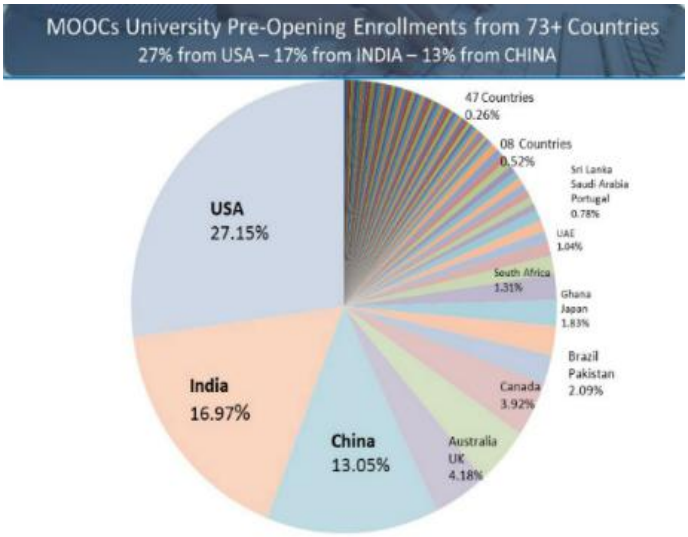
i. Over 7.1 million students were taking at least one online course during the fall 2012 term, an increase of 411,000 students over the previous year.
ii. The online enrollment growth rate of 6.1 percent is the lowest recorded for this report series.
iii. Thirty-three percent of higher education students now take at least one course online.
iv. The percent of academic leaders rating the learning outcomes in online education as the same or superior to those in face-to-face grew from 57.2 in 2003 to 77.0 percent last year, but fell back to 74.1 percent this year.
v. The proportion of chief academic leaders that say online learning is critical to their long-term strategy dropped from 69.1 percent to 65.9 percent.
vi. Ninety percent of academic leaders believe that it is likely or very likely that a majority of all higher education students will be taking at least one online course in five year's time.
vii. Only 5.0 percent of higher education institutions currently offer a MOOC (Massive Open Online Course), another 9.3 percent report MOOCs are in the planning stages.
viii. Less than one-quarter of academic leaders believe that MOOCs represent a sustainable method for offering online courses.

MOOCs are still extracting noise in the academic world. But MOOCs are about more than just education – they are a huge social presence and inhabit a network of their own. Big name universities have signed on to back many of the courses, lending some credibility to the land of online learning. With MOOCs gaining attraction quickly and millions of learners signing on, the appeal is quite powerful. The handy info graphic below takes a look at some interesting facts and statistics about MOOCs – keep reading to learn more!

Coursera drew a million users in just 4 months after their launch. Coursera now has 3.3 million students in 196 countries and 62 university partners. 61.5% of students enrolled in a MOOC are from outside the US.

Brazil, China, India, Canada, and the UK boast high % of enrolled students. 70% already have a bachelor's degree or higher. 80% take courses online for credit. 50% are age 26 or older. MOOCs are free, and the majority (86%) don't require textbooks. The teachers of MOOCs are of the following type:

1) 73.3% of MOOC professors own their course content.
2) The majority have 10 years experience or more.
3) 71.8% taught a MOOC to make higher education more accessible.
4) They spend about 100 hours per class in preparation time
5) About 8 hours per week are spent "in class"
6) There are about 33,000 students enrolled per class
7) About 50% think their online class is as hard as the same in-person class, but over 70% don't think the students deserve credit from their home institution.



VIII. CONCLUSION AND FUTURE SCOPE:

MOOCs is totally a new area of education system. No thorough investigation has been made on MOOCs about its success rate in higher education institution(HEI). More data to be collected from user of MOOCs and then a statistical analysis is to be made. Moreover, analysis should be done on financial viability. The emergence of MOOCs and on-line education could be one good method to implement green computing in HEI. In HEI the following changes are almost unavoidable such as (i) Globalization and the increased momentum for internationalization in HEI, (ii) Worldwide increased demand for access to HEI with a projection that there will be 120 million students worldwide by 2020 which means MOOCs will be one alternative to cater these needs. The time is not very far when MOOCs will be one alternative method for implementing green computing in HEI and giving degrees, diplomas to learners those who are situated in a remote place. There is a lot of scope in India to introduce MOOCs to make more sustainable and financially viable education policy. The reputed universities in India should come forward to start MOOCs in coming years to solve 100% literacy program and also to spread HEI.

IX. ACKNOWLEDGMENT

REFERENCES

[1] Asoke Nath, Shalabh Agarwal, "*Massive Open Online Courses(MOOCs)- A Comprehensive study and its Application to Green Computing in Higher Education Institution*", International Journal of Emerging Trends in Engineering Research, Vol 2, No 2, Page 7-14(February 2014).

[2] I. Maria Joseph, Asoke Nath, "*Some issuesand Challenges in E-learning Methodologies and E-assessment System*", Proceedings of International Conference Worldcomp 2013 held Las Vegas, USA in Jul 22-25,2013. Proceedings page138-143(2013).

[3] I.Maria Joseph, Asoke Nath, "*Integration of Massive Open Online Education(MOOC) System with in_Class Room Interaction and Assessment and Accreditation: An extensive report from a pilot study*", Proceedings of International conference Worldcomp 2013 held at Las Vegas, USA in Jul 22-25, 2013. Proceedings Page 103-111(2013).

[4] Shalabh Agarwal, Archana Vimal, Saima Ghosh, Asoke Nath, "*Green Computing Endeavor in Higher Educational Institutes – a noble initiative towards Sustainable IT Infrastructure*", Journal of Computing(USA), Vol 4, issues 5, May, ISSN- 9617, Page-217-222, 2012

[5] Shalab Agarwal, Asoke Nath, "*Green Computing - a new Horizon of Energy Efficiency and Electronic waste minimization": a Global Perspective*", Proceedings of IEEE CSNT-2011 held at SMVDU(Jammu) 03-06 June 2011, Page 688-693(2011).

[6] Shalabh Agarwal, Asoke Nath, "*Desktop Virtualization and Green Computing Solutions*", Proceedings of The Second International Conference on "Soft Computing for Problem Solving (SocProS 2012)" SocPros 2012 held in December 28 - 30, 2012 also published in Conference proceedings in AISC series of Springer.

[7] Shalabh Agarwal, Asoke Nath, "*A Study on implementing Green IT in Enterprise 2.0*", "International Journal of Advanced

Computer Research", Vol-3, No.1, Issue-3(March),pp. 43-49(2013).

[8] Abhijit Karmakar, Asoke Nath, "*E-Learning Methodologies, Strategies and Tools to Implement lifetime education anywhere anytime*", International Journal of Innovative Research in Advanced Engineering (IJIRAE), Vol-1 Issue 4, Page 193-201(May 2014).

[9] http://www.edudemic.com/state-of-moocs/

[10] http://www.gse.upenn.edu/pdf/ahead/perna_ruby _boruch_moocs_dec2013.pdf

[11] "*An Opportunity for India*." http://www.edudemic.com/2013-survey-online-learning

[12] http://www.moocs.co/Higher_Education_MOOCs.html