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OPEN ONLINE COURSEWARE INITIATIVES FOR ENGINEERING: A STUDY**Devanand Baban Khupate^{*1} & Dr. Anil N. Chikate²**^{*1}Ph.D. Scholar, Dept. of Library & Inf. Science Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, Maharashtra²Research Guide & Head Knowledge Resource Centre Dept. of Library & Inf. Science Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, Maharashtra

ABSTRACT

OCWs i.e. Open Courseware is the repository of the study and learning materials in digital form on the web which is open for every user i.e. Open Access. These repositories envisage storing, indexing, preserving, distributing, and sharing the digital learning resources with any time access offering interoperability. What is most significant about the method is that it ensures faster learning at a comparatively reduced cost and gives access to more learning resources. The OCW project is rooted in the MIT Faculty's decision at the United States, stated in 1999. In India, a number of institutions are digitizing their course materials and a good number of open courseware have been established e.g. National Programme on Technology Enhanced Learning(NPTEL), eGyankosh-a National Digital Repository, CEC Learning Object Repository, Indo- German eGurukul on Digital Libraries, NCERT Online Textbooks, UNESCO SALIS e-Learning Portal, etc. This paper presents a scenario of the Open Courseware initiatives in the world as well as in India that can be helpful and necessary to the engineering curriculum.

Keywords: Open Courseware, OCW, MIT, NPTEL, Open Access, OER.

I. INTRODUCTION

India is at the forefront of the developing world as well as the South Asian region in terms of both economic growth and scientific productivity. The National Knowledge Commission (NKC) is a high-level advisory body to the Prime Minister of India, with the objective of transforming India into a knowledge society. It covers sectors ranging from education to e-governance in the five focus areas of the knowledge paradigm as, easy access to knowledge, all levels and forms of knowledge, Effective creation of knowledge, applications of knowledge systems, Services like e-governance .

The Working Group on Open Access and Open Courseware from NKC has strongly recommended for establishment of open courseware repositories for countrywide dissemination of quality courseware. This would facilitate easy and widespread access to high quality educational resources and drastically improve the teaching paradigm for all our students. Learning material contained in an Open Courseware provides learners an opportunity to gain knowledge beyond their routine classroom environments. These are in the digital form which can be accessed online, thus breaking the barriers of time and distance.

II. OPEN COURSEWARE INITIATIVES

The open access concept came out during 1991 due to the realization of the need to facilitate scholarly scientific communication. Open access to literature means online access without charge to readers or libraries. Committing to open access means dispensing with the financial, technical and legal barriers that are designed to limit access to literatures to paying customers. Open access is a cost-effective way to disseminate and use of information.

Open Courseware

OCWs i.e. Open Courseware are free and open digital publication of high quality educational materials, organized as courses that is provided to the public without charge via the Internet i.e. open access. An Open Courseware site provides open access to the primary teaching materials for courses taught at educational institutions, enabling educators to draw on the materials for teaching purposes, and students and self-learners to use the materials for the

development of their own personal knowledge. The primary characteristics of Open Courseware are that it is offered for free, does not lead to a degree, and does not grant access to faculty. The Open Courseware consists of syllabi, online presentations, and reading recommendations, which makes it particularly handy for use by other faculty.

Open Courseware initiative

The OCW project is rooted in the MIT Faculty's decision, stated in 1999, which regarded the use of the Internet to better carry out the MIT's mission to advance knowledge and State-of-the-Art in Open Courseware Initiatives Worldwide. This decision has come to live with the proposal of the Open Course- Ware initiative in 2000, followed by the publication of the first proof-of-concept site in 2002, which contained 50 courses. Spanish and Portuguese translations were added in the same year as well. The official launch in 2003 was accompanied by the publication of 450 more courses, along the Chinese translation. During 2004, 400 more courses were published (reaching the level of 900 courses), and the first mirror site was established in Africa. In 2005, besides reaching the level of 1250 published courses, OCW began to update the previously published courses. The number of visitors increased dramatically, from reported 2 million in 2007, to 50 million in 2008 and 100 million in 2010 (MIT OCW Our History, 2011). Currently, more than 250 other universities and associated organizations around the world have joined MIT, and have been publishing their course materials freely and openly for more than 23,000 courses in 27 languages. Currently the OCW site reports 810 million visits from 578 million learners from almost every country.

Vision of OCW

OCW has started with the vision of matching the human potential with the opportunities rooted in having access openly to the teaching tools of the world's top learning institutions, having therefore an enormous impact on people and communities worldwide. The envisaged goal of the decade that just started is to reach a billion minds, aiming at helping motivated people around the world to improve both their lives and the world we live in. To accomplish this daring goal, the depth and the quality of the course materials is ought to be improved, along with the site itself. Four major directions of action have been identified:

- (1) Placing OCW everywhere, i.e., making the OCW content easy to find and distribute via ubiquitous devices, including reaching underserved populations;
- (2) Reaching key audiences by customizing OCW materials to better meet the needs of people across a broad spectrum of backgrounds and cultures;
- (3) Creating communities of open learning, by providing for an open learning ecosystem that enables more than access to the content, namely that boost collaborative learning;
- (4) Empowering educators worldwide by providing them with the right tools they need to be able to share OCW content with their students.

III. OPEN COURSE WARE CONSORTIUM

The Open Course Ware Consortium (OCWC) is a collaboration of higher education institutions and associated organizations from around the world creating a broad and deep body of open educational content using a shared model. At present, The Consortium includes hundreds of universities and associated organizations that are committed to advance Open Course Ware and its impact on global education, and it acts in three main directions:

- (1) as a supporting resource for starting and sustaining OCW projects,
- (2) as a coordinator for the OCW movement globally, and
- (3) as a forum for exchanging ideas and planning the OCW's future.

The OCW Consortium's vision matches the natural aspiration for learning with the opportunity to do it, everywhere in the world, by everyone; by having open access to affordable, educationally and culturally appropriate opportunities to gain whatever knowledge or training they desire (OCW Consortium About, 2011).

The Consortium acts to accomplish this vision by addressing the issue of accessing of high quality educational materials, while it partners with organizations that address the related matters, which must also be tackled to fulfill this vision. The members of the OCW Consortium come from USA (52 members), Spain (40 members), Japan (27), Taiwan (19) and South Korea (12). Each of the other 45 participating countries is represented by less than 10

members. Membership to the OCWC is valuable for both individuals and institutions, as The Consortium provides a gateway to OCW projects and courses for the entire OCW community, being an ideal meeting place for people wanting to make structured contributions to the development of open education worldwide.

IV. OPEN COURSEWARE INITIATIVES IN INDIA

National Programme on Technology Enhanced Learning (NPTEL)

This is an Open Courseware initiative by seven Indian Institutes of Technology (IIT) and the Indian Institute of Science (IISc) for creating online Web and Video course content in engineering, science, and humanities streams. The mission of NPTEL is to enhance the quality of engineering education in the country by providing free online courseware. Over 613 Indian Engineering Colleges have been provided with NPTEL content, which can be accessed through the college intranet. The number of visitors on its website has shown a significant increase. While it was around 9.37 lakh in 2008, the number stood at 44.39 in December 2011. It is funded by the Ministry of Human Resource Development (MHRD), Government of India. Six major engineering disciplines have been covered in this project so far (NPTEL Phase I) at the undergraduate (B.E./B.Tech) level. In addition, a number of core curriculum courses common to all engineering programs such as mathematics, physics, chemistry, management, electronics, language, etc. have also been included. This is a wonderful resource for the engineering stream in our country

eGyankosh

Indira Gandhi National Open University (IGNOU) is a national open university that offers distance and open education in India and other countries. IGNOU has initiated the establishment of a National Digital Repository of learning resources eGyankosh. This repository envisages to store, index, preserve, distribute and share the digital learning resources of open and distance learning (ODL) institutions of the country. The repository supports seamless aggregation and integration of learning resources in different formats such as self-instructional study materials, audio-video programmes, and archives of radio and television-based live interactive sessions

CEC Learning object repository

Consortium for Educational Communication (CEC) is an inter-university centre on electronic media, established by the University Grants Commission (UGC). CEC's Learning Object Repository (LOR) is an Open Courseware initiative having educational resources in different subjects like Archeology, Biology, Botany, Chemistry, Commerce, Computer Science, Economics, Education, English, Fine Arts, etc. Users have the facility to browse the LOR by using various options such as Topic, Subject, Learning Object, Keywords, etc.

NCERT Online Textbooks

NCERT is an apex resource organization set up by the Government of India to assist and advice the Central and State Governments on academic matters related to school level education. NCERT publishes school textbooks and it has initiated a step towards making school textbooks freely available on the internet for students and teachers through its website. This portal provides easy navigation to textbook chapters by title/subject of the book for a particular class. The textbooks available there are written in English, Hindi and a few in Urdu.

V. BENEFITS

Benefits of an Open Courseware are multidimensional which are discussed here under:

Institutional benefits

The qualitative learning objects can be shared by learners of different programmes within open and distance learning (ODL) institution and also can be shared by learners of different ODL institutions within or outside the country. Open Courseware improves recruitment by helping the right students find the right programs at the institution and builds global awareness of the institution's unique educational approach and curriculum.

Faculty benefits

Open Courseware builds awareness of the unique contributions to the field and duplication of efforts of preparing self-learning study materials can be minimized. And also builds global awareness of the institution's unique educational approach and curriculum.

Just in time and any time access

The Open Courseware facilitates any time access to its collections whenever and wherever the learner needs.

Eliminate travel costs

Travel has historically been the most costly aspect of corporate training. Open Courseware eliminates travel costs and the time away from the job that travel mandates.

Low cost delivery

An enterprise workforce can have access to hundreds of courses for a fraction of the cost of classroom courses.

Always up-to-date

With Web-based learning and performance support resources residing on a single Web server, updates are immediately available to all worlds wide.

VI. SOFTWARE USED IN DEVELOPING OPEN COURSEWARE

Some major and free software are available of OCWs

Moodle

Moodle is a course management system (CMS). It is a free, Open Source software package designed using sound pedagogical principles, to help educators create effective online courses with opportunities for rich interaction. Modular design means that people can develop additional functionality. Anyone can download and use it on any computer. It can scale from a single-teacher site to a University with 300,000 students. It is also known as a Course Management System (CMS), or Learning Management Systems (LMS), or Virtual Learning Environment (VLE). Web Address: <http://moodle.org>

DSpace

DSpace is a digital library system designed to capture, store, index, preserve, and redistributes the intellectual output of a university's research faculty in digital formats. It was developed jointly by Hewlett Packard (HP) Laboratories and Massachusetts Institute of Technology libraries (MIT). Web Address: <http://www.dspace.org>

E-Prints

E-Prints is open-source software for institutional repositories. It was developed at the University of Southampton and was designed initially to create a pre-print institutional repository for scholarly research, but is now used for other material including reprints, technical reports, conference publications or other means of electronic communication. Web Address: <http://www.eprints.org>

Greenstone

Greenstone is a suite of software for building and distributing digital library collections. Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open-source, multilingual software, issued under the terms of the GNU General Public License. Web Address: <http://www.greenstone.org>

VII. CONCLUSION

Nowadays, following the demographic trends supported with the emerging universal aspiration for participating within higher education programs, there is a huge demand for high quality educational resources that are available

online both freely and openly. Moreover, the lifelong personal evolution in the knowledge and information society is thoroughly supported by the opportunity that anyone have access to such resources from anywhere at any time via the Internet. Seeing the world's knowledge as a public asset that can be accessed, shared, used and reused, etc. mediated by technology, especially ICT, is a powerful idea that may have an influential impact on teaching and learning within our society. Indian academics can play a significant role in creating Open Courseware materials for the students to propagate the teaching and learning process diluting the limitations of traditional educational setup and beginning a new culture of "Learning beyond Classroom". This way a wide range of collection of learning objects and other scholarly materials can be developed. This repository should be made available to the learners and accessible through Intranet and Internet. A well-organized Open Courseware project is essential in the engineering curriculum and it can disseminate and preserve for a wider audience in the future also.

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