Problem Based Learning Tool
A plug-in for Moodle

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Outline

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Problem Based Learning

**Definition**

Problem Based Learning (PBL) is a student centric teaching-learning strategy, where students solve a problem or problems in a group to achieve the learning objectives (LO).
Advantages of PBL

- Problem-solving and Research skills
- Social skill
- Motivation
- Implementation in courses [9, 10, 6, 8, 13, 15]
There are twelve steps [5, 7] in PBL.

Figure: Different steps in PBL
Motivation

On-line tool is required?

- Assessment [17]
- Collaboration
- Communication
- Time Consuming

Moodle is not enough?

- No tool available in Moodle
Why Moodle?

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- **Support**: Very active community
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To design and implement a tool, as a plug-in for Moodle to support Problem Based Learning (PBL) courses in more structured and better way than existing LMSs.
Related works

• Some tools developed to support PBL.
  ■ INDIE [16]
  ■ CoMMIT [12]
  ■ PjBL Module [1]

• Limitations:
  ■ Stand alone system
  ■ Does not have support for all the steps
  ■ Collaboration
Moodle Integration

Problem Based Learning Tool

Figure: Integration in Moodle
Moodle Integration

Figure: Integration in Moodle
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Rubric Module

What it is?
Rubric is an assessment tool. Rubrics are generally used to assess quality or quantity of work, behaviour or learning.
Rubric Module

Type of Rubric

- Peer evaluation
- Self evaluation
- Questionnaire
Figure: Rubrics process flow
Figure: Different steps in PBL
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Activity Module Development

Figure: Activity module directory structure
## Activity Module Development

### Rubrics Module

<table>
<thead>
<tr>
<th>File Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>index.php</td>
<td>List all instances of the functionality the module provides in a course.</td>
</tr>
<tr>
<td>lib.php</td>
<td>Contains all the function definitions.</td>
</tr>
<tr>
<td>mod_form.php</td>
<td>Form displayed to add the activity is coded here.</td>
</tr>
<tr>
<td>version.php</td>
<td>Contains the current version number of the module.</td>
</tr>
<tr>
<td>view.php</td>
<td>Homepage of the activity</td>
</tr>
<tr>
<td>icon.gif</td>
<td>Icon of the module</td>
</tr>
<tr>
<td>db/access.php</td>
<td>Capabilities are defined here.</td>
</tr>
<tr>
<td>db/install.xml</td>
<td>Database tables are defined in xml format</td>
</tr>
<tr>
<td>db/update.php</td>
<td>Use to update the database.</td>
</tr>
<tr>
<td>lang/en_ut8/help/rubrics.php</td>
<td>Different abbreviations of the module are stored.</td>
</tr>
<tr>
<td>lang/en_ut8/help/rubrics/index.html</td>
<td>This lists all the help files for the module</td>
</tr>
<tr>
<td>lang/en_ut8/help/rubrics/mods.html</td>
<td>Main functionality of the module described</td>
</tr>
</tbody>
</table>

**Table:** Purpose of different files in an activity module in Moodle
PBL module

Sub activities in PBL

- **Discussion**: Chat, Forum and Wiki activity module of Moodle
- **Submission**: Assignment module of Moodle
- **File Sharing**: File Manager Block For Moodle
PBL module

Sub activities in PBL

- **RLF**: Developed to use within PBL module
- **Solution**: Developed to use within PBL module
- **Rubric**: Activity module of Moodle
PBL module

Sub activities in PBL

• **Report**: Developed to use within PBL module
• **Search**: Uses the global search feature of Moodle
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Conclusion

Summary

- PBL and Rubric activity module
- PBL tool has support for all the steps of problem based learning
- Rubric can be used as a stand alone tool

Future Work

- For usability test some controlled experiment need to be done
- Group creation and facilitator allocation must be done at the module level
Thank You!
Questions ?

http://www.hesa.ac.uk/.

Why Moodle.


Understanding Problem-Based Learning.

Problem-based learning in aerospace engineering education.

Resources, tools, and techniques for problem based learning in computing.


An elearning standard approach for supporting pbl in computer engineering.

Results of a pbl trial in first-year computer science.
Signs of erosion: Reflections on three decades of problem-based learning at maastricht university.  

Supporting collaborative, problem-based learning through information system technology.  

Problem-based learning as an effective tool for teaching computer network design.  

Tools and strategies for improving PBL laboratory courses with a high student-to-Faculty ratio.  

Problem Based Learning in the Software Engineering Classroom.  

Designing Web-Based Interactive Learning Environments for Problem-Based Learning.  

Assessment and evaluation in problem-based learning.  

Using multimedia to enhance problem-based learning in elementary school.