OPEN COURSEWARE: A NEW PARADIGM IN E-LEARNING

Swapan Deoghuria ***Satyabrata Roy***

Abstract

History has proved that education and discovery are best advanced when knowledge is shared openly. Open Courseware (OCW) is a part of a comparatively new educational movement in the line of Open access and also an opportunity in the field of distance/e-learning that leading institutions and universities around the world can capitalize for the betterment of the society. Great Universities and institutions constantly expand their reach, working across traditional boundaries to grasp and meet the global community's most critical needs. Already world famous institutes like Massachusetts Institute of Technology (MIT), all Indian Institute of Technologies (IITs) and Indian Institute of Science (IISc) are working along this way that will automatically inspire other institutions to openly share their course materials for open dissemination of knowledge and information that can open new doors to the benefits of education for humanity around the world. India is a vast country with different culture and languages. In this paper we studied different aspects of OCW and its impact on total learning process.

Keywords: Open Access; E-Learning; Distance Learning; Open Courseware

1. Introduction

Every student of higher education is familiar with names like MIT, IIT, Harvard, Princeton, Oxford, IISc. etc. Every student has a dream to be enrolled himself/herself in one of those institutions/ universities. Why those are different from others? What are special about those? Are those institutions are special for their great campuses and ultra modern facilities? No. Those are special for their faculty members. They are the real assets of an elite institution. Students try to get admitted into those institutions only for those great teachers. But in reality that dream can be fulfilled for only very small sections of the students. But is there any way to be acquainted with the teaching methods and materials used by those great teachers by the rest of the student community who are not so lucky? OCW can solve the problem to a large extent if such great institutions/universities open up their core teaching materials to all. Already MIT made available most of their undergraduate and graduate level courses online free and openly available to anyone anywhere in the world. Educators are using these materials for their curriculum development and self-learners are using this for their self-study. In India all seven IITs and also IISc have formed a consortium named National Programme on Technology Enhanced Learning (NPTEL) to publish their course material free of cost in Internet to enhance the quality of engineering education. Not only in USA and India, OCW movement is gaining popularity in other countries also.

2. Why Open Courseware ?

The objective of almost all institutions/universities is to "advance knowledge and educate students in different areas of scholarship that will best serve the nation and the world". OCW provides a new model for the dissemination of knowledge and collaboration amongst scholars around the world, and contributes to the "shared intellectual commons" in academia, which foster collaboration among scholars. OCW is also in line with open access movement as all materials available under OCW are free of cost and can be used in any type of non-commercial purpose. Through open courseware, not only enrolled students but also teachers of other institutions, educators and self-learners will be benefited and the overall teaching methods will be improved so that the tendency of leaving science by undergraduate students due to poor teaching will be decreased. Large publishing houses are trying to turn curricula into a commodity. These companies are always trying to leverage the capital value of their curricula. OCW initiative can be thought as a shot across the bow to them.

3. Who will take the lead in India?

Experts of the leading institutes/universities of a specific discipline should take the lead. For example, in India all the IITs take the responsibilities of all engineering fields, IISc can take the responsibilities of the basic sciences and all the IIMs can take the responsibilities of the management course materials. Jawaharlal Nehru University, Calcutta University, Hyderabad University can take the lead for arts and humanities area. AIIMS can take lead for medical sciences, ISIs can take the responsibility for statistics/documentation.

Automatically this will inspire other universities/institutes to publish their courseware in which they have some sorts of expertise.

Initiatives in India and Abroad

Asia

- **India:** The National Programme on Technology Enhanced Learning (NPTEL: http://www.nptel.iitm.ac.in) being carried out by the Indian Institutes of Technology (all seven), Indian Institute of Science and other premier institutions in India is also on the same grounds. The main objective of NPTEL program is to enhance the quality of engineering education in the country by developing curriculum based video and web courses. The program shall be run as per the advice of the National program Committee (NPC) to be constituted by the Ministry. This Committee shall have the overall responsibility for all activities under this program. The Committee shall ensure inter-institutional coordination at the national level. NPC shall also function as a grants-in aid committee and shall recommend release of funds under the program. In addition, there shall be a program Implementation Committee (PIC) comprising of TEL coordinators from resource institute.

  There shall be a National Coordinator each for video courses and e-courses. The NPC may constitute subject-level expert group(s) for each of the subjects covered under the program to ensure harmonization of curriculum so that the largest number of people can benefit from this initiative. A definite mechanism for assurance of quality and certification of courseware produced under the program shall also be put in place.

- **China:** Open Resource for Education (CORE) is a consortium of Chinese universities that has started to translate MIT-OCW courses into Chinese. They will also publicly publish their own Chinese courses in the coming years: http://www.core.org.cn/cn/
- **Japan** OCW Alliance contains materials from the top Japanese universities: http://www.jocw.jp/
- **Taiwan:** The Opensource Opencourseware Prototype System (OOPS) translates the courses into traditional Chinese, through volunteers organized over the internet. The project is led by Fantasy Foundation's Lucifer Chu: http://www.myoops.org/twocw/
- **Thailand:** Available at Faculty of Engineering, Chulalongkorn University (only engineering-related courses) http://mit-ocw.eng.chula.ac.th/
- **Vietnam:** Fulbright Economics Teaching Program: FETP OpenCourseWare http://ocw.fetp.edu.vn/

Europe

- Universia.net is a consortium with more than 700 member universities in Spain, Portugal and Latin America that has translated many MIT courses into Spanish and Portuguese: Universia OpenCourseWare http://mit.ocw.universia.net/
- École Ouverte (Open School), in French (ENS-LSH). http://ecole-ouverte.ens-lsh.fr/

North America

- Carnegie Mellon: Open Learning Initiative http://www.cmu.edu/oli/
- Foothill-De Anza Community College District: Sofia Project http://sofia.fhda.edu/
- Johns Hopkins University Bloomberg School of Public Health: JHSPH OpenCourseWare http://ocw.jhsph.edu/
- Tufts University: Tufts OCW http://ocw.tufts.edu/
- University of California, Berkeley: UC Berkeley on iTunes U http://itunes.berkeley.edu/
- Utah State University: USU OpenCourseWare http://ocw.usu.edu/Index/ECIndex_view
- OCW Consortium (http://ocwconsortium.org) established by MIT and other leading OCW projects to extend the reach and impact of open courseware materials and develop sustainable models for open courseware publication.

4. The Role Model: MIT OCW

MIT is one of the first leading institutions that come up with OCW. By making their educational materials openly available, MIT is demonstrating that they can give away such materials without threatening the value of an MIT education. As of May 31, 2006 MIT has published 1400 courses and constantly evaluating the Access, Use and Impact of MIT OCW. Some of the results provided by MIT OCW evaluation teams are given below which are quite impressive.

- 95% of users report MIT OCW has or will help them to be more productive and effective
- 46% of educators have adopted MIT OCW content to improve their own teaching

- 38% of students use MIT OCW materials to complement a course they are taking; 34% use MIT OCW to learn about subjects outside of formal classes
- 56% of self-learners use MIT OCW to enhance personal knowledge; 16% use MIT OCW to stay current in their chosen field
- 96% of all users would recommend MIT OCW to others

They have also found that MIT OCW is having a significant impact on teaching and learning at MIT:

- 35% of Fall 2005 entering freshmen aware of MIT OCW prior to attending MIT indicate the site was a significant or very significant influence on their choice of school
- 71% of all MIT students (undergraduate and graduate) make use of MIT OCW in their research and studies
- 96% of MIT students using the MIT OCW site report it has had a positive or extremely positive impact on their student experience
- 40% of MIT faculty using MIT OCW report that the site is a helpful tool in revising/ updating courses; 38% use the site for advising students

5. Technology Used to publish OCW

OCW is a new kind of electronic publishing model for educational materials enabled by Internet technologies. OCW should build on a single, searchable organizing structure spanning all courses that includes uniform metadata about the course site's contents. Embedded in the course sites there may be a number of file types, including Adobe PDF, Java Applets, Shockwave, Real Player, Java, and MATLAB. There should be provisions for downloading these applications from OCW site. Currently, electronic courseware, or online course software programs, is referred to by several different names in higher education, including "learning content management systems", "learning management systems", "virtual learning environments" and "Content Management System" (CMS).

6. Open source CMS

There are several open source CMS options for institutions considering implementing their own OCW project. This type of CMS is free to users, or available after payment of a nominal membership fee. A popular international open source CMS is Moodle or "Modular Object–Oriented Dynamic Learning Environment" (Electronic Education Report, 2003). Frustrated with problems associated with WebCT, a Web Master at an Australian university created this free CMS available globally. At present more than 1,800 institutions of higher education are using Moodle (Young, 2004). Moodle (http://moodle.org/) serves over 50,000 registered users speaking 60 languages in 115 countries.

Another growing open source CMS is the Sakai Project, which combines the best tools and solutions from course management systems created at four separate U.S. universities: Indiana University, Massachusetts Institute of Technology, University of Michigan, and Stanford University (Angelo, 2004). To contend with rapidly rising costs of commercial CMS, the four universities joined forces to create an open software product. As of September 2004, 46 higher educational institutions had joined the Sakai Project. Member institutions are allowed to use current source code, build new source code for new features, or revamp source code for current features (Young, 2004).

Other popular open source CMS software are Zope, RedHat, Midgard, OpenACS, OpenCMS and Bricolage. The hope is that utilization of open-source model CMS products could lead to less expensive implementations of OCW on their campuses.

7. Commercial CMS

This type of CMS consists of fee–based instructional technology packages purchased by institutions of higher education. Commercial CMS are primarily distinguished from open-source systems by their cost, which can be substantial. In addition to licensing fees [which could be as high s US$75,000 annually for a university serving 15,000 students, according to Angelo (2004)], other costs associated with CMS include installation, consulting and infrastructure costs, which can also be significant. At present MIT is using a commercial CMS (Microsoft Content Management System 2002) that was customized for their OCW project.

The range of services and services provided by CMS vendors is wide and ever growing. CMS vendors are expanding their courseware functions as they begin to work with the textbook industry and libraries to digitize information and thus increase accessibility to it. For example, Blackboard has new collaborations with publishers like Thomson, Houghton Mifflin, and Pearson Education (Angelo, 2004). We feel that pedagogy will decide the effectiveness of the CMS.

8. Electronic courseware and pedagogy

As the use of electronic courseware has grown, institutions of higher education in India have devoted time and attention to increasing their effectiveness.

We feel strongly that educators using electronic courseware must remember first that pedagogy should drive technology, and second, when using electronic courseware we need to work towards changes in traditional methods teaching and learning. To that end, we mention here some potential benefits for users of electronic courseware:

8.1 New avenues for teaching and learning

The ability of electronic courseware to transcend the barriers of time and space allows students access to learning systems from home, work or school, and enables learning to occur anywhere and anytime. Not only is flexibility in access to information systems (libraries, databases and tutorials) possible for students, but so also is contact with educators, experts, and peers, locally and across vast geographical distances. From the perspective of teaching, the educator can create alternative learning environments, which, by escaping the rule–bound nature of the traditional classroom, can stimulate student engagement and involvement.

8.2 From traditional purveyors of knowledge to facilitators of learning

The use of electronic courseware allows for students to access information on an ongoing basis. Computer storage systems, databases, and the Internet, remove the need for the traditional focus on textbased knowledge of high quality. The technology provides quick and painless access to information through the Web. Students can access a world of knowledge, including factual information from every discipline and multimedia artifacts from film and audio recordings to art and cultural artifacts. Not only does this radically change the structure of the traditional classroom, but it constrains educators to adapt to new roles since they no longer need function as the sole purveyors of knowledge. Another resource peculiar to the information available through the use of courseware includes the use of

lecture notes a resource not available to students in the precourseware classroom. Even if instructors do not post lecture notes, they provide durable access to content that supplements the textbook.

8.3 From content to critical thinking and evaluation

The educator's role as facilitator, rather than purveyor, of knowledge is the most obvious change imposed by electronic courseware as students can potentially obtain a much wider range of knowledge through the use of technology than the individual educator could provide. As educators, then, we must learn not only how to effectively facilitate students' search for, and consumption of, appropriate and relevant materials, but to guide them in understanding these materials. Beyond simply guiding their understanding, we should aim for teaching critical thinking skills through the tools provided to us by CMS.

8.4 From traditional to new instructional design

As we learn to modify our roles as educators to facilitators rather than purveyors of knowledge, and as we learn to guide students to seek, understand and analyze information, it becomes clear that the use of electronic courseware requires educators to develop new methods of instructional design and pedagogy. The important issue here is that curricula need to be revised to include these methods that work with, and take advantage of, technology.

8.5 Rethinking communication and relationships with students

Moving away from pedagogical techniques but still keeping a focus on learning and student issues leads us to another area in which educators must think of "traditional" communication with students, and correspondingly, a rethinking of interpersonal relationships. These are issues that educators must consider in order to effectively make use of these factors, rather than be blindsided by them.

8.6 Increased opportunities for collaboration

Educators can network with colleagues through scholarly discussion lists, interactive chat, or asynchronous e–mail, and concomitantly develop their professional skills. The Web already provides global hypertext publication facilities, which allows educators another avenue to share information and learn from each other. Distance learning facilities also provide such opportunities. Electronic technology can also link the classroom to the "real world," allowing educators to develop a project–oriented focus in their instruction. They can access a wide range of resources, from their local community to national or global communities; from colleagues and professional organizations to industry. Students can access these resources globally on the Internet, link with their peers, and write for real audiences on the Web.

8.7 Educators as learners

The effective use of electronic courseware requires instructors to not only develop more student–oriented instructional methods in order to engage students in independent and active learning through and with the technology, but also constrains us to take a more active and interactive role in the teaching process.

As they seek a more active role in the educational process, educators are forced to "seize the initiative" in becoming leaders in the use, evaluation, and research on technology in the classroom. This final lesson may be the most important one as we improve our own teaching through the processes of learning.

9. Conclusion

OCW will democratize education, breaking down the elitist walls of the ivory towers. Modern technology brings education to the students and OCW makes it possible for students all over the world to study at prestigious institutions without leaving their homes by accessing best lectures by the best teachers. OCW and in general e-learning will short the gap between an educated person and the rest of the society. OCW has dramatically increased (Angelo, 2004) to the point that it has become an essential feature of instructional technology at institutions of higher education (Warger, 2003). Today 94 percent of American colleges and universities use at least one type of electronic courseware for distance education and/or as a supplement to the traditional classroom (Market Data Retrieval, 2003). And two–thirds of faculty members who initially use a CMS continue to do so for future courses (Morgan, 2003). While electronic courseware is used as much for traditional classroom courses as distance courses (Warger, 2003), it is undeniable that the expansion of e-learning has paralleled the growth of OCW.

As we utilize electronic courseware both in the virtual classroom and as a supplement to the traditional classroom, we should remember that electronic courseware provides one more tool in the teacher's repertoire — but it is not the only tool, nor should it become an educator's primary focus. Our focus should be teaching and learning, and in considering teaching and learning with technology we must deal with significant issues that go beyond the use of technology to broader issues of learning. We must remember that our goals as educators include engaging students in higher order learning, facilitating the exercise of critical thinking skills, and ensuring students' mastery of conceptual, analytical, and theoretical knowledge as well as, rather than solely, developing students' ability and comfort with the use of technologies.

In closing we note that it is important that educators consider now the effective use of the new technologies afforded us by electronic courseware or we will find ourselves only too rapidly outpaced by the technology itself. A rethinking of traditional teaching and learning is necessary if we are to effectively utilizing courseware, and making the technological revolution in education happen.

References

1. MIT OCW: http://ocw.mit.edu/
2. The National Programme on Technology Enhanced Learning (NPTEL: http://www.nptel.iitm .ac.in)
3. J.M. Angelo, 2004. "New lessons in course management," University Business (September), at http://www.universitybusiness.com/page.cfm?p=616, accessed 29 August 2006.
4. J. Darby, 2004. "A new approach to e–learning," E–learning age,, volume 34 (December/ January), at http://www.elearningage.co.uk/, accessed 27 August 2006.

5. Educational Marketer, 2003. "Colleges increase use of course management systems, says MDR," Educational Marketer, volume 34, number 8, pp. 4–5.
6. Edutools, 2005. "Course management systems," at http://www.edutools.info/course/, accessed 25 August 2006.
7. Electronic Education Report, 2003. "Interest growing in open–source distance learning platform Moodle," Electronic Education Report, volume 10, number 23, pp. 7–8.
8. Georgia Institute of Technology, n.d. "Global classroom project description," at http://www.lcc.gatech.edu/~herrington/gcpdescription/gcpdesc.html, accessed 27 August 2006.
9. R.N. Katz, 2003. "Balancing technology and tradition: The example of course management systems," EDUCAUSE Review, volume 38, number 4 (July/August), pp. 48–59.
10. G. Morgan, 2003. "Faculty use of course management systems," EDUCAUSE Center for Applied Research, at http://www.educause.edu/ir/library/pdf/ERS0302/ekf0302.pdf, accessed 29 August 2006.
11. National Education Association, 2000. "A survey of traditional and distance learning higher education members," at http://www2.nea.org/he/abouthe/dlstudy.pdf, accessed 29 August 2006.
12. PR Newswire, 2004. "Blackboard course cartridge catalog grows to more than 3,500 course offerings," (16 December); and at http://investor.blackboard.com/phoenix.zhtml?c=177018&p=irol- newsArticle&ID=655315&highlight=, accessed 29 August 2006.
13. Sloan Consortium, 2004. "Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003," at http://www.sloan-c.org/resources/survey.asp, accessed 25 August 2006.
14. T. Warger, 2003. "Calling all course management systems," University Business, volume 6, number 7 (July), pp. 64–65.
15. M.C.W. Yip, 2004. "Using WebCT to teach online courses," British Journal of Educational Technology, volume 35, number 4, pp. 497–501.
16. J.R. Young, 2004. "Sakai Project offers an alternative to commercial/course–management programs," Chronicle of Higher Education, volume 51, number 5 (24 September), pp. B12–B15.
17. Zope: http://www.zope.org/
18. RedHat: http://www.redhat.com/docs/manuals/cms/rhea-rn-cms-en-6.1/
19. Midgard: http://www.midgard-project.org/
20. OpenACS: http://openacs.org/
21. OpenCMS: http://www.opencms.org/opencms/en/
22. Bricolage: http://www.bricolage.cc/