

Building Infrastructure and Community

Assessing Moodle and Sakai as Platforms for the Common Collaboration and Learning Environment

Report of the Assessment Task Force
to the Faculty Committee on Educational Technology

October 30, 2006

Assessment Task Force

Joel Bellon, Career Center

Dawn Canfield, Psychology

Annelie Chapman, Center for Digital Humanities

Bruce Dumes, College Information Services

Mike Franks, Social Sciences Computing

S. Kumar, Anderson School

Pete Neilsen, Academic Technology Services

Nick Reddingius, Office of Information Technology

Terry Ryan, University Library (facilitator)

Ruth Sabeau, College & Office of Information Technology

Stephen Schwartz, University Library

Joseph Vaughan, Center for Digital Humanities

James Williamson, Office of Instructional Development

Table of Contents

INTRODUCTION	1
ASSESSMENT SUMMARY.....	2
KEY DISCRIMINATORS BETWEEN MOODLE AND SAKAI.....	4
NON-DISCRIMINATORS BETWEEN MOODLE AND SAKAI	6
APPENDIX A – DETAILED TECHNICAL ANALYSIS	8
APPENDIX B – DETAILED FUNCTIONAL ANALYSIS.....	17
APPENDIX C – INSTITUTIONAL INTERVIEWS.....	59
APPENDIX D – A REVIEW OF OPEN SOURCE LEARNING MANAGEMENT SYSTEMS	60

Introduction

As recommended in the Joint FSG/TSG Report to the FCET, the Assessment Task Force was asked in July 2006 to “Quickly assess the open source platforms for the standard campus solution for CCLE course/collaboration tools.” After a review of the open source options, Moodle and Sakai were identified as the only viable options. This report documents the Task Force’s assessment of those two systems.

Moodle and Sakai are both strong systems, and both could be made to work effectively at UCLA. Comparing the two was challenging since the assessment was not comparing “apples to apples.” The two systems represent very different communities, different development environments, and different risks and opportunities for UCLA. Choosing a system will represent more than a software choice, it will be a statement of strategic direction. For this reason, the Task Force is deliberately not making a recommendation in this report, but rather laying out the strategic issues for the Faculty Committee on Educational Technology (FCET) to weigh.

The Assessment Summary (p.2) highlights the major pros and cons of Moodle and Sakai and then lays out the trade-offs in terms of values and beliefs about both UCLA and the two systems. Following that summary is a review of the key discriminators between Moodle and Sakai and a list of the other criteria we assessed and determined were not discriminators. The Appendices show the assessment results in more detail.

Two fundamental decisions governed the Task Force’s assessment:

1. The assessment focused on the systems as they exist today. While recognizing that both systems continue to evolve, and that UCLA has the potential to significantly change either system given the influence and resources we could bring to bear, the Task Force felt that it was important to document and compare the present state of the technology and the communities which support them.
2. In assessing the two systems, the Task Force set the functionality bar high. After almost ten years of creating course Web sites for instruction, UCLA faculty will not be satisfied with a system unless it provides a strong set of core functionality. The list of core functions assessed was based on the baseline functions outlined in the Joint FSG/TSG Report.

Though not asked to consider implementation plans, the Task Force has four recommendations to offer:

1. The Joint FSG/TSG Report gave great emphasis to ease of use. Though anecdotal reports from other institutions and the Task Force’s own experience indicate that Moodle is currently easier to use, the assessment group was unable to find or do a formal usability study of either Moodle or Sakai. Careful attention to usability/ease-of-use should be an early part of implementation. An effective user support infrastructure will also be crucial to success.
2. The system cannot stand alone, or stand still. Integration with other campus systems and with other institutions is crucial to ensure that faculty and students are not isolated from other communities of learning. UCLA must also build a system and a process which can adapt quickly to change.
3. Whichever system is selected, UCLA will want to make it better. An obvious first step would be to attempt to replicate the features we admire in whichever system we do not select.
4. In selecting an open source system, UCLA will become a member of that system’s community but that should not limit our collaborations. UCLA should continue to actively partner with all of higher education in planning for next generation educational technology.

Assessment Summary

Moodle

Overall Impression

Development of Moodle began in 1998, it is more mature and it offers more robust functionality than Sakai. Moodle could therefore meet most instructional needs “as is” and would probably be adopted more quickly at UCLA than Sakai. The Moodle community includes few of our peer research universities who have implemented Moodle as their primary enterprise solution. The community management model for Moodle is an informal hierarchy, similar to Linux, and the core design group which decides development priorities receives suggestions for changes through informal discussion.

Pros/Benefits

- + Moodle has better, richer and more stable functionality in the tools most commonly used by instructors: Announcement, Calendar, Discussion, Quiz/Test, File Upload
- + Moodle has a rich set of administrator tools and user documentation.
- + The Moodle community has a proven track record of timely bug fixes and development of new features.
- + UCLA has some experience with Moodle since at least three UCLA units (Atmospheric and Oceanic Sciences, GSEIS, and Statistics) already use it for instruction.

Cons/Risks

- Deep integration may be more challenging to do with Moodle.
- UCLA would be unique among large United States research universities in adopting Moodle as a campus-wide system, and the only University of California campus to do so. Shared development and collaboration among UC campuses and other peer institutions could be more difficult.
- We did not run a Moodle pilot at UCLA in the way that we ran the Sakai pilot, so our knowledge of the details of connecting Moodle to the Registrar’s data and campus authentication is necessarily limited.
- Because the Moodle source code is procedural rather than object oriented, theoretically there is an increased risk that it will be difficult to maintain and to scale to complexity at high volume.

Sakai

Overall Impression

Development of Sakai began in 2004, with a strong vision and commitment from many of our peer institutions who share both our challenges and our aspirations. If its promise is fulfilled, it will become a strong platform for cooperative development with peer institutions. Currently, Sakai is missing some core functionality and has an immature development process. The community management model is structured, with an elected board of directors and a defined voting process for conveying the community priorities for development.

Pros/Benefits

- + The Sakai community includes many large research universities, including three University of California campuses. Integration and cooperation with our peers might be easier, and our common needs may make research tools more likely to be developed by one of our peers.
- + Sakai may be easier to interface with campus and UCOP systems, given its software development platform.
- + Funding from foundations such as Mellon is being directed toward development of tools for Sakai.
- + The Sakai pilot gave UCLA some experience with the system, including integration with the Registrar’s data and campus authentication.

Cons/Risks

- Given the relative immaturity of the system, Sakai can meet fewer needs “as is” and is therefore likely to be adopted more slowly at UCLA. It carries the concomitant risk of early perception of failure.
- UCLA would have to assume responsibility for the development of the missing core functionality, both by partnering with peer institutions and by contributing significant programming resources ourselves, before Sakai would be ready for wide adoption.
- Sakai’s “community open source” model is relatively new and Sakai is its first real test.
- The Sakai development process is still evolving and the community response to bug reports is uneven.
- The Sakai source code is complex and currently requires more effort before a developer can be productive.

Trade-Offs

To select Moodle, we should believe:

1. Early success is important. Having the CCLE quickly adopted by a majority of the faculty is a key goal.
2. UCLA would be happy to be known as a member of the Moodle community, with peers such as the California State University campuses.
3. For instruction, our needs are very similar to the instructional needs of participants in the Moodle community.
4. We will find ways and development resources to either adapt or integrate desirable Sakai tools currently under development such as:
 - Graduate Tools (U Michigan)
 - Federated Repository Search via OKI Digital Repository OSID
 - Open Source Portfolio
 - Sakaibrary (U Michigan/Indiana Mellon funded project to integrate licensed library content into Sakai)

To select Sakai, we should believe:

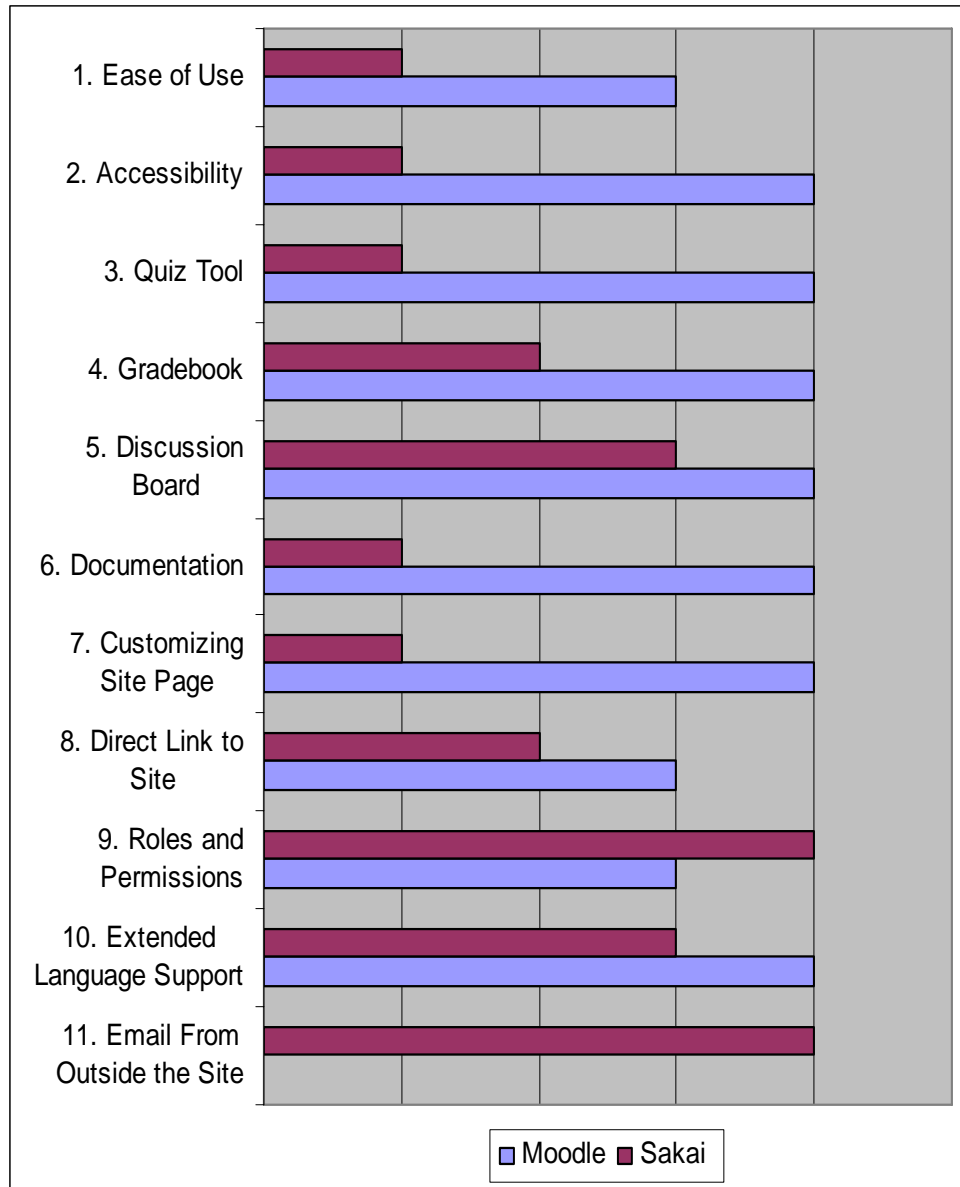
1. By partnering with peers, we can develop a system tailored to the unique needs of large research universities that will be the best match for UCLA's future.
2. Future potential is more important than early adoption. It is difficult to predict with confidence how long it would take for the missing core functionality to be implemented in Sakai; some feel that with the right resources, it could be done in less than 2 years; others are concerned that it could take substantially longer. UCLA is willing to wait for that development and/or we can mitigate the risk of early disappointment by managing expectations well.
3. We are willing to commit significant resources to add core functionality to Sakai, both in partnership with our peers and where necessary alone, and to help the community and development process mature.
4. We will find ways to either adapt or integrate existing desirable features of Moodle, such as:
 - Quiz tool
 - Discussion board
 - Ease of use

Key Discriminators Between Moodle and Sakai

Key Technical Discriminators	Ramifications																					
<table border="1"> <caption>Key Technical Discriminators Comparison</caption> <thead> <tr> <th>Discriminator</th> <th>Moodle (Blue)</th> <th>Sakai (Maroon)</th> </tr> </thead> <tbody> <tr> <td>1. Maturity</td> <td>High</td> <td>Low</td> </tr> <tr> <td>2. Sharing Course Content</td> <td>High</td> <td>Low</td> </tr> <tr> <td>3. Large Research University Community</td> <td>Low</td> <td>High</td> </tr> <tr> <td>4. Administrative Statistics</td> <td>High</td> <td>Low</td> </tr> <tr> <td>5. Time to Develop New Functionality</td> <td>High</td> <td>Low</td> </tr> <tr> <td>6. Framework for Campus Integration</td> <td>Low</td> <td>High</td> </tr> </tbody> </table>	Discriminator	Moodle (Blue)	Sakai (Maroon)	1. Maturity	High	Low	2. Sharing Course Content	High	Low	3. Large Research University Community	Low	High	4. Administrative Statistics	High	Low	5. Time to Develop New Functionality	High	Low	6. Framework for Campus Integration	Low	High	<ol style="list-style-type: none"> 1. Maturity → As the more mature system, Moodle (begun 1998) has more functional tools and add-ons, more existing sites and users, a more complete set of administration tools, more extensive logging and canned reports, much better documentation and help, and an established software development process, making it easier to roll out and maintain, easier to install and customize, easier to upgrade to new versions, and easier to fix bugs. Sakai (begun 2004) is less feature-rich, more cumbersome to configure and manage, and more difficult to upgrade. 2. Sharing course content → Moodle has multiple ways to share course content, including Shibboleth authentication and support for IMS content packages, so importing content from, and sharing access with, other Moodle courses on campus and from other IMS-compliant systems would be easier to do. In Sakai, only two tools (Resources, Content Module) allow sharing across course sites. 3. Large research university community → Sakai is in production at many large research universities as a common campus solution, including at UC Berkeley, UC Davis, and UC Merced, so it would be easier to cooperate with these universities on development and to interoperate with their systems. These peer institutions are more likely to share needs similar to ours, such as the need for tools to help in creating digital editions of manuscripts, to build research tools we could adopt, and to collaborate with us in building research tools. Although large numbers of students are supported by Moodle installations in the UK and New Zealand, enterprise-wide deployments of Moodle in the United States are almost exclusively at smaller institutions with different research needs and institutional priorities. 4. Administrative statistics → Moodle has extensive and detailed site logs as well as good reporting tools and canned reports to mine the logs for information. Sakai currently does not provide reporting tools or canned reports so any reporting would require custom programming. In addition, Sakai does not log individual use so only summary reporting is possible. Even with custom programming, we could not generate individual usage reports or verify individual activity in Sakai. 5. Time to develop new functionality → Since Moodle code is more mature, stable, and well-documented, changes can be implemented more quickly. It currently takes less time for someone to become a competent developer in the Moodle software development environment.* It is also more likely that dedicated faculty and student employees could acquire the skills necessary to develop new functionality in Moodle. 6. Framework for campus integration → The Sakai software development environment* is designed as an enterprise-level platform, scales more easily to complex architectures, and is easier to interface with other similar enterprise-level applications (J2EE based), both at UCLA and throughout the UC system.
Discriminator	Moodle (Blue)	Sakai (Maroon)																				
1. Maturity	High	Low																				
2. Sharing Course Content	High	Low																				
3. Large Research University Community	Low	High																				
4. Administrative Statistics	High	Low																				
5. Time to Develop New Functionality	High	Low																				
6. Framework for Campus Integration	Low	High																				

* "Software development environment" includes code structure, transparency of structure, documentation, well-developed APIs, and industry/3rd party support

Key Functional Discriminators



Ramifications

1. Ease of Use → Easy for faculty to become functionally proficient with little or no training. Personal experience and interviews indicate that Moodle has fewer barriers to entry. Not enough assessment time to conduct formal usability studies and no formal usability studies discovered at other institutions.
2. Accessibility → Students with disabilities can use the system. Moodle has good accessibility while Sakai's is adequate but with significant frustrating issues.
3. Quiz tool → Faculty can create quizzes well-integrated with the course site. Only Moodle currently has a proven and integrated quiz tool. Sakai's quiz tool is widely known to be problematic and unstable.
4. Gradebook → A well-integrated gradebook allows automatic transfer of grades from all tools (Discussions, Quizzes, Assignments, etc) into the system gradebook (NOTE: Refers only to automatic transfer to the Moodle or Sakai gradebook; export to campus gradebook is still required in both Moodle and Sakai). Moodle gradebook is more mature and better integrated, manual transfer of grades from the tools to the system gradebook often needed in Sakai.
5. Discussion board → Allows online discussions, including faculty evaluation of participation. Both systems have discussion boards with basic functionality, with some variation. In Moodle, discussion topics can be graded and show up in the gradebook. In Sakai, students can save drafts and polish postings before going "public."
6. Documentation → Complete and context-sensitive documentation, with little local writing needed, makes a system easier to use with less overhead for UCLA. Moodle comes with extensive and effective documentation, including much that is context-sensitive. Sakai documentation is much more rudimentary.
7. Customizing site page → Faculty and/or local IT staff can customize individual site pages with different texts, colors, graphics, etc. Moodle currently allows more customization by users at the site level.
8. Direct link to site → Non-members who want to browse the course/group offerings have one-click access through a single URL to the public portions of a specific site. Only possible in Moodle, in Sakai non-members must search a list of public sites and click each site's URL to see the public information.
9. Roles and permissions → Granular roles and permissions make it easier for faculty to delegate specific tasks to TAs and students, and to specify who has access to which tool. Sakai currently has more granular roles.
10. Extended language support (Unicode) → Faculty and students can enter diacritics and non-Roman characters in documents and file names. Not all Sakai tools allow non-ASCII entry yet, the Wiki for example. A current bug in Sakai means that non-ASCII characters are not persistent in uploaded file names.
11. Email from outside the site → Email may be sent to site members from outside the system and will be "archived" on the site. Currently only possible in Sakai.

Non-Discriminators Between Moodle and Sakai

Technical Non-Discriminators

Both systems have different approaches to these issues, but the differences are not significant enough to be key discriminators. For more details, see Appendix XX Detailed Technical Analysis.

a. Ability to replace the underlying database engine

Moodle officially supports MySQL and PostgreSQL, and full database independence is planned for v1.7, due September 2006. Sakai is designed for database independence. Though experience has shown that Sakai coding styles that work well with Oracle may generate performance problems with MySQL, the problem is being worked on.

b. Ability to replace the user interface level

Both systems show a clear separation between code and user interface. Sakai is explicitly designed to separate the “presentation” layer.

c. Ability to access UCLA Student Systems

Since the UCLA student systems do not currently conform to standards, custom programming would be required for both systems. Such programming is possible for both systems.

d. Costs/Resources (UCLA costs and/or community resources available)

For Sakai, we will have to do substantial programming to add core functionality to the code base while Moodle has more functionality “out of the box.” We postulate that Sakai may have more core resources available for development of the code base, but Sakai also has more fundamental development yet to do. For both systems, UCLA will have to devote significant resources to campus integration, user support, development, and involvement with the system community.

e. Effort to create a new course/group site

Both systems have existing tools to create new sites.

f. Effort to enable/disable a tool

Both systems have existing tools to enable/disable tools

g. Integration with Local Development & External Repositories/Library Resources

Both systems currently have the same rudimentary integration method, to add URL links to external applications/tools and repositories. Both systems have stated the intent to develop more sophisticated integration through standard interfaces and Service Oriented Architecture, and both systems have projects in progress to do so. We can't predict which system will achieve this deeper level of integration first.

h. Scalability in terms of size (number of classes/groups, number of students, etc)

Both systems can be run in the clustered environment required to scale sufficiently for UCLA's size. Sites exist for both systems with equivalent numbers of classes and students.

i. Support for e-Portfolios

Both systems have the stated intention to implement portfolios. Sakai has released the feature but it is still buggy. For Moodle, the feature is in development at the Open University in the UK.

Functional Non-Discriminators

Both systems support these functions to some degree. Functional differences exist in how each system implements the function but not of sufficient impact to affect a selection decision. For more details, see Appendix XX Detailed Functional Analysis.

- a. **Announcements**
Posting announcements on course/group homepage
- b. **Anti-plagiarism**
Integration with existing anti-plagiarism tools (e.g. Turnitin)
- c. **Assignments**
Tied to calendar, description of assignment, attachments possible
- d. **Calendar**
Internal calendar tool. Neither system will synch with external calendars without extra programming
- e. **Class roster**
Regular feed from Registrar
- f. **Drop Box**
Digital box for submitting files and assignments.
- g. **External Links**
URL to external resources
- h. **Feedback Form**
Should be able to add a feedback form in either system, though would require programming.
- i. **Index of All Classes**
List of all per department/quarter
- j. **Page Authoring**
Create plain text (unformatted) or HTML (formatted) pages
- k. **Resources**
Manage and organize site materials
- l. **Secure transfer of multiple files and directories**
Drag and drop (optional), multiple files/directories.
- m. **Site template**
Ability to create site based on predefined model or structure
- n. **Staff information**
Instructor, TA, and department contact information
- o. **Syllabus**
Ability to create and edit syllabus

Appendix A – Detailed Technical Analysis

#	Question	Moodle	Sakai
1	<p>What is required to participate in a consistent UCLA image as a single entity? (e.g. under a campus portal)</p> <p>Consider both:</p> <ol style="list-style-type: none"> Single sign-on for lab systems Single sign-on for admin systems (multi-levels?) 	<ol style="list-style-type: none"> Using Kerberos as a back-end, Moodle would be able to work for labs. (Campus should have a central Kerberos domain). Moodle has not yet been integrated with ISIS, but the expectation is that this would be possible. 	<p>Sakai can run as a JSR-168 portlet. It is not known of the tools JSR-168 compliant.</p> <p>WSRP and Sakai needs to be explored. Sakai tools are supposed to be producers.</p> <ol style="list-style-type: none"> Using Kerberos as a back-end, Sakai would be able to work for labs (Campus should have a central Kerberos domain). Sakai has been integrated with ISIS.
2	<p>How would we share course materials among departments, campuses, other universities?</p>	<p>Multiple ways:</p> <ul style="list-style-type: none"> Allow Shibboleth authentication between systems. The IMS content package in Moodle 1.6 enables such content packages to be uploaded and included in Moodle courses. In addition, the resource type supports an optional repository, enabling content packages to be shared between courses. Use Moodle import/export (UC Santa Barbara has a large Moodle installation.) Export using multiple quiz formats standards, including IMS-QTI 2.0, GIFT, and others. 	<p>Sakai is working to develop IMS import and export.</p> <p>Sakai has a Site Archive/Import tool, but it is currently incomplete and being worked on.</p>
3	<p>What mechanism to use course materials from other campuses/ other universities?</p>	<p>Multiple ways:</p> <ul style="list-style-type: none"> Allow Shibboleth authentication between systems. The IMS content package in Moodle 1.6 enables such content packages to be uploaded and included in Moodle courses. In addition, the resource type supports an optional repository, enabling content packages to be 	<p>UC Davis is working on a SCORM importer for Sakai.</p>

#	Question	Moodle	Sakai
		<p>shared between courses.</p> <ul style="list-style-type: none"> • Use Moodle import/export (UC Santa Barbara has a large Moodle installation.) • Import using multiple quiz formats standards, including IMS-QTI 2.0, GIFT, and others. • Moodle can read SCORM objects 	
4	How easy to upload instructional material or work products?	<p>Today, uploading files into Moodle is very easy via a simple web form. Management of file uploads is an evolving issue with web-based platforms, and according to a discussion thread on a Moodle forum, the Open University is working on developing the Moodle API to allow connection to JSR-170 repositories:</p> <p>“Basically we’ll have an API that interfaces Moodle files handling everywhere via a plugin to the chosen repository (or repositories). This allows us to use all the great repositories are around without needing to restrict ourselves to just one.” (http://moodle.org/mod/forum/discuss.php?d=4380) (Expected December 2006, V. 1.8)</p> <p>(WebDAV consistency has to be explored.)</p>	<p>Multiple files can be uploaded via a simple web form.</p> <p>Sakai can also use WebDAV. (WebDAV consistency has to be explored).</p>
5	How easy to reuse current or archived components of a course?	<p>Very easy, through a number of models:</p> <ul style="list-style-type: none"> • Materials can be exported/imported into new courses via an archive backup file of the course material. (This archive will not contain the student data.) The import tool allows you to generate the new course from the backup. This allows you to maintain the data in Moodle as a snapshot of the course. The new 	<p>Sakai provides the opportunity to carry forward materials from a previous course when you manually define a new course. However, not all tools are supported, and for some tools not all the material comes forward. (For instance users are not propagated.)</p> <p>Work is being done on IMS compliant export/import.</p>

#	Question	Moodle	Sakai
		<p>Moodle course begins with the previous term's data.</p> <ul style="list-style-type: none"> You can reuse a course by archiving it (with the student data). This archive also acts as a full course backup. The course can be used in the next term, and the archive exists as a backup and can be restored. This method is preferred by instructors who want to reuse materials from previous quarters. Moodle has a "Course reset" option: "This page allows you to empty a course of user data, while retaining the activities and other settings." A meta-course can be defined. Multiple courses can then be created off that meta-course. Work is being done on IMS compliant export/import. 	
6	<p>How would a career-spanning portfolio be assembled? [Implementation of portfolios is a broad campus or departmental decision.]</p>	<p>"I'm currently working on various Open University (UK) Virtual Learning Environment (VLE) projects; principally developing an e-Portfolio system and a Content/Document Management system (CMS/DMS) (that will be the base technology from which our e-Portfolio system will depend upon). Both components will be built as pluggable components into Moodle." http://moodle.org/mod/forum/discuss.php?d=43689</p> <p>The Open University in the UK is working on it.</p>	<p>OSP is integrated in Sakai 2.2.x.</p> <p>The current release of Sakai is the first availability of this feature, and it is buggy.</p>
7	<p>Can we change database engines without disturbing the tools? (e.g. is</p>	<p>Yes: Moodle officially supports MySQL and PostgreSQL using ADOdb, a library</p>	<p>Sakai uses the Hibernate persistent object technology to divorce the database from the</p>

#	Question	Moodle	Sakai
	logic layer separate form data store, stored procedures, java beans and JDBC)	<p>that allows for relatively easy migration to other RDBMS systems. http://en.wikipedia.org/wiki/ADOdb.</p> <p>Regarding other databases, the response is that someone just needs to write the connectors.</p> <p>Expected September 2006, v 1. 7: “Conversion to full database independence using new XML schema for ADOdb. This will give us support for MS SQL Server, Oracle, etc.”</p>	<p>tools. Sakai currently supports Oracle, Mysql, and HSqL. Support for other databases such as PostgreSQL, Microsoft's SQLServer, etc. It is as much a question of how much the foundation will need to QA, as of the work to hook the database into Sakai.</p> <p>One caveat. Even though Sakai works well with MySQL, experience has shown that coding styles that work well with Oracle may generate performance problems with MySQL. This is actively being worked on.</p>
8	Can we change the user interface level without affecting underlying tools? (e.g. Model View Control model, for portable devices, and/or swapping out portals or webservers)	<p>Yes – Moodle does not use a formal MVC model, but there is a clear separation of code and UI, and Moodle uses a database abstraction. Moodle's interface is composed of “themes” and “blocks.” Themes are easily-selected CSS style sheet designs, and blocks are user-configurable components that can be added, hidden, or removed at the admin and user levels.</p>	<p>Yes - A major architectural tenet of Sakai is the separation of the “presentation” layer from the rest of Sakai. The presentation layer is designed so that it can be replace without the underlying tools needing to change. Sakai sites can also utilize CSS skins.</p>
9	<p>What is required to access book of record (BOR) admin data? (e.g., Local copies or real time with less than 10 min currency.)</p> <p>[Note: Since pertinent UCLA BOR data (i.e., SRDB) does not conform to standards, any data retrieval would be custom.]</p>	<p>IMS Enterprise is an international standard XML file format which may be used to specify enrollments/unenrollments in courses, as well as course information and user information.</p> <p>There are various plug-ins for managing course enrollments:</p> <ul style="list-style-type: none"> • Authorize.net Payment Gateway • External database • Flat file • Internal enrolment (default) • IMS Enterprise (1.6) • LDAP • Paypal 	<p>Sakai tools should be able to use all standard methodologies for talking to external data sources. JDBC, SOAP, etc. Other institutions have implemented different ways to gather this data.</p>

#	Question	Moodle	Sakai
		In addition, Moodle has been deployed in the enterprise. Introducing a presentation on Moodle and the enterprise, Martin Langhoff says: “We will cover authentication and enrolment with LDAP, ActiveDirectory, Novell eDirectory, external databases, PeopleSoft, SAP, Lotus Notes, RADIUS servers, and custom proprietary Student Management Systems.” http://catalyst.net.nz/moodle/enterprise/	
10	<p>How much programming needed to create</p> <p>a) a new course instance (class)</p> <p>b) a new tool</p> <p>c) change behavior of a tool</p> <p>d) enable or disable a tool</p> <p>e) integrate other peoples tools (foreign tool - not custom or out of the box)</p> <p>f) How much effort is required to install a custom tool?</p>	<p>Development is done in PHP so this is a resource question.</p> <p>a. None</p> <p>b. Depends on the tool requirement, but currently there are hundreds of contributed modules and plugins available, so this might be an indicator of ease of programming and integration.</p> <p>c. Depends on the tool requirement.</p> <p>d. None.</p> <p>e. Having never done this work, we cannot say, but Moodle has numerous customized third-party tools which may indicate an ease of development.</p> <p>f. Because of the maturity of the community practices, installing third-party tools is well-understood and easy. For example, the MySQL tool, PHPMyAdmin (customized for Moodle) can be added simply by downloading and dropping a folder into the Moodle site. LAMS has also been integrated with Moodle.</p>	<p>Development is done in Java so this is a resource question.</p> <p>a. None</p> <p>b. Depends on the tool requirements, but there are many known projects underway.</p> <p>c. Depends on the tool requirement.</p> <p>d. None.</p> <p>e. Having never done this work, we cannot say, but Sakai has a few customized third-party tools. (Which may indicate either a difficulty or a lack of maturity.)</p> <p>f. Due to either Sakai immaturity or difficulty, installation differs from tool to tool and is not an easy process.</p>
11	a) What level of programmer/ staff expertise is needed to use	a) An administration web interface provides access to customization and	a) Customizing and configuring Sakai requires an OS system administrator (not

#	Question	Moodle	Sakai
	<p>customization and configuration tools?</p> <p>b) Can workspace administration be distributed?</p> <p>c) What are the dominating coding languages used and what are required to successfully interface with API's?</p>	<p>configuration variables. Aside from a few settings, most changes are dynamic and do not require restarting the system.</p> <p>b) Yes.</p> <p>c) PHP. Coding standards are found at http://docs.moodle.org/en/Coding. We cannot definitively answer because UCLA has not attempted integration.</p>	<p>Sakai administrator) to implement modifications to the sakai.properties text file. Every change requires a restart of the server.</p> <p>b) Yes.</p> <p>c) JAVA. JAVA Programming has been done to integrate ISIS and the SRDB.</p>
12	<p>What is the tool integration model? How deep can we integrate at various levels, e.g., at desk top level (cut and paste only?) or at back end level (grade book integration)? What is the vision and what is the reality?</p>	<p>As evidenced by the current feature set, Moodle can integrate with many external tools using a variety of methods:</p> <ul style="list-style-type: none"> • The IMS content package in Moodle 1.6 enables such content packages to be uploaded and included in Moodle courses. • Moodle has LAMS integration. • Import SCORM Learning Objects. <p>Beyond this, the desktop environment is moving to technologies like Ajax, and the line between the web and the desktop will blur more and more.</p>	<p>The vision of Sakai is that each tool exposes an API to allow intra-Sakai data and service integration. The reality is that some tool developers have followed this model (such as the Sakai Gradebook), but others have not.</p> <p>There have been discussions about using Ajax in Sakai.</p>
13	<p>How viable is the developer community process and what could be UCLA impact?</p>	<p>"We have a long list of developers who contribute towards the development of Moodle. Start with our developer information as well as the roadmap, the coding guide and CVS guide to access our source code. Most discussion can be found in Using Moodle, but we also have a bug tracker where you should report general bugs (and fixes!). Sensitive security problems should be posted to the Moodle Security site, so we can deal with them appropriately." (http://moodle.org/). Contributing to the community would be our choice.</p>	<p>Sakai has an active developer forum, and developer bootcamps, but it seems clear Sakai would require a robust local developer community to implement function and troubleshoot. "Development: The community is responsible for all aspects of evolving the Sakai product including architecture, look and feel, tool design, usability, requirements, development, quality assurance, release management, and bug fixing." (http://sakaiproject.org/index.php?option=com_content&task=view&id=108&Itemid=20) Contributing to the community would be our choice.</p>

#	Question	Moodle	Sakai
		Moodle has a core team of Moodle developers and over 30 commercial affiliates (see http://moodle.com/partners/list/).	Sakai has 13 commercial affiliates (see http://sakaiproject.org/index.php?option=com_content&task=view&id=196&Itemid=46)
14	How viable is the user community process, how many UCLA peers and what could be UCLA impact?	The user community works through forums and contributions. Because of its roots in instruction, Moodle's discussions often involve pedagogical issues. Moodle has more production installations.	The user community works through forums and contributions. Focus on pedagogy in Sakai is developing. Sakai has more UCLA peers.
15	How viable and how mature is the Open Source management? What OS model is used? What leverage could UCLA engage?	Moodle's management structure operates like Linux, Python, Perl, and other OSS projects. Its leader, Martin Dougimas, works with the community to shape Moodle's future. Often times he steps in to remind the community of over-arching philosophies (such as adherence to standards and openness). "Ideas for and details of planned future features of Moodle are initially discussed on the forums in the Using Moodle course at moodle.org. That developer discussions are intermixed with user discussions in the same forums may seem strange at first but is one of the reasons for the success of Moodle. It is important that both end-users and developers discuss the future features together. "Once ideas begin to crystalize on the forums they can be summarized in this wiki, either as part of the Roadmap or in the form of Developer notes. These pages then form the basis for further discussion in the forums." (http://download.moodle.org/modules/)	Sakai follows the Apache and Mozilla models of a board of directors supported by a community of developers. Sakai has a funding model based on the Sakai Partners program, which enables fee-paying organizations to have a voice in the governance. As a paying institution, UCLA has a vote.
16	How does the system scale? What machine operating system and/or database limitations? What	Moodle can scale from single-instructor installations to multiple-Moodle installations. The Moodle architecture is	A production deployment would likely consist of a session aware load balancer which would front end a cluster of Sakai/Tomcat

#	Question	Moodle	Sakai
	clustered and/or virtual machine installations are up?	<p>robust and works in a clustered environment. It is deployed in installations with upwards of 130,000 users in a cluster of four machines (one DB server, one load balancer, two web server).</p> <p>A relevant discussion on OS CMS and scalability can be found at: http://www.edtechpost.ca/mt/archive/000686.html</p> <p>A "Case for Moodle" can be found at: http://docs.moodle.org/en/Case_for_Moodle</p>	<p>servers. The Sakai servers would use Oracle or MySQL as their database, both of these support database clustering. There is also Unix file system based storage used by Sakai, so a Unix shared file system would be required. Installations have successfully use NFS, Netapps, Andrew file systems.</p> <p>Sakai is running at UNISA, Michigan and Indiana, all large systems.</p>
17	How are maintenance and functional upgrades applied in production? (e.g., is roll through available or planned?)	<p>Moodle upgrades are automatic and straightforward using tools provided with the new installation.</p> <p>Upgrade entails archiving the existing system file directory, downloading the new version, backing up the database, copying the configuration file from the existing to the new installation, and accessing the Admin URL. The upgrade tool automatically modifies the database schema, installs new tools, and applies the settings from the configuration file. To-date, upgrades have been 100% successful by several campus departments in multiple iterations.</p> <p>If you upgrade a vanilla Moodle with no customizations or third-party tools, a system could be ready in 10 minutes.</p> <p>Upgrading the UI (such as skins) is a separate development issue.</p>	<p>Sakai is architected so that maintenance can be rolled through a cluster without interruption of service. For functional upgrades that require changes in the database or file system, the entire system would need to be brought down for the upgrade.</p> <p>Upgrading to a new version of Sakai entails significant planning, including editing and running migration scripts, installing new versions of jForum and Melete (which add significant time), etc. In our experience, upgrading to a new version of Sakai requires a significant amount of time to research and clarify the instructions (this may be a sign of system maturity).</p> <p>The custom development (such as revealing user presence in jForum) necessary to move from one version to the next is generally not applicable to the next upgrade.</p> <p>If you upgrade a vanilla Sakai with no customizations or third-party tools, a system</p>

#	Question	Moodle	Sakai
			could be ready in half a day. Upgrading the UI (such as skins) is a separate development issue.
18	What system usage tracking data is available (who did what when)?	Moodle offers a number of granular reporting features available at both the instructor and administrator levels. All reports are centralized under Course reports and Admin reports. Customized reports can be written as plug-ins and dropped-in very easily.	Sakai events are logged in a table in the database. Currently there are not administrative tools which make use of this information. Individual universities have written reports which use the information in the database to produce some of this information.
19	How can user branding be done (aka skins)? How hard to change?	Moodle ships with 14 “themes,” including a built-in CSS editor, allowing instructors to modify the look of their site.	Skinning is very difficult in Sakai.
20	What facilities are there to support migration of data from other CMS's (like UCLA's)?	Some sites report migration from WebCT and Blackboard to Moodle. Synergy offers commercial migration support. Moodle has documentation on migrating WebCT to Moodle at: http://docs.moodle.org/en/WebCT_migration A comparative study was done at Johns Hopkins exporting WebCT data to Moodle and Sakai (requires Melete) using the IMS Content Packaging https://jshare.johnshopkins.edu/cgoh1/public_html/presentations/drexel2006.pdf	Sakai has documentation on migration development efforts to Sakai at: http://bugs.sakaiproject.org/confluence/display/MIG/Home A comparative study was done at Johns Hopkins exporting WebCT data to Moodle and Sakai (requires Melete) using the IMS Content Packaging https://jshare.johnshopkins.edu/cgoh1/public_html/presentations/drexel2006.pdf

Appendix B – Detailed Functional Analysis

Section	Functionality	Questions	Moodle		Sakai		Discriminator
			Y/N	Details	Y/N	Details	
A.	Add User Ability to add/modify users (including non-UCLA) easily; assign access rights	1. Can anyone look up a user to see if s/he is in the system?	Y	Moodle demo site has student, teacher and admin accounts. Only the admin account can search for users, as far as I can see.	Y	One can look up profiles in the profiles tool, but I can't find anything on people that I know have accounts (eg. Annelie or Pete). The Profile doesn't seem to list the Sakai ID. So "Yes, maybe" is perhaps a better answer.	Y
		2. Can users not yet in the system be added?	Y	Either by self-subscription (if enabled) or by admin and teacher roles	Y	Yes, anyone may add anyone (default setup).	N
		3. Can all members of a site add a user?	Y	Demo site has admin only being able to add. No mention of adding students in the teacher documentation	Y	Anyone may add anyone that has an email address or a Sakai ID	Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		4. Can all members of a site set permissions on added users, or just on the ones they add?	N	Version 1.6 (current) has a "rather rigid set of capabilities for each role" (http://docs.moodle.org/en/Roles#The_existing_system visited on 9/11/2006 at 9:55am). Version 1.7 has a new roles and capabilities system. Due for release, per the developer roadmap, in September 2006.	Y	depends on the roles given to the new users.	Y
		5. Are manually-added users displayed in Class Roster, and available to other tools (e.g. Assignments, Quizzes, Discussions)?	Y		Y		
		6. Can users be added in batches?	Y	upload comma separated values from a text file	Y	multiple users can be added in the add users form.	N

Section	Functionality	Questions	Moodle		Sakai		Discriminator
B.	Admin statistics Analytical tool; usage statistics; course access logs	7. Can stats be gathered within a course/site, within a set of courses/sites (e.g. by dept. or term), and global to a Division or server?	Y	Not sure. There are some references to a statistics plugin. The Teacher can get a "full report of recent activity" from (see demo site)	N	also not sure	Y
		8. Can reports be customized, e.g. to view certain tools, certain users?	Y		N		Y
		9. Can all users can see site and/or system statistics?	N		N		
		10. Are stats exportable?	Y		N		Y
		11. Can a user see a summary report of all his/her work?	Y	User can see all blog and/or forum posts for a given site. Also, admins can request reports of all activity by a given user in a single or all sites. Clicking on an event in the report goes to that event.	N	Message Center tool may allow user to view all his/her posts, but I couldn't confirm this.	(Y)
		12. Is it possible to pull together all the input of a single student from across all his/her sites?	Y		N		Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
C.	Announcements posting announcement on course homepage	13. Does the system provide a way to create/edit announcements?	Y	One can put announcements in the latest news forum, or one can edit a topic summary (which appears in the center of a course page).	Y	Announcements Tool	N
		14. Are announcements archived?	Y	Taking this question to mean "are announcements kept on the site after new announcements are added?"	Y		N
		15. Are announcements tied with other tools (e.g., tied with Class Roster to send email along with announcement)?	Y	It looks like forum posts can be emailed to subscribers. RSS feeds available.	Y	One can email to all or only to those who have opted in. Announcements also appear in a users My Workspace.	N
		16. Can all users create announcements?	Y	Depends on type of forum, eg a news forum can have "no discussions, no replies" set, so that would prevent posting. But other forum types allow it.	Y	Depends on role/permissions	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		17. Are announcements displayed/viewable in a logical place(s) on the site?	Y	Logic is sometimes in the eye of the beholder, but announcements are viewed both in a recent activity block (which can be placed anywhere on either the right or left of default home page) and in forums themselves	Y	Viewable in my workspace/announcements and in the announcements block of the main site page. Not sure if the block is movable, nor if there's a recent activity thingy of some kind.	Maybe?
		18. Can permissions be set on who creates, who views announcements?	Y				
		19. Is it possible to selectively distribute announcements to all or some of a site's members?	Y	Not that I could see	N	Announcements go to all who are subscribed to the site, but I am not sure how this works with the new roles/permissions system.	N
D.	Anti-plagiarism	20. Is integration with existing anti-plagiarism tools (e.g. Turnitin) built into the system? (with which tools?)	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		21. Can certain users control access to anti-P tools on a site-by-site basis?					
		22. Are Assignments, Discussions, Quizzes and other relevant tools anti-P-aware?					
E.	Assignments tied to calendar, description of assignment, attachments possible	23. Can different users (not just instructors) create assignments?	Y/N	Admin and teacher can create assignments, but not student users	Y	With roles; grant permission to create assignments to a role, then instructor can grant the role to anyone who needs to create assignment	Y
		24. Can open/close dates for assignments be designated?	Y	Straight-forward; option to prevent late submissions	Y	Can add the dates to an announcement	
		25. Are late submissions allowed?	Y	Can specify whether to allow, by assignment	Y	Can specify whether to allow, by assignment	
		26. Are assignments tied with other tools (esp. Calendar- and Gradebook-aware)?	Y	Both calendar and gradebook	Y	Multiple versions of Assignment Tool, one talks to Gradebook. Can generate an announcement, "add due date to schedule" option to integrate with calendar	Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		27. Can assignments be re-used (imported, exported, moved) across courses, terms?	Y	Only through general course import/export tools	Y	Only through general course import/export tools	
		28. Can assignments have multimedia (non-text) prompts?	Y	Via HTML editor and/or via links to external files	Y	Via HTML editor and/or via links to external files	
		29. Can users upload various file formats for submission?	Y	All formats. Size limit can be set by instructor (though presumably an upper limit is set by the sysadmin?)	Y	All formats. Size limit set systemwide, can't be changed by the instructor	Y
		30. Can permissions be set on who can view submitted work (instructor, student, workgroup, etc.)?	?	?	?	?	
		31. Can instructors comment and release comments online?	Y		Y	Comments can't be added or viewed after due date (bug)	Y
		31a. Are resubmissions allowed?	Y				

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		31b. Is the instructor alerted (such as via email) when an assignment is posted?	Y	There is an "email alerts to teachers" option, off by default, in the assignment creation pages.			
		31c. Is there virus checking/filtering for submissions	Y				
		31d. Can assignments be worked on collaboratively, by groups of students (with version control, joint editing, group view of document, etc)?	(N)	Unable to figure out how to add a new assignment and see if possible to assign to a group.	(N)	In Sakai 2.2 this is section-aware, may be able to assign assignments to each section, to work collaboratively.	N
F.	Class roster real-time feed from Registrar	32. Is it possible to automate the population of the class roster, including handling adds and drops during the term?	Y	a variety of methods exist for authentication and enrollment eg LDAP, external database	Y	Deducing "Yes" as the answer because UCLA Sakai has it, right?	N

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		33. Can all site participants be displayed, including manually added (with "Add User") users, guests?	Y		Y		N
		34. Can users configure which info about participants is displayed, and to which site participants it is viewable?	(Y)				
		35. Can the Roster display biographical info, research interests, and a picture?	Y		Y		
		36. Can users specify which participants see the Class Roster?	N		N		
		37. Is Roster info customizable by instructors and other users, or just by sysadmins?	N		N		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
G.	Control access granular access control for every part of current and previous sites, public, class-only, student-only, workgroup-only; policies can be set by dept or instructor	38. Can any element of a site be defined as private (site members only) or public?	Y	Resources has a "visible to Moodlers" show/hide toggle. If logged in as registered user, hidden resource is listed but not available for viewing. If logged in as guest, hidden resource isn't listed.	Y	Resources (and syllabus) can be specified public or private by whomever uploads.	N
		39. Is it possible for all users to specify the audience for elements that they deem "private"?	N	Privately deemed elements can annotated within site. Users do not have admin rights to set elements to be "private" (password protected).	N	Elements that are deemed privated can be annotated within site after login.	
		40. Does the system distinguish public vs. private info (i.e. can a user easily tell which resources s/he sees are public/private)?	(Y)	assumed to be the same as Sakai	N	If user is not on login list, site will not be accessible unless entire site is made public. Individual items on site doesn't carry public/private option.	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		41. Does the system force users to specify public or private for every contribution they make to any tool?	N	Not an option from the users' perspective with posting in d-board, emails, file attachments, etc.	N	Not an option from the users' perspective with posting in d-board, emails, file attachments, etc.	
H.	Customize or replace Homepage by dept or instructor	42. Can a site's Homepage be customized or replaced by another page?	Y	Site homepage can customized with different text, colors, graphics, etc.	Y	Customization of page is set by admin but is very limited to color, text, graphics, etc.	Y
		43. Can all users customize the Homepage of sites they create or for which they have site-creation permissions?	Y	Users with administrators rights are able to customize the site with different text, colors, graphics, etc.		Default template site set by administrator. The administrative rights give to instructors/users allows for minor customizations of color, text, etc.	Y
		44. Can Homepage templates be specified for, e.g., each department?	Y	Different template sites can be replicated for different departments.	Y	A template page, whether by department or subject can be created for replications.	N
		45. Are all elements of the Homepage customizable?	Y	Homepage is customizable with different themes and changes of text, graphics, etc.	Y	Customization of homepage limited to order, color, text, menu bar (discussion board, announcements, emails, etc.)	N

Section	Functionality	Questions	Moodle		Sakai		Discriminator
I.	Direct link to site	46. Does each site have a permanent URL to which one could directly link (e.g. from the Registrar's or MyUCLA pages)?	Y	Authentication is done by means of a single gateway site. After login, course list is displayed. An html login page can be created to specific the class.	Y	Authentication is done by means of a single gateway site. After login, course list is displayed. An html login page can be created to specific the class.	N
		47. Pre-login, does a direct link to a site go to the full public view of that site (showing all public info for that site)?	Y	Login goes to users' list of enrolled courses but viewing of other courses is optional.	N	Login allows users to view courses from different quarters/semesters. Users can only access enrolled sites.	Y
		48. Post-login, does the direct link to a site go to the full view of that site (showing both public and private elements)?	Y	Post-login allows from user to see list of enrolled courses.	Y	Goes directly to list of courses that users are enrolled in.	N
		49. Can ability to link directly to a site be disabled on a site-by-site basis (i.e. can sites be hidden)? (by which users?)	Y	Unknown	Y	Sites can be disabled to users by removing users from login lists of particular sites. Sites can also be hidden from users.	Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
J.	Discussion board Threaded. And ability to sort by student for grading, export for instructor to take away, checkbox to print specific set of posts. Compile new posts in printable/exportable doc for instructor to read new ones.	50. Can a site have multiple D-boards (e.g. for different sections)?	Y	Multiple subjects (sections) can be created within a discussion board to correspond to individual sections. Students in their sections can post messages in the listed subjects/sections created.	Y	Multiple subjects (sections) can be created within a discussion board to correspond to individual sections. Students in their sections can post messages in the listed subjects/sections created.	Y
		51. Is the D-board threaded?	Y	Discussion board is threaded to allow users to reply to messages tied to previous messages.	Y	Users are able to reply/create messages/subjects tied to previous subjects/messages.	N
		52. Can threading be disabled?	Y	Unknown	?	Can be disabled from programmer's perspective.	Y
		53. Can posts have attachments?	Y	assumed to be the same as Sakai	Y	Attachments are allowed with size limitations.	N
		54. Can non-text media be attached with annotations?	Y	Annotations of media attachments can be written in the body of subject.	Y	Non-text media can be attached as typical file attachment. Annotations to media can be inputted in the body of the subject.	N

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		55. Can all site users create, organize discussion categories, topics?	Y	Guest users can only view course. Enrolled users can view, organize by newest, oldest, threaded, and nested.	Y	Users are limited to certain rights set by the administrator.	Y
		56. Is it easy for users to write and post?	Y	Interface is self-explanatory with title, body, attachment, reply and submit button.	Y	Interface is self-explanatory with title, body, attachment, reply and submit button.	N
		57. Can users save drafts?	N	No option available to save draft.	Y	Users are apply to preview and save drafts for later postings.	Y
		58. Does the system auto-save so drafts aren't lost due to session timeout?	N	No save draft so no autosave feature.	N	There is no auto-save feature.	Y
		59. Can users add links, images, etc. within posts?	Y	Able to add links, images, characters, icons, etc. onto body of topic.	Y	Users are able to add URLs directly on body of message but images, videos, etc. must be added as file attachments with message.	N
		60. Can posts be sorted in different ways?	Y	assumed to be the same as Sakai	Y	Can be sort by read, unread, date, ascending, and descending.	Y
		61. Can specified posts (e.g. unread) be exported?	N	assumed to be the same as Sakai	N	Entire site can be exported with selected posts deleted or saved.	N

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		62. Can selected posts (e.g. all those of a given student, all replies to a topic) be concatenated and printed?	Y	assumed to be the same as Sakai	N	Can't be concatenated but listed message can be printed as appeared on.	Y
		63. Is it easy to view just new/unread posts?	N	No indications of unread postings and discussion board options does not allow for filtering of read/unread postings.	Y	No indications of unread postings and discussion board options does not allow for filtering of read/unread postings.	N
		64. Can posts, topics be tied to other tools (esp. Gradebook, Calendar)?	Y	Specific tools can be directly tied to the discussion board by URL's entered onto the topic body.	N	Specific tools can be directly tied to the discussion board be URLs can be entered onto the topic body.	Y
		65. Does the D-board support audio discussion (i.e. audio posts) as well as text?	Y	Audio files can be sent as a file attachment and downloaded to be played by specific players installed on local computer.	Y	Audio files can be sent as a file attachment and downloaded to be played by specific players installed on local computer.	N

Section	Functionality	Questions	Moodle		Sakai		Discriminator
K.	Drop box For teams as well as students. Notify team members with submission.	66. Is it easy and intuitive to submit to the Dropbox?	Y	You can use the Assignment tool as a Digital Drop Box. This allows Instructors and Students to exchange files. The Drop Box works by uploading a file from a disk or a computer to the Moodle server. instructors can set limit size to files	Y		
		67. Can users attach notes with submissions?	N	no comment box	Y	can add description	Y
		68. Can submissions be commented by instructor/reviewer and returned to submitter?	Y	feedback provided by instructors	Y	but it is in the Assignment tool	
		69. Does the Dropbox accept any file type?	Y		Y		
		70. Can multiple files be submitted?	Y	via contrib add-on module	Y		
		71. Is there a limit on file size (by file or by user)?	Y	set by instructor	Y	you can add up to 20mbs worth of files at one time	
		72. Can drop box be closed to all or a subset of users?	Y	Assignment can be closed to all but not subset	N	Assignment can be closed to all but not subset	Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		73. Can you set multiple deadlines within a drop box?	Y	Moodle doesn't have a drop box, but it does allow multiple assignments, each with its own deadline.	Y	Sakai has a Drop Box but it has no dates attached to it. The Assignments Tool does allow multiple assignments, each with its own deadline.	
		74. Is there a way for certain users to be notified of new submissions?	Y	Assignments notify instructors	Y	Assignments notify instructors. Resource Tool uploads can email site members. Not Drop Box though.	
		75. Can drop box or portions of dropbox be closed for deadlines?	Y	late submission	Y	drop box tool NO, assignment yes	
		76. Can any user set permissions and deadlines for submissions?	Y		N		Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		77. Is Drop box tied to other tools (e.g. Calendar, Announcements, etc.)?	Y	No drop box. Work can be submitted by students and marked by teachers using Assignments or Workshops. A Workshop is a course peer assessment activity with a huge array of options (see settings below). Workshop allows participants to assess each other's projects, as well as exemplar projects, in a number of ways. It also coordinates the collection and distribution of these assessments. Assignments allow the teacher to grade various types of student submissions. Assignments show up in Calendar and Upcoming Events (aka Announcements). - taken from Moodle docs.	Y	Drop box and Assignments tools both allow uploads. Assignments is connected to Calendar but only deadline. Announcements shows only start time. Drop box doesn't connect with either. It's just a storage area for student that instructor can see.	Y
L.	Email archive Emails to class archived	78. Is it easy to turn on email archiving and specify the site email address?	N	No email listserv function	Y	Does have email listserv fuction. If you use the email address from the Sakai site the emails will be archived.	Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		79. Can any user enable and configure email archiving for his/her site?	N		N	only instructors can	
		80. Is it possible to configure the email archive for specific users?	N		N	not really specific, only 2 categories (anyone or site participants)	
		81. Can all users view the email archive?	N		Y		Y
		82. Are there spam protections?	N		N	anyone or site participant restriction (maybe use this to block out spam from outside users?)	
		83. Is email archive sortable?	N		Y		Y
		84. Is email archive exportable?	N		N		
M.	External links URL to external resources	85. Does the system provide a flexible way to create and organize links to external URLs?	Y	in Resources, but you can add external links in any pages that have a WYSIWYG editor, only teachers are allowed to add them to the Resource page	Y	can add and organize them in Resources Tool	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		86. Can any user can add links to a site?	Y	only if you are an instructor	Y	only if you are an instructor	
		87. Is it possible to set permissions on who can add links on a site-by-site or systemwide basis?	Y	The admin can set permissions to allow any member to have admin rights to the site (Moodle refers to them as teachers), but only teachers can add links	Y	instructors can provide permissions that allow users to upload files and post links to websites in the Resources tool of a site. Resource permission settings are at the folder level.	
		88. Can links be annotated by any user?	N	You need to be a teacher or TA to annotate or edit the links. With Wiki would allow students to add and edit links.	Y	assuming the instructor gave you the right to revise. Wiki is another option.	Y
		89. Can links be moved between sites for re-use, sharing?	Y	Can clone a course by archiving then restoring it. You can also merge materials between courses.	Y	Site Info / Import from Site allows this	
		90. Is there a way to mark external links to be included in Resources?	Y	you can put links directly into Resources	Y	you can put links directly into Resources	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
N.	Feedback form Collects referring page, IP address, browser type, ISIS session info, UID, etc. especially error pages	91. Is there a way to add a feedback form to a site? On any page within the site?	N	Should be able to modify template, but not sure how much you can configure to retrieve information (such as IP addresses, etc)	N	Should be able to modify template, but not sure how much you can configure to retrieve information (such as IP addresses, etc)	
		92. Can the desired info be specified by editing a feedback template or in some other non-technical way?	N		N		
		93. Can different feedback forms be used in different sites, or universal to system?	N	Depends how much programming you want to do.	N	Depends how much programming you want to do.	
		94. Does the system gather, process, return the feedback to any user (which is configurable) and in a useful way for troubleshooting and analysis?	N		N		
		95. Can feedback be anonymous?	N		N		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		96. Is it possible to request feedback on a specific exercise or element in a site whenever a user accesses it?	N		N		
O.	Gradebook integration with campus gradebook	97. How would grades related to system-internal work be integrated with an external campus gradebook?	Y	export to my.ucla, but need to change the format to look like my.ucla's (ie: similar column, etc)	Y	export to my.ucla, but need to change the format to look like my.ucla's (ie: similar column, etc)	
		98. Can grades assigned be exported in formats easily used in spreadsheets and other Gradebook tools?	Y	excel or text format	Y	Excel and CVS formats	
		99. Is the Gradebook aware of other tools (esp. Calendar, Syllabus, Discussions, Assignments, Quizzes/exams)?	Y	when you add an assignment or quiz, you specify the type of grade scale, this gets added to the gradebook automatically, unless no grade scale is specified	Y	Yes, but limited at this time.	Y

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		100. Is it possible to grade once, instead of multiple times?	?	not sure what this means	?	not sure what this means	
		101. Is there a user-configurable time-out?	N	has to deal with ISIS timeouts which are not user configurable	N	has to deal with ISIS timeouts which are not user configurable	
		102. Is the user interface for structuring the grading schema intuitive?	Y	if a grading scale is specified on an assignment, quiz, etc., then it is automatically added to the gradebook, but you can edit preferences to hide grades	N		Y
P.	Index of all classes list of all per department/quarter	103. Does the system index sites, and in what way can they be grouped, sorted?	Y	Has categories but not subcategories, sorting only by course title. Not equivalent to what some depts currently have.	Y	But only before login. Grouping by class or research project and academic term only. Sorting only by site title. Doesn't seem to have categories or departments groupings. Not equivalent to what some depts currently have.	Y
		104. Can any user specify the way in which sites are listed?	N		N		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		105. Is it possible to control which sites are viewable in the index? Which users can control this?	Y	Sites can be hidden and not viewable in index. Admin only.	Y	Sites can be private and not viewable in index. Admin can set this, not sure about instructor.	
		106. Does the index list the direct links to sites (see Direct link to site)?	Y		Y		
Q.	ISIS integration	107. Would integration with the campus single sign-on (currently ISIS) involve significant work?	(U)	Unknown, but other campus applications (such as ClassWeb), written in PHP have been demonstrated to work.	N	Work has already been done; newer version of Sakai will require modifications, but this is not anticipated to be too much work.	
		108. Is there a way to also accommodate non-UCLA users who need to log in?	Y	Yes: Non-UCLA users can use their email account and be given a "local" Moodle account. (In the future, if ISIS supports external users, this can be revisited.)	Y	Yes: Non-UCLA users can use their email account and be given a "local" Sakai account. (In the future, if ISIS supports external users, this can be revisited.)	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
R.	Library-resource integration integration between classes, e-Reserves, digital repositories, and other digital library resources	109. Is there a way for users to view and link to campus-authorized library resources (e.g. class e-reserves, UCLA-licensed repositories, Learnstor objects) from within the system?	Y	Manual links are possible but off-campus users will still need BOL VPN. Automatic links to ereserves would need to be programmed. Learnstor uses Dspace at UCLA and Moodle is talking about integrating it.	Y	Manual links are possible but off-campus users will still need BOL VPN. Automatic links to ereserves would need to be programmed. Learnstor uses Dspace at UCLA and Sakai is talking about integrating it via OKI OSIDS.	
		110. Can different users view and link to Library resources?	N	No special Library integration.	N	No special Library integration.	
		111. Can one specify which Library resources should be accessible from within the CCLE? Which users can do this specification?	N	No special Library integration.	N	No special Library integration.	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		112. Can one distinguish Library (licensed) resources from external links and other site Resources (so users know not to share them with outsiders)?	Y	Only by manually organizing the URL links or resources. Couldn't find any mention of setting Copyright icons or notices.	Y	File uploads can display copyright alert and require acknowledgement when accessed by others. But URLs cannot. Manual organization also possible.	Y
S.	Multilanguage support full Unicode support across all tools	113. Can all users input any Unicode character set into any tool that accepts text input?	Y	As of current version (1.6) Moodle is now 100% Unicode, which means any language can be mixed together and an end to a number of problems that different character sets caused us.	Y	As of current version 2.2.1.	
		114. Are all the standard input methods supported (e.g. Windows, Mac, Linux keyboard layouts)?	Y	As of Moodle 1.6 See Ted Liu email for more details.	Y	As of Sakai 2.2.1See Ted Liu email for more details.	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		115. Is Unicode fully supported at the data storage layer in a standard way?	Y	Moodle 1.6 not only changed the database structure, but also the database content (everything is converted to Unicode). Due to some bugs in MySQL and how it handles Unicode, we just worked out that MySQL 4.1.16 is the minimum version we can use for Moodle 1.6. See http://docs.moodle.org/en/UTF-8_migration	Y	When you create database for sakai, you need to specify default character set utf8.	
T.	Page authoring create plain text (unformatted) or HTML (formatted) pages	116. Can users easily input either plain text or HTML pages in all tools where text submissions are anticipated (e.g. Homepage, announcements, assignments, discussion posts, etc)?	Y	WYSIWYG Editor allows toggle between plain text and html input in Calendar, Assignments , Discussion Forum, News Events(announcements), quizzes (hot potato quizzes and regular quizzes), Lesson Plan	Y	WYSIWYG Editor allows toggle between plain text and html input in Announcements, Assignments , Discussion Forum, Drop Box, Schedule, Syllabus.	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		117. Does the system provide an intuitive HTML editor that is functional for page authoring and display across platforms and browsers?	N	WYSIWYGs wont work in Safari (it's a known Safari problem), but Moodle allows for you to edit using html tags, markdown text, and plain text with a popup explaining how to use the editors	N	Not in Safari. HTMLArea requires Internet Explorer >= 5.5 (Windows only), or Mozilla >= 1.3-Beta on any platform. Any browser based on Gecko will also work, provided that Gecko version is at least the one included in Mozilla-1.3-Beta (for example, Galeon-1.2.8). However, it degrades gracefully to other browsers. They will get a regular textarea field instead of a WYSIWYG editor.	
		118. Is there Unicode support for all page authoring?	Y	Looks like Unicode can go into WYSIWYG Editor. Requires knowing how to configure your computer correctly for Unicode input.	?	Looks like Unicode can go into WYSIWYG Editor. Bug http://bugs.sakaiproject.org/jira/browse/SAK-5313	
U.	Quizzes SAMigo (the Sakai quiz and test tool) is known to be problematic and unstable.	119. Does the system have an editing tool to create quiz items, including importing from other sources?	Y		Y		
		120. Can different users create quizzes, tests, surveys?	(Y)	Forthcoming in v 1.7 (Sept 2006)	Y	With modifications to roles and permissions	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		121. Can quizzes be pre-built and selectively released by date or to selected users?	Y		Y		
		121b. Can quizzes be pre-built and selectively released by date or to selected users?	N		N		
		122. Does the system allow quizzes and question banks to be shared across sites?	Y		Y		
		123. Can quizzes/question banks be shared by multiple users dependent on permissions?	(U)	Needs further testing	(U)	Needs further testing	
		124. Can the system import/export IMS QTI or other standard quiz formats? from other LMS's?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		125. Can quiz prompts and answers incorporate digital media (images, sound, video)?	Y		Y		
		126. Are quizzes integrated with other tools (esp. Gradebook- and Calendar-aware)?	Y		N		
		127. Is it possible to structure and deliver complex exams (high-stakes) online?	Y		N		
		128. Can the system generate a random quiz from a bank of questions?	Y		N		
		129. Does the system track student scores, including the best score of several attempts?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		130. Is it possible to summarize scores by section, group, class or student (may be part of Admin statistics)	Y		(U)	Needs further testing	
V.	Resources Manage and organize site materials	131. Is it easy to upload files?	Y		Y		
	Answer in both cases is dependent on system configuration	132. Can the system store very large (1Gig) files without performance compromise?	Y		Y		
		133. Can folders be easily created/modified to organize resources?	Y		Y		
		134. Can resources be shared across sites?			Y		
		135. Can Resources store any file format, including digital media files?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		136. Is it possible to store keyword and locally defined metadata and retrieve/search by this metadata?	N		N		
		137. Which users can add resources?	(Y)	Forthcoming in v 1.7 (Sept 2006)	Y	Dependent on roles and permissions	
		138. Can users configure limitations on uploads by user, by site, by term, by file type?	Y	By user upload	N		
		139. Is there versioning control for document changes?	N		N		
		140. Does the system collect and manage copyright status of the resources?	N		Y	Sakai will display a number of copyright options upon upload and download, if set.	
	Links to any files work, but managing copyright is left to the external site.	141. Does the system support linking to an external URL for a copyrighted work in lieu of an uploaded file?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		142. Is it easy to specify public/private/selected audience for a given resource?	N		Y	Public and private, "Yes"; "selected", "No"	
		143. How are multiple files uploaded?	Y	Through WebDAV, but using separate authentication from ISIS	Y	Through WebDAV, but using separate authentication from ISIS	
		144. Can resources be annotated?	Y		Y		
		145. Is there close integration with Library search and discovery systems?	(U)		(N)	Maybe: Twin Peaks offers limited connection to open Library resources, but does not work in the latest version of Sakai due to an incompatibility between the current HTML WYSIWYG editor	
		146. Can users set access permissions for what they've uploaded to any user-defined group?	(N)	v 1.7 has a more granular roles and permission structure, but this has not been tested.	N		
		147. Is it possible to create Group workspaces?	(N)	v 1.7 has a more granular roles and permission structure, but this has not been tested.	Y	Groups are created and a folder in Resources can be designated to a specific group.	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
W.	Secure transfer of multiple files and directories drag and drop (optional), multiple files/directories	148. Does the system provide a way for some/all users to transfer multiple files and directories? both ways (upload and download)?	Y	Via WebDAV or uploading a zip file. Moodle will unzip the file.	Y	Via WebDAV	
		149. In a secure (e.g. SFTP) way?	Y	Multiple files can be uploaded a number of ways, and how to do that securely varies with the method: Upload via FTP - Yes, if SFTP is implemented by the System Admin (note: not the CCLE Admin) Upload via WebDav - Yes, if secure WebDAV is implemented by the System Admin (note: not the CCLE Admin) Upload a single web page with multiple forms (one for each file) - Yes, if the upload page is https	Y	Multiple files can be uploaded a number of ways, and how to do that securely varies with the method: Upload via FTP - Yes, if SFTP is implemented by the System Admin (note: not the CCLE Admin) Upload via WebDav - Yes, if secure WebDAV is implemented by the System Admin (note: not the CCLE Admin) Upload a single web page with multiple forms (one for each file) - Yes, if the upload page is https	
		150. Is directory structure preserved?	Y	If the user uploads a .ZIP file with an internal directory, Moodle will unzip the file and restore the directory structure.	Y	Via WebDAV	
		151. Can files be rearranged in different folders once uploaded?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		152. Is multiple file/directory transfer supported within all relevant tools (e.g. Resources, Drop-box, Assignments, D-board)?	Y	Moodle's Resources are shared across tools. For Resources (Y), Drop Box (Y - using web form), Assignments (files Y, directories N), Discussion (files Y, directories Y via zip archive)	(Y)	For Resources (Y), Drop Box (Y - using web form), Assignments (files Y, directories N), original Discussion tool (files Y, directories N), jForum (N)	
		153. Is drag-and-drop of multiple files supported?	Y	Through WebDAV, but using separate authentication from ISIS	Y	Through WebDAV, but using separate authentication from ISIS	
X.	Site template ability to create site based on predefined model or structure [NOTE: We consider site appearance a meta-question because UCLA has not determined if the flexibility to change a site's appearance is a desired feature]	154. Can sites be created based upon pre-specified templates?	Y	A template can be customized more, including instructor-created skins, tool selection and placement. If the setting is permitted, students can change the look of a course for themselves	Y	A template is a selection of Tools, Roles, Skin and Appearance. Instructor can choose from pre-defined skins. Appearance: instructor cannot choose or easily create a skin: must be created by a web developer, then uploaded to server and the Sakai Admin must set the skin for the site.	
		155. Can individual sites be built on templates, or only groups of sites? How granular can template-specification be?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		156. How are templates created? Which users can create templates?	(Y)	Instructors and system admins	(Y)	System administrators	
		157. Can any user specify the template needed for a specific site(s)?	Y		(Y)		
		158. Do site templates include permissions settings on tools?	(N)	v 1.7 has a more granular roles and permission structure, but this has not been tested.	Y		
		159. Can users create a template based on the organization and configuration of tools on an actual site, but excluding user data?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
Y.	Staff info Instructor, TA, dept contact information	160. How would personnel information (names, contact info, office hours, etc.) related to a given site be added? By which users?	Y		Y	Automated from Registrar's data by Admin	
		161. Can one automate the addition of certain personnel info from external campus data sources?	(U)	Unknown, but other campus applications (such as ClassWeb), written in PHP have been demonstrated to work.	Y		
		162. Is personnel info modifiable once added? By which users?	Y	By admin or user	Y	By admin or user	
		163. Is there a way to link relevant staff info to external campus directories, etc. (e.g. email addresses, URLs for personal web pages, etc.)?	Y		Y		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
Z.	Syllabus	164. Is it easy to upload a pre-existing file for use as a syllabus and edit it in the system?	N	Unless the upload file is an HTML file, the answer is no.	N	Unless the upload file is an HTML file, the answer is no	
		165. Can a syllabus be created and edited within the system?	Y	The course structure format in Moodle can be seen as a syllabus	Y	Sakai has a separate form-based tool.	
		166. Is there versioning of previous/new syllabi?	N		N		
		167. Can a syllabus in one site be shared with other sites?	Y		Y	If you use an external URL for your syllabus.	

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		168. Can the syllabus be linked with Library resources (online repositories, e-Reserves) and/or Resources stored in the site?	Y		Y		
		169. Can events in the syllabus be linked to the Calendar?	Y		N		
		170. Is the syllabus Gradebook-aware – the grading system in the syllabus is synchronized with the system or campus Gradebook?	N		N		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
AA.	Calendar	171. Can the Calendar sync up with all campus-related calendars for a particular user?	(U)	If campus had an Exchange or iCal calendaring system, then the answer to this depends on the CCLE's built-in calendar	(U)	If campus had an Exchange or iCal calendaring system, then the answer to this depends on the CCLE's built-in calendar	
		172. Can the Calendar sync with/download to a PDA?	N		N		
		173. Can users see other users' calendars to facilitate scheduling of appointments?	N		N		
		174. Does the Calendar support drag-and-drop of events?	N		N		

Section	Functionality	Questions	Moodle		Sakai		Discriminator
		175. Does the Calendar capture all site-specified events from other tools (esp. Quizzes, Assignments, Syllabus)?	Y		N		
Functional Meta-Categories (Across Individual Functions)							
BB.	Accessibility			<p>Excepts from Patrick Burke assessment: Based on my testing the accessibility winner is Moodle. I had some problems with Moodle as well, but overall found the system much more manageable [than Sakai]. Heading navigation is generally more sensible, & message navigation was much easier (even in forums with dozens of posts).</p> <p>Both Sakai & Moodle promise accessibility improvements in their next versions (Moodle 1.6; Sakai 3.0).</p> <p>From Foothill DeAnza evaluation Spring 2006 (tentative, based on email, full report may follow): 7 on a 10 point scale, highest score of the course management systems evaluated</p> <p>Moodle Accessibility Specification: http://docs.moodle.org/en/Moodle_Accessibility_Specification.</p>		<p>Excepts from Patrick Burke assessment (attached): I found the Sakai interface extremely difficult & frustrating (using the Academus implementation). Even the basic screens of messages to users were hard to navigate. And when I finally found what should be the Delete button, it said "Not permitted to delete items from here."</p> <p>They seem to be trying for accessibility, but often make things worse. Many pages overuse the heading tags, so that navigating is a lengthy process, very far from the organized outline of page content that headings should provide. As another example, the checkbox for each mail message is marked "To select / de-select for a subsequent action", meaning that I have to hear that (probably several times) to manage each message.</p> <p>Both Sakai & Moodle</p>	Y

Section	Functionality	Questions	Moodle	Sakai	Discriminator
				<p>promise accessibility improvements in their next versions (Moodle 1.6; Sakai 3.0).</p> <p>From Foothill DeAnza evaluation spring 2006 (tentative, based on email, full report may follow): 6(?) on a 10 point scale</p>	
CC.	Ease of Use		<p>Based on our personal experience, easier to use. Awaiting institutional interviews and/or usability study reports from other institutions.</p>	<p>Based on our personal experience, harder to use. Awaiting institutional interviews and/or usability study reports from other institutions.</p>	
DD.	Documentation		<p>Moodle has good, extensive documentation, including context sensitive online help.</p>	<p>Sakai documentation is much more rudimentary, less granular, and less complete.</p>	
EE.	UC-Wide Community		<p>Not yet adopted by any UC campus as a common campus solution.</p>	<p>In production at UC Berkeley, UC Davis, and UC Merced as a common campus solution.</p>	

Appendix C – Institutional Interviews

The Assessment Task Force conducted interviews with representatives of the following 6 institutions. Summary notes and audio recordings of the interviews are posted on the Sakai FCET Collaboration site www.sakai.ucla , under Resources.

Moodle Sites

1. Humboldt State University (Riley Quarles, Manager, Instructional Media; Michael Penney, Moodle Administrator; Jeff Graham, Instructional Support)
FCET Collaboration / Resources / Assessment Task Force Interviews / Humboldt State
2. San Francisco State University (Kevin Kelly, Coordinator for Online Teaching and Learning)
FCET Collaboration / Resources / Assessment Task Force Interviews / San Francisco State (notes only, no audio)
3. New Zealand Open Polytechnic
Ken Udas (currently at Penn State)
FCET Collaboration / Resources / Assessment Task Force Interviews / New Zealand Open Polytechnic
Richard Wyles, eLearning Director
FCET Collaboration / Resources / Assessment Task Force Interviews / New Zealand Open Polytechnic

Sakai Sites

4. UC Santa Barbara (Steve Miley, Manager, Instructional Computing)
FCET Collaboration / Resources / Assessment Task Force Interviews / UC Santa Barbara
5. Yale University (Chuck Powell, Director, Academic Media and Technology)
FCET Collaboration / Resources / Assessment Task Force Interviews / Yale
6. UC Merced (Faust Gorham, Information Technology)
FCET Collaboration / Resources / Assessment Task Force Interviews / UC Merced

Appendix D – A Review of Open Source Learning Management Systems

A Review of Open Source Learning Management Systems

UCLA Common Collaboration and Learning System Assessment Task Force
August 2006, v. 3

EXECUTIVE SUMMARY	62
INTRODUCTION AND METHODOLOGY	62
DOTLRN	64
DOTLRN FEATURES.....	64
<i>dotLRN</i>	64
<i>Assessment</i>	65
<i>Bulk Mail</i>	66
<i>Calendar</i>	66
<i>Curriculum</i>	66
<i>dotLRN Homework</i>	67
<i>dotLRN Ecommerce</i>	67
<i>Edit this Page</i>	67
<i>Evaluation</i>	68
<i>Expenses</i>	68
<i>FAQ</i>	68
<i>File Storage</i>	69
<i>Forums</i>	69
<i>LORS Central</i>	70
<i>LORS Management</i>	70
<i>News</i>	71
<i>Photo Album</i>	71
<i>Project Manager</i>	72
<i>Staff List</i>	72
<i>Survey</i>	72
<i>Syllabus</i>	73
<i>User Tracking</i>	73
<i>Weblogger</i>	74
<i>Wimpy Point</i>	74
ATUTOR	75
ATUTOR FEATURES	75
<i>Learners</i>	75

<i>Instructors</i>	76
<i>Administrators</i>	78
<i>Developers</i>	79
<i>Recently Completed Features</i>	80
<i>Proposed Features of ATutor</i>	81
CLAROLINE	83
DOKEOS	84
GANESHA	85
ILIAS	86
ILIAS FEATURES	86
<i>Personal Desktop</i>	86
<i>Learning Environment</i>	86
<i>Communication</i>	87
<i>Groups</i>	87
<i>Authoring Environment (Editor)</i>	87
<i>Administrative Environment</i>	88
<i>Metadata System</i>	88
<i>Additional Features</i>	88
LON-CAPA	89
LON-CAPA FEATURES	90
OLAT	91
OLAT FEATURES.....	91
<i>General</i>	91
<i>OLAT Course system and learning resource repository</i>	91
<i>Groups, Assessment and Communication</i>	92
<i>Testing system</i>	92
<i>Doku / Help</i>	92
APPENDIX A: FOCUS LIST - OPEN SOURCE SYSTEMS	93
NOTES	94

Executive Summary

In the summer of 2006, as part of their charge to identify a Common Collaboration and Learning Environment for UCLA, the CCLE Assessment Task Force posed the question, “Are there other open source systems besides Moodle and Sakai that should be considered for the common campus solution?”

Using the report “Focusing Resources and Fostering Creativity”ⁱ as a basis of criterion, two candidates emerged as potential systems: dotLRN and ATutor. Subsequent analysis and research determined these systems do not match the needs of UCLA.

The CCLE Assessment Taskforce will, therefore, undertake a thorough analysis of Moodle and Sakai as the two possible solutions for the UCLA common campus solution

Introduction and Methodology

A series of research cycles were conducted to identify a list of potential OS systems.

1. In the first cycle, a Google search of “open source lms” resulted in web links to systems, reviews, whitepapers, scholarly articles and mainstream publication articles which were subsequently scanned to develop a list of OS systems.

For example, in “Wake-Up Call: Open Source LMS,” Sam Adkin writes,

There are currently dozens of OS learning technology products on the market, and the list is growing. Moodle, Ganesha, Claroline, ILIAS, and Sakai appear to be the dominant OS LMS products so far, at least in terms of adoption size and market buzz.ⁱⁱ

From this, we added Ganesha, Claroline, ILIAS to our list. We also pursued systems passed to us from colleagues, such as this note: “Gartner has just released its Hype Cycle for Higher Education 2006, and Open-Source E-Learning Applications are included (they’ve put them into the “Sliding into the trough of disillusion” section J). The 4 sample vendors Gartner lists are: Sakai, Moodle, Claroline, ILIAS.”

2. A preliminary cycle of Internet research narrowed this list to a Focus List of eight potential systems (see Appendix A). Reasons for exclusion from the Focus List included missing websites, abandoned or stalled projects, beta or experimental projects, etc.

The specific reasons for excluding candidate systems from the Focus List vary, but generally fell along these criteria:

- a. Uses an inappropriate technology stack. This means, for example, systems which are written in an obscure language for which we neither have local expertise nor can hire it; rely on platform/OS technologies which are proprietary and/or promote vendor lock-in; make central use of less well known or relatively immature technologies; require technologies which have not been demonstrated to scale adequately (such as flat files instead of databases); rely on technology which is outdated or near end of life.
- b. Is not known to be used by a large institution. Having a large number of users, however, can demonstrate scalability.
- c. Has weak development or user/support communities.
- d. Conducts business (documentation, conferences, developer and user forums, etc.) primarily in a language other than English

Another discriminating factor was identifying those Learning Management Systems (like LAMS or Melete) which are specifically designed for creating and delivering sequenced learning content and tracking users. This kind of learning and instruction may found at UCLA, but it is not the primary method of

instruction on the campus. These kinds of systems are better suited for predetermined training or learning environments, such as large corporate training or the military, where learning objectives are easily compartmentalized into specifically packaged content. LMSes usually supplement the kind of CCLE UCLA is seeking, in much the same way that Melete supplements Sakai or LAMS integrates with Moodle (and soon with Sakai).

3. A third round of research included a more substantive review of the Focus List, and the feature set of these eight systems was compared to the CCLE report. We rejected a number of these systems for various reasons as explained in the report.

For the remaining few systems, we visited the product website and followed links to institutions where the system is in operation. We looked at the product support forums, development roadmap, technology stack, and any other characteristics to derive a positive or negative determination of the product.

4. Two systems, dotLRN and ATutor emerged as potential additions to Moodle and Sakai. The ATF was asked to review these systems for their applicability and after a thorough and careful analysis, the ATF felt neither system matched the requirements for the UCLA CCLE.

More information on the potential candidates is included below. Much of this information is reformatted from the system websites and included herewith for the reader's convenience.

dotLRN

- <http://www.dotlrn.org/>
- Developed at MIT
- Tcl / Oracle and PostgreSQL

Findings: Does not meet UCLA CCLE requirements. According to the WCET Edutools July, 2006 report, "Peer Comparison of Course/Learning Management Systems, Course Materials Life Cycle, and Related Costs," the MIT Sloan School of Management has made a strategic decision that they will not be involved in software development as a core activity, and as a result has decided in principle to transition from SloanSpace (an instantiation of .LRN). No U.S. research institutions run .LRN at the scale of an institutional solution. An additional concern for some reviewers was the Tcl language. While acknowledging the maturity and potential for the language, campus lacks resources for development.

Comments

dotLRN is built on the OpenACS (Open Architecture Community System), "a toolkit for building scalable, community-oriented web applications. OpenACS is the foundation for many products and websites, including the .LRN e-learning platform. OpenACS is open source and is available under the GNU General Public License."ⁱⁱⁱ

dotLRN is a fully open source eLearning platform. The commitment to open source emphasizes the author's belief that the core infrastructure and application suite for eLearning should be part of the "intellectual commons" and freely available to all. .LRN is being made available as open source software under the GNU General Public License.

A portal framework and integrated application suite to support course management and online communities. Knowledge organizations recognize the need to support a variety of applications and tools to foster learning and to promote collaboration. Just as users rely on the "Office" suite of applications (word processing, spreadsheet, database, presentation, email) for basic productivity, .LRN contains an integrated suite of applications to support distributed collaborative communities engaged in learning and research.

A scalable, secure, and enterprise-ready eLearning platform that can be deployed readily by small and large organizations. By its very nature, an eLearning platform cannot be a stand-alone application. .LRN will deliver "vertical integration" into the enterprise infrastructure through well established open standards and published APIs. A modular architecture to permit flexibility and to drive innovation. As new technologies and tools emerge, ranging from P2P to wireless, organizations need the flexibility to stitch together various solutions and products. Based on the Web Services paradigm, .LRN will deliver a componentized architecture to permit "horizontal integration" of best of breed open source and proprietary technologies.

dotLRN Features

dotLRN

dotLRN is a full-featured application for rapidly developing web-based learning communities, specifically in the context of Course Management. dotLRN is a Learning Community Management System which means it helps manage communities of users and the exchange of information therein.

1. Classes and Communities can be created and the administrator can select whether the policy to join them is closed, open or requires approval.
2. Different roles are supported for the dotLRN Classes, students, professors or administrative staff.
3. The user portal can be personalized by each user.
4. The administrators can change the layout of the Class/Community (portlet location or templates) and it will be the default layout for all members.
5. Different roles are supported for dotLRN Communities, administrators and members
6. dotLRN provides default applications that can be used in Classes and Communities, such as: attachments, bulk-mail, calendar, faq, file-storage, forums, general-comments and news.
7. Several Openacs packages can be integrated to dotLRN, such as: Project Manager, Assessment, Survey, Evaluations, Lorms and others.

Assessment

The assessment module provides OpenACS with capabilities to conduct surveys, tests and dynamic information gathering in general.

1. Create assessment that allows anonymous responses.
2. Change assessment interface to create different types of assessments like surveys, revisions, quizzes, exams, etc.
3. Set the time required to complete an assessment and the number of tries allowed.
4. Change sections order.
5. Change questions order within the section.
6. Preview sections.
7. Reuse sections.
8. Create different types of questions: short answer, open question, file-upload questions and multiple choice questions.
9. Set points to each question.
10. Set the number of questions displayed on each page.
11. Reuse questions.
12. Reuse set of multiple choices.
13. Copy questions
14. Separate submit of questions.
15. Display questions by: order of entry, randomly or alphabetical.
16. Set up an action in order to execute a transaction into the system, called triggers (e.g. set up a registration form in order to use it on the registration process).
17. Branching.
18. Copy an entire assessment.
19. Grant permissions over each assessment.
20. Grant permission over the assessment instance.
21. View responses by users.
22. Export responses into csv file.
23. Send email to people who already complete the assessment.
24. View change history of an assessment.
25. Delete an assessment.
26. Create actions that can be associated to a trigger.
27. Administrate manually executed triggers for all or each assessment.
28. Notify a user when a trigger is executed.
29. Import a QTI zip file to create an assessment.

30. Export an assessment into a QTI zip file.

Bulk Mail

It is used to send an email to several users at the same time.

1. Used in dotLRN, users or just the administrators can send mails to all members of a community/class (members and administrators), and the admins can keep track of the mails sent by all users of the community.
2. Bulk Mail can be used in other packages providing an interface that allows users to send bulk mails to a list of users depending on the applications (e.g. Assessment uses bulk mail to send mails to users that has completed a survey).

Calendar

It provides a UI for storing events that have a time or that last a day. It offers a list view, a day, week, and month view.

1. Add an event item, this event can be set to last all day or the user can specify an hour range, this event also can be repeated and the recurrence can be set as every month, every day, every year and a limit date can be also set.
2. Users are allowed to use different calendars in order to help them difference between community events and personal events.
3. A file or URL can be attached to the events.
4. Events can be edited, deleted.
5. Users can manage different categories for their events this can become pretty handy when administrating a community.
6. Grant or revoke permissions over a calendar.
7. Grant or revoke permissions over calendar package.
8. Users can request notification for calendar.
9. Users can download a file to synchronize this calendar with Microsoft's Outlook.

Curriculum

The Curriculum module allows you to arrange URLs of suggested learning resources into a series of educational elements, a study path that the students are invited to follow. It allows teachers to set up curriculums made up of learning elements that are URLs found anywhere online. Provides online students with a course navigation and user tracking service that offers guidance through curriculums created by teachers.

1. Add a curriculum.
2. Add elements to a curriculum.
3. Enable or disable elements of the curriculum.
4. Request notifications for curriculums.
5. Edit default assignees
6. Edit package parameter
7. Grant or Revoke package permissions
8. Map category trees to curriculums.

dotLRN Homework

The dotLRN Homework package provides a dropbox for students to upload homework files and for professors, teaching assistants and other graders to upload their comments and corrections to such files. Administrators can make subfolders in class homework dropbox folder, this will be used to create a separate subfolder for each homework assignment. Students can only access homework files they've uploaded themselves along with each file's associated comments and corrections files.

1. Create folders (admin).
2. Add homework files to folders.
3. Create new revisions for homework files.
4. Show all homework file revisions.
5. Add comments to assignment files uploaded by students.
6. Create new revisions of comments.
7. Move/Delete comments files.
8. Request notifications for new homework files, comment or correction files.

dotLRN Ecommerce

Based on dotLRN Catalog, dotLRN Ecommerce is used to create courses and sections (dotLRN communities) and manage them as ecommerce products.

1. Create and categorize courses.
2. Add sections to courses (dotLRN communities).
3. Associate an assessment to register to the course.
4. Remove sections from the course.
5. Process course purchase.
6. Manage section sessions and registrants attendance.
7. Manage section waiting list.
8. Manage sections on the Ecommerce interface.
9. Create a purchase account.
10. Edit email templates.
11. Edit default portals settings.
12. Review orders.
13. Manage Category trees.
14. Register to a course.
15. Join waiting list when course is full.
16. Add courses to shopping cart.
17. Review the shopping cart.

Edit this Page

An easy to use publishing system with versioning and permissions. After an ETP instance is created, the user got a virtual directory on her/his website where he/she can create and edit pages, links, or subdirectories. The pages created have a very plain appearance and behavior, but is possible to have different templates by setting the application type of each page.

1. Edit page properties.
2. Edit content, preview changes and commit work.
3. View revisions history.
4. Edit parent page.
5. Change ETP application to: FAQ, news or subnav-article.
6. Add/Edit/Delete content items as: pages, subtopics and external or internal links.
7. Change order of content items.
8. Grant permissions to users over the ETP page.

Evaluation

This package allows the professors and TAs to assign tasks to the students and to grade them, and to the students to upload their answers and see their grades.

1. Modify assignment types.
2. View Students grades.
3. Request for notifications.
4. Add tasks.
5. Edit tasks grading scale.
6. Delete tasks (disable or enable revisions).
7. Upload a solution for a task.
8. Grade students and add comments on grade changes.
9. View students photo when grading.
10. View students uploaded answer.
11. View students post history when task is related to a forum.
12. View grade history.
13. Upload an answer to a task.
14. View professor solution for a task.

Expenses

Expense tracking package for managing line expenses for each class in a dotLRN community

1. Administer Expense codes (category tree).
2. Create expenses from the dotLRN community/class portlet.
3. View all expenses created on the dotLRN communities/classes.
4. Export All non-transferred and mark all transferred.
5. Export all but don't mark transferred.
6. Delete an expense from the community or class.

FAQ

Handles frequently asked questions Q&A presentation. Can be one Q&A per page or all presented flat. Support for notification as well as WYSIQYG Editor and Categories, both optional, the administrator can configure the use of both components.

1. Add/edit/preview faqs.
2. Enable for disable a FAQ.
3. Create new Q&A.
4. View all faqs.
5. Insert Q&A.
6. Swap Q&A order.

File Storage

The file-storage application allows individuals to place their files on a publicly accessible web site and share them with other members of that web community or with the public at large. Organize files in a hierarchical directory structure. Upload using Web forms, using the file-upload feature of Web browsers. Move files between folders or copy files to other folders.. Retrieve historical versions of a file.

1. Add files.
2. Create urls.
3. Add/Edit/Delete folders.
4. Modify folders permissions.
5. Watch files properties.
6. Upload a new revision for a file.
7. Rename files.
8. Copy files.
9. Move files.
10. Delete files.
11. Manage files permissions.
12. Delete file revisions.
13. Download files.
14. Unzip a file containing multiple files at the time its uploaded

Forums

Discussion board software that supports threaded and flat view, moderation, and a stand alone search function. Users can create discussion forums with open, moderate and closed policy. The forum administrator can approve or reject a forum if this is on moderate policy. Users can create new threads for the forum if the administrator allows them. Posted messages can be forwarded to any person. Threads can be moved from a forum to another or between threads.

1. Add forums
2. Enable or disable forums.
3. Manage forums permissions.
4. Manage permissions for each forum.
5. Edit package parameters.
6. Post a new message in a forum.
7. Request notifications for a single forum or all forums.

8. Reply a message posted.
9. Forward a message posted.
10. Edit a message.
11. Move threads to another forum.
12. Move thread to other threads.
13. Change forum display.
14. Replay to first post of a page.

LORS Central

This application manages the services from the Learning Object Repository.

1. Add Course.
2. View course revisions.
3. Edit course metadata.
4. Edit manifest schema.
5. Add items to folders.
6. Add metadata to items.
7. Watch file storage folder.
8. Associate or drop associations of courses to classes or communities.
9. Watch all views of an object.
10. Add resources to items.
11. Search learning objects.
12. Export course into a zip file.
13. Add files to clipboard to be used in other courses.
14. Make an item revision live.
15. Hide an item for all courses.
16. Grant or revoke permissions over each course.

LORS Management

LORS Management allows a user to create a course created with IMS CP & SCORM; Import Course Content (IMS CP & SCORM); Course Management; Course Structure; Metadata Viewer; Course Delivery; Export Course Content

1. Add course by uploading a zip file.
2. Search learning objects.
3. Watch shared courses in the repository.
4. Add metadata to a course.
5. Enable or disable tracking for a course.
6. Export course into a zip file.
7. Edit learning objects.
8. Change course status.
9. Share a course.

10. Change presentation format.
11. Navigate into the course from lorm class/community portlet.
12. Grant or revoke permissions over each course.

News

The News application allows community members to disseminate information that is relevant to the community members. Allows community members to post current news. Allows community administrators to post news of interest to community members.

1. Create a news item by edit the content or upload a file.
2. Set release date and archive date.
3. Preview news items.
4. Create new items revisions and add log information.
5. Change news items status.
6. Subscribe via RSS.
7. Archive news as: next week, next month.
8. Make news as permanent.
9. Delete news.
10. Display news depending on their status(approved, unapproved, enabled, disabled, etc).

Photo Album

Is a generalized application for storing and displaying groups of photos on a web site. It provides a convenient and uniform system for uploading, storing, and displaying groups of photos on a web site. Photos are grouped together into albums which can contain 0 or more photos. The albums can have descriptive attribute information that can be revised with history tracking and can be displayed as a unit that allows user to browse through the photos in the album.

1. Add a new folder.
2. Add new albums into the folders.
3. Add photos to the albums.
4. Edit photos information.
5. Edit album attributes.
6. Move album to another folder.
7. Modify album permissions.
8. Edit folder information.
9. Show the html source code of the image for copy and paste.
10. Make a photo as cover photo of an album.
11. Edit photo attributes.
12. Delete photos.
13. Modify folders permissions.
14. Modify package parameters.

Project Manager

Track tasks, estimates and actual progress for a project. Project Managers uses the notifications to inform the users about the state of the tasks and the projects.

1. Add a project and set the logged variables, start date, end date, customer goal and other information.
2. Add/Edit Customers.
3. Add/Edit/Delete tasks to projects.
4. Add/Edit/Log the task assignees and set their roles.
5. Remove myself from the task assignees.
6. Add comments to a task.
7. View project changes.
8. Mark task as done.
9. Watch tasks in calendar view (by month or by week).
10. Add process.
11. Add/Edit/Delete tasks to processes.
12. Use some or all processes tasks to add to a project.
13. Delete processes.
14. Add a log entry for the project.
15. Rate the assignees performance when the project is closed.

Staff List

Allows users to see the staff list of the dotLRN Class.

1. View class professor.
2. View members list.
3. Add a member.
4. Export staff list into a CSV file.
5. Remove all students.
6. Remove all course assistants.
7. Remove all teaching assistants.
8. Remove all professors.
9. Remove all course administrators.
10. Drop users membership.
11. Update users biography.
12. Send a bulkmail to members of the class.
13. Allows to change the users role.

Survey

Allows to survey users. Allows to create surveys for users and decide when the survey will be enabled. Users can take the survey one or more times. It generates reports of the answers given by the users.

1. Add/Edit/Copy/Delete survey.

2. Enable or disable a survey.
3. Preview a survey.
4. View responses by user.
5. View responses on a CSV file.
6. Set survey as: multiple responses or limit to one.
7. Set that users can or can not edit their responses.
8. Request notifications for the survey.
9. Send bulk mail to all users that have already answered the survey.
10. Add/Edit/Copy questions.
11. Set question presentation type as: One line answer, Essay answer, multiple choice answer, date answer or file upload answer.
12. Set question as required.
13. Change questions order.
14. Answer a survey.
15. View survey responses.
16. Edit survey responses.

Syllabus

This portlet allows the user to have always available the dotLRN Class/Community Syllabus.

1. Add an url where the course syllabus is.
2. Add a file containing the class syllabus.
3. Add New revisions of the syllabus.
4. Rename the syllabus file.
5. Copy the syllabus file to another folder.
6. Move file to another folder.
7. Delete file.
8. Manage file permissions.
9. Show only the live revision of the syllabus.

User Tracking

Used to track user behaviour and activities, so that Professors and administrators can use this to understand how the system is used and make improvements in the learning process.

1. View site statistics: Number of views, First and last visit, Visits group by year, month and days, visits from each machine, visits of each user, user agents used to access the site.
2. View communities statistics: Registration history of a class or community, views to each community/class, first and last visit to class , visited objects (e.g. forums, faq), last consult date, contributions of the user to the class (e.g. forums, faqs).
3. View users statistics: Visited objects, last consult date, number of visits, first and last visit date, contributions to the site and classes or communities, sessions history, number of registrations on a month, search users.
4. View advanced statistics: Combine information to have a personal report.
5. Edit program data charge.

Weblogger

Weblog creation and management. Allows notifications to users about the changes on the weblogs. It allows to show weblogs in the Front page of the site and the administrator can determine how many entries he wants to show and how many lines will be shown.

1. Add /Edit/Delete a blog item.
2. Set blog item as publish or draft.
3. Unpublish a weblogger item.
4. Add a comment to the blog item and attach a file or link to it.
5. Watch all draft entries.
6. Use Bookmarket.
7. Map a category tree to weblogger.
8. Add a link to blogroll.
9. Show all email subscribers.
10. Set package parameters.
11. Manage the RSS feeds.
12. Configure trackback.
13. Add/Remove ping urls.

Wimpy Point

Wimpy Point allows users to create online slide presentations and supports collaborative editing, customizable style sheets, printable output, and commentability. Users can create and administrate presentations and allow other users to see them or administer. Also, the owner of a presentation can allow all users to see the presentation. It can be integrated with dotLRN and be used in the communities.

1. Create/Edit/Delete presentations.
2. Add /Edit/Remove/Insert slides to presentation.
3. Show presentation.
4. Watch printer friendly view.
5. Change order of slides.
6. View presentation on print view.
7. Grant permissions for viewing and editing within presentations.
8. Change people who can view/edit presentations.
9. Create/View all revisions of a presentation.
10. Create and edit styles.
11. Make comments available for all users or only editors.
12. Show list of all wimpy point users.
13. Watch all or only your presentations.

ATutor

- <http://www.atutor.ca>
- Developed at University of Toronto

Findings: Does not meet UCLA CCLE requirements. The primary concern is that ATutor was created, and the lead development remains, at the University of Toronto. While acknowledging that UT is a peer research institution and the system has a fine feature set, the ATF felt such strong central focus from one institution may not provide UCLA the same benefits found in more broadly-based community development.

Comments

The Proposed Features page lists features which have been requested by the ATutor user community. ATutor.ca members can vote on features to give them priority, and potential developers can assign themselves the task of adding a new feature. New features can be requested in the ATutor Feature Requests forum.^{iv}

Review: <http://www.lmsnews.com/modules/content/index.php?id=22>

ATutor Features

The following is a relatively detailed list of the standard features in ATutor. Also see the Modules Section for additional features and third party add-on software.

Learners

1. **Accessibility:** ATutor was designed with accessibility as a priority. A wide range of features ensure assistive technology users can participate fully in learner, instructor, and administrative activities.
2. **Security: New in 1.5.3!** Login passwords are encrypted. Forgotten passwords must be reset, rather than retrieved by email, removing the possibility they might be intercepted when being sent over the Internet.
3. **My Courses :** Instructors and students can manage the ATutor courses they teach and/or are enrolled in.
4. **Adaptive Navigation:** Learners can move through ATutor content using global, hierarchical, or sequential navigation tools. Navigation elements can be displayed as text, icons, or both text and icons, and they can be hidden to simplify the environment.
5. **Work Groups: New in 1.5.3!** Learners can collaborate with others on course projects, communicate as a group through the forums share resources using the File Storage, and work together authoring project documents. Exercises or assignments can submitted to the group leader, or course instructor. This replaces much of the functionality found in the ACollab module, though it is still possible to use along with ATutor work groups.
6. **File Storage: New in 1.5.3!** All user on an ATutor system have their own file storage utility. File storage areas can also be shared across groups, or an entire course. Version control can be enabled to keep track of drafts or changes to documents.
7. **Group Blog: New in 1.5.3!** Each group has access to their own blog, to which they can post public messages, available to all course member, or private messages, available only to group members and instructors.

8. **Feedback:** Following an action (such as saving preference settings, or posting a message), feedback is given on the status of the operation. This could be a success message, warnings to consider, or errors to fix.
9. **Preference Settings:** Learners can control ATutor features and the theme ATutor is presented in.
10. **Communication Tools:** Learners can communicate with others using ATutor's private mail, the discussion forums, the chat rooms, or the "User's Online" tool. Threads and messages can be sorted in a variety of ways. Students can communicate with those in other courses through shared forum, or a community forum. Subscribe to forums or topic threads to have forum messages sent by email.
11. **Content Package Viewer:** Learners can export content from ATutor as Content Packages that can be viewed offline in the accompanying viewer.
12. **Content Tracker:** Learners can keep track of the content pages they have visited.
13. **Test Manager:** Learners can take tests, review test results, and keep track of their scores.
14. **Glossary:** Words and phrases added to the glossary by the instructor can be accessed from terms embedded within content pages, or viewed alphabetically in their entirety using the Glossary tool.
15. **Links Database:** Each course, and groups within courses, has a tool for collecting links to Web-based information. Both students and instructors can add links. Instructors can manage course links, and : **New in 1.5.3!** students can manage group links.
16. **Course Search:** A search engine allows learners to search course content. Search for courses in the course catalogue.
17. **TILE Repository Search:** Learners can [search the TILE learning objects repository](#) for content related to the topics they are studying, and download content packages for viewing offline.

Instructors

1. **Instructor ATutor Handbook:** Instructor documentation is linked from each section of the handbook, to the screen ATutor it refers to. A link to the full Handbook is available on every screen.
2. **SCORM Run-Time Environment & SCO Manager:** Thanks to Matthai Kurian and the Swiss Federal Institute of Technology Zurich for creating an ATutor SCORM run-time environment (RTE) and SCO package manager. Add prepackaged, interactive, interoperable content to your courses. Initial support for SCORM 1.2 LMS-RTE3, with additional SCORM support coming.
3. **Student Tool Preferences:** Instructors can choose from the available course tools and menu modules, selecting only those that are used in a particular course. Optionally display tools in the main navigation bar, or link them into the course home page for quick access. **New in 1.5.3!** Tools can be located on the course home page, or moved to a separate Student Tools page.
4. **Course Tools Page:** All ATutor tools can be accessed quickly from a central course Manage Page.
5. **Content Usage:** Individual usage statistics can be reviewed to identify gaps in content coverage and the learning tendencies of each learner.
6. **Work Groups Manager: New in 1.5.3!** Instructors can manually create, or automatically generate work groups for a variety of purposes. Groups might be used to provide a private area where students can work, to create an assignment submission area, to assign a test to specific students, or for a variety of other possibilities. The new Work Group feature replaces much of the functionality previously found in the ACollab add-on module, which can still be used in addition to the new work group features.

7. **Learning Tools:** Instructors have access to all the learning tools that are available to learners. Context sensitive access to the ATutor Handbook allows instructors to access the right documentation page quickly. Full instructor documentation is also available in the ATutor HowTo Course. Units of ATutor HowTo can be imported and modified to create custom documentation for a course.
8. **File Storage: New in 1.5.3!** In addition to the File Manager, which contains files associated with ATutor content pages, the File Storage utility can be used to store private files, files to be shared with course members or group members, or used as a place to collect assignment submissions.
9. **Assignment Drop Box: New in 1.5.3!** Extending the File Storage, instructors can create file folders for collecting assignment submissions, collected from all course members, from group members, or from individuals. A collection of assignments can be zipped together and downloaded.
10. **Content Editor:** Instructors can create content in HTML or plain text. This content can be imported from a local editor, or edited directly online. Release dates can be set to control when content is viewable to learners. Content pages can be moved to different locations within a course. Related pages can be linked to content as references or relevant information. Use the File Manager while creating content. Click on the **Insert** button next to a file in the file manager to embed a link or an image in a page while authoring content.
11. **Visual Editor:** A JavaScript based WYSIWYG editor is available as an extension of the Content Editor so content creators can format course materials without knowing any HTML. A soon to be ATAG 2.0 compliant version of the TinyMCE 2.01 WYSIWYG HTML editor assists authors in creating accessible content.
12. **Accessibility Checker:** The ATRC [AChecker Web service](#) has been integrated into the Content Editor to allow authors to review the accessibility of their content to people with disabilities who may be accessing ATutor using assistive technology. A variety of standards are available for an international audience. AChecker automatically identifies known accessibility problems, and allows authors to make decisions on potential problems that AChecker can not identify for certain. Accessibility reports are saved in the AChecker database, and allow ongoing monitoring of accessibility as content evolves. The AChecker Web service is available as a plugin for TinyMCE, so content can be assessed for accessibility directly from within the editor.
13. **IMS/SCORM Content Packaging:** Instructors can export content from ATutor as IMS/SCORM conformant Content Packages that can be viewed offline in the accompanying viewer, or imported into ATutor or another conformant e-learning system. Entire courses, or individual course units can be packaged for viewing or redistribution. Content from other compliant systems can be imported into ATutor. Import and export complex content such as Java applets, Flash content, and other embedded programmed objects.
14. **Reading List: New in 1.5.3!** Instructors can gather a list of resources (books, papers, urls etc.) related to topics in a course, and create a Reading List based on those resources.
15. **Learning Objects Repository:** [Search the TILE learning objects repository](#) for course related materials. Download content packages from the repository for viewing, or import them directly into ATutor. Enter a URL to a content package anywhere on the Web, and import it into your course. Export content from ATutor into the repository, [login to the repository](#) to author new content, add to, or enhance existing content.
16. **Backup Manager:** The entire content and structure of a course can be backed up and stored on the ATutor server, or downloaded and saved to your local computer. Create a copy of a course as a master for future sessions, or move a course to a new location.
17. **News & Announcements:** Instructors can post messages to the course Home Page to guide learners through the course. News can be used for weekly introductions, announcing important dates, or posting critical information. The announcements page is always the first page a learner visits when they log into a course. An RSS feed can be turned on to display course announcements on other Web sites.

18. **File Manager:** Instructors can upload and manage course related files. Directories can be created to sort files, zip archives can be uploaded and unpacked. A popup file manager can be opened alongside the Content Editor or test question editor. Course files can be easily linked into content pages or test items as they are being created. Text or HTML files can be created or edited online. Rename files, or batch move or delete files.
19. **Test Manager:** Instructors can create tests with multiple choice, true/false, Likert, and a number of open ended question types. M/C, multi-select M/C, and T/F questions are marked automatically. A test release window can be created to make a test available for a certain period, feedback can be customized, and test results can be archived. Self-marking tests can be created to provide students with instant feedback. Create surveys and link them to the course home page. Select from a pool of questions to generate random question quizzes. Assign tests to groups of students. Add questions to a Question Database, then select questions from the database to assemble a test or quiz. Create image based test items, and arrange items horizontally or vertically. **New in 1.5.3!** Questions can be arranged in any order.
20. **Polls:** Instructors can create one question polls to quickly gather student opinions.
21. **Forums:** Instructors can create and manage multiple forums for each of their courses. Messages can be edited, deleted, locked from reading and/or replying, and "stuck" to the top of a thread list if a message is important. Administrators can create forums shared across multiple courses. Request a shared forum to allow students in all your courses to communicate with each other. Subscribe to forums, or to topic threads to have messages sent by email.
22. **Course Properties:** Instructors can view course login statistics, edit course properties, and send course-wide email messages. A default display language can be set for each course. Assign a course as public, protected, or private, or hide a course while it is being developed. Control student access to content packaging. Turn on an RSS feed for course announcements, and display them on other Web sites. **New in 1.5.3!** Set the release date for a course, after which it becomes available to students. Create a custom splash page for each course.
23. **Enrollment Manager:** Instructors may import a comma separated list of students to enroll in their courses, or export an enrollment list for staff keeping. Create an enrollment list online to add new students to a course. Automatically generate login names and passwords for students and send them by email when a student is enrolled in a course. Assign students as Alumni so they can participate in discussions for future course sessions.
24. **Privileges:** Through the Enrollment Manager, instructors can assign students access to various instructor tools, creating teaching assistants or co-instructors.
25. **Addon Modules:** FAQ, Google Search, RSS Feeds, EWiki, ACollab, ATalker Text-to-Speech, and SCORM Packages modules are each available with a quick installer. Many more add-on modules to come.

Administrators

1. **Module Manager:** Administrators can install modules, enable and disable them, define a default module and menu configuration for new courses. Developers can create integrated and third party feature modules for ATutor to extend its functionality. Types of Modules administrator, instructor, group, course, and public modules, as well as fully integrated feature extensions, or third party add-on software.
2. **Administrator's Home Page:** All administrator tools can be accessed quickly from a central Administrator Home Page.
3. **Administrator ATutor Handbook:** Administrator documentation is linked from each section of the handbook to the screen ATutor it refers to. **New in**

1.5.3! The Handbook can be translated, and multiple translations managed for each ATutor installation.

4. **Multiple Administrators:** Create multiple administrator accounts assigning specific privileges to each.
5. **Master Student List:** Require newly created student accounts to be authenticated against a custom imported student ID/PIN paired list.
6. **Themes Manager:** Easily create a custom version of ATutor by modifying or creating a theme. Type in a URL to a theme to install it in ATutor (see [Themes](#)). Assign themes to categories of courses. Export a theme to share with others. Login to [submit themes to atutor.ca](#) to make them available to the ATutor Community.
7. **Automated Installer and Upgrade:** A fast and easy way to install or upgrade ATutor!
8. **General Statistics:** View system usage statistics.
9. **Secure Course Content:** Secure course content directory to prevent unauthorized access to course files.
10. **Instructor Request:** Review requesting instructors' personal information, and assign instructor status so they may create courses. Administrators are informed by email when new requests are made.
11. **User Manager:** Users on a system can be sorted, personal information can be viewed, and access privileges can be modified. Send announcements to all users on an ATutor system, or to students, or to instructors. **New in 1.5.3!** Search through the users database using a variety of search strategies to find individual students, or a group of students.
12. **Course Manager:** Much like the User Manager, courses on a system can be sorted, their properties modified, and their instructors managed. Create new courses and assign an instructor. Use course backups to generate initial content for a new course. Create shared forums for select courses, or create a community forum for all courses. **New in 1.5.3!** Easily jump between the administration section and courses without having to re-login each time.
13. **Backup Manager:** Generate backups of courses to create master copies. Download backups for safe keeping or to move courses to another ATutor server. Use backups to generate new courses.
14. **Cron Utility:** **New in 1.5.3!** Schedule scripts to run at specific times. Use the Cron Utility to run the Mail Queue every few minutes. Write custom scripts to generate statistics, create a system backup, or to send system reminders, etc. using the cron utility to schedule when they run..
15. **Course Categories:** The ATutor course browser includes a course category browser, so courses can be sorted into a custom defined set of categories, perhaps by department or topic or grade level, for example. Themes can be assigned to course categories so all courses within a category look the same.
16. **Language Manager:** Import language packs directly into ATutor. Once imported, edit languages as needed. Create an ATutor Language Pack by exporting the language from your ATutor system. Make the language pack available to other, and submit it to the [atutor.ca Translation Forum](#) as an attachment, so others can use and continue to maintain the language. **New in 1.5.3!** Easily search through the text of the language to quickly find and customize interface, feedback, and module language.

Developers

1. **Developer Documentation:** Guidelines, instructions, recommendations for those who wish to develop ATutor core features, bundled with each ATutor distribution
2. **Module Developer Documentation:** Guidelines, instructions, recommendations for those who wish to develop ATutor Modules, bundled with each

ATutor distribution.

3. **Hello World Template Module:** A sample module that implements all potential module features, which can be used as a template for creating new ATutor modules.
4. **ATutor SVN Code Repository:** Developers can checkout the live evolving ATutor source code from a public Subversion repository. With approval, developers can commit their features to the repository to be include in the ATutor distribution .
5. **ATutor Bug Reports:** New in 1.5.3! Developers can keep up on bug fixes using the ATutor Bug Tracker With approval, developers can report to, and provide comments on, bugs listed.

Recently Completed Features

1. **Module Installer/Manager [done]:** Develop a strategy for defining ATutor feature modules. Most features like those available via Student Tools or Manage in the ATutor 1.5, could be included as optional modules, and other features could be linked here to add custom system or course specific LMS features. Add a set of tools that will install and manage ATutor modules.
2. **Extended Test Options [done]:** Extend test manager to allow multiselect multiple choice questions. Manual ordering of test questions within tests. Image based tests. Limit students to one try, or multiple tries on tests. Additional test statistics, how many times a certain question results in the right answer or the wrong answer, compare the student's status and ranking for a certain test in his group, and how a student compares with the mean score on a test.
3. **Forum Subscribe [done]:** A feature to allow users to subscribe to entire forums, and receive notice whenever a new message is posted to the forum, instead, or in addition to, subscribing to individual threads as can currently be done
4. **Added Group Functionality [done]:** Extend the group assignment functionality currently available for assigning tests to groups, to include groups assignment for forums, chats, content pages, integrated ACollab groups, etc.
5. **RSS Feeds Utility [done]:** A utility that would allow instructors to create feeds for announcements, forum posts, and a utility to read RSS feeds and displays them in a menu module or an external application.
6. **Administrator User Add Feature [done]:** Similar to the instructors import course list feature, allow ATutor administrators to import a new students list.
7. **Multiselect Content Mover [done]:** Add checkboxes to listing on the content editor properties screen move column that would allow multiple files to be moved at once.
8. **Assignment Manager [done]:** Utility to allow instructors to define assignment parameters/files etc. Allow students to upload assignment files, and instructors to assign marks for assignments.
9. **Replace WYSIWYG editor [done]:** Replace the current JavaScript editor with one that complies with accessibility standards (W3C ATAG compliant). TinyMCE looks like a good candidate.
10. **Visual Content Editor link to File Manager [done]:** Have a button in the visual editor that opens a pop up of the file manager. Selecting a file would insert a link to the file. And maybe clicking on an image would insert a thumbnail.
11. **Course Catalog Search [done]:** Utility to allow ATutor members and visitors to search through course titles, descriptions, content titles, and content. Preview, Enroll, Request Enrollment functions (for private courses).
12. **Course Documents Library [done]:** A utility to allow instructors (and optionally students) to upload course related documents, for download by other course members (like the drafting room/library in ACollab). The File Storage utility.
13. **Password Encryption [done]:** SHA1 encryption for login/registration/profile password fields.
14. **File Manager for Students [done]:** Extend the ATutor File Manager to allow students to upload files. Could allow uploads of assignments, the ACollab drafting room and library files, course shared files, private files,...
15. **File Manager Extensions [done]:** Include checkboxes beside files & folders in the file manager to allow batch deletes instead of one delete at a time.

- Create rename feature to allow instructors to change filenames. Allow recursive delete for folders that contain files
16. **SCORM Runtime Environment [done]:** Add a SCORM runtime environment as an addon for ATutor. Sharable content objects stored in a course SCO directory intact, rather than loading them into ATutor content.
 17. **Course/Category/System Themes [done]:** Automate import/export of ATutor themes. Allow ATutor administrator to assign themes to course categories, so all courses in the same content area look the same, or to assign them to specific courses so instructors can create their own custom themes.
 18. **Search Users/Courses [done]:** Have a search feature for finding particular users (and maybe even courses) for ATutor.
 19. **Import HEAD content from HTML documents [done]:** In the content editor, and content package importing tools, save information in the HEAD area of the HTML so JavaScript and CSS available in the original document can be called into ATutor content pages.
 20. **ATutor Themes [done]:** Create additional themes. Developer access is not required to add themes to the ATutor themes library. Any ATutor administrator can copy the default theme in the themes/ directory to another renamed directory, then modify the files in the copied theme to create a custom look and feel.
 21. **Check Session Creation [done]:** The installer should check if it can initialize sessions.

Proposed Features of ATutor

1. **Gradebook:** Utility to record all student marks. Pass/Conditional/Fail check option for instructors. Auto pass/conditional/fail mark based on predefined passing mark based on total raw marks, or average percentage mark achieved. Prerequisite utility for instructors that allows them to choose
2. **Calendar/Scheduler:** Create a course/personal calendar to allow students to record personal tasks/events, and allow instructors to post course tasks/events.
3. **E-commerce Module:** Integration with e-commerce system so it could be automatically used for free or paid courses. Add to Lopo's suggestion. <http://atutor.ca/view/2/2749/1.html>
4. **SCORM 2004:** Extend the current SCORM 1.2 support to include SCORM 2004
5. **Portal Session Integration Modules:** ATutor already works with POSTNuke and Mambo. What about others like Plone, Drupal, and Plumtree... [Suggest others in the Feature Requests Forum]
6. **Extended Test Options (QTI Lite):** Create an IMS QTI import/export utility to allow instructors to reuse tests and test questions.
7. **Directory Server Support:** Create a general utility that will allow ATutor to authenticate against a organization member database or directory service. Include LDAP, SOAP, Active Directory ...
8. **Visual Editor for Other Authoring Features [done]:** Extend the Visual editor to be used with announcements, copyright, custom header, inbox, forum messages, test questions
9. **Integrate ACollab [mostly done]:** Move the ACollab group collaboration features into ATutor and make them optionally available like other Student Tools as part of the standard source distribution.
10. **Custom Course Icons:** Add a tool to create course and course properties to add or edit a custom course icon.
11. **Recursive Content Release:** Have release date for a parent topic recurse to all subtopics. Automatically email course members when content is released.
12. **PHP Content Repository:** Create repository software in PHP, and make available as an addon for ATutor. Must comply with IMS Content Packaging specifications.
13. **Forum Archiving:** Create an admin and instructor feature to create and manage copies of course forums. Archiving for read-only public and private access. Include forums and messages with course backups, and make the forums an optional backup restore property.
14. **Integrate ADOdb Abstraction Library:** Integrate the ADOdb database abstraction libraries, to allow ATutor to work with databases other than MySQL. see <http://adodb.sourceforge.net/>
15. **Profile Portrait Field:** Add a portrait field to registration/profile so users can upload an image of themselves to be displayed as a thumbnail for forum and inbox messages. Modify Forum and Inbox to display portrait.

Claroline

- <http://www.claroline.net/>
- LAMP: Apache / MySQL / PHP
- Primary language is French

Findings: Does not meet UCLA CCLE requirements due to primary language and questions of security and scalability; as evidenced in the following notes. First, from the installation instructions:

Claroline is built to have one table for each "course-tool" pair. So table for chat in course foo is not the same table for course bar.

This means that there will be many tables. It's more user-friendly to have one database for each course but before install we don't know how many courses would be created. So Claroline need a user with database creation rights. (it's multi databases option at the installation)

A lot of mysql administrator would find it crazy: 'haw, give db creation rights to my users ... NO!'

If the administrator holds still on their position, you can request one database and shake all tables of courses in the same database. (it's the single database option at the installation).^v

Second, according to one review, the security is primitive:

For the registration, entering name, user-id and password is all that is needed. A more exact matching, i.e. with registration-restrictions for certain classes is, like already mentioned, not possible with Claroline.^{vi}

Comments

“Claroline has been designed for a 20.000 students university. Today, more than 400 organisations use this tool in 30 languages, 60 countries and help to improve it day after day (see credits). You can contribute too.”^{vii}

Dokeos

- <http://www.dokeos.com/>
- LAMP: Apache / MySQL / PHP

Findings: Does not meet UCLA CCLE requirements because no known use in comparable institutions, scalability, database concerns, and too immature: with the next version, due in November 2006, the system is making a major transition “from a LMS approach to an integrated learning management suite”^{viii}

Scalability will also be an issue:

Currently Dokeos uses a course based storage system. Every single course in Dokeos has its own database in which all learning objects are stored. There's a major problem with this. If you want to use a learning object in 2 courses, 2 copies of the same learning object are stored. This doesn't look too bad at first sight. But imagine a learning path including several presentations. If a teacher wants to use this learning path in, let's say, 5 different courses, there's a need of re-using the same learning object.^{ix}

Database design faults:

As many of you might know, the integrity in the Dokeos database is not something we can be proud of. Users are referenced by their username somewhere while they still have a unique ID, some courses are referenced by their course_code somewhere and by their course_id somewhere else. This has lead to misunderstandings or duplication of code in the database library. It also makes plugin facilities harder to develop, as the database structure is not quite as clear as it should be. Anyway, there is much to say about this, but only one thing to do: add foreign key integrity. Many of the fields to resize or replace are already mentioned in the database documentation. The fields will be discussed here also as this has a MAJOR impact on the Dokeos code.^x

Comments

Dokeos is an Open Source elearning and course management web application translated in 34 languages and helping more than 1.000 organisations worldwide to manage learning and collaboration activities.

Dokeos is also a company helping these organisations launch and develop blended learning programmes^{xi}

The roadmap for 1.8 promotes interesting features, including:

- Authoring: new tests types, templates for easy content creation, powerpoint2learningpath
- Scorm: better import and export, online editing of imported Scorm packages
- Usability: coherence of the interface, new design
- Live conferencing: integration of LMS and virtual classroom

Ganesha

- <http://zodevga.anemalab.org/Eng/ZoDevGa>
- PHP / MySQL
- Primary language is French

Findings: Does not meet UCLA CCLE requirements because it is primarily developed for training environments and offers an incompatible feature set.

Ganesha does not have any built-in content authoring tools, but it does provide facilities for handling the tracking information of other authoring tools. ^{xii}

Appears intended for personal use:

Most Learning Management Systems (LMS) such as WebCT or Docent are expensive, complex to use and there is no common standard. In addition, only schools and large institutions can afford to buy such software. This means that teachers/trainers who want to try out e-learning have to wait for their employer to buy the software.

With Ganesha, any teacher/trainer can come to the support website (anemalab.org), download the software, install Ganesha on a personal website (even using a free provider such as www.free.fr) and put their courses on-line for their students. Everything is free! ^{xiii}

ILIAS

- <http://www.ilias.de/ios/index-e.html>
- Developed at the University of Cologne
- Primary language is German

Findings: Does not meet UCLA CCLE requirements. While retaining many of the features we seek in a CCLE, the one major obstacle for ILIAS is its non-adoption by comparable institutions in the United States. ILIAS was created at the University of Cologne, Germany, and as such, the primary language (in documentation, white papers, and conference presentations) remains German.

ILIAS Features

All functions of the current ILIAS version (2.3.x) are listed below:

Personal Desktop

- Personal starting page
- Information about last learning unit visited (time, last page visited)
- Notification of new messages and newsgroup threads that you missed
- Administration of your personal data
- Language settings
- Information about multiple choice tests you haven't finished yet
- 'Who is online?' function
- Displaying important links to external webpages

Learning Environment

- All accessible learning units and subscriptions are displayed
- Work offline (and save money) with our new offline-reader function
- Navigate through the learning unit with the overview function
- Search for hitwords or names in a single or all learning units
- Glossary (limited to the learning unit) with own navigation
- General information about learning unit and professorship
- Printing function with specially edited documents (only the contents are printed, not the HTML or navigation elements)
- Create your own personal notes
- Test your skills with our multiple-choice tool
- File sharing: download additional course material of any type
- News function: always be informed about the latest changes to learning units

Communication

- Internal mail system for all users with easy message administration
- Create a discussion forum for your learning unit
- Create open or closed group discussion fora
- Group mails
- News on a learning unit are send to all subscribers
- Integration of Java-based Babylon chat

Groups

- Overview and administration of all groups
- Open, closed and administrator groups
- Groups can be created by any user with just one mouse click
- Structured administration system (owner, admin, member)
- Invite or exclude members
- Administration of all resources of a group (learning units, newsgroups)
- File sharing
- Allow other groups to use group resources (read and/or write permission)

Authoring Environment (Editor)

- Create learning units in our own author's environment
- Create and edit learning units together with other authors
- Use all common internet formats in your learning unit
- Insert text with the copy & paste function (layout functions available)
- Upload images and multimedia elements
- Create and edit tables and ImageMaps with integrated generator
- Create multiple-choice tests with integrated tool
- Flexible structuring of contents with multiple structuring functions
- Internal dynamic links with ILIAS addressing (VRI)
- Administration of all available multimedia applications (Java, Flash, QuickTime, wav, Real, etc.)
- Publish contents for target groups and re-use already completed learning units with our broker-tool (IBO)
- Choose between different layouts for learning units
- Create your learning units in HTML and import them into ILIAS
- Import spreadsheets from other applications
- Import AICC learning modules
- Formula editor TeX-to-ILIAS

Administrative Environment

- User administration
- Learning unit administration
- Administration of special fields, types of content, special characters and plugins
- Messaging and newsgroup administration
- System settings
- Help system administration
- Brokerage tool (IBO) for re-use of content
- User tracking statistics
- Authentication: LDAP, RADIUS or external authentication

Metadata System

- Data description in all levels of a unit (learning unit, pages, elements), according to IMS and Ariadne
- Create and administrate metadata in author's environment
- Addressing of all ILIAS contents with VRI (VIRTUS Resource Identifier)

Additional Features

- Public section: allow visitors without an account to check out ILIAS. Access to learning units is thus limited to the top level page
- Payment function: make access to your learning units liable for costs, either for all users or for a particular user group
- XML-based import and export of ILIAS learning units
- Integrated help system available in the following languages: english, german, italian, greek and ukrainian
- Currently available system languages: english, german, french, italian, spanish, greek, norwegian, swedish, danish, polish, indonesian, ukrainian and chinese

LON-CAPA

- <http://www.lon-capa.org>
- Developed at Michigan State
- JavaScript / Perl / MySQL

Findings: Does not meet UCLA CCLE requirements. A detailed usability study^{xiv} conducted by the LON-CAPA team has revealed that at this stage LON-CAPA has deeply-rooted usability issues and will require significant development to bring it up to a level equal with peer systems such as Sakai, Moodle, or WebCT.

Comments

“Today (Spring 2006), LON-CAPA is serving over 16,000 course enrollments per semester at MSU alone, and approximately 40,000 course enrollments system-wide, ranging from middle school to graduate level courses. Disciplines include astronomy, biology, business, chemistry, civil engineering, computer science, family and child ecology, geology, human food and nutrition, human medicine, mathematics, medical technology, physics, and psychology.”^{xv}

A note on usability

Overall, participants, regardless of experience level, had difficulty understanding and choosing among menu items, and reading and using forms and tables. Experienced participants easily completed common tasks, but had trouble performing new or unfamiliar ones, finding the system’s navigation confusing, and information missing where expected. Inexperienced participants similarly struggled with the system’s menu, forms, and tables.

In general, participants had difficulty choosing items in the main menu to accomplish their tasks and understanding the labels of the menu items. They also found it difficult to read tables and locate table information. Participants struggled when using forms to make tables, charts, spreadsheets, or to locate specific information, most notably in selecting which options would create the charts and displays the participants wanted. Moreover, they described the labels and language used throughout the system as difficult to understand and not mirroring real-world actions or objects, such as a ‘grade book’. Participants also struggled when accessing user assistance (help) features. They were either unable to locate or recognize help features, or if they did locate them, were unable to understand the information well enough to complete the task.^{xvi}

The conclusions of the report hint at current difficulties with the LON-CAPA interface and suggest system revision should it want to compete with Sakai, Moodle, et al:

These issues touch on a larger area of concern, which is consideration of LON-CAPA as a course management application, as opposed to an advanced quiz and test tool. LON-CAPA is very quiz and testing-centric, which reflects its primary purpose, and is not necessarily bad. However, this likely puts it at a disadvantage against other full-featured, open source course and project management applications such as Moodle and Sakai, and third party systems such as Angel, Blackboard or WebCT. If LON-CAPA’s future development plans include positioning it as a course management offering, we recommend:

- An analysis of LON-CAPA’s features and capabilities versus competing open source products such as Moodle and Sakai, and third-party products such as Angel.

We also recommend that developers review the system’s navigation and features through evaluations such as a card sort and a user task analysis prior to revising the application, to develop the optimal information architecture and label scheme from a user perspective.^{xvii}

LON-CAPA Features

LON-CAPA is a full-featured, web-based course management system similar to commercial systems, see edutools.info for comparisons. In addition, it has the following features:

- Content sharing and content reusability, including
 - Network of shared resources from over 70 participating institutions
 - Shared repository of circa 150,000 resources including assessment questions and multimedia content
 - Easy semester transition
 - A large set of resources in physics/astronomy, chemistry, biology, mathematics/statistics, and geology
 - Ability to add new resources to the existing content pool
- Creation and grading of randomized homework, quizzes or exams, including the ability to
 - create sophisticated question types such as: click-on image, random label, random plot, or formula response
 - reduce blind copying of answers by giving a different version of the problems to each student
 - print randomized bubblesheet exams and quizzes
 - configure the reporting of grades and feedback with a wide variety of options
 - contextualize threaded homework discussions
- A development group based that sustains a twice-yearly LON-CAPA release cycle to insure rapid incorporation of instructor-requested enhancements.
- An open-source freeware system

OLAT

- <http://www.olat.org/public/index.html>
- “Online Learning and Training”
- Developed at University of Zurich, Switzerland
- Started 1999; 2-year rebuilding project completed 2004
- Primary language is German

Findings: Does not meet UCLA CCLE requirements. Most of the documentation (white papers, et al) is in German; no promoted adoption by U.S. or Canadian universities

OLAT Features

General

1. 100% Java, only tomcat and a relational database management system required (has been successfully tested with MySQL, Postgres and HSQL)
2. Pure HTML based GUI
3. "No frames" solution
4. Extension mechanism for developers to extend OLAT for custom needs
5. Unlimited number of user accounts, courses and groups
6. Multilingual (for now in German, English, Italian, French, Spanish, Greek, Polish and Czech)
7. Fully UTF-8 based
8. Dialect support in internationalisation
9. Right based security - more flexible than role based security
10. Virtual file system to access all accessible file resources over a single mount point
11. Full integration of the Shibboleth authentication and authorization protocol (used by SWITCH AAI in Switzerland)
12. Personalized portal style user home
13. File sharing disk space for each user (via HTTP or WebDAV)

OLAT Course system and learning resource repository

1. Swift creation of courses with the OLAT course editor
2. Integrate whatever content (nested frames, mathML, SVG) via iframe
3. Any pedagogical concept supported - no concept forced
4. Course structure easily configurable with course elements like:
 - a. Structure
 - b. IMS Content Packaging
 - c. SCORM content (SCORM 1.2 RTE full support)
 - d. Local content (via file upload or WebDAV, integrated WYSIWYG content editor)
 - e. External content (image database, web application)

- f. IMS QTI test, self-test and questionnaire
 - g. Task (selection of multiple tasks, drop-in-box, manual scoring)
 - h. Manual scoring
 - i. Enrollment in groups
 - j. Discussion forum, exportable to RTF
 - k. File dialog (discussion forum per uploaded file)
 - l. Chat
 - m. File share folder
 - n. Contact form
5. Course export and import
 6. Course archiving system to download test results and the like
 7. Course audit infrastructure to track different file record changes, user behaviour and access statistics.
 8. Course preview and simulation
 9. Bulk changes for courses with huge amount of users
 10. Ability a customize the style of courses
 11. Digital repository to share learning resources with other authors
 12. Publish resources to users
 13. Organization of resources via catalog

Groups, Assessment and Communication

1. Advanced group management, associating a given group to learning areas
2. Advanced enrolment system (self enrolment in groups, management of available seats)
3. Self-organized learning / collaborative work via project groups: every user can create a group and work together with peers.
4. Instant Messaging and awareness integration. The Jabber Instant Messaging System is fully integrated into OLAT. See which users / Buddies are online, chat with anyone who is online.
5. Automated alerts about changes using e-mail notification. Subscriptions are implemented for forum- specific, folders-specific notification and test results.
6. Personalized RSS news feed

Testing system

1. Testing system with different question types (Multiple Choice, Single Choice, kPrim, Fill-in-the-blank), fully based on IMS QTI v1.2 (see the OLAT QTI conformance statement).
2. Automatic or manual score calculation in course
3. Personalized task management
4. Questionnaire/Survey system, fully based on IMS QTI v1.2.1.

Doku / Help

1. Integrated context sensitive help system and comprehensive manual
2. Documentation for developers

Appendix A: Focus List - Open Source Systems

Name	Website	Notes
.LRN	http://www.dotlrn.org/	
ATutor	www.atutor.ca	
Claroline	http://www.claroline.net/	French
Dokeos	http://www.dokeos.com/	
Ganesha	http://zodevga.anemalab.org/Eng/ZoDevGa	French
ILIAS	http://www.ilias.de/ios/index-e.html	German
LON-CAPA	http://www.lon-capa.org	
OLAT	http://www.olat.org/public/index.html	German

Notes

-
- ⁱ “Focusing Resources and Fostering Creativity,” <http://www.oit.ucla.edu/ccle/docs/JointFSG-TSGreporttoFCET.pdf>
- ⁱⁱ Adkins, Sam. “Wake-Up Call: Open Source LMS” <http://www.learningcircuits.org/2005/oct2005/adkins.htm>
- ⁱⁱⁱ <http://www.openacs.org/>
- ^{iv} <http://www.atutor.ca/development/index.php>
- ^v http://www.claroline.net/doc/en/index.php/Install_general_information
- ^{vi} See the review of Claroline found at: <http://www.lmsnews.com/modules/content/index.php?id=15>. Additional reviews of ATutor, LON-CAPA and OLAT can be found at this site.
- ^{vii} <http://www.claroline.net/collaborate.htm>
- ^{viii} http://www.dokeos.com/wiki/index.php/Dokeos_1.8_roadmap
- ^{ix} http://www.dokeos.com/wiki/index.php/Dokeos_LCMS_design
- ^x http://www.dokeos.com/wiki/index.php/Database_refactoring
- ^{xi} <http://www.dokeos.com/>
- ^{xii} <http://zodevga.anemalab.org/Eng/PedagogicalFeatures>
- ^{xiii} <http://www.anemalab.org/commun/english.htm>
- ^{xiv} Rudden, Casey and Amy Diehl, et al. “LON-CAPA Faculty Users Usability Evaluation Report,” <http://www.lon-capa.org/FacultyUsability.pdf>, June 14, 2006
- ^{xv} <http://www.lon-capa.org/whatis.html>
- ^{xvi} “LON-CAPA Faculty Users Usability Evaluation Report,” p. 3
- ^{xvii} Ibid., p. 5