Open Education Resource: Flipping the classroom with MOODLE

Work done as part of AICTE approved FDP on Use of ICT in Education for Online and Blended Learning

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Open Education Resource: Flipping the classroom with MOODLE

About the OER
The open education resource is a collection of MOODLE Lesson activities that are useful as out-of-class activity while flipping the classroom. There are three lessons as part of this OER, and each deals with an aspect related to Concept Maps. Concept mapping is a technique that is useful across domains and can be a useful tool for: Knowledge Integration and Summary.

- OER is downloadable from: [www.et.iitb.ac.in/~jkmadathil/et4et/oer.html](http://www.et.iitb.ac.in/~jkmadathil/et4et/oer.html) (You may also provide your Wordpress page details if that is the webpage used for dissemination of the OER)
- Target Audience: First year Engineering Students (any domain)
- Tags: Flipped Classroom, MOODLE, Concept Map, Educational Technology, Engineering Students
- OER developed in MOODLE 2.3
- This resource is licensed under CC-BY-SA ver 4.0. You are free to use, distribute and modify it, including for commercial purposes, provided you acknowledge the source and share-alike. To see more details about the license visit [http://creativecommons.org/licenses/by-sa/4.0/](http://creativecommons.org/licenses/by-sa/4.0/)

Learning Objectives
After using this OER, learner will be able to:

- Identify the characterizing features of a concept map
- List down the benefits of Concept Mapping – As a learner and as a Teacher
- Explain the theory behind concept mapping
- Familiarize themselves with 2 tools for creating concept maps
Helpful Documentation for Tool Use
[1] for design and development of Lesson Activity in MOODLE (an Open Source Tool)
[2] for use of Jing (a Freemium Tool)
Section 2: Design Decisions

Nature of Decisions taken
The design decisions involved in the creation of this OER were of broadly three types:

1. Content Decisions
2. Pedagogic Decisions
3. Technology Decisions

Content Decisions
The content decisions related to:

a. Earmarking specific segment to be covered – Decided on CMaps – What, Why and How?
b. The research papers/publications and other materials to be provided – IHMC CMap Page, Theory Underlying CMap paper, Theory of Assimilation diagram

Pedagogic Decisions
Typically in a flipped classroom strategy, there are two segments – Out-of-class segment and In-Class segment. The out-of-class segment requires student to refer to some given material (Video, Text etc) and form an understanding about the concepts that are relevant. In terms of concept marking the pedagogic decisions that were taken for the Out-of-class segment related to:

a. Cognitive Levels of Questions to be asked along with the resources – Mostly Recall to Apply level question for out of class and Create Level question for In-class
b. Assessment Strategies – Multiple choice questions for out of class, Team-Pair-Solo strategy for in-class

Technology Decisions
While developing the Out-of-Class and In-class activities, the major technology decisions taken were:

a. Tool to be used for creating screencast – Jing, as it had a time limit of 5 minutes and provided option for creating videos as .swf files that can be directly played from browser.
b. MOODLE Lesson Activity for setting up Out-of-Class segment as it allowed guided self-learning.
Section 3: OER Description

Active OER
For checking the active OER, you may access the Guest Course – “FDP_OER OER 101 – Sample OER’s” in the IDP-ET Moodle (http://www.et.iitb.ac.in/moodle/course/view.php?id=11&section=1).

The guest password required for exploring the activity is: et_guest@123

Lesson Settings
Screenshots 1-3 shows the general settings of a Lesson. This is same for all the lessons. If there are variations, then they are duly noted under each description.

Screenshot 1: General and Appearance setting in MOODLE

Screenshot 2: Prerequisites, Flow of Control and Grading
You can create sequencing of the flow by ensuring that prerequisites for successive lessons. For e.g., “Concept Map – What?” is a prerequisite for “Concept Map – Why?” and “Concept Map – Why?” is a prerequisite for “Concept Map – How?”

You can create sequencing of the flow by ensuring that prerequisites for successive lessons. For e.g., “Concept Map – What?” is a prerequisite for “Concept Map – Why?” and “Concept Map – Why?” is a prerequisite for “Concept Map – How?”

Screenshot 3: Access Restriction and Completion Settings

Once again access restriction settings can ensure that a proper sequence has been followed in the access of lesson (if Prerequisites are not mentioned).
Screenshot 4: Contents of Lesson – “Concept Map – What?”

<table>
<thead>
<tr>
<th>Page title</th>
<th>Page type</th>
<th>Jumps</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is a concept map?</td>
<td>Content</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q1: Characteristics of a concept map</td>
<td>True/false</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q2: Characteristics of a concept map</td>
<td>True/false</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q3: Characteristics of a concept map</td>
<td>True/false</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q4: Characteristics of a concept map</td>
<td>True/false</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q5: Characteristics of a concept map</td>
<td>True/false</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>What are characteristics of a concept map?</td>
<td>Content</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q: Organization of concepts in a concept map</td>
<td>Multichoic</td>
<td>Next page</td>
<td>Add a new page...</td>
</tr>
<tr>
<td>Q: Is this a concept map?</td>
<td>True/false</td>
<td>End of lesson</td>
<td>Add a new page...</td>
</tr>
</tbody>
</table>

Screenshot 5: Setting up Content in the Lesson

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Screenshot 6: Preview of the created content

Watch the video cast above to learn what are concept maps, and what is meant by the technique of concept mapping.

Also available are the slides corresponding to the video.

You can view the video cast and go through the slides as many times as you want.

Here is a concept map of concept-maps, from the IHMC CMap Tool home page.

You can proceed to the self-assessment question on the next page.

If you are unable to watch the video embedded in this page, copy and paste the below link in your browser:


<table>
<thead>
<tr>
<th>Content</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Content 1:</td>
<td>Test your understanding - characteristics of concept maps</td>
<td></td>
</tr>
<tr>
<td>Jump 1:</td>
<td>Next page</td>
<td></td>
</tr>
</tbody>
</table>

Screenshot 7: Creating MCQ and branching instructions inside the lesson

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Screenshot 9: Student view of MCQ

How to use this OER
For using this OER, please ensure that you have admin permission in your MOODLE course (needed for importing activities). Else ask your administrator to restore this backup in your course.

Step 1: Download the set of 3 lessons (OER) from www.et.iitb.ac.in/~jkmadathil/et4et/oer.html

Step 2: Go to the MOODLE course where you want to import this lesson. In the Administration section click “Restore”

Step 3: Drag and drop the three files into the “Files” area and click restore
Step 4: Verify the contents of the restore by going back to the lesson

Step 5: After verifying, post the instructions to your students to complete the lesson activity before the next class using MOODLE forums.

Step 6: Before start of the next class please go and check the reports (see fig below) to see how students performed.
Additionally, if there are some common errors made by students, you may start the face-to-face session with a Peer Instruction question to elicit the misconception and resolve it.

**Best Practices with Lesson Activity**
Here are some of the best practices from our experience on using this Lesson Activity in classroom:

1. Provide this activity at least 1 week in advance.
2. Provide minor incentive (marks) for completion of the activity.
3. Ensure that there is a tangible output at the end of out-of-class activity to ensure learners are interested (E.g. For the lesson “Concept Map – How?” students had to create concept maps for two videos.)
4. It would be good if the screencasts and resources were separately available in a “Resources” folder in the MOODLE course itself. This will take care of common cribs related to “website not available”, “resources not accessible” etc.
Section 4: Evaluating Effectiveness of OER

The OER effectiveness can be assessed at two levels:

1. At the student level
2. At the consumer level

Effectiveness at the student level
Effectiveness at the student level involves metrics related to student access of the resource and student learning.

The Moodle lesson report can be used to evaluate this effectiveness, with the report showing the total number of students who accessed the reports (along with time) and their marks (based on their answers to MCQs). Additionally there is an option for teacher to grade essays and these marks also will be calculated if needed.

Effectiveness at consumer level
OER consumers are typically teachers who want their students to learn concept mapping. Linking a survey on three main constructs – Ease of Use, Concept Coverage and Concept Complexity, can help in identifying the effectiveness of this OER at consumer level. This has to be done as a follow-up activity.

Implementing Survey
Thus every user who downloads this resource will be asked their email address and as a follow up the survey will be send to their email address.

Survey Questions

<table>
<thead>
<tr>
<th>Construct</th>
<th>Question</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of Use</td>
<td>I found it easy to download the Lesson Activity</td>
<td>Strongly Disagree to Strongly Agree (5-point Likert Scale)</td>
</tr>
<tr>
<td></td>
<td>I found the instructions to setup the Lesson Activity useful in setting the activity in my Course</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I was able to successfully create Lesson in my own course</td>
<td></td>
</tr>
<tr>
<td>Concept Coverage</td>
<td>The Lesson covers the required concepts related to concept maps that I need for</td>
<td></td>
</tr>
<tr>
<td>Concept Complexity</td>
<td>The content inside the Lesson is too complex for my students to understand</td>
<td></td>
</tr>
</tbody>
</table>

| my course | |

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### Section 5: Consolidated Log of Team Work

The consolidated log of team work is as shown below:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Team Member</th>
<th>Amount of Time</th>
<th>Additional Logs if any</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion</td>
<td>Team Leader</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool Exploration</td>
<td>Team Leader</td>
<td></td>
<td>Plan uploaded in Wiki</td>
</tr>
<tr>
<td></td>
<td>Team Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OER Creation</td>
<td>Team Leader</td>
<td></td>
<td>Plan uploaded in Wiki</td>
</tr>
<tr>
<td></td>
<td>Team Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OER Documentation</td>
<td>Team Leader</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Reflection (Diary Logging)</td>
<td>Team Leader</td>
<td></td>
<td>Review Comments in Wiki</td>
</tr>
<tr>
<td></td>
<td>Team Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OER Evaluation</td>
<td>Team Leader</td>
<td></td>
<td>Edits made in Wiki</td>
</tr>
<tr>
<td></td>
<td>Team Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team Member 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 6: Building a Community of MOODLE and Flipped Classroom Adopters

Possible Sources for Community Building
Some of the viable sources for building a community are:

- Teachers who are using MOODLE
- Teachers who plan to use Flipped Classroom Strategies

Plans for Community Building
The resource is already available in the webpage and its access requires the users to provide their email id. Thus there will be a list of interested users whom we can follow up using email. All the interested users can then be connected using a local Wordpress or Moodle website.
Works Cited

   https://docs.moodle.org/29/en/Lesson_activity