

# 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

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# 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.x-x) 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:

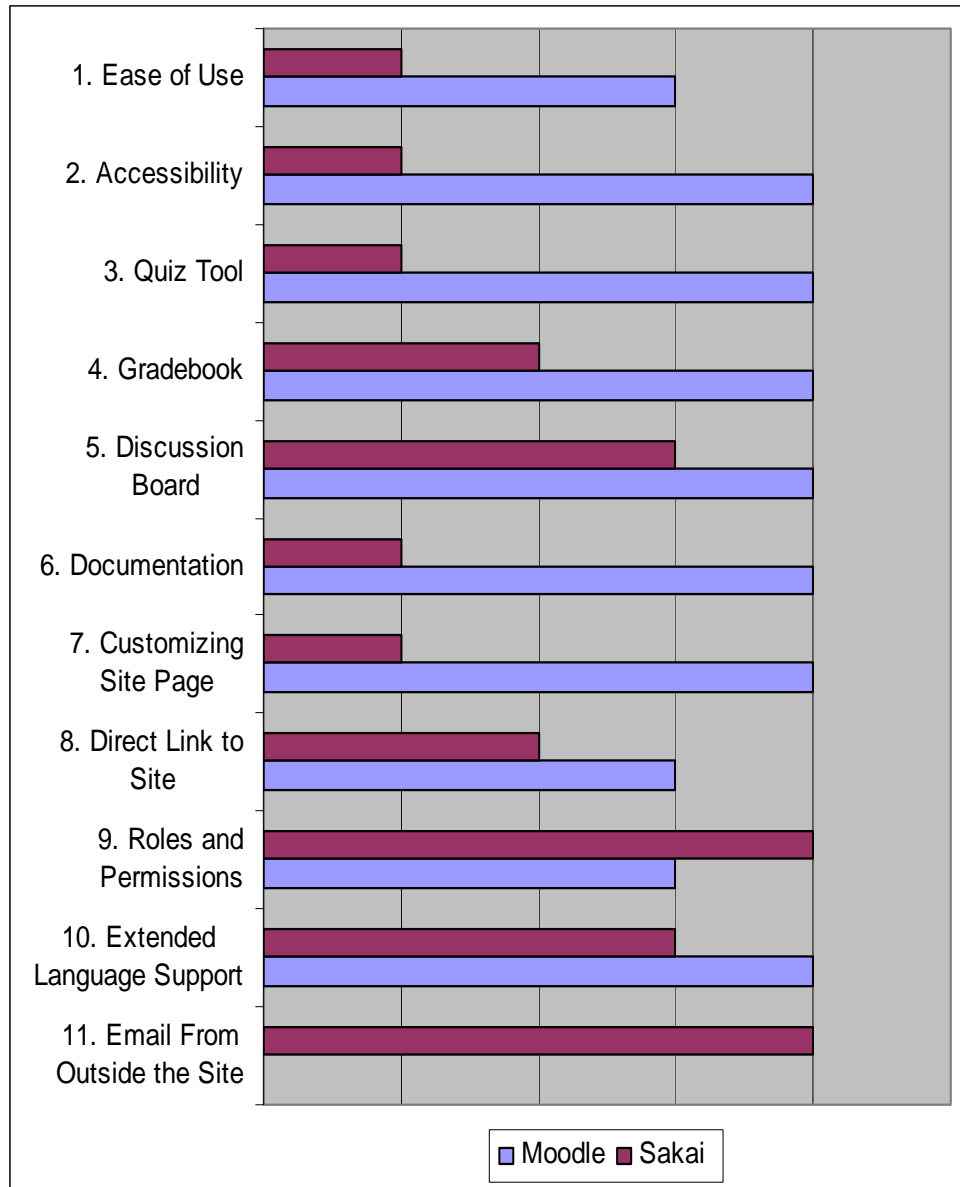
1. By partnering with peers, we can develop a system tailored to the unique needs of large research universities that will be the best match for UCLA's future.
2. Future potential is more important than early adoption. It is difficult to predict with confidence how long it would take for the missing 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>Relative Performance of Moodle and Sakai</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"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>
Discriminator	Moodle (Blue)	Sakai (Maroon)																				
1. Maturity	High	Low																				
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6. Framework for Campus Integration	Low	High																				

\* "Software development environment" includes code structure, transparency of structure, documentation, well-developed APIs, and industry/3<sup>rd</sup> 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