



iQTool - 2007-1967/001-001

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## **Work package WP2 Research**

### **Report on Open Source LMS Research**

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## 1. Executive Summary

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The iQTool project develops innovative content and a software tool to support quality of vocational training and eLearning. In order to meet this goal, several quality assurance systems had to be identified and their applicability to the institutions dealing with eLearning had to be studied. Moreover, in order to ensure the fulfilment of the project's aim, research work had to be done in order to develop a quality assurance methodology that will be further used in order to develop appropriate training material for the project's target groups. iQTool will develop a software tool for the evaluation of the training materials in LMS according to the quality assurance methodology. The software tool to be developed will be integrated with an appropriate open source LMS and should be general enough and appropriately designed so that it could be integrated with other LMS in the future. The identification of an appropriate open source LMS to be used in iQTool implied the need to identify all possible candidates and evaluate them in order to select the most appropriate one. The software will offer the possibility to store answers related to the quality of training materials and will offer to developers and teachers an opportunity to display statistically the results to help to evaluate them.

This report documents the results of the research work on the evaluation of open source e-learning platforms and the selection of an appropriate open source LMS to be integrated with the software tool to be developed in WP3. This contains first of all the identification of related resources and links to candidate open source LMS, and the establishment of the evaluation criteria system and the determination of indicators. According to the criteria system, the evaluation was made and considered internationally and commonly used open-source LMSs. The evaluation resulted in the suggestion for using the ILIAS open source LMS in the project. The evaluation was carried out by the members of the participating team based on a plan developed in advance.

The work reported in this document was carried out in the context of the following tasks of work package WP2:

- Task 2.1 “Research Plan” of iQTool work package WP2 “Research”. Among the activities of this preparatory task was the specification of the baseline for the research on open source LMS. The research plan contained links to resources (projects, surveys, open source LMS) that were identified and further used during the rest of the tasks of WP2. TUC/MUSIC and SZTAKI specified the research plan with respect to open source LMS, which is presented in section 3.
- Task 2.2 “Work out criteria system”. Among the activities of this task was the definition of a criteria system and the corresponding evaluation methodology used for the evaluation of open source LMSs in order to facilitate the selection of the most appropriate one for the needs of the iQTool project. The LMS to be selected will be extended with the software tool to be developed in WP3 that



will be used for quality assurance in eLearning. The evaluation methodology developed is presented in section 4.

- Task 2.3 “Research: Open source platforms”. This task implemented the evaluation methodology for the evaluation of open source LMSs that was developed in task 2.2 and produced detailed evaluation forms for the LMSs identified in the corresponding research plan of task 2.1. The results of the evaluation are presented in subsection 5.
- Task 2.5 “Evaluation of the results”. Exploiting the evaluation results for open source LMSs of task 2.3, this task provided suggestions for the selection of the most appropriate LMSs with respect to the aims of iQTool project. These suggestions mainly refer to WP3 that will develop the iQTool software tool and are presented in section 6.

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## 2.Introduction

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### 2.1 Objective and Scope

This document presents the results of the research activities that took place in work package WP2 of the iQTool project with respect to the evaluation of open source LMSs and the selection of the appropriate one to be used in the iQTool project activities. The work reported here is directly related to the following tasks of work package WP2:

- **Task 2.1 Research plan (Task leader: TUC/MUSIC).** This task developed the research plan of the work-package containing links to resources (projects, surveys, open source LMS) to be used during the surveys. TUC/MUSIC and SZTAKI specified the research plan with respect to open source LMS.
- **Task 2.2 Work out criteria system (Task leader: TISIP).** This task defined the criteria system for the evaluation of open source LMS as well as for the quality assurance models and methodologies including the specification of the questionnaire to be used for acquiring information from the target groups regarding the usage of quality assurance approaches and the awareness and acceptance/efficiency of such approaches. Appropriate forms were specified for uniform reporting of the evaluation results. TUC/MUSIC and SZTAKI specified the criteria system and the review forms with respect to open source LMS.
- **Task 2.3 Research: Open source platforms (Task leader: SZTAKI).** This task surveyed available open source LMS based on the research plan of Task 2.1 and the criteria system of Task 2.2. For each system, the survey was based on material that is publicly available as well as on direct evaluation of the systems. The survey was made by TUC/MUSIC and SZTAKI by filling the review forms specified in Task 2.2 containing appropriate criteria.
- **Task 2.5 Evaluation the results (Task leader: CENFIM).** This task evaluated the results of the research undertaken in Tasks 2.3 and 2.4 with the purpose to analyse them from the perspective of the needs of the project and provide suggestions to WP3 and WP4. TUC/MUSIC and SZTAKI analysed the results of the research made for open source LMS providing suggestions for the selection of the most appropriate one to be used in the context of WP3.
- **Task 2.6 Research reports (Task leader: TUC/MUSIC).** This task integrated the results of the research and evaluation made in Tasks 2.3, 2.4, and 2.5 in the form of the final work-package report providing also suggestions for WP3 and WP4. All partners contributed to the report according to their responsibilities and contributions in tasks 2.1, 2.2, 2.3, 2.4 and 2.5. TUC/MUSIC was responsible for the report as whole and for the part of the report that refers to open source LMSs



- **Task 2.7 Project workshop (Task leader: TUC/MUSIC).** The workshop was held in Chania, Greece, 12-13 June 2008. It was organized by TUC/MUSIC. All partners participated in the meeting were the major results of the research activities were presented and evaluated.

## 2.2 Structure of the document

The structure of the rest of this document is as follows: Section 3 presents the research plan produced in the first stage of the project in order to identify all relevant resources for the research on open source LMS. Section 4 presents the evaluation methodology used along with the corresponding criteria system. Section 5 presents the evaluation results and, finally, section 6 presents the final suggestions for the project.

### 3. Identification of related projects, surveys and open source LMSs

At the very beginning of the iQTool project, the technical partners of the project (TUC/MUSIC and MTA-SZTAKI) developed a research plan in order to identify sources for the evaluation of open source LMSs and production of a list of open source LMS that will be taken into account in the evaluation activities. The sources were related projects and surveys that contain evaluation of open sources LMS in that facilitated the specification of the evaluation criteria and the evaluation methodology. These resources were the starting point for the study made in task 2.3 “Research: Open source platforms”. They were also used during the activities of task 2.5 “Evaluation of the results” in order to suggest an appropriate LMS.

#### 3.1 Related projects identified

The tables below contain references to projects that have been identified and used as sources of material related with the research on open source LMSs.

<b>Project name</b>	<b>Chiron - Innovative Technologies and Solutions for Ubiquitous Learning (CHIRON) FR/04/C/F/RF-81103 Leonardo da Vinci project 2004-2006</b>
<b>Project url</b>	<a href="http://semioweb.msh-paris.fr/chiron/">http://semioweb.msh-paris.fr/chiron/</a>
<b>Project description</b>	The objective of the program is to prepare reference studies that analyse the results of research and pilot activities related to eLearning solutions integrating web, digital TV and mobile technology. The ubiquitous learning activities deal with materialization of personalized life-long learning on-demand for all, anywhere, anytime.

<b>Project name</b>	<b>LMS - Open source</b>
<b>Project url</b>	<a href="http://www.nshu.se/english/page/4610/lmsopensource.htm">http://www.nshu.se/english/page/4610/lmsopensource.htm</a>
<b>Project description</b>	Project of Uppsala Learning Lab from 2004 to 2005 financed by Swedish Netuniversity. A survey was done of the existing open source systems and systems developed within the Swedish university system. A compilation of significant international initiatives as for example, SAKAI and other projects financed by the EU, was also be done. The project presented suggestions for coordination of the Swedish resources and, possibly, a joint national development and administration project. The project also coordinates the exchange of experience between the seats of learning that are interested in discussing the specification of requirements for LMS systems as well as discussions regarding coordination of resources.





<b>Project name</b>	<b>New Zealand Open Source VLE Project</b>
<b>Project url</b>	<a href="http://eduforge.org/projects/nzvla">http://eduforge.org/projects/nzvla</a>
<b>Project description</b>	Developing FOSS e-learning application software - now with a specific focus on Moodle, Fez/Fedora and the Mahara ePortfolio development. OSVLE –II continues the direction of the NZOSVLE project. ‘Code mobility’ via open source communities holds great promise for an economically sustainable ICT investment pathway for NZ education. Interoperability standards and the modular, extendible architecture of the open source framework holds the promise of delivering the desired flexibility and ensuring greater future proofing in a technology environment that is fast evolving.

<b>Project name</b>	<b>Evaluation and Adaptation of OSS for Distance learning in Asia</b> <b>PAN DORA: Pan Asia Network Distance and Open Resource Access project</b>
<b>Project url</b>	<a href="http://www.pandora-asia.org/panprojects.php?main=panprojects_3.htm">http://www.pandora-asia.org/panprojects.php?main=panprojects_3.htm</a>
<b>Project description</b>	The objectives of this project are to evaluate existing distance learning (DL) software, both commercial and open source (OS), and to identify suitable software that can be customized to meet specific needs of educational institutions in Asian region. The customization would include individual institutional requirements of the system, as well as language localization, of the partner countries involved in the project (i.e. Mongolia, Sri Lanka and Vietnam).

<b>Project name</b>	<b>QUIS – Quality, Interoperability and Standards in e-learning</b>
<b>Project url</b>	<a href="http://www2.tisip.no/quis/index.php">http://www2.tisip.no/quis/index.php</a>
<b>Project description</b>	<p>The activities in the QUIS project were directed towards QUality in e-learning, Interoperability and reusability of e-learning material and development of Standards. The project also looked at cost effectiveness in e-learning.</p> <p>In the context of this project an analysis of commercial and experimental eLearning systems was made.</p>

### 3.2 Related surveys identified

The tables below contain information about surveys, reports and papers that have been identified as relevant to the research on open source LMSs.

<b>Document title</b>	<b>An Epic White Paper: Open Source Learning Management Systems</b>
<b>Document url</b>	<a href="http://www.epic.co.uk/content/news/oct_07/whitepaper.pdf">http://www.epic.co.uk/content/news/oct_07/whitepaper.pdf</a>
<b>Document description</b>	They select 13 Open Source LMSs after filtering, analyse five key markets (Large enterprise, SME, government and public sector, primary and secondary education, rapid roll out) and propose the open source LMS best suited to each. The white paper was published in 2007 and is freely available on the Web. They found Atutor, DotLRN, Ilias, Moodle and Sakai to be the most successful.

<b>Document title</b>	<b>Edutech - Evaluation of Open Source Learning Management Systems – 2005</b>
<b>Document url</b>	<a href="http://edutech.ch/lms/ev3/">http://edutech.ch/lms/ev3/</a>
<b>Document description</b>	Edutech is a mandate of the Swiss Virtual Campus programme, hosted at Centre NTE, University of Fribourg. They prepared a report on the quality of current open source (OS) e-learning management systems (LMS) or course management systems (CMS) in 2005. About 40 open source LMS products were considered but detailed evaluation was done only for six products (ATutor, Claroline, dotLRN, Ilias, Moodle, OLAT) which fulfilled their criteria. The report is freely available on the Web.

<b>Document title</b>	<b>COL LMS Open Source</b>
<b>Document url</b>	<a href="http://www.col.org/colweb/webdav/site/myjahiasite/shared/docs/03LMSOpenSource.pdf">http://www.col.org/colweb/webdav/site/myjahiasite/shared/docs/03LMSOpenSource.pdf</a>
<b>Document description</b>	The Commonwealth of Learning from 3waynet Inc. conducted a survey to evaluate the Open Source Learning Management System Software in 2003. Their objectives were to identify criteria which will be useful in evaluating open source LMS, to assess candidate LMS using the criteria and to recommend an LMS for installation and use by COL. About 35 open source LMS products were considered but the evaluation was done



only for five products (ATutor, dotLRN, ILIAS, LON-CAPA and Moodle). Their top two recommendations were ATutor and ILIAS. The findings can be freely downloaded in a pdf document.

<b>Document title</b>	<b>Learning Management Systems for the Rest of Us</b>
<b>Document url</b>	<a href="http://odtl.dcu.ie/projects/web-tl/vle/CUE-LMS-White-Paper.pdf">http://odtl.dcu.ie/projects/web-tl/vle/CUE-LMS-White-Paper.pdf</a>
<b>Document description</b>	Corporate University Enterprise, Inc. created a white paper on the assessment of open source learning management systems in 2003. They examined five systems, namely Claroline, Ganesha, Ilias, Moodle, The Manhattan Virtual Classroom.

<b>Document title</b>	<b>An Evaluation of Open Source E-Learning Platforms Stressing Adaptation Issues</b>
<b>Document url</b>	<a href="http://www.campussource.de/aktuelles/docs/icalt2005.pdf">http://www.campussource.de/aktuelles/docs/icalt2005.pdf</a>
<b>Document description</b>	ICALT 2005 paper by Sabine Graf and Beate List from Vienna University of Technology. Nine LMS is compared ATutor 1.4.11, Dokeos 1.5.5, dotLRN 2.0.3, based on OpenACS 5.1.0, ILIAS 3.2.4, LON-CAPA 1.1.3, Moodle 1.4.1, OpenUSS 1.4 extended with Freestyle Learning 3.2, Sakai 1.0, and Spaghettilearning 1.1.

<b>Document title</b>	<b>An Evaluation of Open Source Learning Management Systems According to Learners Tools</b>
<b>Document url</b>	<a href="http://www.formatex.org/micte2006/Downloadable-files/oral/An%20Evaluation%20of%20Open%20Source.pdf">http://www.formatex.org/micte2006/Downloadable-files/oral/An%20Evaluation%20of%20Open%20Source.pdf</a>
<b>Document description</b>	Research report created by Hüseyin Uzunboylu, Fezile Özdamlı and Zehra Özçınar from Near East University and Atatürk Teacher Training Academy, Nicosia, Cyprus was published on m-ICTE2006 Conference in 2006. The aim of the research is to evaluate the current existing Open Source Learning Management Systems in the market. For this, seventy two Open Source Learning Management Systems have been subjected to a general evaluation. After that, among them the eight, most demanded software, were chosen: Atutor, Bazaar, Bodington, Claroline, Coursemanager, ILIAS, Moodle and Sakai. Those software chosen were investigated in detail according to



features of the Communication Tools, Productivity Tools, Student Involvement Tools, respectively. Software have been evaluated by being members of websites, using demo programs and in accordance to the features of given at the internet website.

<b>Document title</b>	<b>Rating the Importance of Different LMS Functionalities</b>
<b>Document url</b>	<a href="http://fie.engrng.pitt.edu/fie2006/papers/1602.pdf">http://fie.engrng.pitt.edu/fie2006/papers/1602.pdf</a>
<b>Document description</b>	<p>This paper evaluates and compares the importance of different LMS functionalities and analyses the effect on students' learning. Some results are taken from a study with more than 180 students in the context of an Operating Systems laboratory.</p> <p>This study can be used for several applications such as: evaluation of different LMSs, supporting teachers to select more relevant and effective functionalities, as well as to understand the effect on the student learning of some functionalities and deriving some guidelines about a specific e-learning methodology.</p>

<b>Document title</b>	<b>Model Driven LMS Platform Integration</b>
<b>Document url</b>	<p><a href="http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4215246">http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4215246</a></p> <p>Another version of this document is available at: <a href="http://ftp.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-288/p02.pdf">http://ftp.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-288/p02.pdf</a></p>
<b>Document description</b>	<p>This paper proposes a common platform independent framework that can be used to specify and classify existing or future Learning management systems (LMS) and possibility of their cooperation. The proposed framework is based on OMG's Model Driven Architecture.</p>

<b>Document title</b>	<b>Learning or Management System? A Review of Learning Management System Reviews</b>
<b>Document url</b>	<a href="http://lrc.umanitoba.ca/wordpress/wp-content/uploads/2006/10/learning-or-management-system-with-reference-list.doc">http://lrc.umanitoba.ca/wordpress/wp-content/uploads/2006/10/learning-or-management-system-with-reference-list.doc</a>



<b>Document description</b>	This report covers the typical decision-making criteria utilized by various organizations in selecting an enterprise LMS—most often with the intention of settling on a single, system-wide platform.
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<b>Document title</b>	<b>Learning or Management System? A Review of Learning Management System Reviews</b>
<b>Document url</b>	<a href="http://www.educause.edu/ir/library/pdf/ERB0314.pdf">http://www.educause.edu/ir/library/pdf/ERB0314.pdf</a>
<b>Document description</b>	This document described an evaluative framework for an analysis of course management technology requirements. Rather than starting with lists of features, the framework begins with the processes that course management technology supports. It takes the views of both students and faculty into account.

<b>Document title</b>	<b>Evaluation of Learning Management System software</b>
<b>Document url</b>	<a href="http://eduforge.org/docman/view.php/7/17/Evaluation%20of%20LMS%20-%20Part%20II.pdf">http://eduforge.org/docman/view.php/7/17/Evaluation%20of%20LMS%20-%20Part%20II.pdf</a>
<b>Document description</b>	This document describes the findings of an initial evaluation of Open Source Learning Management System software. It forms part of an evaluation methodology to select the core LMS as part of an overall platform architecture.

### 3.3 Links to open source LMS

Various sites and documents exist that contain links to existing open source LMSs. The most up to date sites identified in the research plan are the following:

- The edutools site ([www.edutools.info](http://www.edutools.info)) provides independent reviews, side-by-side comparisons, and consulting services to assist decision-making in the e-learning community for more than 60 Learning Content Management systems including Learning Management Systems.
- The courseware tools section in the UNESCO Free and Open Source Software Portal contains a list of more than 60 open source courseware tools including Learning Management Systems. It is accessible at [http://www.unesco.org/cgi-bin/webworld/portal\\_freesoftware/cgi/page.cgi?g=Software%2FCourseware\\_Tools%2Findex.shtml;d=1](http://www.unesco.org/cgi-bin/webworld/portal_freesoftware/cgi/page.cgi?g=Software%2FCourseware_Tools%2Findex.shtml;d=1)



- On the page of EduTech, links to about 40 open source LMS can be found: [http://edutech.ch/lms/ev3/opensource\\_lms\\_longlist.php](http://edutech.ch/lms/ev3/opensource_lms_longlist.php)
- The appendix of COL LMS Open Source report contains link and synopsis of 35 open source LMS. Available at <http://www.col.org/colweb/webdav/site/myjahiasite/shared/docs/03LMSOpenSource.pdf>
- The appendix of Epic White Paper: Open Source Learning Management Systems comprises open source LMSs that are under active development and have released stable, English language versions. It contains 50 items. Available at: [http://www.epic.co.uk/content/news/oct\\_07/whitepaper.pdf](http://www.epic.co.uk/content/news/oct_07/whitepaper.pdf)

Using the above resources, the following list of links to most important open source LMS was assembled:

- Fle3 1.5.0 - <http://fle3.uiah.fi/>
- eFront 3.1.2 - <http://www.efrontlearning.net/>
- Ilias 3.9.1 - <http://www.ilias.de/>
- Moodle 1.8.4 - <http://moodle.org/>
- ATutor 1.5.5 - <http://www.atutor.ca/>
- Sakai 2.4.1 - <http://www.sakaiproject.org/>
- dotLRN 2.3.1 - <http://dotlrn.openacs.org/>
- Claroline 1.8.8 - <http://www.claroline.net/>
- OLAT Online Learning And Training 5.2.3 - <http://www.olat.org/>
- LON-CAPA 2.6.2 - <http://www.lon-capa.org/>
- KEWL.NextGen 1.3.0 - <http://kngforge.uwc.ac.za/>
- Docebo 3.5.0.3 - <http://www.docebo.org/>
- Dokeos 1.8.4 - <http://www.dokeos.com/>
- Interact 2.4.1 - <http://www.interactole.org/>
- Metacoön 1.9.5 - <http://www.metacoön.de/>
- OpenElms 5.0 - <http://www.openelms.org/>
- Bodington 2.8.0 - <http://bodington.org/>



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The evaluation activities that followed used the above list of identified open source LMS as a baseline.

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## 4. Criteria system and evaluation methodology

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The objective of the criteria system is to facilitate the evaluation of available open source LMS in order to be able to select the most appropriate one for the needs of the iQTool project. In order to meet these needs, we should be able to identify the most important open source LMS and proceed with a more detailed evaluation of each one of them in order to propose the one(s) that suit the best the needs of the project.

The evaluation methodology adopted consists of two phases:

- Phase 1: First level evaluation to specify a short list of LMSs to be further evaluated in detail.
- Phase 2: Detailed evaluation of the LMS identified in Phase 1 in order to rank them and propose candidates to be selected in iQTool.

Each evaluation phase used certain evaluation criteria:

1. A group of mandatory criteria have been used in Phase 1 in order to produce the short list of open source LMSs. These criteria reflect the necessary features of the LMS to be selected and are presented in section 3.2.1 below along with the corresponding review form that was used.
2. A group of evaluation criteria have been used in Phase 2 in order to be able to rank the open source LMSs that will were included in the short list. These criteria are presented in subsection 3.2.2 below below along with the corresponding review form that was used.

The list of LMSs evaluated was identified during the research plan specification and is given at the end of subsection 3.1.3 above.

### 4.1 Mandatory criteria for Phase 1 of the evaluation and corresponding review form

The following criteria were used in order to filter the list of available open source LMS and produce a short list of those ones that will be further evaluated in Phase 2:

1. Active Development Community
2. Existence of Stable Versions
3. Support English Language (at least)
4. SCORM compliance
5. Support Learning Objects as Minimum Granularity of Learning Content
6. Support Core LMS Functionality





- a. Manage users, roles, courses (including student enrolment), instructors, and facilities and generate reports
  - b. Assessment/testing
  - c. Display scores
  - d. Web-based course delivery
7. Availability of Information about their User Base
8. Existence of Organization to Support Further Development
9. Availability of Third Party Reviews
10. Check whether the sw license is an OSI (Open Source Initiative - <http://www.opensource.org>) approved license or, if they use a different license, ensure that it allows modifications and derived works.

The reasons behind the selection of the above criteria is that they could be evaluated quickly and give a yes/no answer. Moreover they are directly related to the needs of the iQTool project.

Using these criteria we were able to evaluate quickly each candidate open source LMS and eliminate non-viable candidates resulting in a short list of candidates that were then evaluated in detail in Phase 2.

The above criteria are considered as Boolean and each candidate failing to satisfy all of them was not be considered in the short list. The corresponding review form used is given next:

General Information about the LMS	
LMS Name	
Supporting Organization	
URL	
Forums	
Review Info	
Reviewer Name and Organization	
Review Date	
Review criteria	
Active Development Community	<i>YES or NO</i>



Existence of Stable Versions	<i>YES or NO</i>
Support English Language (at least)	<i>YES or NO</i>
SCORM compliance	<i>YES or NO</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES or NO</i>
Support Core LMS Functionality	<i>YES or NO</i>
Availability of Information about their User Base	<i>YES or NO</i>
Existence of Organization to Support Further Development	<i>YES or NO</i>
Availability of Third Party Reviews	<i>YES or NO</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES or NO</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>YES or NO</i>

## **4.2 Evaluation criteria for Phase 2 of the evaluation and corresponding review form**

The following subsections describe the proposed evaluation criteria used in Phase 2 of the evaluation. Background information is given to justify the importance of each criterion as well as how it was measured. Each candidate LMS got a relative score for each criterion using the approach described in each criterion below. The score was a real number from 0 to 10. The final evaluation rank was computed as a weighted average (see section 3.3 for the actual evaluations).

### **4.2.1 Community**

***Weight of this criterion to compute the total rank: 15%.***

#### *General description*

Proprietary vendors use financial resources to ensure extensive testing and quality assurance. On the contrary, open source projects are exploiting the community of users and developers in order to ensure proper testing and quality feedback. This is



why the community behind an open source project is considered as a very significant resource. The more people are interested in a project, the more likely it is that it will be active and keep going. A large and active community is also a clear indication about the acceptance of the software because if the software was not good enough to use, there would not be so many people who cared about its development.

### *Measurement*

The community is mostly visible in terms of:

- Posts: Number of posts per period, number of topics.
- Users: Number of users, and the user/developer ratio in terms of the number of people and number of posts. If only users post, the developers are not as involved as they should be.
- Response time: If and how soon user questions are answered.
- Quality: The quality of posts and replies. Are questions answered to the point, are the answers very short or more elaborate? Is there much discussion about changes and feature additions?
- Friendliness: How friendly the community is towards each other, especially to newcomers. The community should have an open feel to it, encouraging people to participate.

The depth of conversations, as mentioned in the fourth item, gives a good impression of how involved the community is with the ongoing development of the project. Much discussion about the software, in a friendly and constructive manner, encourages the developers to enhance the software further.

The community activity is also reflected in other areas such as support and documentation, but these are measured in other criteria.

### **4.2.2 Release activity**

***Weight of this criterion to compute the total rank: 10%.***

#### *General description*

The number of releases per period and their significance is an important indication of how seriously the developers are working in the project. The significance of releases refers to how large the changes are per release (e.g. if there are feature additions or just bug fixes in the release) and illustrates the progress made by the developers. Open source repositories exist where projects can share files with the public, provide information on activity that could be useful to evaluate the release activity.

Two major types of releases exist:



- Stable releases: These are releases that can be used by actual users for production purposes. These versions are the most important ones for the end user and have minimal risk of failure.
- Development releases: These releases are not intended for end users and are used “at the risk of the user” because there is a higher probability of failure. Various types of such releases exist such as “beta”, “daily builds” or CVS (Concurrent Version System) versions, each more up to date with the latest changes.

Each new release is usually accompanied with release notes along with the download that list all the changes made in the software since the previous release. Other than the release notes, the project might also have a roadmap, which usually shows what goals the developers have, how much of these goals are completed, and when the deadline or estimated delivery date is for each goal.

As a project goes on, it usually gets more stable and the frequency/importance of releases gets lower. However, no project should be completely static: It is important that it is maintained and will remain maintained in the future, so the release activity gives a good indication of the maintenance of the project.

#### *Measurement*

Release activity reflects the development progress. This is measured using the release frequency and significance per release. Find the project’s change logs to check:

- The number of releases made per period of time. Most projects will make several releases in a year, sometimes once or twice a month. A year is usually a good period to count the releases.
- The significance of each release. The change log or release notes explain what has changed in the release. These descriptions are sometimes very elaborate, where every little detail is described, and sometimes very short, where just large changes are listed. A good distinction to make is whether the release only contains bug fixes or also contains enhancements to features or completely new features.

The project might also have a public roadmap. Check if any deadlines have expired. Compare the roadmap to the progress of the project to see if they keep to it. If the project is listed on SourceForge and/or FreshMeat, some of the release activity information is available there.

#### **4.2.3 Life span**

***Weight of this criterion to compute the total rank: 10%.***

#### *General description*

The life span refers to the time that the LMS is available for use. This criterion is important because it gives an indication of the stability and the potential of an LMS.



A young LMS usually has a lot of bugs and it is unstable. Older LMSs have lower probability that the developers will suddenly stop contributing to the evolution of the system. However, age is not always a guarantee of the chance of survival. First of all, very old software may be stuck on old technologies and methods, from which the only escape is to completely start over. Some software has already successfully gone through such a cycle, which is a good sign in terms of maturity.

The age and release activity level of an LMS are often related. Young projects often have a higher activity level than older ones, because once a project has stabilized and is satisfactory to most users, the discussions are less frequent and releases are smaller, containing mostly bug and security fixes. This doesn't mean that the activity should ever be slim to none because no project is ever static.

### *Measurement*

Life span is a measurement of a project's stability. It is checked using:

- The age of the product: The date of the first release.
- The version number: A 0.x number usually means the developers do not think the software complete or ready for production use at this time.
- If the project is very old it is worthwhile to check if it has gone through a cycle of redesign, or it is currently having problems with new technology.

Keep in mind that the version number doesn't always tell the whole story. Some projects might go from 1.0 to 2.0 with the same amount of change that another project has to go from 1.0 to 1.1. The fast progression of the version number might be used to create a false sense of progress. Other software products are still in a 0.x version, even after a long time, and after they are proved suitable for production use.

## **4.2.4 Support**

***Weight of this criterion to compute the total rank: 5%.***

### *General description*

This is a very important criterion for any software product. There are two types of support:

- Usage support: It refers to providing support to the product users regarding the use of the software.
- Maintenance: It refers to solving of problems in the software.

The way support is handled is a measure of how seriously the developers work on the software. One way to check this is to see if there is a separate bug tracker for the software, and how actively it is being used by both the developers and the users. When the developers use it but hardly any users seem to participate, the users may not be pointed in the right direction to report problems.



Aside from community support, larger or more popular projects may have paid support options. The software is free to use, but the user has the option to get professional support for a fee, either on a service agreement basis where a subscription fee is paid for a certain period of time, or a per incident fee for each time the user calls on support. There are companies that offer specialized support for certain open source software. This is called third party support. The fact that paid support exists for an open source product, especially third party support, is a sign of maturity and a sign the product is taken seriously.

### *Measurement*

Support for Open Source software is in most cases handled by the community. Mature products often have paid support options as well if more help or the security of a support contract is required. Check what type of support is offered and at what level:

- Community support: The usage support is usually found in the community. Do they have a separate forum or group for asking usage related questions? How active is this forum? Are developers participating? Are questions answered adequately? The way the community is organized influences the community support's effectiveness. A large project should have multiple areas for each part of the project, but the areas should not be spread too thin. Failure support within the project is often handled by a bug tracker where problems are reported and tracked. Check how many of the developers are involved in this.
- Paid support: Paid support might be available from the project team itself. Check the details and see if there are any people who have given their opinion about the quality of this support. Check if any third party support is available and if the form of support they offer is useful. Some companies offer service contracts, others offer only phone support on a per-incident basis. Check for paid support options whether they will be used or not. How the situation may be during actual use of the software is not always clear and it can give a better impression of the maturity of the software.

### **4.2.5 Documentation**

***Weight of this criterion to compute the total rank: 10%.***

#### *General description*

There are three main types of documentation:

- User documentation: Refers to the existence of documents that describe how to use the system. There can be different levels in the user documentation corresponding to different user levels and rights (e.g. administrators). Additionally, there can be various user-contributed tutorials and How-Tos, available on the project's website or elsewhere.
- Developer documentation: This is very important for an open source project. It is also important with respect to the iQTool needs (extensions to be made in



the selected LMS). The developer documentation concerns separate documents on how to add or change the code, as well as documentation within the source code, by way of comments. The comments usually explain what a section of code does, how to use and change it and why it works like it does.

- Maintenance documentation: It is often available for larger server-based applications. Includes the install and upgrade instructions. These need to be clear, with the required infrastructure and the steps for installing the software properly explained.

### *Measurement*

Documentation is often lagging behind the status of the system, since especially user documentation is often written only after functionality is created. So it is important to know if the documentation is up to date or not. There are three types of documentation to check:

- User documentation: Check for the existence of user documentation on the project's site. The site will in most cases have a separate section for documentation. The minimum that is usually available are instructions on the installation of the software. Additional documentation may include descriptions of the main features, 'How-Tos' and/or tutorials with instructions. If the software has different access levels, such as administrator and normal user, see if this distinction is made in the documentation as well. The documentation for larger projects is often handled by a documentation team. See if there is a discussion area about the documentation and how active they are.
- Developer documentation: The developer documentation consists of documents that describe the development process and how to participate comments in the source code that explain what the file or portion of code does and why. Check the available developer documents if they are clear on how to develop the software and how to join the developer community. Check the code whether a file starts with a short description of the file's use, and if there are any comments made throughout the file and how clear they explain the how and why of the file's operations, and whether the comments match the workings of the code.
- Maintenance documentation: Check if these are available either on the website and/or packaged with the software and if these documents are clear.

### **4.2.6 Security**

***Weight of this criterion to compute the total rank: 5%.***

#### *General description*

Security depends strongly on how much attention the developers give to it. The quality of the code has much to do with it. The vulnerabilities are often found by



'hackers' who try to break the software, sometimes by blunt force or simple trial and error. In this case vulnerability might get exploited before the developers know about it. The attack is the first clue in that case. The open source software's vulnerabilities, however, could be found by one of the developers or users, just by reviewing the code, and report the problem, so it can be fixed.

#### *Measurement*

There are various security advisories to check for bugs in all types of software that make it vulnerable to attacks. A couple of well known advisories are <http://www.securityfocus.com> and <http://www.secunia.com>. Check these sites for vulnerabilities in the software and see how soon they were fixed in a new version. Keep in mind that more popular software will have a higher chance of having vulnerability reports, so the mere lack of reports is no proof of its security. On the project's website it can be seen, for instance in the community or in release notes, how serious the project is about security.

#### **4.2.7 Functionality**

***Weight of this criterion to compute the total rank: 25%.***

#### *General description*

Open source software often uses the method 'Release Early and Often'. This method enables faster error correction, by keeping the software up to date as much as possible. It also encourages people to contribute because they see the result of their work in the next release much sooner. However, this often means that the software is incomplete during the first releases.

Where vendors of proprietary software will offer full functionality descriptions for their software, open source projects might not have the complete information on the website regarding the full functionality offered for their software. Just like with documentation, the information on the website might be lagging behind the actual functionality. Other means of checking the current functionality set might be needed. Fortunately, open source software that is freely available gives the added option of installing the software which enables the full testing of the functionality, an option that is mostly not available with proprietary software, where at most only limited versions, in terms of functionality or time, are given freely for trying out the software.

#### *Measurement*

One problem with Open Source projects is that the documentation is not always up to date with the latest software. Look beyond the feature list on the website to find out what features the software has. Eventually the software itself should be investigated. If it is a web-based application, an on-line demo might be available, though installing it on a test environment could be useful because it also gives insight on how well the software installs.





A list of functional requirements for the goal of use of the software can be used to check if the needed functionality is available. It is wise to make a distinction in the list between features that are absolutely necessary, where the absence would lead to elimination, and those that would be a plus, which results in a higher score. If there is something missing there is always the option to built it or have it built.

When comparing functionality, those features that are part of the functional requirements should take priority, but additional features may prove useful later. The features used or requested by the users in the future, is not really predictable.

Part of the functionality is localisation. The languages in which the interface and documentation are translated are a sign of the global interest taken in the software.

#### **4.2.8 Integration**

***Weight of this criterion to compute the total rank: 20%.***

##### *General description*

Four are the important elements here for software that is being used in collaboration with other software, and for those who are planning on adapting the software to their use, such as adding functionality or customizing certain aspects so that it fits better in the organization's environment:

- Modularity: Modularity of software means that the software or part of the software is broken into separate pieces, each with their own function. This type of structure has a number of important advantages as easier software management, easier incorporation of new functionality without touching the core software, and easier customization (selection of needed functionality, leaving out those that are not necessary for the intended use).
- Support for standards: Usage of well-accepted standards makes it easier to communicate between different software packages, and to switch between software packages. In some industries standards are far more important than in others. For some software there may not even be an applicable standard. The use of current and open standards in open source software is a sign of the software's maturity.
- Collaboration with other products: This is closely connected to standards.
- Software Requirements: Most software is written for a specific Operating System (OS), for example Microsoft Windows or Linux. Certain types of software also rely on other software, such as a web server or a database. The requirements of the software will state which software and which versions of that software are compatible. If these requirements are very specific it could lead to problems if they are incompatible with the organization's current environment.

##### *Measurement*



To rank a candidate LMS with respect to this criterion, the four elements described above should be taken into account:

- Modularity: Check the documentation and code base for evidence of a modular structure. The development documentation describes how to add modules if the software is modular.
- Standards: Software projects that use standards usually include information about this in their feature list or documentation. Check whether the standards implementation is complete or still underway.
- Collaboration with other products: If the software can work with relevant other product this can usually be found in the feature list or documentation.
- Software Requirements: Check the software requirements in the documentation of the software. There is usually a section on this in the installation document. Check whether these requirements can be met in the current environment and how flexible they are in terms of the versions of the required software. Compatibility with new versions of the required software might be an issue. Check how fast the software catches up with changes in the required software.

#### 4.2.9 Review form for Phase 2 of the evaluation

The following form was given to the evaluators from TUC/MUSIC and MTA-SZTAKI to report the evaluation results for each open source LMS selected in the short after Phase 1 of the evaluation. The form was based on the Phase 2 criteria.

General Information about the LMS	
LMS Name	
Supporting Organization	
URL	
Forums	
Summary Description of the LMS	
Review Info	
Reviewer Name and Organization	



Review Date		
Evaluation criteria		
<b>Criterion</b>	<b>Rank 0-10</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>
Community		
Release activity		
Life span		
Support		
Documentation		
Security		
Functionality		<p><u>Localization</u> Mention and comment on language support</p> <p><u>Communication Tools</u> Mention and comment on available tools such as video-conference, whiteboard, email, chat, discussion forums, file exchange and sharing,, on-line notes, blogs, wiki etc.</p> <p><u>Administration Tools</u> Mention and comment on available tools and functionality such as authentication, course authorization, course registration, etc. Mention also and comment on supported user roles.</p> <p><u>Learner testing</u> Mention and comment on available tools and functionality such as test types supported, automated testing management, automated testing support, reporting tools for test results including graphic reports, on-line grade book etc.</p> <p><u>Course management</u> Mention and comment on available tools and functionality such as student tracking, course management, content/presentation personalization, student portfolios, calendar/progress review, bookmarks etc.</p>
Integration		



Review Result	
Final rank	<p><i>Compute final rank using the following formula:</i></p> $w1*0.15 + w2*0.10 + w3*0.10 + w4*0.05 + w5*0.10 + w6*0.05 + w7*0.25 + w8*0.20$ <p><i>where <math>w_i</math> is the rank given to criterion <math>i</math>.</i></p>
Notes	<p><i>Put here any other information regarding the evaluation (e.g. problems encountered and solutions taken) or the system under evaluation.</i></p>

## 5. Evaluation results

This subsection presents the results of the actual evaluation of the identified open source LMS in task 2.1 according to the evaluation methodology elaborated in task 2.2. We present the review forms from Phase 1 of the evaluation in subsection 3.3.1 and the review forms from Phase 2 of the evaluation in subsection 3.3.2. The evaluation was made by experts from TUC/MUSIC and MTA-SZTAKI.

### 5.1 Review forms from Phase 1 of the evaluation

The results of the Phase 1 of the evaluation are presented here using the corresponding review forms.

General Information about the LMS	
LMS Name	eFront 3.1.4
Supporting Organization	Epignosis LTD
URL	<a href="http://www.efrontlearning.net/">http://www.efrontlearning.net/</a>
Forums	<a href="http://forum.efrontlearning.net/">http://forum.efrontlearning.net/</a>
Review Info	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	7/5/2008
Review criteria	
Active Development Community	YES
Existence of Stable Versions	YES
Support English Language (at least)	YES
SCORM compliance	NO ( <i>SCORM import only</i> )
Support Learning Objects as Minimum Granularity of Learning Content	YES ( <i>in the form of lesson units</i> )
Support Core LMS Functionality	YES



Availability of Information about their User Base	<i>YES (limited)</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES (but very limited)</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES (Gnu General Public License)</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>

<b>General Information about the LMS</b>	
LMS Name	ATutor 1.6
Supporting Organization	<a href="http://www.atutor.ca/">Adaptive Technology Resource Centre University of Toronto</a>
URL	<a href="http://www.atutor.ca/">http://www.atutor.ca/</a>
Forums	<a href="http://www.atutor.ca/forums/">http://www.atutor.ca/forums/</a>
<b>Review Info</b>	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	7/5/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>YES (SCORM 1.2)</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>



Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES (limited)</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES (Gnu General Public License)</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>YES</i>
<b>General Information about the LMS</b>	
LMS Name	Sakai 2.5
Supporting Organization	The Sakai Foundation
URL	<a href="http://www.sakaiproject.org/">http://www.sakaiproject.org/</a>
Forums	
<b>Review Info</b>	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	8/5/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>NO (Efforts to support SCORM are on going)</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>



Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i> <i>Educational Community License Ver. 1.0</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>
<b>General Information about the LMS</b>	
LMS Name	dotLRN 2.3.1
Supporting Organization	.LRN Consortium
URL	<a href="http://dotlrn.openacs.org/">http://dotlrn.openacs.org/</a>
Forums	.LRN Q&A: <a href="http://openacs.org/forums/forum-view?forum%5fid=14017">http://openacs.org/forums/forum-view?forum%5fid=14017</a>
<b>Review Info</b>	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	8/5/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>YES</i>





Support Learning Objects as Minimum Granularity of Learning Content	YES
Support Core LMS Functionality	YES
Availability of Information about their User Base	YES
Existence of Organization to Support Further Development	YES
Availability of Third Party Reviews	YES
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	YES ( <i>Gnu General Public License</i> )
Review Result	
Selection of LMS in the short list	YES
General Information about the LMS	
LMS Name	Claroline 1.8.9
Supporting Organization	The Claroline Consortium
URL	<a href="http://www.claroline.net/">http://www.claroline.net/</a>
Forums	<a href="http://forum.claroline.net/">http://forum.claroline.net/</a>
Review Info	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	8/5/2008
Review criteria	
Active Development Community	YES
Existence of Stable Versions	YES
Support English Language (at least)	YES
SCORM compliance	YES



Support Learning Objects as Minimum Granularity of Learning Content	YES
Support Core LMS Functionality	YES
Availability of Information about their User Base	YES
Existence of Organization to Support Further Development	YES
Availability of Third Party Reviews	YES
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	YES <i>Gnu General Public License v2</i>
Review Result	
Selection of LMS in the short list	YES
General Information about the LMS	
LMS Name	Dokeos 1.8.4
Supporting Organization	Dokeos Company
URL	<a href="http://www.dokeos.com/">http://www.dokeos.com/</a>
Forums	<a href="http://www.dokeos.com/forum/">http://www.dokeos.com/forum/</a>
Review Info	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	9/5/2008
Review criteria	
Active Development Community	YES
Existence of Stable Versions	YES
Support English Language (at least)	YES
SCORM compliance	YES
Support Learning Objects as Minimum	YES



Granularity of Learning Content	
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES (limited)</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i> <i>Gnu General Public License v2</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>YES</i>

<b>General Information about the LMS</b>	
LMS Name	OLAT Online Learning And Training 5.2.3
Supporting Organization	University of Zurich
URL	<a href="http://www.olat.org/">http://www.olat.org/</a>
Forums	<a href="http://www.olat.org/website/en/html/development_mailinglists.html">http://www.olat.org/website/en/html/development_mailinglists.html</a>
<b>Review Info</b>	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	9/5/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>



SCORM compliance	<i>NO (SCORM 1.2 import only)</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i> Apache Open-Source License v. 2.0
<b>Review Result</b>	
Selection of LMS in the short list	NO
<b>General Information about the LMS</b>	
LMS Name	LON-CAPA 2.6.3
Supporting Organization	The LON-CAPA Academic Consortium
URL	<a href="http://www.lon-capa.org/">http://www.lon-capa.org/</a>
Forums	
<b>Review Info</b>	
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC
Review Date	9/5/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>NO</i>



Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES (Gnu General Public License)</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>

<b>General Information about the LMS</b>	
LMS Name	MOODLE – Modular Object-Oriented Dynamic Learning Environment 1.8.4
Supporting Organization	Moodle Service Network, moodle.org
URL	<a href="http://moodle.com">http://moodle.com</a> , <a href="http://moodle.org">http://moodle.org</a>
Forums	<a href="http://moodle.org/course/view.php?id=5">http://moodle.org/course/view.php?id=5</a> (free registration)
<b>Review Info</b>	
Reviewer Name and Organization	Gyula Papp - Kölcsey Ferenc Teacher Training College of the Reformed Church / CONSEDU BT.
Review Date	May 23, 2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>



Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>YES</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>NO</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES (GNU GPL version 2)</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>YES</i>
<b>General Information about the LMS</b>	
LMS Name	Fle3 1.5.0
Supporting Organization	LeGroup, Media Lab, University of Art and Design, Helsinki
URL	<a href="http://fle3.uiah.fi">http://fle3.uiah.fi</a>
Forums	Mailing lists at <a href="http://fle3.uiah.fi/mailling.html">http://fle3.uiah.fi/mailling.html</a>
<b>Review Info</b>	
Reviewer Name and Organization	Tarmo Toikkanen, LeGroup
Review Date	21.5.2008
<b>Review criteria</b>	
Active Development Community	<i>NO</i>



Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>NO</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>NO</i>
Support Core LMS Functionality	<i>NO</i>
Availability of Information about their User Base	<i>NO</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>
<b>General Information about the LMS</b>	
LMS Name	OpenElms 5.0
Supporting Organization	e-learning wmb – UK
URL	<a href="http://www.openelms.org/">http://www.openelms.org/</a>
Forums	-
<b>Review Info</b>	
Reviewer Name and Organization	Tibor Szkaliczki
Review Date	15/05/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>



SCORM compliance	<i>YES</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>YES</i>

<b>General Information about the LMS</b>	
LMS Name	Metacoon 1.9.5
Supporting Organization	Bauhaus University Weimar – Germany
URL	<a href="http://www.metacoon.de/">http://www.metacoon.de/</a>
Forums	-
<b>Review Info</b>	
Reviewer Name and Organization	Tibor Szkaliczki
Review Date	15/05/2008
<b>Review criteria</b>	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>





Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>YES</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>YES</i>

<b>General Information about the LMS</b>	
LMS Name	KEWL.NextGen 1.3.0
Supporting Organization	University of the Western Cape – Southern Africa
URL	<a href="http://kngforge.uwc.ac.za/">http://kngforge.uwc.ac.za/</a>
Forums	-
<b>Review Info</b>	
Reviewer Name and Organization	Tibor Szkaliczki
Review Date	13/05/2008
<b>Review criteria</b>	



Active Development Community	<i>NO</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>NO</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>NO</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>NO</i>
Existence of Organization to Support Further Development	<i>NO</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>

<b>General Information about the LMS</b>	
LMS Name	Interact 2.4.1
Supporting Organization	Christchurch College of Education – New Zealand
URL	<a href="http://www.interactole.org/">http://www.interactole.org/</a>
Forums	<a href="http://sourceforge.net/forum/?group_id=69681">http://sourceforge.net/forum/?group_id=69681</a>
<b>Review Info</b>	
Reviewer Name and Organization	Tibor Szkaliczki
Review Date	14/05/2008
<b>Review criteria</b>	



Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>NO</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>NO</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>NO</i>
Existence of Organization to Support Further Development	<i>NO</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>
<b>General Information about the LMS</b>	
LMS Name	Docebo 3.5.0.4
Supporting Organization	Docebo SRL - Italy
URL	<a href="http://www.docebo.org/">http://www.docebo.org/</a>
Forums	<a href="http://www.docebo.org/doceboCms/page/9/Forum.html">http://www.docebo.org/doceboCms/page/9/Forum.html</a>
<b>Review Info</b>	
Reviewer Name and Organization	Tibor Szkaliczki
Review Date	13/05/2008
<b>Review criteria</b>	



Active Development Community	YES
Existence of Stable Versions	YES
Support English Language (at least)	YES
SCORM compliance	YES
Support Learning Objects as Minimum Granularity of Learning Content	YES
Support Core LMS Functionality	YES
Availability of Information about their User Base	YES
Existence of Organization to Support Further Development	YES
Availability of Third Party Reviews	YES
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	YES
<b>Review Result</b>	
Selection of LMS in the short list	YES
<b>General Information about the LMS</b>	
LMS Name	Bodington 2.8.0
Supporting Organization	University of Leeds – UK
URL	<a href="http://bodington.org/">http://bodington.org/</a>
Forums	-
<b>Review Info</b>	
Reviewer Name and Organization	Tibor Szkaliczki
Review Date	15/05/2008
<b>Review criteria</b>	
Active Development Community	YES



Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>NO</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
<b>Review Result</b>	
Selection of LMS in the short list	<i>NO</i>

<b>General Information about the LMS</b>	
LMS Name	ILIAS 3.9.1
Supporting Organization	University of Cologne Cooperation Network Support Partners
URL	<a href="http://www.ilias.de/">http://www.ilias.de/</a>
Forums	Free Support Forum <a href="http://www.ilias.de/iosbb/index.php">http://www.ilias.de/iosbb/index.php</a>
<b>Review Info</b>	
Reviewer Name and Organization	Attila Budai Dennis Gabor College, Hungary



Review Date	21.05.2008
Review criteria	
Active Development Community	<i>YES</i>
Existence of Stable Versions	<i>YES</i>
Support English Language (at least)	<i>YES</i>
SCORM compliance	<i>YES</i>
Support Learning Objects as Minimum Granularity of Learning Content	<i>YES</i>
Support Core LMS Functionality	<i>YES</i>
Availability of Information about their User Base	<i>YES</i>
Existence of Organization to Support Further Development	<i>YES</i>
Availability of Third Party Reviews	<i>YES</i>
OSI approved license or, if they use a different license, ensure that it allows modifications and derived works.	<i>YES</i>
Review Result	
Selection of LMS in the short list	<i>YES</i>

The following table summarizes the results of phase 1 of the evaluation.

LMS Name	Active Development Community	Existence of Stable Versions	Support English Language (at least)	SCORM compliance	Support LOs as Min. Gran. of rning Content	Support Core LMS Functionality	Avail. of Information about their User Base	Existence of Organization to Support Further Devel.	Availability of Third Party Reviews	OSI approved license	Selection of LMS in the short list
eFront 3.1.4	√	√	√	X	√	√	√	√	√	√	X
ATutor 1.6	√	√	√	√	√	√	√	√	√	√	√
Sakai 2.5	√	√	√	X	√	√	√	√	√	√	X
dotLRN 2.3.1	√	√	√	√	√	√	√	√	√	√	√
Claroline 1.8.9	√	√	√	√	√	√	√	√	√	√	√
Dokeos 1.8.4	√	√	√	√	√	√	√	√	√	√	√
OLAT 5.2.3	√	√	√	X	√	√	√	√	√	√	X
LON-CAPA 2.6.3	√	√	√	X	√	√	√	√	√	√	X
Moodle 1.8.4	√	√	√	√	√	√	√	√	√	√	√
Fle3 1.5.0	X	√	√	X	X	X	X	√	√	√	X
OpenElms 5.0	√	√	√	√	√	√	√	√	√	√	√
Metacoon 1.9.5	√	√	√	√	√	√	√	√	√	√	√
KEWL.NextGen 1.3.0	X	√	√	X	X	√	X	X	√	√	X
Interact 2.4.1	√	√	√	X	X	√	X	X	√	√	X
Docebo 3.5.0.4	√	√	√	√	√	√	√	√	√	√	√
Bodington 2.8.0	√	√	√	X	√	√	√	√	√	√	X
ILIAS 3.9.1	√	√	√	√	√	√	√	√	√	√	√

**Table 1: Phase 1 evaluation results for Open Source LMSs.**



### **5.1.1 List of open source LMS in the short list produced after the Phase 1 of the evaluation**

According to the evaluation results from Phase 1 of the evaluation reported in the review forms give above (see also table above), the following open source LMS were selected for the short list used in Phase 2 of the evaluation:

- Ilias 3.9.1 - <http://www.ilias.de/>
- Moodle 1.8.4 - <http://moodle.org/>
- ATutor 1.5.5 - <http://www.atutor.ca/>
- dotLRN 2.3.1 - <http://dotlrn.openacs.org/>
- Claroline 1.8.8 - <http://www.claroline.net/>
- Docebo 3.5.0.3 - <http://www.docebo.org/>
- Dokeos 1.8.4 - <http://www.dokeos.com/>
- Metacoos 1.9.5 - <http://www.metacoos.de/>
- OpenElms 5.0 - <http://www.openelms.org/>

The results of the evaluation from Phase 2 are given in the next subsection.





### 5.2 Review forms from Phase 2 of the evaluation

The results of the Phase 2 of the evaluation are presented here using the corresponding review forms.

General Information about the LMS		
LMS Name	ATutor 1.6	
Supporting Organization	<a href="http://www.atutor.ca/">Adaptive Technology Resource Centre University of Toronto</a>	
URL	<a href="http://www.atutor.ca/">http://www.atutor.ca/</a>	
Forums	<a href="http://www.atutor.ca/forums/">http://www.atutor.ca/forums/</a>	
Summary Description of the LMS	<p><b>ATutor</b> is designed with accessibility and adaptability in mind. Administrators can install or update ATutor easily, develop custom themes to give ATutor a new look, and easily extend its functionality with feature modules. Educators can quickly assemble, package, and redistribute Web-based instructional content, easily import prepackaged content, and conduct their courses on-line. Students learn in an adaptive learning environment.</p>	
Review Info		
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC	
Review Date	12/5/2008	
Evaluation criteria		
Criterion	Rank 0-10	Justification <i>Justify the rank with respect to the measurement guidelines</i>
Community	7	As it can be seen in <a href="http://www.atutor.ca/forums/">http://www.atutor.ca/forums/</a> the ATutor's community is active. Questions are answered in reasonable time. Answers are of adequate quality.
Release activity	8	ATutor is a reasonably mature LMS with a significant release activity.
Life span	7	First released in 2002.
Support	9	Adequate support from the community. Paid support available. Third party support also available.



Documentation	7	Adequate user, maintenance and developer documentation.
Security	7	Adequate response to vulnerability reports.
Functionality	9	<p><u>Localization</u></p> <p>Fully internationalized (30+ languages)</p> <p><u>Communication Tools</u></p> <p>Rich set of communication functionality offered through discussion forums, discussion groups, file exchange, built-in email functionality, chat support (although limited) and whiteboard.</p> <p><u>Administration Tools</u></p> <p>All desired administrative functionality is available (authentication, course authorization, course registration).</p> <p><u>Learner testing</u></p> <p>Most important test types are supported including multiple choice, multiple answer, matching, ordering, fill-in the blank, short answer, survey questions, and essay tests. QTI standard is supported. Questions can contain other media elements (images, videos, audio). Automated testing management is supported.</p> <p><u>Course management</u></p> <p>Student tracking is supported and students can access their own tracking information. Bookmarks and tools for progress review are available. Course management is offered through a variety of functionality. Instructors can personalize access to specific course materials based on group membership.</p>
Integration	9	ATutor 1.5.2 introduced the concept of modules, providing developers with a framework to implement additional functionality in a coherent and loosely coupled way.
Review Result		
Final rank	$7*0.15 + 8*0.10 + 7*0.10 + 9*0.05 + 7*0.10 + 7*0.05 + 9*0.25 + 9*0.20 = \mathbf{8.10}$	
Notes	-	



General Information about the LMS		
LMS Name	dotLRN 2.3.1	
Supporting Organization	.LRN Consortium	
URL	<a href="http://dotlrn.openacs.org/">http://dotlrn.openacs.org/</a>	
Forums	<a href="http://openacs.org/forums/forum-view?forum%5fid=14017">http://openacs.org/forums/forum-view?forum%5fid=14017</a>	
Summary Description of the LMS	<p>.LRN "out-of-the-box" consists of a robust portal system, a comprehensive suite of collaborative applications, and an enterprise infrastructure layer based on open standards.</p> <p>.LRN is based on a highly-scalable community framework that 's ideally suited to support teaching, research, and administration .LRN allows users and administrators to define different kind of communities, where each community can be equipped with different tools and resources for shared work, dialogue, and investigation.</p>	
Review Info		
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC	
Review Date	13/5/2008	
Evaluation criteria		
Criterion	Rank 0-10	Justification <i>Justify the rank with respect to the measurement guidelines</i>
Community	8	Very big and active community. Answers to questions are of good quality and are given quickly.
Release activity	7	Reasonable release activity taking with new versions including significant features.
Life span	6	First version released in 2003
Support	7	Adequate support from the community. Paid support from third parties is available but from a limited number of vendors.



Documentation	4	Documentation needs improvement at all aspects.
Security	7	OpenACS/dotLRN implements several security features such as sophisticated authentication procedures, a role-based security model, scripting language, page contracts and SQL variable "encapsulation".
Functionality	9	<p><u>Localization</u></p> <p>Internationalized (40+ languages/dialects, some of the translations are not finished)</p> <p><u>Communication Tools</u></p> <p>Adequate set of communication functionality offered through discussion forums, discussion groups, file exchange, built-in email functionality, chat support.</p> <p><u>Administration Tools</u></p> <p>All desired administrative functionality is available (authentication, course authorization, course registration). Extensible user roles are supported.</p> <p><u>Learner testing</u></p> <p>Most important test types are supported including multiple choice, multiple answer, short answer, survey questions, and essay tests. QTI support is offered. Possibility to define custom question types is offered. Questions can contain other media elements (images, videos, audio). Automated testing management is supported. Online gradebook is supported.</p> <p><u>Course management</u></p> <p>Bookmarks and tools for progress review are available. Course management is offered through a variety of functionality. Instructors can personalize access to specific course materials based on group membership. Usage statistics can be aggregated across courses or across the institution.</p>
Integration	8	Extensibility is offered through "packages".
Review Result		
Final rank	$8*0.15 + 7*0.10 + 6*0.10 + 7*0.05 + 4*0.10 + 7*0.05 + 9*0.25 + 8*0.20 = 7.45$	



Notes	-
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General Information about the LMS		
LMS Name	Claroline 1.8.9	
Supporting Organization	The Claroline Consortium	
URL	<a href="http://www.claroline.net/">http://www.claroline.net/</a>	
Forums	<a href="http://forum.claroline.net/">http://forum.claroline.net/</a>	
Summary Description of the LMS	Claroline is an <b>Open Source eLearning and eWorking platform</b> allowing teachers to build effective on-line courses and to manage learning and collaborative activities on the web. Translated into 35 languages, Claroline has a large worldwide users' and developers' community.	
Review Info		
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC	
Review Date	14/5/2008	
Evaluation criteria		
Criterion	Rank 0-10	Justification <i>Justify the rank with respect to the measurement guidelines</i>
Community	6	Most active is the French section of the community.
Release activity	5	Very frequent releases with not always significant improvements showing low maturity.
Life span	7	Existing from 2001
Support	7	Paid support is possible. No third party support. Community support is typical.
Documentation	5	Documentation is of medium quality.



Security	7	Usually responding to vulnerability reports
Functionality	8	<p><u>Localization</u></p> <p>Internationalized (translated in 35 languages).</p> <p><u>Communication Tools</u></p> <p>Adequate set of communication functionality offered through discussion forums, discussion groups, file exchange, emails, chat support.</p> <p><u>Administration Tools</u></p> <p>All desired administrative functionality is available (authentication, course authorization, course registration). Extensible user roles are supported.</p> <p><u>Learner testing</u></p> <p>A number of test types are supported including multiple choice, multiple answer, matching, and fill-in the blank tests. QTI support is offered. Questions can contain other media elements (images, videos, audio). Automated testing management is supported. Online gradebook is supported.</p> <p><u>Course management</u></p> <p>Course management is offered through a variety of functionality. Limited personalization. Adequate student tracking support. Usage statistics can be aggregated across courses or across the institution.</p>
Integration	4	Modular extensibility is currently lacking
Review Result		
Final rank	$6*0.15 + 5*0.10 + 7*0.10 + 7*0.05 + 5*0.10 + 7*0.05 + 8*0.25 + 4*0.20 = \mathbf{6.10}$	
Notes	-	

General Information about the LMS
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LMS Name	Dokeos 1.8.4	
Supporting Organization	Dokeos Company	
URL	<a href="http://www.dokeos.com/">http://www.dokeos.com/</a>	
Forums	<a href="http://www.dokeos.com/forum/">http://www.dokeos.com/forum/</a>	
Summary Description of the LMS		
Review Info		
Reviewer Name and Organization	Nektarios Moumoutzis & Polyxeni Arapi TUC/MUSIC	
Review Date	15/5/2008	
Evaluation criteria		
<b>Criterion</b>	<b>Rank 0-10</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>
Community	6	The size of the community is reasonable. Some questions remain unanswered.
Release activity	7	Reasonable release activity showing a level of maturity.
Life span	5	First public release found was made in 2004.
Support	7	Paid support offered. Reasonable support from the community. No third part support.
Documentation	7	Reasonable documentation covering all the aspects related to its usage and development.
Security	7	Addresses adequately the main security issues.
Functionality	8	<u>Localization</u> On-going effort to support about 45 languages/dialects.



		<p>English, French and Spanish are fully supported.</p> <p><u>Communication Tools</u></p> <p>Adequate set of communication functionality offered through discussion forums, discussion groups, file exchange, emails, chat support.</p> <p><u>Administration Tools</u></p> <p>All desired administrative functionality is available (authentication, course authorization, course registration).</p> <p><u>Learner testing</u></p> <p>Most important test types are supported including multiple choice, fill-in the blanks, matching, hotspots, open question tests. QTI support is offered. Questions can contain other media elements (images, videos, audio). Online gradebook is supported. Surveys are also supported to collect feedback from the users.</p> <p><u>Course management</u></p> <p>Course management is offered through a variety of functionality covering all important aspects with respect to course creation, tracking of student progress and student registration. Instructors can personalize access to specific course materials based on group membership.</p>
Integration	9	Modular extensibility offered.
Review Result		
Final rank	$6*0.15 + 7*0.10 + 5*0.10 + 7*0.05 + 7*0.10 + 7*0.05 + 8*0.25 + 9*0.20 = 7.30$	
Notes	-	

General Information about the LMS	
LMS Name	Metacoon 1.9.5
Supporting Organization	Bauhaus University Weimar – Germany
URL	<a href="http://www.metacoon.de/">http://www.metacoon.de/</a>





Forums	-	
Summary Description of the LMS	It is used mainly in German Universities.	
Review Info		
Reviewer Name and Organization	István Simonics MTA SZTAKI	
Review Date	30/6/2008	
Evaluation criteria		
<b>Criterion</b>	<b>Rank 0-10</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>
Community	6	The users are from higher education in Germany: Bauhaus University Weimar, TU Ilmenau, Friedrich-Schiller-University of Jena, University of Erfurt, The University for Applied Sciences Erfurt, Fachhochschule Jena / FH-Zittau-Görlitz, Bildungsportal Sachsen / Technical University of Chemnitz, The Campussource Developer Group, The ITO project in co-operation with the University of Stuttgart, Bildungsportal Thüringen, Campussource.  The community is closed they did not answer the direct e-mail to contact. There was no reply on e-mail. They did not involve newcomers.
Release activity	0	No relevant data.
Life span	5	The date of the first release: 1/08/2007  The version number is 1.9.6  The project is young.
Support	5	There is a free possibility to join to the community with registration and password. There is a third party support <a href="http://www.metaventis.com/">http://www.metaventis.com/</a> , but only in German.
Documentation	5	There is a 6 page flyer about the system both in English and German. There is developer documentation but needs registration. Needs registration to get maintenance



		documentation. The demo web site is under construction!
Security	0	No relevant data.
Functionality	5	<p><u>Localization</u></p> <p>English and German, but most of documents are German.</p> <p><u>Communication Tools</u></p> <p>Global communication tools (for the whole platform): address book with email functionality, instant messages / Messenger (global), the following communication tools can be set for each course/room list of all on-line users for each room with a messenger functionality, business cards, pin boards (for definable topics), forums, chat rooms, mailing lists for groups, group presentations with list of members, settings nickname und icon, Business card &amp; address.</p> <p><u>Administration Tools</u></p> <p>Yes everything is related to registration for higher education students and teachers. User name, password, system settings</p> <p><u>Learner testing</u></p> <p>No relevant data.</p> <p><u>Course management</u></p> <p>System administration: server directories, system parameters, file manager options, system profiles, create / erase tools (components) and layouts, write your own help texts (e.g. for Intranet usage).</p>
Integration	8	<p>The LMS has a modular structure. It supports SCORM. They have their own plug-ins. Aggregate course material, XML content QTI, audio/video slide presentation.</p> <p>Server side requirements: platform: is based on a LAMP system (Linux, Apache, MySQL, PHP) it has been optimized for larger numbers of users (3300 students an teachers use a metacoon system at the University of Jena) the authoring tools require the installation of Tomcat and Cocoon in order to render XML to HTML and PDF.</p> <p>Client side requirements (pc of the user/author): learners only need a web browser metacoon has been optimized for</p>



		a solution of min. 1024x768 on the following browsers: : MS Internet Explorer 6.0+, Netscape 6.0+, Mozilla 1.5+, Mozilla Firebird 0.7+ and Firefox 0.8+ (recommended for mac users), Opera 7.5.4+ please activate java script the authoring tools are java applets.
Review Result		
Final rank	$6*0.15 + 0*0.10 + 5*0.10 + 5*0.05 + 5*0.10 + 0*0.05 + 5*0.25 + 8*0.20 = 5$	
Notes	-	

General Information about the LMS	
LMS Name	ILIAS 3.9.1
Supporting Organization	University of Cologne, ISN Zurich Cooperation Network Supporter and Support Partners User groups by country
URL	<a href="http://www.ilias.de/">http://www.ilias.de/</a>
Forums	Index: <a href="http://www.ilias.de/iosbb/index.php">http://www.ilias.de/iosbb/index.php</a> User Support System Administration Installation and ILIAS Setup Using ILIAS in... ILIAS Development <ul style="list-style-type: none"> <li>• General(11)</li> <li>• Learning and Content Resources(9)</li> <li>• Communication/Syndication(4)</li> <li>• Groupware/Collaboration(4)</li> </ul>
Summary Description of the LMS	ILIAS is a powerful web-based learning management system that allows you to easily manage learning resources in an integrated system. <ul style="list-style-type: none"> <li>• Individual Personal Desktop</li> <li>• Course Management</li> <li>• Group Management</li> <li>• Repository with Role Based Access Control</li> <li>• Learning Content (XML, SCORM, AICC) Development and Management, On-line Glossary</li> <li>• Standards Compliance (LOM, SCORM 1.2, SCORM 2004, IMS-QTI, AICC)</li> <li>• SCORM 1.2 RTE Level 3 Certified</li> </ul>



	<ul style="list-style-type: none"> <li>• SCORM 2004 3rd Edition Certified</li> <li>• Learning Progress Management, User Tracking</li> <li>• Test &amp; Assessment</li> <li>• Survey</li> <li>• Chat</li> <li>• Forums</li> <li>• Exercises</li> <li>• Wiki</li> <li>• RSS Support</li> <li>• Instant Messenger Integration</li> <li>• Podcasting</li> <li>• Google Maps Support</li> <li>• PayPal payment</li> <li>• Authentication (LDAP, Shibboleth, CAS, Radius, SOAP)</li> <li>• Web Service Interface (SOAP)</li> </ul>
Review Info	
Reviewer Name and Organization	István Simonics MTA SZTAKI
Review Date	30/6/2008
Evaluation criteria	
<b>Criterion</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>
Community	<p>10</p> <p>Central ILIAS forums:</p> <p style="text-align: right;">Besides that,</p> <p>several different forums exist in the Cooperation Network and in the ILIAS User Group and the ILIAS installation. Approximate estimation: Topics = 100 000, Posts = 10 million, during one year. We can estimate the followings:</p> <ul style="list-style-type: none"> <li>• Running installations (regular daily use) = more than 1000</li> </ul>

		<ul style="list-style-type: none"> <li>• Test installations, test systems = app. 50 000</li> <li>• Number of users worldwide = more than 1 000 000</li> <li>• User / Developer ratio = 1000:1</li> </ul> <p>Developers:</p> <ul style="list-style-type: none"> <li>• central ILIAS team Cologne and Zurich = app. 20 person</li> <li>• Cooperation network participants = 15 institutions, 24 supporters and Support Partners+ individual installations, developments etc.: app. 2000</li> </ul> <p>Response time depends on the question and topic: usually within one working day. Questions raised in several different forums: usually quickly.</p> <p>Bug Tracker Database: covers all bug reports, by category, status, resolution, etc. App. 5000 reports during 1 year, for app. 10 versions. Some of them couldn't be reproduced, more than 50% are resolved.</p> <p>The professional quality of the answers is sufficient. Introduction of new services is discussed electronically and during workshops by country. An annual international conference is held, both for developers and users.</p> <p>Central support is very friendly and effective:</p> <ul style="list-style-type: none"> <li>• Free support forums</li> <li>• Bug Tracker Database</li> <li>• International conferences</li> <li>• User groups by country with an individual network and support</li> </ul>
Release activity	9	<p>ILIAS project is publishing one main version in every six month.</p> <p>Published Releases in 2008:</p> <ul style="list-style-type: none"> <li>• 3.10.0 2008.06.02</li> <li>• 3.9.4 2008.05.09</li> <li>• 3.9.3 2008.03.14</li> <li>• 3.9.2 2008.02.04</li> <li>• 3.8.6 2008.02.04</li> <li>• 3.8.5 2008.01.02</li> </ul> <p>Basic version: 1. 2. 3 - essential architectural changes  Main versions: 3.1-3.10 – essential functional additions  Sub-versions: 3.9.1-3.9.4 – bug fixes</p>
Life span	9	<p>First release: 1998. 11.02.  3.9.4 – 2008.05.09 (stable)  3.10.0 – 2008.06.02 (beta)</p> <p>There is no such problem, the software is being continuously updated.</p>
Support	10	<p>See also chapter 1.0.</p> <p>Supporter</p> <ul style="list-style-type: none"> <li>▪ <a href="#">SUN Microsystems</a></li> </ul>

		<ul style="list-style-type: none"> <li>▪ <a href="#">Studer &amp; Raimann web-systems</a></li> <li>▪ <a href="#">Qualitus GmbH</a></li> <li>▪ <a href="#">Fachhochschule für Wirtschaft Berlin</a></li> <li>▪ <a href="#">Phillips-Universität Marburg</a></li> </ul> <p>Support Partners</p> <p><a href="#">Databay AG</a>, Aachen, Germany, ILIAS Hosting, ASP, Development, <a href="#">Ralf Schenk</a></p> <p><a href="#">Qualitus GmbH</a>, Cologne, Germany, ILIAS Training and Consulting, <a href="#">Norbert Bromberger</a></p> <p><a href="#">Studer &amp; Raimann web-systems</a>, Bern, Switzerland, ILIAS Training, Consulting and Technical Support, <a href="#">Martin Studer</a></p> <p><a href="#">Boldt Media</a>, Aachen, Germany, eLAIX Development and Support, <a href="#">Harry Boldt</a></p> <p><a href="#">iNetworks</a>, Århus, Denmark, ILIAS Consulting, Development and Customizing, <a href="#">Jesper Gødvad</a></p> <p><a href="#">edutrends</a>, Bolzano, Italy, ILIAS Development and Customizing, <a href="#">Stefan Haberl</a></p> <p><a href="#">OC Open Consulting srl</a>, Ravenna, Italy, ILIAS Consulting and Customizing, <a href="#">Roberto del Mastro</a></p> <p><a href="#">Konsultex Informática</a>, São Paulo, Brasil, ILIAS Consulting and Integration, <a href="#">Miguel Koren O'Brien de Lacy</a></p> <p><a href="#">Consultex Informatica s.r.l.</a>, Buenos Aires, Argentina, ILIAS Consulting and Integration, <a href="#">Miguel Koren O'Brien de Lacy</a></p> <p><a href="#">Interoktat Bt., Hungary</a>, Budapest, Hungary, Gábor Erdélyi</p>
Documentation	9	<p>User Documentation</p> <p>By the ILIAS team in Cologne,</p> <p><a href="http://www.ilias.de/docu/goto_docu_cat_581.html">http://www.ilias.de/docu/goto_docu_cat_581.html</a></p> <p>User Guide and Reference Manual for the ILIAS Learning Management System</p> <ul style="list-style-type: none"> <li>• for ILIAS 3.9 in <i>English and Deutsch</i> <ul style="list-style-type: none"> <li>ILIAS Documentation 3.9</li> <li>Online Assistance for ILIAS Authors</li> <li>Online Assistance for ILIAS Lecturers</li> <li>Online Assistance for System Administrators</li> <li>Benutzerdokumentation</li> <li>Online-Hilfe für Autoren</li> <li>Online-Hilfe für Dozenten</li> <li>Online-Hilfe für Systemadministratoren</li> </ul> </li> <li>• for ILIAS 3.8 in <i>English and Deutsch</i> <ul style="list-style-type: none"> <li>Assistance on special modules</li> <li>Test &amp; Assessment</li> <li>Survey</li> <li>Creating Java Applet Questions for ILIAS 3.8</li> <li>ILIAS Documentation</li> <li>Online Assistance for ILIAS Authors</li> </ul> </li> </ul>

		<p>           Online Assistance for ILIAS Lecturers            Online Assistance for System Administrators            Benutzerdokumentation            Online-Hilfe für Autoren            Online-Hilfe für Dozenten            Online-Hilfe für Systemadministratoren         </p> <ul style="list-style-type: none"> <li>• for ILIAS 3.7 in <i>English</i> <ul style="list-style-type: none"> <li>User Guide</li> <li>Authoring Learning Content</li> <li>Performing Exercises, Tests and Surveys</li> <li>Communicating using ILIAS</li> <li>Basic Functionality of ILIAS</li> <li>RM02 - Courses</li> <li>RM03 - Group</li> <li>RM05 - Forum</li> <li>RM08 - Digilib Book</li> <li>RM11 - File</li> <li>RM15 - Media Pool</li> </ul> </li> <li>• for ILIAS version 3.6 in <i>English and Italian</i> <ul style="list-style-type: none"> <li>User Documentation</li> </ul> </li> <li>• for ILIAS 3.5 in <i>Deutsch</i> <ul style="list-style-type: none"> <li>Benutzer-Dokumentation</li> <li>Benutzerhandbuch Test &amp; Assessment</li> <li>Benutzerhandbuch Umfrage-Werkzeug</li> </ul> </li> </ul> <p>Learning Resources</p> <ul style="list-style-type: none"> <li>• Administration of roles and permissions - Scenarios and exercises for the role based access control (RBAC) administration in ILIAS 3.</li> <li>• Rollen- und Rechteverwaltung - Szenarien und Übungen für die RBAC-Verwaltung in ILIAS</li> <li>• Payment - Dokumentation der Payment-Schnittstelle in ILIAS</li> </ul> <p>By the ILIAS team in Hungary</p> <ul style="list-style-type: none"> <li>• Every institution prepares their own user guide and those are public, e.g.</li> <li>• GDF ILIAS, <a href="http://ilias.gdf.hu/repository.php?ref_id=7242&amp;cmd=render">http://ilias.gdf.hu/repository.php?ref_id=7242&amp;cmd=render</a> Hogyan használjuk az ILIAS-t?</li> <li>• ÉVI - ETI Virtuális Iskola, <a href="http://www.etitav.hu/repository.php?ref_id=109&amp;cmd=render">http://www.etitav.hu/repository.php?ref_id=109&amp;cmd=render</a> Felhasználói kézikönyv és segítségnyújtás ILIAS Development Guide The ILIAS 3 development process and basic concepts 1 Introduction 1.1 Vision / Concept</li> </ul>
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		<p>1.2 Specification  1.3 Documentation  1.4 Test  1.5 Release and Maintenance  1.6 Bibliography  2 General Coding Conventions  3 Object Oriented Programming  4 Architecture  5 Subversion Code Repository  6 Special Features for Developers  7 Database Access  8 Permission Handling  9 User Data  10 Styles and Templates  11 Forms and Object Data  12 Locator  13 Tabbed Menues  14 Repository  15 Plugins  16 SOAP Interface  Source: <a href="http://www.ilias.de">http://www.ilias.de</a>  Maintenance documentation can be found in each version's roadmap.</p>
Security	9	<p>We are not aware of any successful system attacks. ILIAS is used by NATO in trainings and regularly checks the system security.  There is a regular central procedure to report security problems, and these problems are continuously examined centrally.</p>
Functionality	10	<p><u>Localization</u>  There are 22 different language versions, contains 8188 language strings at the moment.  ILIAS supports content development in different languages.  International installations</p> <ul style="list-style-type: none"> <li>• <a href="#">Trans-national</a></li> </ul> <p>All countries in alphabetic order</p>





		<ul style="list-style-type: none"><li>• <a href="#">Argentina</a></li><li>• <a href="#">Austria</a><ul style="list-style-type: none"><li>○ <a href="#">universities and education</a></li><li>○ <a href="#">business</a></li></ul></li><li>• <a href="#">Belgium</a></li><li>• <a href="#">Brasilia</a></li><li>• <a href="#">Canada</a></li><li>• <a href="#">China</a></li><li>• <a href="#">Columbia</a></li><li>• <a href="#">Denmark</a></li><li>• <a href="#">France</a><ul style="list-style-type: none"><li>○ <a href="#">universities and education</a></li><li>○ <a href="#">business</a></li></ul></li><li>• <a href="#">Germany</a><ul style="list-style-type: none"><li>○ <a href="#">universities and research</a></li><li>○ <a href="#">universities and research (II)</a></li><li>○ <a href="#">universities and research (III)</a></li><li>○ <a href="#">universities and research (IV)</a></li><li>○ <a href="#">vocational education</a></li><li>○ <a href="#">business</a></li><li>○ <a href="#">business (II)</a></li><li>○ <a href="#">non-profit organizations and institutions</a></li><li>○ <a href="#">administration and public service</a></li></ul></li><li>• <a href="#">Hungary</a></li><li>• <a href="#">Italy</a><ul style="list-style-type: none"><li>○ <a href="#">general</a></li><li>○ <a href="#">universities and education</a></li><li>○ <a href="#">business and organizations</a></li></ul></li><li>• <a href="#">New Zealand</a></li><li>• <a href="#">Poland</a></li><li>• <a href="#">Romania</a></li><li>• <a href="#">Russia</a></li><li>• <a href="#">Spain</a></li><li>• <a href="#">Switzerland</a><ul style="list-style-type: none"><li>○ <a href="#">general</a></li><li>○ <a href="#">universities and education</a></li><li>○ <a href="#">business</a></li><li>○ <a href="#">institutions and organizations</a></li></ul></li><li>• <a href="#">Ukraine</a></li><li>• <a href="#">United States of America</a></li></ul>
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[New Zealand](#)  
[Poland](#)  
[Romania](#)  
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[universities](#)  
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	<p><u>Communication Tools</u></p> <p>ILIAS supports standard ways of communication as chats, forums and mails. The personal desktop includes an awareness function, that shows users, that are currently online. ILIAS also sends information via RSS to the user and displays external RSS feeds in the system.</p> <p>For communication purposes ILIAS offers an internal news system, discussion forums and a combined PHP/Java chat. Tutors can moderate forums and chats.</p> <ul style="list-style-type: none"> <li>• An internal news system for all users incl. the administration of the own news and profile</li> <li>• ILIAS supports the delivery of internal mails to internal and/or external e-mail addresses as well.</li> <li>• News to groups</li> <li>• Discussions forums with different modes of presentation ("Who answered last?" / "Who answered whose questions?")</li> <li>• Notice of new articles in forums by email</li> <li>• To attach files to articles in discussions</li> <li>• Administration of the forums and contents</li> <li>• Invitation to the chat by the "Who-is-online?"-mode</li> <li>• Port to virtual class rooms (iLinc)</li> <li>• Webcasting</li> </ul> <p>Beside RSS support, ILIAS offers the ability to manage podcasts. To create a podcast is as easy as uploading a audio file to the web. The author decides whether items are available through the web, or within the LMS only.</p> <p><u>Administration Tools</u></p> <p><b>System Administration and Terms of Use</b></p> <p>The new setup makes it very easy to install ILIAS on a server and configure clients. After installation the entire system administration can be done in ILIAS itself.</p> <p>This contains the creation of roles for certain circles of users or the administration of the clients as well as the construction of a systematic of knowledge and organization to categorize the angled contents.</p> <ul style="list-style-type: none"> <li>• System settings (for example, whether an anonymous visitation of the platform is possible or not)</li> <li>• Language settings (over 20 languages available)</li> <li>• Enable modules, partial modules and tools</li> <li>• Construction and Configuration of clients</li> <li>• Administration / import of users and courses (LDAP, SOAP ports)</li> <li>• Role based access control of repository objects</li> </ul>
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		<ul style="list-style-type: none"> <li>• Creation and modification of role templates (global roles, local roles)</li> <li>• Administration of categories (structuring in form or content)</li> </ul> <p>Due to the openness of its source code ILIAS can be adapted easily to specific requirements and corporate identity of an institution. For changes of the “Look&amp;Feel” only little modifications of the HTML layout templates are necessary. The user can additionally choose among different user interfaces ("skins"), which are controlled by style sheet.</p> <p>ILIAS is available as open source software under the GNU General Public Licence (GPL) and can be used without any restrictions. Schools, universities, educational institutions and every interested person may use the system free of charge and contribute to its further development. Users, authors and administrators need only a browser and Internet access. Several operating systems like Unix, Linux, Mac OS X and Windows can be used for the ILIAS server with MySQL and PHP. All additional third-party software (e.g. MySQL, PHP, Apache) is available as Open Source software as well and can be downloaded from our website for free. The software is adaptable to specific claims and can be enhanced to own ideas.</p> <p>Users worldwide contribute already to the software development coordinated by the ILIAS open source team (<a href="http://www.ilias.de">www.ilias.de</a>) at the University of Cologne, who is the contact for all interested people.</p> <p><b>Authentication</b></p> <p>ILIAS supports a lot of different authentication methods: Standard Login/Password Authentication (Database), LDAP, Shibboleth, CAS, Radius and SOAP based Authentication.</p> <p><b>Group System</b></p> <p>Because of an own internal group system ILIAS allows cooperative learning and working on the platform without additional tools. Learning groups, working groups or groups for certain fields of interest could be constructed. Users can create groups that are open for everyone or have specially defined access restrictions. Other users can be invited or get access with a password. All necessary tools for the administration of group members and resources are part of the system.</p> <ul style="list-style-type: none"> <li>• Groups with different access settings (open or no registration, required registration, required invitation, private or public groups)</li> <li>• Administration and delivery of group resources, e.g. learning modules, forums or files</li> </ul>
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	<ul style="list-style-type: none"> <li>• Administration of group members and invitation of new members</li> <li>• Access control an permission settings to tools and features</li> <li>• Construction of cascading groups (groups could contain subgroups)</li> </ul> <p><u>Learner testing</u></p> <p>ILIAS offers an integrated environment for the creation and enforcement of tests &amp; assessments. This can be used for the monitoring of learning progress by the users as well as the tutors and examiners. The test &amp; assessment supports the following types of questions:</p> <ul style="list-style-type: none"> <li>• Multiple choice</li> <li>• Single choice</li> <li>• Allocation questions</li> <li>• Cloze questions (free text, select box)</li> <li>• Arrangements duties</li> <li>• Hot spot (search images to click on)</li> <li>• Unsettled questions</li> </ul> <p>Questions are deposited in a question pool and arbitrarily re-usable. All kinds of types of questions can be combined in setting the tests. The different weighting of the answers, the determination of the schemes to evaluate and the margin of error in announced answers (for instance slips of the pen) are supported. The examination performance of a participant can be used to activate self-controlled new, previously arranged contents.</p> <p>Also the configuration of (anonymous) assessments is available via the integrated authoring tools and can so be appointed in every learning scenario very easily. Basic descriptive scores (for instance frequency of occurrence) are directly announced by ILIAS. So among other things can be requested the quality of courses.</p> <p>All results of tests and questions are exportable in formats of excel or CSV and so deeper valuable in specific evaluation tools (for instance SPSS).</p> <p><u>Course management</u></p> <p>ILIAS allows efficient creation of courses and course materials. It offers standardized tools and templates for the learning and working process including integrated navigation and administration.</p> <p><b>Personal Desktop</b></p> <p>Every user in ILIAS has his or her own Personal Desktop. It collects all resources, that are needed by the learning to fulfill the daily learning tasks. The personal desktop features News, Personal Messages, Learning Resources, Personal Notes, Bookmarks, External Web Feeds and other</p>
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		<p>information. The learner can re-arrange these blocks of information according to his needs.</p> <p>This is the personal working space for each user in ILIAS. Here users begin their session in ILIAS, and continue using it for a course for instance or enter a virtual working group. Main page of the Personal Desktop is the Overview where all Personal Items, News, Mails, Notes, and Bookmarks are displayed. The list of Active users shows which other colleagues, course members or group participants are online at the moment.</p> <p>From the Personal Desktop a user has access to the Personal Profile with the settings of each user and to the personal Learning Progress too.</p> <p>Features:</p> <ul style="list-style-type: none"> <li>• Subscribed courses and content modules (incl. last visited page)</li> <li>• New and unread internal mails, e.g. course mails or system messages</li> <li>• Subscribed own forums and groups</li> <li>• Administration of the personal profile, for instance the language setting or vCard</li> <li>• Administration of the personal bookmarks for internal and external links</li> <li>• "Who-is-online?"-feature incl. invitation to the chat</li> <li>• Calendar and time scheduler</li> <li>• Overview and administration of personal notes (Desktop and all content items of the repository)</li> <li>• Overview for monitoring of the personal learning progress</li> <li>• Push-feature for the contents (tutor can place all contents on the Personal Desktop of the users)</li> </ul>
Integration	9	<p>Object oriented, modular structure. Development documentation sufficiently elaborates on it, see chapter 5.</p> <p><b>Standard Compliance</b></p> <p>ILIAS accomplishes the e-learning-standard SCORM 1.2 and first of all open-source-LMS, it achieves the maximum conformance level LMS-RTE3. It also supports LOM metadata standard, AICC and IMS-QTI.</p> <p><b>Supported Standards</b></p> <p>ILIAS version 3 supports the following e-learning standards:</p> <p>SCORM 1.2 (LMS-RTE3 compliant) and SCORM 2004 SCORM 1.2 RTE3</p> <p>SCORM 2004 AICC LOM metadata</p>



	<p>XML</p> <p>IMS QTI (Test&amp;Assessment Tool)</p> <p>ILIAS 3.9.0 is the first open source LMS that has been certified to be compliant to SCORM 2004 3rd edition. See the list of SCORM certified products at <a href="http://adlnet.org">adlnet.org</a>.</p> <p>There are already built connectors with more systems, e.g. Moodle and office applications (eLAIX). Being SCORM compatible content exchange is possible with all other SCORM compatible applications. More program packages are built in to ILIAS in practice, e.g. Mathematica.</p> <p>The software environment can be fully built with open source programs. ILIAS continuously follows the ICT developments, is compatible with new versions.</p> <p><b>SOAP Interface</b></p> <p>Today learning management systems are integrated into a larger environment of institutional administrative systems. To enable information exchange with these systems, ILIAS offers a SOAP interface, that allows to control almost everything in ILIAS with an external application.</p>
Review Result	
Final rank	$10*0.15 + 9*0.10 + 9*0.10 + 10*0.05 + 9*0.10 + 9*0.05 + 10*0.25 + 9*0.20 = \mathbf{9.45}$
Notes	-

General Information about the LMS	
LMS Name	Docebo 3.5.0.4
Supporting Organization	Docebo SRL - Italy
URL	<a href="http://www.docebo.org/">http://www.docebo.org/</a>
Forums	<a href="http://www.docebo.org/doceboCms/page/9/Forum.html">http://www.docebo.org/doceboCms/page/9/Forum.html</a>
Summary Description of the LMS	The system is supported with live forums, Faq, tutorials, but the community is not too big cc 22-25.000.
Review Info	



Reviewer Name and Organization	István Simonics MTA SZTAKI	
Review Date	30/6/2008	
Evaluation criteria		
<b>Criterion</b>	<b>Rank 0-10</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>
Community	6	They have a live community. In the Forum there are 12 topics. The website can be red on 9 languages. There are detailed benchmarking and supports on 12 languages. The highest hits is from Italy: 935, the fewest is the Japanese Docebo 21. The answers are in 1-2 days. They have a live discussion about changes and feature additions. They are open for newcomers.
Release activity	5	They have bug trackers.
Life span	5	The version number: 3.5.0.4
Support	5	There is a free possibility to join to the community with registration and password. The forum is live. There is a free support in several languages.
Documentation	6	Detailed documentations can be downloaded via web. There is developer documentation wiki, Faqs. Documentation is free to download.
Security	5	They support bug tracking in every version.
Functionality	5	<p><u>Localization</u></p> <p>There are 12 language support.</p> <p><u>Communication Tools</u></p> <p>Global communication tools: address book with email functionality, instant messages video conferences.</p> <p><u>Administration Tools</u></p> <p>It is highly supported.</p> <p><u>Learner testing</u></p>



		No relevant data.  <u>Course management</u>  System administration: server directories, system parameters, file manager options, system profiles.
Integration	5	LMS have a modular structure. It supports SCORM. The system integrated interfaces to other products e.g. Adobe. The installation is supported with a step by step tutorial.
<b>Review Result</b>		
Final rank	$6*0.15 + 5*0.10 + 5*0.10 + 5*0.05 + 6*0.10 + 5*0.05 + 5*0.25 + 5*0.20 = 5.25$	
Notes	-	

<b>General Information about the LMS</b>		
LMS Name	OpenElms  5.0	
Supporting Organization	e-learning wmb – UK	
URL	<a href="http://www.openelms.org/">http://www.openelms.org/</a>	
Forums	-	
Summary Description of the LMS	It is based on a business model and activities.	
<b>Review Info</b>		
Reviewer Name and Organization	István Simonics  MTA SZTAKI	
Review Date	30/6/2008	
<b>Evaluation criteria</b>		
<b>Criterion</b>	<b>Rank 0-10</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>





Community	3	The community is closed they did not answer the direct e-mail to contact. There was no reply on e-mail. They involve newcomers according to the registration.  For a list of users, see notes below.
Release activity	0	No relevant data.
Life span	5	The version number: 5.0
Support	3	There is a free possibility to join to the community with registration and password. The support is directly from supporting organization: e-learning wmb – UK for fee according to maximum licenses.
Documentation	3	There is no free documentation. There are free eLearning materials but with restricted rules! There is no developer documentation. Needs registration and fee to get maintenance documentation.
Security	0	No relevant data.
Functionality	3	<u>Localization</u> There is only English version. <u>Communication Tools</u> No data. <u>Administration Tools</u> No relevant data. <u>Learner testing</u> No relevant data. <u>Course management</u> No relevant data.
Integration	3	The LMS has a modular structure. It supports SCORM. They have their own plug-ins.
Review Result		
Final rank	$3*0.15 + 0*0.10 + 5*0.10 + 3*0.05 + 3*0.10 + 0*0.05 + 3*0.25 + 3*0.20 = \mathbf{2.75}$	
Notes	The users are from several business sector: Alliance Trust, Andersen Consulting, Aquis Systems Ltd., AutoDesk, Basingstoke and North Hants Hospital, Bayer, Bayerische Landesbank, Beds Direct, Belfast City Council, Boots, British American Tobacco, Clinphone Plc, Courtaulds, Credo, Data Monitor, Direct Rail Services, RS, Egg, Erinaceous, Fitzpatrick Contractors, Freshfields, Friends United	



	<p>Network, G-Cap Media, Glasgow City Council, Gravatom Engineering Systems, Harcourt Education, Henkel, HM Prison Service, Human Fertilisation Embryology Authority, Institute of Quality Assurance, International Project Consultants, J Sainsbury, Leboeuse Lamb Green Macrae, Leeds Building Society, Loddon NHS Trust, McCain Foods (G.B.) Ltd, Merck Sharp &amp; Dohme, Merrill Lynch, National Association of Local Councils, National Council of School Leaders, NHS, North Kirklees Primary Care Trust, Oaklands College, Port of London Authority, Procter and Gamble, Queens Park Rangers FC, Rabobank, Royal Philanthropic Society, Samsung, Sanofi Beaute, Scottish Enterprise, SeaFrance, Serco, Surrey County Council, Sims Portex, Strathclyde Passenger Transport, Styles &amp; Wood, Syngenta, Surrey County Council, Texaco, Tokyo Electric, Thames Valley University, Torpoint, Trillium, TV One, Unilever, Vegetarian Society, Westminster City Council, Western Asset Management, WR Evans (Chemist), Wolverhampton City Council, Zebra Architects.</p>
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General Information about the LMS		
LMS Name	MOODLE 1.8.4	
Supporting Organization	Moodle Service Network, moodle.org	
URL	<a href="http://moodle.com">http://moodle.com</a> , <a href="http://moodle.org">http://moodle.org</a>	
Forums	Using Moodle Course <a href="http://moodle.org/course/view.php?id=5">http://moodle.org/course/view.php?id=5</a> (free registration)	
Summary Description of the LMS	It is used in a broad community. Support and localizations are good.	
Review Info		
Reviewer Name and Organization	István Simonics MTA SZTAKI	
Review Date	30/6/2008	
Evaluation criteria		
<b>Criterion</b>	<b>Rank 0-10</b>	<b>Justification</b> <i>Justify the rank with respect to the measurement guidelines</i>



Community	9	<p>In 75 forums montly <math>\approx</math> 600-700 new topics and <math>\approx</math> 3000 replies. Over 20.000.000 users worldwide, over 400.000 registered users on the Moodle.org site in 193 countries. Approximately 5-6000 participants is active. On forums are 119 official developers. The user/developer ratio of the number of post <math>\approx</math> 20:1. Mostly the experienced users answer.</p> <p>Response time is 10-15 minutes to some days. Average 4-5 hour. This depends on the topic and forum members' number.</p> <p>Both short and very detailed replies occur.</p> <p>Community between forum members is very friendly and tolerant. They always help one another.</p>
Release activity	9	<p>Releases are built Weekly. The weekly variants contain only error corrections and bug fixes. The version number changes on the case of an essential change.</p>
Life span	8	<p>First release: Moodle 1.0 – 2002. 08. 20. The version number: 1.9.1 (15<sup>th</sup> May 2008.) Moodle in past years it was rewritten repeatedly. Changing rather module they appear on a level.</p>
Support	8	<p>75 forums working in English and more different national languages. The developers moderate these forums.</p> <p>All developers involved in bug fixes.</p> <p>The Moodle Partners are a group of service companies guided by the core developers of Moodle. They provide a range of optional commercial services for Moodle users, including fully-serviced Moodle hosting, remote support contracts, custom code development and consulting. The customers range from individual educators up to company training departments and universities.</p>
Documentation	8	<p>Moodle teacher, administrator &amp; developer documentation: <a href="http://docs.moodle.org/en/Main_Page">http://docs.moodle.org/en/Main_Page</a></p> <p>Moodle Tracker: <a href="http://tracker.moodle.org/secure/Dashboard.jspa">http://tracker.moodle.org/secure/Dashboard.jspa</a></p> <p>The code is well commented. Developer documentation: <a href="http://docs.moodle.org/en/Developer_documentation">http://docs.moodle.org/en/Developer_documentation</a></p> <p>Maintainance documentation is the administrator documentation on the Moodle Docs Wiki. The documentation is plain and clear. Administrator documentation: <a href="http://docs.moodle.org/en/Administrator_documentation">http://docs.moodle.org/en/Administrator_documentation</a></p>
Security	9	<p>The security is very important. In this year eight mistakes were discovered. He was repaired already at the time of the announcement. Details in the Moodle Security Forum. (<a href="http://moodle.org/mod/forum/view.php?id=7128">http://moodle.org/mod/forum/view.php?id=7128</a> )</p>
Functionality	9	<p><u>Localization</u></p> <p>There are currently a total of 78 language packs. These languages next: Afrikaans, Albanian, Arabic, Armenian,</p>

	<p>Basque, Belarusian, Bosnian, Bulgarian, Catalan, Croatian, Chinese (Simplified), Chinese (Traditional/Big5), Czech, Danish, Dutch, English, English (US), Estonian, Farsi, Filipino, Finnish, French, French (Canada), Gaelic, Gallego, Georgian, German, German (Personal), Greek, Gujarati, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Italian, Japanese, Kannada, Khmer, Korean, Lithuanian, Lao, Latin, Latvian, Macedonian, Malayalam, Malaysian, Maori (Ngai Tahu), Maori (Waikato Uni), Mongolian, Norwegian, Norwegian (Primary), Nynorsk, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Samoan, Sinhala, Serbian (Cyrillic Bosnia Herzegovina), Serbian (Cyrillic), Serbian (Latin), Slovak, Slovenian, Somali, Spanish (International), Swedish, Tagalog, Tamil, Tamil (Sri Lanka), Thai, Tongan, Turkish, Ukrainian, Uzbek, Vietnamese, Welsh.</p> <p><b>Communication Tools</b></p> <table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Forum</td> <td>Activity module</td> <td>Standard</td> </tr> <tr> <td>Chat</td> <td>Activity module</td> <td>Standard</td> </tr> <tr> <td>Messaging</td> <td>Block</td> <td>Standard</td> </tr> <tr> <td>Blog</td> <td>Block</td> <td>Standard</td> </tr> <tr> <td>RSS</td> <td>Block</td> <td>Standard</td> </tr> <tr> <td>Wiki</td> <td>Activity module</td> <td>Standard</td> </tr> <tr> <td>Mail</td> <td>Activity module</td> <td>Third-Party</td> </tr> <tr> <td>QuickMail</td> <td>Block</td> <td>Third-Party</td> </tr> <tr> <td>Skype-module</td> <td></td> <td>Contributed</td> </tr> <tr> <td>Covcell Audio-Video Conferencing Tool</td> <td>Other</td> <td>Contributed</td> </tr> <tr> <td>Covcell Whiteboard</td> <td>Activity module</td> <td>Contributed</td> </tr> <tr> <td>OpenMeeting</td> <td>Activity module</td> <td>Contributed</td> </tr> <tr> <td>WiZiQ Live Class</td> <td>Activity module and block</td> <td>Contributed</td> </tr> <tr> <td>Dimdim Web Meeting Activity</td> <td>Activity module</td> <td>Third-Party</td> </tr> <tr> <td>DFWiki</td> <td>Activity module</td> <td>Third-Party</td> </tr> <tr> <td>OU wiki</td> <td>Activity module</td> <td>Third-Party</td> </tr> </tbody> </table> <p>More modules enable to teachers and student commenting the entries. For example: Glossary, Database and Forum modules.</p> <p><b>Administration Tools</b></p> <p>Authentication methods (also known as authentication plugins) include:</p> <ul style="list-style-type: none"> <li>• Manual accounts</li> <li>• No login</li> <li>• CAS server (SSO)</li> <li>• Email-based self-registration</li> <li>• External database</li> </ul>	Name	Type	Status	Forum	Activity module	Standard	Chat	Activity module	Standard	Messaging	Block	Standard	Blog	Block	Standard	RSS	Block	Standard	Wiki	Activity module	Standard	Mail	Activity module	Third-Party	QuickMail	Block	Third-Party	Skype-module		Contributed	Covcell Audio-Video Conferencing Tool	Other	Contributed	Covcell Whiteboard	Activity module	Contributed	OpenMeeting	Activity module	Contributed	WiZiQ Live Class	Activity module and block	Contributed	Dimdim Web Meeting Activity	Activity module	Third-Party	DFWiki	Activity module	Third-Party	OU wiki	Activity module	Third-Party
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RSS	Block	Standard																																																		
Wiki	Activity module	Standard																																																		
Mail	Activity module	Third-Party																																																		
QuickMail	Block	Third-Party																																																		
Skype-module		Contributed																																																		
Covcell Audio-Video Conferencing Tool	Other	Contributed																																																		
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	<ul style="list-style-type: none"> <li>• FirstClass server</li> <li>• IMAP server</li> <li>• LDAP server</li> <li>• Moodle Network authentication</li> <li>• No authentication</li> <li>• NNTP server</li> <li>• PAM (Pluggable Authentication Modules)</li> <li>• POP3 server</li> <li>• RADIUS server</li> <li>• Shibboleth</li> <li>• NTLM/Integrated Authentication (3rd party plugin)</li> </ul> <p>A course enrolment (or enrollment) key is what keeps unwanted people out of your course. Moodle provides a number of ways of managing course enrolment, called enrolment plugins. They include:</p> <ul style="list-style-type: none"> <li>• Authorize.net Payment Gateway</li> <li>• External database</li> <li>• Flat file</li> <li>• IMS Enterprise (from 1.6 onwards)</li> <li>• Internal enrolment (default method)</li> <li>• LDAP</li> <li>• Paypal</li> <li>• Moodle Network (from 1.8 onwards)</li> <li>• OSCommerce (non-standard)</li> </ul> <p>Moodle comes with 7 predefined roles:</p> <ul style="list-style-type: none"> <li>• Administrator - Administrators can usually do anything on the site, in all courses.</li> <li>• Course creator - Course creators can create new courses and teach in them.</li> <li>• Teacher – Teachers can do anything within a course, including changing the activities and grading students.</li> <li>• Non-editing teacher – Non-editing teachers can teach in courses and grade students, but may not alter activities.</li> <li>• Student – Students generally have less privileges within a course.</li> <li>• Guest – Guests have minimal privileges and usually can not enter text anywhere.</li> <li>• Authenticated user – All logged in users.</li> </ul> <p>In Moodle may be editing an existing role or creating new roles.</p> <p><u>Learner testing</u></p> <p><b>Quiz module</b></p> <p>The Quiz activity module allows the teacher to design and set quizzes consisting of a large variety of Question types,</p>
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	<p>among them multiple choice, true-false, and short answer questions. These questions are kept in the course Question bank and can be re-used within courses and between courses. Quizzes can allow multiple attempts. Each attempt is automatically marked, and the teacher can choose whether to give feedback and/or show the correct answers. Moodle's quiz module has a large number of options and tools, making it extremely flexible. You can create quizzes with different question types, randomly generated quizzes from pools of questions, allow students to have repeated attempts at a question or retake quizzes multiple times, and have the computer score it all.</p> <p>The quiz Results tab includes several sub tabs, one for each report, plus a regrade and manual grading tabs. The number of subtabs shown, depends on the number of report plugins.</p> <p>Item analysis presents processed quiz data in a table, suitable for analyzing and judging the performance of each question for the function of assessment.</p> <p>Regrade will recalculate the quiz grades. This may become necessary if you have changed one of the questions or the grade possible for the quiz or a question.</p> <p>Manual grading - The grade of any question in a quiz can be manually overridden, and a comment added. A teacher can do this from the review page. There are also some question types that Moodle does not grade automatically (at the moment only the Essay question). This report helps you grade questions of these types by listing just the questions that still need to be graded.</p> <p><b>Question bank</b></p> <p>This feature allows a teacher to create, preview, and edit questions in a course question bank, a database of questions. These questions can then be used in Quizzes and through the export process in a Lesson. The teacher enters the question bank by creating or editing a quiz activity or through the Administration block. Questions are organized into categories and subcategories.</p> <p><b>Question type in Moodle:</b></p> <ul style="list-style-type: none"><li>▪ Calculated</li><li>▪ Description</li><li>▪ Essay</li><li>▪ Matching</li><li>▪ Embedded Answers (Cloze)</li><li>▪ Multiple Choice</li><li>▪ Short-Answer</li><li>▪ Numerical</li><li>▪ Random Short-Answer Matching</li></ul>
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	<ul style="list-style-type: none"> <li>▪ True/False</li> </ul> <p><b>Third-party question types</b></p> <ul style="list-style-type: none"> <li>▪ Drag and Drop</li> <li>▪ Molecule design</li> <li>▪ Opaque</li> <li>▪ RQP</li> <li>▪ Regular Expression Short Answer</li> </ul> <p><u>Course management</u></p> <p><b>Course management</b></p> <p>Reports:</p> <ul style="list-style-type: none"> <li>▪ <b>Teacher log reports</b> – Show activity within the course. It allows tutors to see what resources are being used and when. For example a teacher can check that an individual student has viewed the resource they claim to have read, and how long. Individual user reports generate some basic graphical views of this information. The drop-down menus are used to set filters. The teacher can view the log records at course level, user level and/or activity level on a specific day or all days. When groups are enabled in a course that will be another option.</li> <li>▪ <b>Course activity report</b> – An activity report will show all activity in the course, sorted by topic. Each item will be shown with its type and name.</li> <li>▪ <b>Individual activity report</b> – From here you can select an outline report (which looks similar to an activity report on all students), full report, grade report, or select today's logs or all logs. Again, reports are sorted by topic. A detailed report on a person will show each item, organized by topic, with what that person has done involving that item. For example, a forum will be listed with how many posts to that forum a person has made.</li> <li>▪ <b>Statistics</b> – If you enable site statistics, Moodle will gather statistics about each course and for the whole site, and produce graphs displaying them. The statistics graphs and tables show how many hits there have been on various parts of your site during various time frames. They do not show how many distinct users there have been. They are processed daily at a time you specify. You must enable statistics before you will see anything.</li> </ul> <p><b>Content management</b></p> <p>Moodle supports a range of resource types which teachers can add to their course sections.</p> <p>Resources:</p>
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		<ul style="list-style-type: none"> <li>▪ Text page</li> <li>▪ Web page</li> <li>▪ File or website link (any filetype)</li> <li>▪ Directory</li> <li>▪ IMS content package</li> <li>▪ Label</li> </ul> <p>Activity (standard) modules</p> <ul style="list-style-type: none"> <li>▪ Assignment (offline, online, single file upload, advanced upload)</li> <li>▪ Chat</li> <li>▪ Choice</li> <li>▪ Database (for collections)</li> <li>▪ Forum</li> <li>▪ Glossary</li> <li>▪ HotPot (Importing Hot Potatoes test)</li> <li>▪ LAMS (include LAMS lesson)</li> <li>▪ Lesson</li> <li>▪ Quiz</li> <li>▪ SCORM/AICC (play SCORM 1.2, SCORM 2004 content package and AICC scripts)</li> <li>▪ Wiki</li> <li>▪ Workshop</li> </ul> <p><b>Calendar</b></p> <p>The Calendar displays the following events:</p> <ul style="list-style-type: none"> <li>▪ Site (event viewable in all courses - created by admin users)</li> <li>▪ Course (event viewable only to course members - created by teachers)</li> <li>▪ Groups (event viewable only by members of a group - created by teachers)</li> <li>▪ User (personal event a student user can create - viewable only by the user)</li> </ul> <p>Events are added to the calendar, and can be aimed at individual users, your defined groups, or your courses. Adding closing dates to assignments, forums, quizzes, etc. will cause them to show up in the calendar block. You can view previous or future months on Calendar by clicking the left/right arrows next to the current month's name. The current date is outlined. You can hide or show various categories of events by clicking on the color key below the calendar. This can make the calendar easier to read.</p> <p><b>Portfolios</b></p> <p>Moodle support more internal and external ePortfolio module or application.</p> <p><b>Internal portfolio systems:</b></p> <ul style="list-style-type: none"> <li>▪ Simple portfolio</li> </ul>
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		<ul style="list-style-type: none"> <li>▪ SPDC portfolio module/block</li> <li>▪ Exabis ePortfolio block (export and import portfolios in SCORM format)</li> </ul> <p><b>External applications:</b></p> <ul style="list-style-type: none"> <li>▪ ELGG – Personal Learning Environment</li> <li>▪ Mahara – is an open source e-portfolio, weblog, resume builder and social networking system (connection with Moodle Network)</li> </ul>
Integration	9	<p>The LMS has a modular structure. The name of Moodle is an acronym: Modular Object-Oriented Dynamic Learning Environment. Moodle is very modular. Moodle has a number of features that are modular, including themes, activities, interface languages, database schemas and course formats. This allows anyone to add features to the main codebase or to even distribute them separately. Currently just 350 modules and block their existences for Moodle.</p> <p>Module Installation description: <a href="http://docs.moodle.org/en/Installing_contributed_modules_or_plugins">http://docs.moodle.org/en/Installing_contributed_modules_or_plugins</a></p> <p>Moodle developer documentation for modules: <a href="http://docs.moodle.org/en/Developer_documentation#Modules_included_in_the_standard_distribution">http://docs.moodle.org/en/Developer_documentation#Modules_included_in_the_standard_distribution</a></p> <p>Server side requirements: platform: is based on a LAMP system (Linux, Apache, MySQL, PHP) it has been optimized for larger numbers of users (3300 students and teachers use a metacoocn system at the University of Jena) the authoring tools require the installation of Tomcat and Cocoon in order to render XML to HTML and PDF.</p> <p>Client side requirements (pc of the user/author): learners only need a web browser metacoocn has been optimized for a solution of min. 1024x768 on the following browsers: : MS Internet Explorer 6.0+, Netscape 6.0+, Mozilla 1.5+, Mozilla Firebird 0.7+ and Firefox 0.8+ (recommended for mac users), Opera 7.5.4+ please activate java script the authoring tools are java applets.</p> <p>Standards in Moodle:</p> <ul style="list-style-type: none"> <li>▪ IMS content Packaging (complete)</li> <li>▪ IMS Common Cartridge (???)</li> <li>▪ SCORM 1.2 (RTE-3)</li> <li>▪ SCORM 2004 (partly)</li> <li>▪ IMS Enterprise (enrolment – complete)</li> <li>▪ IMS QTI 2.0 (question export)</li> </ul> <p>Collaboration with other products:</p> <ul style="list-style-type: none"> <li>▪ Moodle-Moodle – Collaboration (Moodle Network is a new feature found in the 1.8 release of Moodle. The network feature allows a Moodle administrator to establish a link with</li> </ul>



		<p>another Moodle, and to share some resources with the users of that Moodle.)</p> <ul style="list-style-type: none"> <li>▪ Mahara (via Moodle Network)</li> <li>▪ ELGG</li> <li>▪ DOOR – Learning Object repository connection</li> <li>▪ LAMS – LAMS is an IMS Learning Design authoring system and server application.</li> </ul> <p>Software Requirements:</p> <p>Operating systems</p> <ul style="list-style-type: none"> <li>▪ Windows</li> <li>▪ Linux (SUSE Linux Enterprise Server, Ubuntu, Debian, RedHat)</li> <li>▪ Novell</li> <li>▪ BSD</li> <li>▪ Mac OS X 10.3, 10.4, 10.5</li> <li>▪ UNIX</li> </ul> <p>Web server</p> <ul style="list-style-type: none"> <li>▪ Apache 2</li> <li>▪ IIS</li> </ul> <p>Database</p> <ul style="list-style-type: none"> <li>▪ MySQL version 4.1.16 or later is required, or PostgreSQL 8.0 or later</li> <li>▪ Oracle, MSSQL, (interbase, Foxpro, Access, ADO, Sybase, DB2 and ODBC)</li> </ul> <p>PHP</p> <ul style="list-style-type: none"> <li>▪ Version 4.3.0 or later required</li> </ul>
Review Result		
Final rank	$9*0.15 + 9*0.10 + 8*0.10 + 8*0.05 + 8*0.10 + 9*0.05 + 9*0.25 + 9*0.20 = \mathbf{8.75}$	
Notes	-	

## 6. Suggestions for selection of an appropriate open source LMS to be used in iQTool

The following table presents in summary the results of the Phase 2 of the Evaluation with respect to the evaluation criteria used:

LMS Name	Community	Release activity	Life span	Support	Documentation	Security	Functionality	Integration	Final Rank	Order
ATutor 1.6	7	8	7	9	7	7	9	9	8.10	3
dotLRN 2.3.1	8	7	6	7	4	7	9	8	7.45	4
Claroline 1.8.9	6	5	7	7	5	7	8	4	6.10	6
Dokeos 1.8.4	6	7	5	7	7	7	8	9	7.30	5
Metacoocn 1.9.5	6	0	5	5	5	0	5	8	5.00	8
ILIAS 3.9.1	10	9	9	10	9	9	10	9	9.45	1
Docebo 3.5.0.4	6	5	5	5	6	5	5	5	5.25	7
OpenElms 5.0	3	0	5	3	3	0	3	3	2.75	9
Moodle 1.8.4	9	9	8	8	8	9	9	9	8.75	2

**Table 2: Phase 2 evaluation results for Open Source LMSs.**  
Green cells correspond to highest marks.

It is evident from the above table that the evaluation results show that the best candidate for iQTool is ILIAS. It has the highest final rank and it also has the highest ranks with respect to each one of the 8 evaluation criterial used. The next candidate is Moodle that also received the highest marks with respect to Release activitiy, Security



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and Integration. The third candidate is ATutor that received also received the highest mark with respect to Integration. **Consequently, the suggestion is to select the ILIAS Open Source LMS to be used in iQTool.**

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## 7. References

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2. An Evaluation of Open Source E-Learning Platforms Stressing Adaptation Issues <http://www.campussource.de/aktuelles/docs/icalt2005.pdf>
3. An Evaluation of Open Source Learning Management Systems According to Learners Tools <http://www.formatex.org/micte2006/Downloadable-files/oral/An%20Evaluation%20of%20Open%20Source.pdf>
4. ATutor 1.5.5 open source LMS <http://www.atutor.ca/>
5. Bodington 2.8.0 open source LMS <http://bodington.org/>
6. Chiron - Innovative Technologies and Solutions for Ubiquitous Learning (CHIRON) FR/04/C/F/RF-81103 Leonardo da Vinci project 2004-2006 <http://semioweb.msh-paris.fr/chiron/>
7. Claroline 1.8.8 open source LMS <http://www.claroline.net/>
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<http://www.educause.edu/ir/library/pdf/ERB0314.pdf>
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<http://www.nshu.se/english/page/4610/lmsopensource.htm>
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25. Metacoön 1.9.5 open source LMS <http://www.metacoön.de/>
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[http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=4215246](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4215246)
27. Moodle 1.8.4 open source LMS <http://moodle.org/>
28. New Zealand Open Source VLE Project <http://eduforge.org/projects/nzvle>
29. OLAT Online Learning And Training 5.2.3 - <http://www.olat.org/>
30. OpenElms 5.0 open source LMS <http://www.openelms.org/>
31. QUIS – Quality, Interoperability and Standards in e-learning  
<http://www2.tisip.no/quis/index.php>
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<http://fie.engrng.pitt.edu/fie2006/papers/1602.pdf>
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