OER: Open Educational Resources for Effective Content Management and Delivery

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Abstract: In the current day scenario as we come across the implementation of outcome based education in the place of traditional teaching. The outcome based education is focusing on the three key aspects Design, Delivery and assessment. The Design refers to here the preparation of course curriculum and its related components, Delivery refers to how and what mechanisms need to follow in delivering a content and finally assessment to verify and validate to what extent we are successful in implementing OBE. The design and assessment are easier tasks when compared with the delivery. Delivery of course content will decide the attainment. In the current paper we tried to showcase the different content delivery mechanisms. Majorly we focused on the course file format which we are in the practice since 2012, and some other best practices which we have adopted which includes open educational resources like MOODLE, Word press for better content Management and delivery.

Keywords: OER, MOODLE, Word press, Course File.

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1. Introduction

The basic tool for every teacher in order to deliver the content is course file ,which includes various components like curriculum, course outcomes and its mapping to Program outcomes and its mapping to program educational objectives, and many more, the following table will give the list of contents available as part of the course file.

The following is the list of contents prepared as part of course file.

Table 1: Index of course file

S.No.	Item Description
1	Course information sheet
2	Syllabus
3	Text books & other references
4	Time table
5	Program Educational Objectives(PEO's)
6	Program Outcomes(PO's)
7	Course Outcomes(CO's)
8	Mapping of course out comes with PO's & PEO's
9	Course schedule
10	Lecture plan
11	Unit wise date of completion & remarks
12	unit wise assignments
13	case studies (2 In No.)
14	Unit wise multiple choice questions for CRT & competitive examinations
15	Previous question papers
16	Tutorial sheets
17	Topics beyond syllabus
18	Assessment sheets of course outcomes (Direct &Indirect)
19	Add-on programmes / Guest lectures
20	Unit wise PPT's
21	Unit wise lecture notes

The contents of the course file starts with Course information sheet: This includes course name, course number, course prerequisites, regulation , course coordinator name followed with syllabus, textbooks and other references including web references, individual time table, followed by Programme Educational Objectives , Programme Outcomes ,then well formed course outcomes which are prepared by following blooms taxonomy, follows with mapping of course outcomes with programme outcomes and programme educational objectives. Upto this point the stakeholders will identify the basic information of the course. From onwards the course content delivery comes into the picture, course schedule gives the information of the schedule of each unit in a course and minute lecture plan will provide the information of day wise completion of each topic in a unit, followed with two set of case studies which are prepared at the minimum of apply level in blooms, case study-I must be submitted before first mid-term examination and case study-II must be submitted before II mid-term examination. Along with these course deliveries tracking, the course file ends with by adding previous question papers, content beyond the syllabus and add-on programs offering in the course, more importantly the assessment sheets are kept at the end of assessment process once after collecting the entire result related to that particular course. The overall implementation of OBE depends on the how effectively the course file is prepared and how efficiently we implemented it.

2. The best practices for effective content delivery through the flipped classroom

As the teachers it is not possible to address each and every student for clarifying their doubts and some students will left alone in lot of doubts ,these issues can overcome by implementing flipped classroom strategy asking the students to follow the video lecture or power point presentations which enables the student to learn the concept with more conceptual understanding. The video lectures can be followed by the students before coming to the class or students can go thru the video lectures who missed the classroom teaching, but the main intension of using flipped class room to before coming to the class students can go thru the video lectures later they are allowed to do only discussion in the class room. The various tools for content delivery thru flipped classroom are

- The Word press free hosting website can be used for creating your own website so as to post the material related to your course and asking the students to go thru the videos or power point presentations and this is not only meant to post the content related to the course we can also conduct the quizzes to assess the each individual student.

- MOODLE (Modular Object-Oriented Dynamic Learning Environment) is a free and open-source software learning management system written in PHP and distributed under the GNU General Public License[4]. developed on pedagogical principles , moodle is used for blended learning, distance education, flipped classroom and other e-learning projects in schools, universities, workplaces and other sectors[5] With customizable management features, it is used to create private websites with online courses for educators and trainers to achieve learning goals[6]. MOODLE allows for extending and tailoring learning environments using community sourced plug ins

3. Open Educational Resources

Open educational resources (OER) are freely accessible, openly licensed documents and media that are useful for teaching, learning, and assessing as well as for research purposes. It is the leading trend in distance education/open and distance learning domain as a consequence of the openness movement. There is no universal usage of open file formats in OER [1]. The idea of open educational resources (OER) has numerous working definitions [2] . The term was firstly coined at UNESCO's 2002 Forum on open courseware and designates "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge [8].OER Initiatives as defined by [9] are Learning content, Tools and Implementation resources.

3.1 The various definitions of OER given by various foundations/bodies

A. The William and Flora Hewlett Foundation

OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge[7].

B. OECD (Organization for Economic Co-operation and Development)

"Digitized materials offered freely and openly for educators, students, and self-learners to use and reuse for teaching, learning, and research. OER includes learning content, software tools to develop, use, and distribute content, and implementation resources such as open licenses"[7].

C. UNESCO

"Teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions" [7].

D. The Cape Town Open Education Declaration

"[O]pen educational resources should be freely shared through open licences which facilitate use, revision, translation, improvement and sharing by anyone. Resources should be published in formats that facilitate both use and editing, and that accommodate a diversity of technical platforms. Whenever possible, they should also be available in formats that are accessible to people with disabilities and people who do not yet have access to the Internet"[7].

E. The Wiki-educator OER Handbook

"The term "Open Educational Resource(s)" (OER) refers to educational resources (lesson plans, quizzes, syllabi, instructional modules, simulations, etc.) that are freely available for use, reuse, adaptation, and sharing"[7].

F. OER Commons

"Open Educational Resources are teaching and learning materials that you may freely use and reuse, without charge. OER often have a creative commons or GNU license that state specifically how the material may be used, reused, adapted, and shared"[7].

3.2 Types of licenses in CC:

The CC licenses all grant the "baseline rights", such as the right to distribute the copyrighted work worldwide for non-commercial purposes, and without modification [3]. The details of each of these licenses depend on the version, and comprise a selection out of four conditions:

Table 2: Creative commons Licenses

Icon	Right	Description
	Attribution(BY)	Licensees may copy, distribute, display and perform the work and make derivative works and remixes based on it only if they give the author or licensor the credits in the manner specified by these.
	Share-alike(SA)	Licensees may distribute derivative works only under a license identical ("not more restrictive") to the license that governs the original work. Without share-alike, derivative works might be sublicensed with compatible but more restrictive license clauses, e.g. CC BY to CC BY - NC.)
	Non-Commercial(NC)	Licensees may copy, distribute, display, and perform the work and make derivative works and remixes based on it only for non-commercial purposes.
	No Derivative Works(ND)	Licensees may copy, distribute, display and perform only verbatim copies of the work, not derivative works and remixes based on it.

4. Open Education Resource: OOP Course using MOODLE

We have created an OER with help of MOODLE on Object Oriented Programming which serves as an effective tool for delivering the content ,this Open Educational Resource Consists of concepts related to the OOP course which includes hand book, power point presentations, videos lectures, assignment and

quizzes kept for unit wise and students need to attend the courseware and has to attend the quiz within the stipulated time and has to submit the assignments from the same OER under student login. The video lectures are created using screencast-o-matic tool.

This OER helps the faculty to upload study materials, assignments, quizzes and it becomes quite easy for faculty to assess the assignment and quizzes. This OER helps the students to learn the concept at any point of time and the submit the quizzes and know his score thru the same OER.

The following is the information about the open educational resource created by us:

4.1 The learning outcomes of created OER

☐ A learner can able to develop the programs using object oriented concepts in C++.

☐ A learner can able to analyze the differences between the Friend function and member function in the implementation of Operator Overloading.

☐ A learner can Identify the techniques to catch the runtime errors and handling them smoothly

☐ A Learner can attempt the quiz and can assess his skills in the OOP Course.

☐ A learner can individually assess his skills under different levels of blooms taxonomy.

4.2 Target Audience

he Audience of this course can be beginners like Students who are pursuing in II Year of their under graduation, undergoing this OOP Course and Job seekers can attempt the quiz to assess their skills and teachers/researchers for the extension of the course if any,

4.3 Tools

The OER is created by using Moodle account of our institution. OER is created under http:://www.moodle.anuragweb.club

4.4 Creative Commons

Attribution-Non-Commercial

CC BY-NC : This license lets others to remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms.

4.5 OER Design Decisions

Our OER which is created on Moodle which immensely benefitting the students as well as faculty for its rich set of available material and questionnaire .It has become very easy for faculty to assess the student skills in that particular course. Especially we had a lot of brainstorming sessions once after OER has been decided what type of materials must be uploaded and what type of questions to consider while preparing the quiz ,and how many questions ,whether to consider blooms levels or not, if we consider the blooms level what would be the performance of the students, what are the student expectations from this OER, we prepared the questions which are quite simple and moderate so as to get the students to get habituated in the usage of OER. Once if the student feels the good experience with OER this tool becomes more effective for content delivery than any other alternatives. As part of this OER we decided to post material related the object oriented Programming course which includes power point presentations ,video lectures, assignments and quiz. The questions are prepared based on different levels of blooms taxonomy so as to make the students to go beyond the curriculum there by improving their applicability skills. This OER based content management and delivery enables the student to transform their thinking levels from the lower order thinking skills to reach higher order thinking skills.
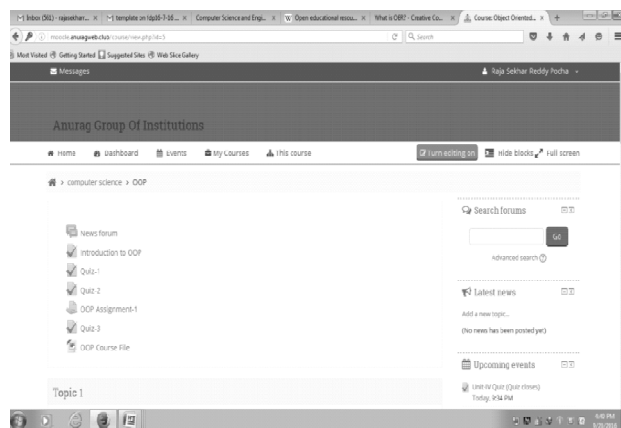
4.6 The Home page of created OER
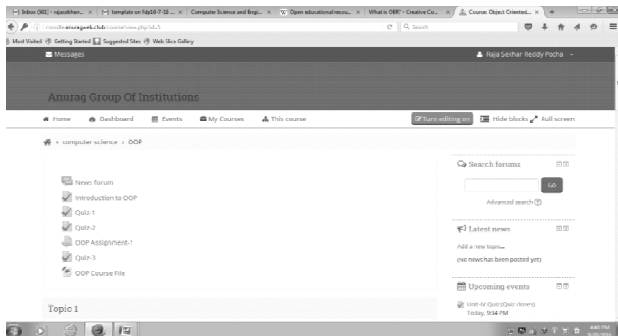

Fig. 1 Snapshot of OOP OER home page

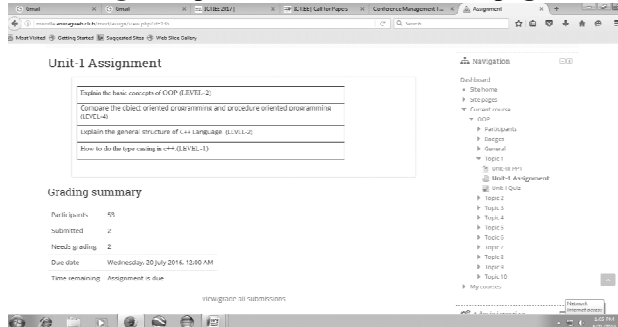**Fig.1 Snapshot of OOP OER home page**

Fig. 2 Snapshot of assignment submission page and grading summary can be seen
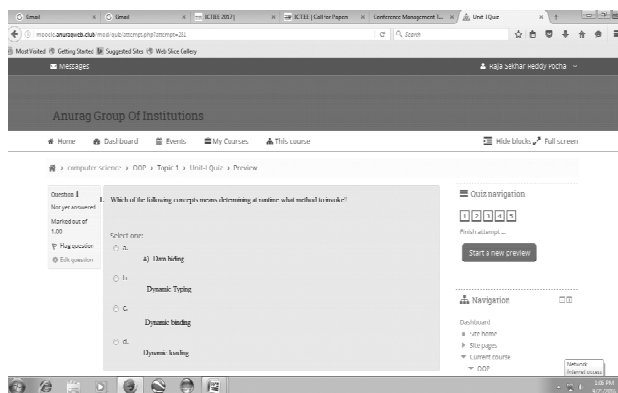

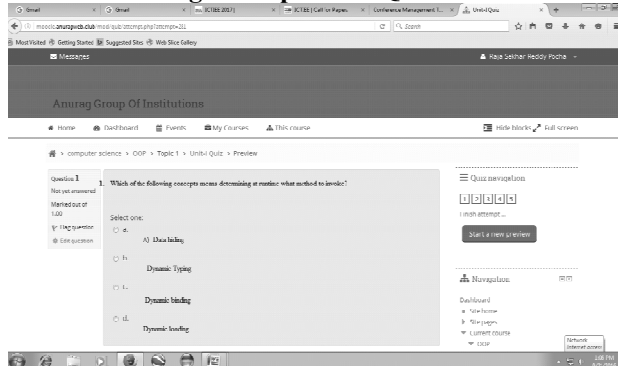**Fig. 3 Snapshot of Quiz test**

Fig. 4 Snapshot of Quiz grading

Presently for II B.Tech I semester students the content related to object oriented programming in the form of handbook, power point presentations, video lectures, assignments and quizzes are available in our OER.

5 Conclusions

Our paper mainly focuses on the tools available freely for effective content delivery and how we as a teachers we are practicing it and expected to meet the better results than ever before, but attainment of the same is postponed to future work as the results of the current course is not in hand readily. The use of OER can also be extended by forming collaborative communities to share ,extend and distribute the work among communities who are working on the same domain or specialization or a course.

Acknowledgement

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