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Awareness and Extent of Utilisation of Web-based Open Source e-Learning Coursewares among Educators and Students

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ABSTRACT

Open source movement plays a vital role in the development of open education resources in higher education. Open source e-learning courseware (OSeLCW) is an initiative within this movement. Many institutions today post their courses for free and open access via the Internet to users all over the world. This paper assesses the awareness, access, and utilisation of such wealth of web-based OSeLCW among educators and students of engineering colleges in Mysore city.

Keywords: E-learning, web-based learning, open educational resources, open courseware, open source e-learning coursewares, awareness, access, utilisation

1. INTRODUCTION

The Open Educational Resources (OER) movement is rapidly growing in the higher education environment. Within this movement, open courseware (OCW) is an initiative that finds its origin in the free open source software approach[1]. The United Nations (UN) has shown a great concern towards OCW and OER aiming to bridge the digital divide between and within nations.

The concepts behind OCW are deeply integrated in the UN millennium declaration and the universal declaration of human rights[2]. OCW offers an alternative view of the future of educational technology and the learning content to be delivered thereby—a future in which more time, money, and effort are spent getting learners in touch with high quality instructional contents; and less time, money and energy are spent worrying about digital rights management and stopping pirates[3]. According to OCW consortium, an open courseware is a free and open digital publication of high quality university-level educational materials, often including syllabi, lecture notes, assignments, and examinations, organised as courses[4]. The courses are made freely available for educational purposes that users across the world can use, reuse, redistribute and adapt the materials under open licenses like creative common license.

2. OPEN COURSEWARE MOVEMENT

The OCW movement was initiated in 2001 by the Massachusetts Institute of Technology (MIT), USA. Later, leading institutions world wide joined this OCW movement, like Tokyo Institute of Technology (TITECH), Japan; Utah State University (USU), US; Korea University, Korea; USQ, Australia; TU Delft, Netherlands etc. Today there are more than 200 institutions and organisations around the globe running OCW websites and they have formed OCW Consortium. This consortium plays a vital role to advance education and empower people worldwide through open courseware[4]. Some of the OCWs are:

2.1 MIT OCW

MIT OCW is a large-scale, web-based electronic publishing initiative. Through OCW, MIT makes its core teaching materials openly available for educational purposes only. MIT publishes these materials in standard formats for users having access to the Internet anywhere in the world. MIT now has 1,800 courses already posted on its OCW website. MIT OCW is being translated into other languages like Chinese, Spanish, Portuguese, German, Vietnamese, etc. under the special arrangement with MIT, and in some other cases MIT has agreed to let institutions create mirror sites at their locations[5].

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2.2 TITECH OCW

TITECH OCW is an imitative website carried out by TITECH to provide free access to course materials for users around the world. The aim is to release the Tokyo Tech's high-level educational resources on science and technology as the world's public property[6].

2.3 Utah State University OCW

Utah State University (USU) OCW project is carried out by the USU, USA. The idea behind USU OCW is to post course materials for open access free of charge, as a model for sharing knowledge in the Internet era. The courses are written by faculty and are meant for teaching of undergraduate and graduate subjects. They are also useful to advanced technology-enhanced education in the Utah State University and at the global level[7].

2.4 Visvesvaraya Technological University e-learning Courseware

Visvesvaraya Technological University (VTU) is a leader in engineering education in Karnataka. In August 2003, VTU established an e-learning centre to facilitate distance education and training to the students and faculty of VTU via satellite and Web. VTU e-learning website provides e-learning courseware (eLCW) in the form of lecture notes as well as tech-specific courses. The lecture notes are viewed as supplementary materials for the distance education program conducted by VTU. The tech-specific courses aim to empower the student-learner to develop his/her technical skills with current technology to meet the needs of the hour for different companies and industries[8].

3. OBJECTIVE

OCWs are available free on the Web for educators, students, and self-learners all over the world. There are many OCWs, which help students and teachers for their study and teaching. The course materials available at MIT, TITECH, and USU websites cover largely the computer science and engineering course curriculum of BE programmes offered by the VTU. A comparative study of VTU course curriculum and MIT's OSeLCW revealed similarity between them, and these OCW course materials are expected to be of much use to VTU students and educators as well. This motivated the authors to assess the awareness, access, and utilisation of OCW and VTU e-learning course materials among educators and students of computer science and engineering at engineering colleges. The study gains its importance in the light of the utility of OER and OCW for educators and students in enhancing the quality of teaching and learning in higher education and thereby produce globally competitive graduates and also in designing course curriculum to suit global competition.

The objective of the study was to understand the level of awareness among educators and students in engineering colleges of Mysore city, about the four websites that offer free and open e-learning course materials relevant to computer science and engineering education and to assess their access and utilisation by these educators and students.

4. METHODOLOGY

The questionnaire with different scales was used as a tool to assess three different aspects, viz., awareness, access, and utilisation of OCW and VTU e-learning courseware websites. This was primarily meant for students. Another questionnaire meant for educators was designed to elicit opinion about the helpfulness of these e-learning course materials in designing course syllabi, and integration of open course materials for classes they teach.

Data were collected during February and March 2008 from educators and BE students of sixth and eighth semester of computer science and engineering students studying in five engineering colleges, namely, the National Institute of Engineering (NIE), Sri Jayachamarajendra College of Engineering (SJCE), Vidya Vardhaka College of Engineering (VVCE), Geetha Shishu Shikshana Sangha Institute of Engineering and Technology for Women (GSSSIETW), and Vidya Vikas Institute of Engineering and Technology (VVIET) in Mysore city. The details of questionnaires distributed and filled in questionnaires received from educators and students are detailed in Table 1. Data in the filled questionnaires were coded, tabulated, and analysed using statistical package for the social sciences (SPSS). Statistical methods like chi-square test, contingency table analysis and F ratio were employed to describe the awareness, access, and utilisation of OSeLCWs.

4.1 Awareness among Students and Educators about OSeLCWs

Table 2 gives the frequency and per cent responses of the students' and educators' awareness about OSeLCWs, and results of contingency coefficient tests.

Contingency coefficient (CC) test revealed a significant association between awareness and websites (CC=0.478; P=0.000). This type of trend was found to be similar for educators (CC=0.426; P=0.000) and students (CC=0.494, P=0.000), where awareness was found to be maximum for VTU and least for USU. However, individually when verified about the awareness of each website, no significant difference was observed between educators and students, i.e., the X^2 value between educators and students using OSeLCW of MIT, TITECH, USU and VTU is .397, .024, 2.086 and .025 respectively.

Table 1. Details of the questionnaires distributed to and received from educators and students

Name of the institution	No. of questionnaires distributed		No. of questionnaires received		Percentage of responses received	
	Educators	Students	Educators	Students	Educators	Students
NIE	6	30	5	18	83.33	60.00
SJCE	6	30	4	20	66.67	66.67
VVCE	6	20	4	10	66.67	50.00
GSSSIETW	6	25	4	15	66.67	60.00
VVIET	6	25	5	13	83.33	52.00
Total	30	130	22	76	73.33	58.46

Table 2. Frequency and per cent responses of students and educators awareness about OSeLCWs

OSeLCW websites		Overall	Educators	Students	X^2 (between educators and students)	P value
VTU	Frequency	91 (92.9 %)	20 (90.9 %)	71 (93.4)	0.025	0.876
TITECH	Frequency	41 (41.8 %)	9 (40.9 %)	32 (42.1 %)	0.024	0.867
USU	Frequency	20 (20.4 %)	7 (31.8 %)	13 (17.1 %)	2.086	0.149
MIT	Frequency	65 (66.3 %)	15 (68.2 %)	50 (65.8 %)	0.397	0.528
Test statistics	CC	0.478	0.426	0.494		
Significance	P value	**0.000**	**0.000**	**0.000**		

The P value of these items also shows no significant difference in the awareness among educators and students.

4.2 Access to OSeLCW Websites by Educators and Students

Table 3 provides mean of the access to various OSeLCW websites by educators and students. A significant difference is observed in the mean access (Table 3) to various websites (F=59.477; P=0.000), where we find highest access to VTU (mean 1.65) website, followed by it is MIT (0.81), TITECH (0.43) and USU (0.24) the least. Educators and students differed significantly (F=4.854; P=0.028), where educators were found to access websites more (mean 0.92) than students (mean 0.74). The relationship between educators and students interaction with websites was found to be non-significant (F=0.095; P=0.866) indicating that pattern of access to various websites is the same by educators and students.

4.3 Obtaining Printouts

Table 4 furnishes mean scores of users obtaining printouts from the OSeLCW websites.In the case of getting print out of e-resources from OSeLCWs, significant difference is observed in obtaining printouts from various websites (F=12.88; P=0.000). it is found that the mean value of printouts obtained from VTU is more (mean 1.13) compared to all other OSeLCWs. Next in order are MIT (mean 0.60), TITECH (mean 0.20) and USU (mean 0.19) which is the least. Statistically no

Table 3. Mean of access to OSeLCW websites by educators and students

Group	OSeLCW websites								Overall	
	MIT		TITECH		USU		VTU			
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Educators	0.95	0.84	0.50	0.80	0.45	0.67	1.77	0.97	0.92	0.97
Students	0.76	0.71	0.41	0.50	0.18	0.48	1.62	0.71	0.74	0.82
Overall	0.81	0.74	0.43	0.57	0.24	0.54	1.65	0.78	0.78	0.86

F (websites) = 59.477; P=0.000; F (groups)=4.854; P=0.028; Interaction- F=0.095; P=0.866.

Table 4. Mean scores of users obtaining printouts from the OSeLCW websites

Group	OSeLCW websites								Overall	
	MIT		TITECH		USU		VTU			
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Educators	0.86	1.13	0.14	0.47	0.23	0.69	0.91	1.15	0.53	0.96
Students	0.53	1.01	0.22	0.74	0.18	0.63	1.20	1.38	0.53	1.06
Overall	0.60	1.04	0.20	0.69	0.19	0.64	1.13	1.33	0.53	1.04

F (websites) =12.88; P=0.000; F (groups)=0; P=0.992; Interaction F=1.26; P=0.289.

differences were found between USU and TITECH websites. However, between educators and students, a non-significant difference (F=0; P=0.992) may be observed, where educators (mean 0.53) and students (mean 0.53) had similar mean scores. The comparison between educators and students in respect of obtaining printouts from websites was found to be non-significant (F=1.26; P=0.289) indicating that pattern of getting print out from various websites is same for educators and students.

4.4 Downloading Files/Modules

The mean score and standard deviation of downloading files from OSeLCW by the educators and students (and results of 2-way ANOVA) is provided in Table 5.

The two-way ANOVA was used to analyse the respondents' views about downloading files/modules from various websites to their local discs. The analyses reveal a significant difference between various websites (F=30.71; P=0.000), where the mean score of students and educators downloading from VTU website is highest (mean 1.90) and this is followed by MIT (mean 1.13), TITECH (mean 0.46) and USU (mean 0.30) which has the least mean score. The comparison of overall mean scores between downloading files from websites shows a non-significant difference (F=3.52; P=.061), where educators' mean is 0.78 and students mean is 0.99. However, the mean score of the students compared to educators in downloading from VTU courseware is high and hence the difference is significant (F=5.464; P=0.001).

4.5 Helpfulness of OSeLCWs in Designing Course Curriculums

OSeLCWs have been prepared keeping in mind the development at global level. Experts from top class institutions are involved in preparing these resources. There are 22 educators in five colleges involved in teaching computer science and engineering subjects. Keeping the contents of OSeLCWs in mind educators in concerned subjects were asked whether these OSeLCWs were of help to them in preparing course curriculum. Table 6 presents frequency and scores of educators' responses about the utility of OSeLCWs in designing curriculum.

Table 6 exhibits that there are eight educators out of 22 who have expressed that the VTU OSeLCW was helpful in designing and developing curriculum of their courses. Among them five have expressed that VTU

Table 5. Mean scores on downloading files/modules to local disk from various websites by educators and students

Group	Websites								Overall	
	MIT		TITECH		USU		VTU			
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Educators	1.23	1.02	0.41	0.67	0.36	0.73	1.14	0.99	0.78	0.94
Students	1.11	1.05	0.47	0.68	0.28	0.79	2.12	1.14	0.99	1.18
Overall	1.13	1.04	0.46	0.68	0.30	0.78	1.90	1.18	0.95	1.13

F (websites)=30.71; P=0.000; F (groups)=3.52; P=0.061; Interaction F=5.464; P=0.001.

Table 6. Helpfulness of OSeLCWs in designing course curriculums

OSeLCW websites	Helpfulness of OSeLCWs				Total
	Not at all	To some extent	To moderate extent	To a great extent	
VTU	14 (63.6 %)	5 (22.7 %0	2 (9.1 %)	1 (4.5 %)	22 (100 %)
TITECH	19 (86.4 %)	3 (13.6 %)	0 (.0 %)	0 (.0 %)	22 (100 %)
USU	21 (95.5 %)	1 (4.5 %)	0 (.0 %)	0 (.0 %)	22 (100 %)
MIT	3 (13.6 %)	6 (27.3 %)	8 (36.4 %)	5 (22.7 %)	22 (100 %)

Contingency Coefficient=0.586; P=0.000

OSeLCW was helpful to some extent, two have expressed that it was moderately helpful, and one said that it was helpful to a great extent. They represent 22.7 per cent, 9.1 per cent, and 4.5 per cent of the total educator respondents, respectively. Remaining 14 respondents, representing 63.6 per cent, have found these resources not at all useful for designing course curriculums.

Nineteen out of 22 educator respondents expressed that the MIT OSeLCW was helpful in designing course curriculum. Among them 6 have said it is helpful to some extent, 8 expressed that it was helpful to moderate extent, and 5 said that it was helpful to a great extent. They represent 27.6 per cent, 36.4 per cent, and 22.7 per cent, respectively. Remaining three educators, representing 13.6 per cent of the total, have opined that it was not helpful. With regard to TITECH and USU OSeLCWs, large majority (86.4 per cent and 95.5 per cent) educators have expressed that they were not helpful for them in designing course syllabus. It may be observed from the table that there exists significant association between various OSeLCWs and the extent of their helpfulness to educators in designing course curriculum as the contingency coefficient is 586 (i.e., CC =0 .586) and the P value is 0.000 (i.e., P= 0.000).

4.6 Integrating Contents of OSeLCWs with Lecture Notes

Educators involved in teaching computer science and engineering courses were asked to furnish their opinion as to whether they used and integrated OSeLCWs in preparing lecture notes and if so the extent of their usage. Table 7 presents frequency of faculty responses and their percentages.

Table 7 demonstrates that there are eight out of 22 educators who used the contents of VTU's OSeLCW in preparing class notes. Out of these eight educators three (13.6 per cent) each have expressed they have used the same to some extent and to a moderate extent, and two (9.1 per cent) have said that they have used the same to a great extent. Remaining 14 educators representing 63.6 per cent of the total have expressed that they have not used the VTU's OSeLCW in preparing lecture notes. Twenty-one out of 22 educator respondents stated that they have used MIT's OSeLCW in preparing lecture notes. Out of these 21 educators 7 have used this to a great extent, 10 have used to a moderate extent, and 4 have used to some extent. They represent 31.8 per cent, 45.5 per cent, and 18.2 per cent of the total respectively. Remaining only one educator representing 4.5 per cent of the total has said that he has not used the MIT's OSeLCW for preparing lecture notes. The large majority of educators have not used OSeLCWs of TITECH and USU. They represent 86.4 per cent and 95.5 per cent of the total respectively.

Thus, it may be observed from the table that these exists significant associations between different institutions' OSeLCWs and their usage by the educators in preparing lecture notes. As the contingency coefficient is 0.618 and P value is 0.000 (i.e. P=.000).

5. DISCUSSION

The results of the study reflect maximum awareness, access, and creation of offline resources (copying and getting print out) from the VTU followed by MIT, TITECH, and USU websites respectively by respondents. VTU course materials are much more cited because VTU is the highest body to prescribe syllabi for technical institutions in Karnataka.

A significant observation this study brings out is that unlike students, educators download more files from MIT OSeLCW than VTU eLCW. It is observed that course materials offered by MIT OSeLCW are more useful to educators so they go beyond VTU eLearning materials. This is a positive attitude on the part of educators as MIT OSeLCW has highly sophisticated scholarly materials.

With respect to adapting syllabi and lecture notes by educators to develop their own course syllabi and courses' content, the findings reveal that no significant associations were observed between websites and categories of responses. Educators adhere to a certain policy of education which makes them restricted to a specific syllabus. In other words, they are syllabus-driven that make them uninterested to look into OSeLCW materials of other institutions/agencies.

Table 7. Educator's responses about integration of the contents of OSeLCWs into class notes

OSeLCW websites	Integrating contents of OSeLCWs into lecture notes				Total
	Not at all	To some extent	To moderate extent	To a great extent	
VTU	14 (63.6 %)	3 (13.6 %)	3 (13.6 %)	2 (9.1 %)	22 (100 %)
TITECH	19 (86.4 %)	3 (13.6 %)	0 (0.0 %)	0 (0.0 %)	22 (100 %)
USU	21 (95.5 %)	1 (4.5 %)	0 (0.0 %)	0 (0.0 %)	22 (100 %)
MIT	1 (4.5 %)	4 (18.2 %)	10 (45.5 %)	7 (31.8 %)	22 (100 %)

Contingency Coefficient=0.618; P=0.000

To increase the awareness and utilization of OSeLCWs, sensitization and information literacy programmes have to be made by libraries and information centres cooperatively with educational administrators to motivate educators and students to use and adapt such high quality scholarly materials as OSeLCWs in their curricula. Students are syllabus-oriented, which makes them unable to go beyond it. In other words they are overloaded with the syllabus which does not give them chance to look for further opportunities to enhance their knowledge.

6. CONCLUSION

Overall, the findings show that the respondents had maximum awareness, access, and creation of offline resources of eLearning materials of VTU followed by OSeLCWs of MIT, TITECH, and USU. For better utilization of OSeLCWs, educational administrators and faculty members have to work together in collaborative manner in adapting and integrating OSeLCWs materials in their curricula and learning. Adapting OSeLCWs by higher education institutions will lead to improvement in the teaching and learning process and thereby produce globally competitive graduates and post graduates.

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