Moodle: Learning Environment
OLAREX project report

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The report described the Moodle platform that is tailored to the purposes of OLAREX project. All learning and communication instruments are explained. The personalize learning environment is presented.
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1 Introduction
The Learning environment is developed in format to ensure the using of the whole perspective of e-learning technology. For this task Moodle – chosen LMS (Learning Management System) was tailored in order to meet specific needs expected out of WP2 “Analysis of existing situation. Conceptual design of educational approach”.

In order to enrich the competency of using ICT for self-learning a personalized learning environment was proposed in frame of the project and designed applying available Moodle open-sources instruments and tools.

Moodle\(^1\) was adjusted:
- to ensure stable operability of remote experiments;
- to offer multilingual environment, that will allow to improve a foreign language on the wish of the students/teachers;
- to use semantic web technologies.

The results of analysis in WP2 are integrated into structure of learning area of OLAREX and moodle functionality.

2 Moodle – Learning Management System

2.1 History
Moodle (Modular Object-Oriented Dynamic Learning Environment) is an open source e-learning software platform, also known as a Course Management System (CMS), Learning Management System (LMS), or Virtual Learning Environment (VLE).

*The pedagogical approach of Moodle includes a constructivist and social constructionist approach to education, emphasizing that learners can contribute to the educational experience.*

The first version of Moodle was released on 20 August 2002. Since there, platform became well known tool for development of e-learning courses in formal education institutions such as university, colleges, schools, and training organization. Moodle was originally developed by Martin Dougiamas for his PhD to help educators create online courses with a focus on interaction and collaborative content. Moreover, Moodle is in continual development and evolution by open network – Moodle community. For now this community involves over one million registered users who share ideas, code, information and free support.

\(^1\) For OLAREX standard core package of the latest official update of Moodle 2.2 on the date of installation was used
2.2 Features
Moodle support typical of an e-learning platform features such as:

- Assignment submission
- Discussion forum
- Files download
- Grading
- Moodle instant messages
- Online calendar
- Online news and announcement (College and course level)
- Online quiz
- Wiki
- SCORM

Additional to these basic features, original innovations like its filtering system present an asset in the characteristic list of the platform. Because of Moodle components the platform can be used in many types of environments such as education, training and development, and business settings.

The functionality of Moodle can be extended by creating new plugins and modules. Moodle's infrastructure supports many types of plugins such as:

- activities (including word and math games)
- resource types
- question types (multiple choice, true and false, fill in the blank, etc)
- data field types (for the database activity)
- graphical themes
- learning environment structure
- social and communication tools
- authentication methods (can require username and password accessibility)
- enrollment methods
- content filters

Many freely-available third-party Moodle plugins are feasible for usage\(^2\).

2.3 Interoperability
Moodle runs without modification on Unix, Linux, FreeBSD, Windows, Mac OS X, NetWare and any other systems that support PHP and a database, including most webhost providers.

Moodle supports MySQL, PostgreSQL and MS SQL 2005 and Oracle databases. Other databases may also work with Moodle.

PHP 5.3.2 and database MySQL 5.0.25 execute in the OLAREX project.

\(^2\) http://moodle.org/plugins/
E-learning systems can have many dimensions of interoperability. Moodle interoperability features include:

- authentication, using LDAP, Shibboleth, or various other standard methods (e.g. IMAP)
- enrolment, using IMS Enterprise among other standard methods, or by direct interaction with an external database
- quizzes and quiz questions, allowing import/export in a number of formats: GIFT (moodle's own format), IMS QTI, XML and XHTML (NB although export works very well, import is currently not complete). Moodle provides various types of questions - Calculated, Description, Essay, Matching, Embedded Answers, Multiple Choice, Short Answer, Numerical, Random Short-Answer Matching, True/False.
- resources, using IMS Content Packaging, SCORM, AICC (CBT), LAMS
- integration with other Content Management Systems such as Drupal, Joomla, and Postnuke (via third-party extensions)
- syndication, using RSS or Atom newsfeeds - external newsfeeds can be displayed in a course, and forums, blogs, and other features can be made available to others as newsfeeds.

Moodle also has features for importing quizzes or entire courses from Blackboard and WebCT. Moreover, some utilities, e.g. Reteach, helps convert Blackboard courses to a Moodle-friendly format.

3 Personal Learning Environment

Personal Learning Environment (PLE) puts the individual learner at the center of process of learning and helps learners to control and manage their own learning activity. This environment allows learners to

- set their own learning goals,
- manage learning: content and process,
- communicate with others in the process of learning.

and through developing environment to achieve learning goals.

The PLE concept includes integration of formal and informal learning sets into a single experience, the use of social networks that can cross institutional boundaries, and the use of networking protocols (Peer-to-Peer, web services, and syndication) to connect a range of resources and systems within a personally-managed space.

Technically, the PLE represents the integration of a number of "Web 2.0" technologies like blogs, Wikis, RSS feeds, Twitter, Facebook, etc.— around the independent learner. The PLE may be described: "... one node in a web of content, connected to other nodes and content creation services used by other students. It becomes, not an institutional or corporate application, but a personal learning center, where content is reused and remixed according to the student's own needs and
interests. It becomes, indeed, not a single application, but a collection of interoperating applications—an environment rather than a system.\(^3\)

![Diagram of Personalised Learning Environment designed by Julie Collareda](image)

**Figure 1:** Personalised Learning Environment designed by Julie Collareda\(^4\)

## 4 OLAREX Learning Environment

Based on preliminary research the consortium decided to build OLAREX learning environment using Moodle. As of December 2011 it had a user base of 72,177 registered and verified sites, serving 57,112,669 users in 5.8 million courses. *All consortium partners* use Moodle for development courses in their institutions. Moreover, for most of the teachers consortium work with, Moodle is still their primary online teaching environment. We used Moodle 2.2 standard package with basic features to install the OLAREX learning environment. All additional modules and plugins for the project function were tailored on the base of Free, Open Source software of modules and plugins. These instruments are presented on the Moodle Plugins Directory.

### 4.1 Basic Features

**4.1.1 Add Resource/Upload a file**

Moodle supports a different resource types that teacher can add to their course. In edit mode, a teacher can add resources via a drop down menu. Resources appear as a single link with an icon in front of it that represents the type of resource. The tool is easy to use, like email attachment or web link in it. This is information transfer but it possible to use in collaborative connotation by collecting students/teachers files through the Forum, WIKI or Assignment, as well over external collaborative tools such as Google Docs, external wikis, and blogs. The follow formats of recourses are available:


\(^4\) http://juliecollareda.wikispaces.com/Creating+your+own+personal+learning+environment

- File – an image, a pdf document, a spreadsheet, a sound file, a video file.
- Folder - folders help organize files and one folder may contain other folders.
- IMS (Instructional Management Systems) content package - static material from other sources in the standard IMS format
- Label - can be a few displayed words or an image used to separate resources and activities in a topic section, or can be a lengthy description or instructions.
- Page - the student sees a single, scrollable screen that a teacher creates with the robust HTML editor.
- URL – use it on any place where students can reach on their web browser. Flickr, Youtube, Wikipedia or this page in Moodle Docs are a few examples.

4.1.2 News Forum / Site news
The News Forum includes in basic feature of the Moodle installation. The News Forum is a special forum for general announcements. This forum is automatically created for each course and for the front page of the Moodle site. It is a standard forum and includes course updates. The teacher can design new forum topic, students can participate in the already open discussion, but they cannot design own new forum topic. The updating news forum on regular basis can establish course rhythm in class. However, the News forum may be removed from a course under the wish of the teacher or course creator.

4.1.3 Discussion Forum
The Discussion Forum uses for many types of learning activities such as class debate, team discussions, report weekly project findings, web quests, role play & feedback, gather resources & reviews, assessment support, weekly student’s magazine, etc. It is easy for applying. Forum has usable default settings.

This tool can be used for different pedagogic approach:

- Communication and interaction - students can communicate with teachers and peers, interact as a class or in groups
- Collaboration and content co-creation - explore topics, discuss them and write together
- Peer Evaluation and review

4.1.4 WIKI
A wiki is a tricky tool for implementing in class environment and needs some experience from teacher and students. Actually, wiki is a set or collection of collaboratively authored web pages. This wiki page everyone in class can create together, right in the browser, without any necessary skills and knowledge in HTML. A wiki starts with one front page. Each author can add other pages to the wiki by simply creating a link to a page that doesn’t exist yet. Usually for communication setting teacher can use it for brainstorming, planning, and collaborative writing, etc. It also can be applied for peer review and evaluation.

The three types of wiki: (a) HTML, (b) Creol, and (c) NWiki, only refer to the way in which the user can provide info on wiki webpage. The style presentation determined by the way in which user wants to use it, how things like links and images to be structured.
Figure 2: OLAREX Learning Environment: WIKI

The “HTML” way is to just use the TinyMCE editor which gives the user full formatting tools available on the Toolbar. You can, via the TinyMCE code, add or subtract toolbars and buttons as suits your individual requirements (Fig.2).

If user would like to provide content into "wiki-like" style then either "NWiki" or "Creole" should be used. It is not big difference between two of them, but "Creole" adds some formatting functionality not available in "NWiki".

4.1.5 Glossary
This tool allows creating and maintaining a list of definitions, and terms such as dictionary or to present info. Only original author can edit an entry. Class can collect reviews, resources, etc. The glossary can be apply as a collaborative tool where students can read, comment, and rate entries made by other students or teachers.

Glossary can be used in many ways. The entries can be searched or browsed in different formats. Entries can be put in categories. The auto-linking feature will highlight any word in the course which is located in the glossary.
4.1.6 Quiz

This tool can be used to assess learning, formative or summative. It is not distribution, but assessment channel and can be used as a self-test instrument. The teacher can design and build quizzes consisting of a large variety of Question types, including multiple choices, true-false and short answer questions. These questions are kept in the Question bank and can be re-used in different quizzes.

Features:

- Feedback about performance and self-assessment on each question or overall. The quiz module can display feedback and scores at different times during the quiz, using the review options in the Quiz settings.
- Quiz Reports - summarize single student’s attempt to answer each question as well perform a robust item analysis of a question’s validity based upon aggregated student responses.
- Single Quiz - automatically select random and/or specific questions from different categories of questions.
- Scoring (marks-grades) - individual questions in a specific quiz, grading attempts for a quiz and each question type.
- Quiz Settings - different display methods; randomize questions for each student and/or randomize answers for each student.
- Determine the number, position of questions; labels with information.
- Question behaviour /Quiz result presentation: (1) no feedback while attempting the test, only later; (2) grades / feedback during the quiz; (3) another chance to answer the question (for fewer marks) having read the feedback.

The OLAREX integrated several different types of questionnaires such as Drag and drop markers, Drag and drop onto image, Select missing words, etc. (Fig.4)

![Image](image_url)

**Figure 4: OLAREX Learning Environment: Quiz**

4.1.7 Lesson

Lesson module is used for branched info and testing. It needs some efforts to set up, because of that the Lesson should be plan first. It is individual activity, not a group activity tool.

The lesson module presents a series of HTML pages to the student who is usually asked to make some sort of choice underneath the content area. The choice will send them to a specific page in the Lesson.

There are 2 basic Lesson page types: question pages and content pages. There are also several advanced navigational pages which can meet more specialized needs of the Teacher. The Lesson module was designed to be adaptive and to use a student’s choices to create a self directed lesson.

The main difference between a Lesson and other activity modules available in Moodle is that each choice, which student makes can show a different teacher response/comment and send the student to a different page in the lesson. Thus with planning, the Lesson module can customize the presentation of content and questions to each student with no further action required by the teacher.
4.1.8 Assignment
Assignment is an easy to use tool. The assignment module allows the teacher to collect work from students, review it and provide feedback including grades. Students can submit any digital content by uploading the files or by creating the content directly in Moodle environment. Moodle supports different file formats such as word-processed documents, spreadsheets, images, audio and video clips.

This instrument is not allow collaboration/team, interactive and communicative work. It is only for individual learning style with grading and deadline.

There are 4 types of assignments:

4.1.8.1 Upload a single file
A student can upload a single file or multiple files, which can be zipped before submitting. After learners upload their files, the instructor will be able to open the submission and using the Moodle interface to assign a grade and provide comments.

4.1.8.2 Advanced uploading of files
This function includes multiple file submission, allowing students to locate a message with their submission and returning a file as feedback.

4.1.8.3 Online Text
The online text assignment by using the Moodle editing tools TinyMCE allows the learner to compose, revise, edit and submit response. Furthermore, with the online assignment, instructors can grade, edit and provide comments within the work online.

4.1.8.4 Offline activity
This tool is usually useful for blended learning setting. This arrangement allows the instructor to communicate the project tasks and expectations online while creating an entry for the project in the Moodle gradebook. The project may be presented to the instructor either at a face-to-face session or online.

If peer assessment activity is necessary the Workshop module can be used. The most features of Workshop are similar to the Assignment module.

4.1.9 Database
With this features teacher and student to build can display and search a bank of record entries about any topic. The format and structure of entries can be almost unlimited, including images, files, URLs, numbers and texts. The database activity has a presets feature and can be imported from other sources to avoid to create a new database from scratch.

The database activity creates and adds to the course with “Add an activity” dropdown list. After creating the database users should define the collecting information: field name and description and field types, and format/templates in which database displays entries.

The field name is what is shown when an entry is added. It must be unique and short. The field description helps identify the field. The field types are follows:
- Checkbox – students can select checkboxes for entries
- Date – students can enter a date by picking a day, month and year from a drop down list
- File – students can upload a file from their computer
- Latitude/longitude – students can enter a geographic location using latitude and longitude using determined by teacher tools such as Google Earth, OpenStreetMap, GeaBios, Mapstars, etc.
- Menu (one /line) – the text entered in the options area will be presented as a drop-down list. Students can choose from this list.
- Menu (multi-select) – the text entered in the options area will be presented as a list. Each line becomes a different option.
- Number – students can enter any number
- Radio buttons – students can choose only one entry using radio buttons
- Text – for providing a text up to 60 characters in length. For longer text, or for text that requires formatting such as headers and bullet points, students should use a text area field
- Text area – for a long text using the text editor
- URL – user can add a link to a website: autolink uses for clickable URL; forced name for the link for creating hyperlink to the text.

4.1.10 Survey
The Survey is a course activity that assesses and stimulates learning in online environments. It allows evaluating teaching and learning processes. The module includes COLLES (Constructivist On-Line Learning Environment Survey) and ATTLS (Attitudes to Thinking and Learning Survey).

The teacher may track the survey results and present the results from the survey in excel or text format.

**Note:** Moodle surveys are not anonymous. While students cannot see each other’s results, teacher can view each student’s survey. There is no way to assure anonymity. Teacher should inform students on this limitation.

4.1.11 Editor (TinyMCE)
In Moodle the HTML text editor or TinyMCE is used. TinyMCE is an open-source platform independent web-based Javascript HTML WYSIWYG editor. The editor uses entering and editing text content online. The editor is presented by icons. These icons and functions are familiar to word processor users. In this case Moodle users do not need special editor training.

A site administrator can enable / disable text editors in Settings > Site administration > Plugins > Text editors > Manage editors. By default the TinyMCE HTML editor and plain text area are enabled.

The Moodle editor has default Google spell engine: spell-checker. Site administrator can change setting in Settings > Site administration > Plugins > Text editors > TinyMCE HTML editor.

![Figure 5: Moodle Editor functions: Row1](Image)
The editor consists from three blocks or three rows.

The first row (Fig. 5) includes:

1. Font dropdown list;
2. Size dropdown list;
3. Heading dropdown list;
4. Undo and Redo functions;
5. Find function;
6. Replace function;
7. Full screen toggle.

The second row (Fig. 6) consists:

2. Text formatting tool;
3. Line format;
4. Colour editing;
5. Paragraph formatting.

![Figure 6: Moodle Editor functions: Row2](image)

The third row (Fig. 7) includes:

3. Number, Bullets and Indents;
2. Link formatting;
3. Insert group;
4. HTML source toggle and Spellchecker.

![Figure 7: Moodle Editor functions: Row3](image)

Insert group consists of:

Insert Image, Insert Multimedia, Insert Equation – DragMath insertion button, Insert Non breaking space, Insert Custom character – Special keyboard characters, Insert Table

In order to create simple equation needs to click on the DragMath insertion button. This opens The DragMath interface (Fig. 8).

The toolbar of DragMath interface is collection of tabs. Each tab is tab is a collection of “templates”, that is each symbol is a “template” and can be dragged and dropped onto the work space. To end editing and insert the script into the Moodle page, the Insert button should be used. This simple interface makes it easy for even novices to create complex mathematic formulas.

It is very helpful tool for OLAREX as a STEM project.
4.2 OLAREX Personal Learning Environment
Contemporary personal learning environment depends from the studying preferences of learner. It includes different instruments, technology and methodology. PLE can consists from formal learning tools such as Learning Management System(s), and informal tools such as social WIKI as collaborative instruments, YouTube as videocasting, and Del.icio.us as social bookmarking, etc.

In frame of OLAREX several instruments integrated.

4.2.1 ePortfolio
In order to provide shere future to personal environment the Olarex team tailored block Exabis E-Portfolio⁶.

It provides ePortfolio functionality for each student and teacher. Students can build up their ePortfolios collecting weblinks, files and notes within individually defined categories, publish ePortfolio-artefacts to specific target-groups using views to get reflections and comments submitted by other persons as well as import uploaded assignments from within the Moodle-installation. The ePortfolio includes following functions:

- personal information,
- management of categories and subcategories,

⁶ developed by GTN GmbH
The personal information page is used to display the main facts of a user. It can be used as CV presentation.

Categories are used to structure ePortfolio artefacts. Categories can be added and maintained by using the categories-tab (Fig.2)

In My Portfolio (Fig.3) users can upload files, link to external websites (i.e. social media resources) or create notes. Links, Files and Notes are associated with categories and sub-categories. Artefacts can be composed to views. These views can be published to other users of the Moodle-installation or into the web.
Views (Fig.4) help assemble artefacts to one page that can be published to a certain target group. Using drag & drop artefacts can be added to a view. Using the access-options the distribution of views can be controlled. A link to an external view is automatically generated when checking the external-access option. Publishing-options have to be unchecked per view to cancel access.

Export/Import is an additional functionality of the module. The user can choose from three different tasks: Export into the SCORM-Format, Import, and Import from Moodle-assignments.

All ePortfolio-artefacts that have been put together using a view can be exported to the SCORM-zip-format. The SCORM file can be opened with other SCORM-editors.

Existing SCORM-packages can be imported using the Import function.

The Import from Moodle-assignments activates when a user has made uploads into. All Moodle-courses that the user is enrolled in are displayed. Documents that are associated with activities can be chosen and imported into the personal ePortfolio with a category association. If user does not have any enrolment to assignment, the alert shows: “At the moment you have no submission at any assignment!”

In Shared Portfolios a list of portfolio-views that have been share to the individual ePortfolio user can be seen.
Collaboration and Communication activity is valuable part of the contemporary learning methods. Collaboration requires individuals working together in a coordinated fashion, towards a common goal. Accomplishing the goal is the primary purpose for bringing the team together. Collaborative software is designed to facilitate action-oriented teams working over geographic distances for communication, collaboration and the process of problem solving. Moreover, collaborative software may support project management functions, such as task assignments, time-managing deadlines, and shared calendars.

The base Moodle features allow to organized collaboration activity, such as discussion and peer review. Peer review can be organized with WIKI, discussion can be setup with new and with discussion forums, and database.

In order to provide more complex support of the target audiences the OLAREX team integrated several additional communication modules.

### 4.3 OLAREX Collaboration and Communication Instruments

<table>
<thead>
<tr>
<th>Information</th>
<th>Categories</th>
<th>My Portfolio</th>
<th>Views</th>
<th>Export/Import</th>
<th>Shared Portfolios</th>
</tr>
</thead>
<tbody>
<tr>
<td>View: Game Based Learning Theory</td>
<td>View Information</td>
<td>Game Based Learning Theory</td>
<td>Here you can find resources to this topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your Items</td>
<td>warning labels for games</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Items</td>
<td>Personal Information, Headline, Text</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharing: External Access and Internal Access: Access for all</td>
<td>External Access, Internal Access: Access for all, Access only for the following users</td>
<td></td>
<td></td>
<td></td>
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</table>

**Figure 11: ePortfolio: Views**
4.3.1 Google and Facebook Authentication plugin

The plugin allows viewing contact list and profile of users, accessing email addresses and signing automatically in Google/Facebook/Moodle through any accounts (Fig.12).

![Image of Google/Facebook Authentication plugin]

**Figure 12: Google/Facebook Authentication plugin**

The plugin works as follow:

1. It displays a Google and Facebook authentication request window. Only email and basic information, such as username, location, first name... are requested from the user. Then user clicks “Allow Access”;
2. User's email does not exist in the Moodle DB: new user account with username is created automatically and user is logged in.
3. User's email exists, and user authentication is set: user is logged in automatically.

4.3.2 BigBlueButton Module

The BigBlueButton is open source software delivering high-quality learning materials, trainings to remote students by educational institution. This instrument supports virtual meeting communication features.

The BigBlueButton Activity Module provides full access to BigBlueButton's capabilities from within Moodle interface:

- Create links for multiple virtual classroom within a course
- Create welcome messages
- Schedule classes in the Moodle Calendar
- Launch BigBlueButton in its own window
- Provide presentation in form of the slides
- Interact with slides by drawing on and modification their in real time
- Record and playback lectures (for this feature the BigBlueButton 0.8 server was installed).

4.4 Connection between Remote Laboratory and Moodle

4.4.1 General overview

The external university - not member of the federation of the Remote laboratories- can access remote experiments through their institutional Moodle LMS using special plug-in. This plug-in was developed by researchers of WebLab-Deusto, University of Deusto.

In working scenario follows roles are established:
1) **Remote laboratory administrator** (e.g. WebLab-Deusto administrator at University of Deusto)

The Administrator can grant the external institution as an end-user, we will call it “INSTITUTION”, with remote VISIR laboratory for access with limit time period, e.g. 3600 seconds.

2) **LabManager administrator** (e.g. LabManager administrator in INSTITUTION)

When LabManager plug-in deployed in INSTITUTION, it has a LabManager administrator, e.g. LabManager administrator in INSTITUTION. The LabManager administrator of the INSTITUTION has an access to WebLab-Deusto at University of Deusto with username e.g. 'institution'. He should also have administration rights in Moodle or other LMS where remote laboratory will be deployed. The administrator has authority to set up Moodle access to the remote experiment, e.g. VISIR of WebLab-Deusto at University of Deusto.

3) **LMS administrator** (e.g. Moodle admin)

As a LMS administrator he can design courses. He can see that the LabManager admin has granted remote laboratory, e.g. VISIR of WebLab-Deusto at University of Deusto. The administrator will allow using defined laboratory in particular course. Some teacher can be granted with LMS administrator role.

4) **Educator**

Teacher /tutor/ educator can upload SCORM objects which will let anyone enrolled in course an access to assigned remote laboratory, e.g. VISIR.

5th) **Student**

Students will see the SCORM object and will use the laboratory.

In case of University the roles "2" and "3" might be assigned to the same person (someone at IT Services). For secondary school "1" and "2" will be assigned to the administrator of the remote laboratory, since the LabManager will be deployed in University of Deusto, and "3" and "4" will be appointed to the representatives of the secondary school.

### 4.4.2 How to integrate remote experiment in the course environment

Assuming that the LabManager is deployed, and it has already registered account in WebLab-Deusto.

Secondary school teacher should follow next steps:

1) The LabManager administrator will provide a special SCORM package for entering in the LabManager.

2) The teacher will upload this package, using SCORM package activity (Fig.13) and run it. Please title this Activity – “LabManager”.
In order to enter to LabManager, user should choose the designed activity over the link, in our case it is LabManager (Fig. 14). The Teacher will access the LabManager as a LMS administrator (see "3rd" in 4.4.1.)
In the LabManager area user should click on the button “Enter” to connect to LMS Manager authorization area (Fig.15), which will bring to external area of Manager of courses and SCORM packages of remote experiments (Fig.16).

Figure 15: LabManager authorization area

Figure 16: LabManager Start page

With button “Add” the Teacher can add own course to the list of exists. “Edit Permission” option allows adding permission to the desired course to use a laboratory (e.g. VISIR) and edit times (in second) and priority of using the remote experiment.

The SCORMs allow downloading available SCORM packages of remote experiments (Fig.17)

Figure 17: List of available SCORM packages of remote experiments
3) The teacher will upload the package to Moodle using SCORM package activity. Any student enrolled in that course will be able to see remote experiment and run it (Fig.18).

![Figure 18: Remote experiment running](image)

If the teacher wants to extend the SCORM object, at this point it should be done manually.