Sakai: Open Source … Open Minds

By Larissa Biggers

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In the age of rapidly changing technology, institutions of higher learning must consider the following questions:

- Is it possible to implement a flexible, affordable, and sustainable learning system that will grow with our organization’s evolving needs?
- How can we move content between systems, share learning objects, and create new, lightweight learning applications that empower learners to make sense of concepts, data, and the knowledge generated in our institution?
- How can we create a unified framework through which communities of interest can access information, experts, and resources?

Sakai, a collaboration and learning application, can answer all three of these. Read on to learn all about it.

Origins of Sakai

In 2004, Indiana University, University of Michigan, MIT, and Stanford received a $2.4 million grant from the Andrew W. Mellon Foundation to develop Sakai. Sakai is used in higher education research institutions around the world to support instruction, research, and outreach. Predicated on collaboration, the system is open-source and has open standards. Although not flawless, it does offer new possibilities that are precluded by proprietary, "closed-source" commercial products.

The Sakai Partners Program (supported by member contributions and the William and Flora Hewlett Foundation) extends this community source project to other academic institutions. Today there are more than 95 academic partners, and notable commercial partners include Apple, IBM, Oracle, Pearson, and Sun Microsystems.

(Editor’s Note: Sakai is named after Iron Chef Hiroyuki Sakai, because the early versions of the tool were based, in part, on the University of Michigan’s CHEF course management system.)

Traditional model of instruction

Learning management systems (LMSs) support and use the tools associated with traditional teaching methods, in which the instructor controls the learning environment. The instructor decides what to teach and how to teach it. Students have knowledge gaps that need to be filled with information. In short, the traditional teacher causes learning to occur. (Novak, 1998 – please see References at the end of this article.)

With these types of LMSs, the burden of responsibility lies solely with the instructor, who must set up the course, learn and work with the tools, and teach while the student passively receives information.

The collaborative learning model

Sakai, on the other hand, is based on collaborative learning, which by definition, asks students to cooperate to reach consensus in open-ended activities. The collaborative learning environment (CLE) is best suited to group work, where students can freely interact with each other and construct their ideas together. Finally, because the CLE is student-centered, students are in control of their own learning and ultimately, the outcome of their learning.
With Sakai, students are active learners and contributors, and the instructor is a facilitator. Specifically, the instructor activates tools and gives students or groups of students permissions to use as few or as many tools (and some or all of the functionality of the tools) as they like; the instructor does not have to know the tools inside and out. Students can self-organize and make their learning/knowledge visible, and instructors build a community of learners where responsibility is shared among the group rather than owned by the instructor.

Its ability to offer group collaboration sites is one of Sakai’s most powerful features, and the sites are easy to set up, so users can serve themselves. On many campuses, collaboration sites have become so popular with faculty and students that Sakai adoption rates increase, with less resistance to the change of course management system than might have been expected. Collaboration sites can be used by researchers who need to work with their colleagues around the world, by faculty engaged in governance committee work, and by students working with research committees, study groups, or activity clubs.

All this said, if an instructor wants to employ a more traditional model of instruction, Sakai can support that choice too.

**Linking pedagogy and technology**

All technologies promote certain behaviors while constraining others. This is the nature of technology, due, in part, to the underlying assumptions made by designers and developers. For example, one popular LMS designed to help instructors manage course materials in reality restricts students from taking greater ownership of the learning process. The instructor is responsible for creating all aspects of the learning environment – from posting content and quizzes to posting announcements and creating groups. Students are not permitted to upload content (other than assignments) or to establish online groups of their own.

As mentioned, Sakai was developed first and foremost as a CLE. As such, Sakai permits setting roles and permissions flexibly for each course site. Thus, instructors can empower students to create their own groups, upload course content, review their peers’ work, create class surveys, serve as TAs (teaching assistants) or mentors to others in the class, and so on. This is a dramatically different approach that moves us toward the kinds of learning engagement about which Chickering and Gamson wrote in “Applying the Seven Principles for Good Practice in Undergraduate Education.” (See the References at the end of this article.)

**Tools**

Sakai contains a rich variety of group and individual communication tools, as well as standard LMS capabilities. Tools are either “core” or “provisional.” Core tools have been through a rigorous quality assurance process and are part of the Sakai download; provisional tools have been proposed and/or are in a state of development. The Sakai Foundation helps to guide the selection of tools that become provisional, and partners work with the foundation to develop tools for which the community expresses the greatest need. (See Table 1.)

<table>
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<tr>
<th>A set of generic collaboration tools forms the core of Sakai.</th>
<th>The core tools can be augmented with tools designed for a particular application of Sakai.</th>
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<tbody>
<tr>
<td>Announcements Preferences</td>
<td>Teaching Tools Assignments Portofolio Tools Forms</td>
</tr>
<tr>
<td>Drop Box Presentation</td>
<td>Grade book Evaluations</td>
</tr>
<tr>
<td>Email Archive Profile/Roster</td>
<td>Module Editor Glossary</td>
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Many tools are unique, in that they are not available, available only in limited forms, or available at additional cost in other systems. For instance, Sakai:

- Has wiki and blog functionality within a secure environment, thus protecting student privacy while incorporating current technologies
- Is leading the way in integrating library database content inside the collaboration and learning environment, increasing ease of student access to peer-reviewed sources
- Enables students and faculty to create portfolios of their best work, which can subsequently be used for functions such as accreditation
- Allows faculty and administrators to assess student learning, programs, and more
- Provides fine-grained permission capabilities for site tools
- Includes myriad group-aware tools:
  - Announcements
  - Assignments
  - Calendar
  - Forums
  - Grade book
  - Mail tool
  - Messages
  - Resources
  - Roster
  - Site Statistics
  - Tests & Quizzes

Unlike systems created by remote coding teams, Sakai tools are designed by educators for educators. Take the Sakai assignment tool; it enables instructors to grade and comment within a student assignment without downloading it, and at the same time, it keeps an unmarked copy of the assignment for the student to revise.

Since Sakai is open source and uses open standards, users can integrate tools external to Sakai. A few examples include:

- TurnItIn, the plagiarism detection service,
- TILE, The Inclusive Learning Exchange that creates learning objects for various learning styles and abilities, and
- LAMS, the intuitive visual environment for creating sequences of learning activities, just to name a few.

**Open Source**

Sakai uses the Educational Community License, which is an approved Open Source Initiative license.
"open/open" license makes the source code available for unrestricted development by commercial or noncommercial entities, and it does not impose use of a particular license on derivative works. Anyone can use the Educational Community License by changing the copyright line to list the institution name (or individual name, if appropriate) and the copyright year. The Sakai Project strongly encourages use of the Educational Community License to facilitate easy software code reuse and sharing.

A great advantage that open/community source systems offer over commercial systems is the ability to exercise greater influence and control over the technologies that become essential components of an institution’s enterprise. According to a recent Educause Research Bulletin, because these technologies are truly "open" and typically conform more closely to common standards, schools have the ability to modify, extend, and integrate them more easily than proprietary systems.

Because schools can also take part in the governance of community source projects like Sakai and Open Source Portfolio (OSP), they can help set directions for their future development and use. By taking control of our technology destiny, we disengage our future from vendor business plans. The result is improved tools and greater flexibility to meet our changing technology needs. (See Table 2 for a comparison of LMS and CLE characteristics.)

| Table 2 LMS characteristics compared to those of CLEs |
|---------------------------------|--|
| **LMS**                        | **CLE**                                           |
| Learning Management System      | Collaborative Learning Environment                |
| Instructor Led                  | Instructor Facilitated                            |
| Passive Students                | Student Collaboration                             |
| Closed System                   | Open System                                       |
| Course Sites                    | Course Sites; Communities of Practice; Collaboration Sites |
| Conform to company set standards| Conform to common standards                        |
| Functionality determined by corporate business plan | Functionality determined by governance community of users |

As open source software, Sakai brings several advantages to campuses that implement it. In the wake of Blackboard's purchase of WebCT and Angel, Sakai emerges as an alternative for schools concerned about the risks of proprietary systems, including uncertain licensing costs, unresolved product roadmaps, and continued instability due to patent lawsuits. In today's technology landscape, open source applications are becoming a "safe haven" compared to the uncertainties and turmoil in the proprietary software marketplace.

For some, the words "open source" are as much a warning sign as a possible solution. Visions of anonymous coders working in foreign basements don't sit well in calculating the IT total cost of ownership.

While still open source, Sakai builds on a "community source" model, supported by world-class institutions and governed by a board of directors at the non-profit Sakai Foundation. The current board includes representatives from educational institutions, both national and international, as well as a representative from a Sakai commercial affiliate (for more info see http://sakaiproject.org/board-directors).
With a diverse representation across types of colleges and institutions, Sakai's leadership guides the vibrant Sakai community in areas like managing contributions to future Sakai requirements, quality assurance, and tool and project coordination. As universities choose a course management system, it is a welcome change to have an option that is not only designed by fellow educators, but also governed by our peers.

**Potential drawbacks**

For some, the fact that Sakai is a Java-based application is a deterrent, because to contribute to Sakai's development, a programmer must have or acquire Java expertise. Schools typically need Java developers (or a vendor to provide hosting) to help them understand the possibilities for customization, integration with other enterprise systems, and so on. Java expertise is in high demand and can be costly.

Also, because multiple institutions are developing Sakai, the user experience can be somewhat inconsistent (for example, in some institutions the "save" function might be a text label; at others, it could be a Save button. Thus, one big push for Sakai 3 is on consistency of the User Experience (UX).

Note that all issues are being consciously addressed in Sakai 3. Visit this website for more information: [http://sakaiproject.org/future-directions](http://sakaiproject.org/future-directions).

**UNC at Chapel Hill Sakai Pilot**

Given the capabilities, proven track record, and potential of Sakai, the University of North Carolina (UNC) at Chapel Hill elected to conduct a pilot evaluation of the system. As of this writing, the evaluation is publicly available on our blog, [http://www.unc.edu/sakaipilot/blog](http://www.unc.edu/sakaipilot/blog). The pilot, offered through Information Technology Services-Teaching and Learning Interactive (ITS-TLI), was designed to evaluate the efficacy of Sakai for teaching, research, outreach, and administrative purposes, is led and managed by the Sakai Action Group.

During the pilot period, approximately 1,000 students, 35 faculty, and 100 staff used Sakai for course work, collaboration, research, or administrative projects. The pilot experience met or exceeded expectations of the Sakai Action Group and participants, who are now employing Sakai successfully in a variety of ways. The report recommends expanding the use of Sakai, researching a possible migration path to Sakai, and implementing automatic student and course data integration.

Please see faculty interviews and other information on UNC Sakai pilot page ([http://www.unc.edu/sakaipilot/blog/?cat=16](http://www.unc.edu/sakaipilot/blog/?cat=16)) to learn more.

**Conclusion**

The traditional LMS provided a good start for higher education institutions and professionals to move to a digital data setting. And today's adaptive and flexible CLE products, such as Sakai, are the next step in the evolution of collaborative and active learning. Because online learning environments are absolutely central to the mission of any educational institution, and because the cost associated with such mission-critical technologies is considerable, the ability for any institution to influence the direction, development, and unique deployment of this new generation of learning environments is especially appealing.

We expect technologies to change rapidly over the coming years, and we must find strategies to respond to those changes. Sakai is a solution for those evaluating a long-term IT strategy with a particular eye toward supporting innovative, flexible pedagogies.

**References**


Chickering, Arthur W., and Gamson, Zelda F. 1987. Seven Principles for Good Practice in


Sakai 3 Proposal http://confluence.sakaiproject.org/download/attachments/26444008/Sakai+3+Proposal+v08.pdf?version=1