

Elearning roadmap / Technical working group final report Executive summary - Working draft

Charge and review process

The technical working group was charged with conducting a technical analysis of Blackboard version 9, Sakai version 2 and Moodle and their ability to be integrated effectively into the Duke environment from a technical perspective. To address this charge, we established four review categories that together represent the multiple factors that must be present for a successful LMS implementation: technical architecture; technical integration; ongoing support; and the product's maturity and customer base.

Within each category, we developed a list of specific technical elements to review, ranked according to whether they were perceived to be (1) essential to a Duke LMS implementation; (2) highly desirable (but not a showstopper), or (3) nice to have if available. The essential elements in each category became the minimum standards for technical fit. Beyond that, we identified additional key differentiators from the technical standpoint that should factor into the overall recommendation about future LMS directions.

Our data was gathered through a review of readily available technical documentation about each solution and through consultation with colleagues at other institutions, to seek answers or amplification on some technical points and to get a general sense of their technical approach and priorities in implementing their chosen system. We also reviewed technical hosting and support information from third party support providers to augment our understanding of the technical capabilities of each system. It was the judgment of the working group that the most feasible approach given our timeline and available resources was to base our analysis on these external information sources and the experience of colleagues in similar institutions, rather than setting up test instances of the three solutions under investigation.

Conclusions

Based on the data gathered through the process described above, it is our determination that Blackboard 9, Sakai and Moodle have the capability of meeting our essential technical criteria. This seems especially clear in the case of Blackboard 9 and Sakai, both of which have extensive technical documentation publicly available and large organized professional communities involving technical support and development staff. It was somewhat more difficult to make the direct case for Moodle, based on existing technical documentation about that solution. However, there are multiple Research I institutions as well as third-party hosting providers that have been able to stand up Moodle in a way that appears to meet our essential technical criteria, so we are accepting that as indirect evidence of Moodle's ability to meet our defined standards. In all cases, these institutions and third-party providers have invested significant technical resources to build out Moodle to meet academic and business requirements.

Key differentiators / other factors to consider

In addition to our general conclusions above, there are three key differentiators that emerged in our analysis of the data for each of the four categories:

- The cohesiveness of the overall technical community around the product
- The amount of technical development and functional effort needed to define business requirements, translate these requirements into an enterprise system, and augment functionality;
- The openness and extensibility of the code base and associated elements in the technical infrastructure and feature set.

Duke's analysis of these differentiators is directly connected to three strategic questions that are tied to the larger recommendation process (and are therefore beyond the scope of the charge of the technical working group:

- What strategic value does Duke place on engagement in the professional community?
- At what level do we set our "build" of the chosen LMS solution? Do we stay with a fairly basic implementation, or do we take advantage of multiple opportunities to deliver a more robust set of features within that solution?
- To what degree are other areas of the technical enterprise engaging in a "best in breed" approach that would allow us to leverage development resources and technical connectors across multiple tools, possibly including the LMS?

The bottom line from the point of view of the technical working group is that all of the solutions under review could be made to work from the technical standpoint, provided the appropriate level of technical resources are made available to fit the needs of the chosen solution and the desired level of "build" and support.

Elearning Technical Group Report

Data Analysis categories

The technical working group was charged with conducting a technical analysis of Blackboard version 9, Sakai version 2 and Moodle and their ability to be integrated effectively into the Duke environment from a technical perspective. To address this charge, we established four review categories that together represent the multiple factors that must be present for a successful LMS implementation.

Category: Technical infrastructure (of core systems and extensible elements)

- Define the ways the LMS needs to be able to integrate within the campus IT environment;
- assess the degree to which each LMS under consideration can do this;
- assess the relative ease of any such integration that is possible;
- determine (roughly) the support effort required for any such integrations.

Category: Technical architecture

- identify the technical architecture (e.g. storage, database, application server, etc)
- identify the architecture needed to support an enterprise LMS
- identify the criteria for assessing best fit within the Duke IT environment
- assess the overall stability, scalability, and extensibility of each system within the required technical architecture

Category: Technical support

- define the categories of technical support for the overall LMS technical/application environment
- assess the ease of support in each of those categories

Category: Product maturity and customer base

- product maturity, sustainability, dependence on grant funding
- customer base (connecting to guiding principles)
- summary of lessons learned from peers

Within each category, we developed a list of specific elements to review, ranked according to whether they were perceived to be (1) essential to a Duke LMS implementation; (2) highly desirable (but not a showstopper), or (3) nice to have if available. The essential elements in each category became the minimum standards for technical fit. The elements in each category are listed below, with items identified as Priority 1 comprising the essential elements for the analysis.

Priority	Architecture
1	Modularization
1	Table-driven vs. direct modification
1	Scaleability as users increase
1	Availability of technical architecture documentation
1	Fit of recommended architecture within OIT service classifications
1	Support for security
1	Support for backup & recovery
1	Virtualization options
2	Granular / modular configuration of CSS
2	Support for fail-safe redundancy
2	Support for high availability
2	Archiving capabilities
2	Options for automating archiving
2	Options to ingest archived materials at the system level
3	Ownership of source code

3	Ability to connect to & migrate from different types of storage
3	Ability to handle large data sets

Priority	Technical support
1	Availability of overall development/release schedule and upgrade path for the product?
1	Availability of paid support?
1	Availability of technical tools, support and/or community resources to migrate course resources
1	Availability of technical training for local support team (user support, developer support)
1	Breadth and depth of professional services available? (e.g. used PeopleSoft integration/customization for the gradebook)
1	Difference in internal support model (similar to what we have now, vs. what might be needed to others - e.g. more development resources needed?)
1	Existence/quality of technical documentation & knowledge base
1	Existence/quality of technical requirements
1	Granular administrative access to enable different job functions
1	Mechanism for implementing system and application monitoring?
1	Ability for Duke to make a critical change if required
2	Availability of information about technical problems for troubleshooting (and metrics)
2	Existence/quality of user documentation
2	Internationalization of support
2	Level of Duke influence on product direction
2	Limits on support (coverage, e.g. 24/7, international, # of people who can request support, response time)
2	Mechanism to generate usage data / metrics and/or availability of 3rd party tools for this purpose

Priority	Technical Integration
1	Availability of /support for plug-ins from the community
1	Availability of APIs for technical integration
1	Compliance with Duke security guidelines
1	Integration with Shibboleth
1	Mechanism for non-Duke affiliate accounts
1	Support for unique identifiers (for integration with local IDM)
1	<i>Support for batch interactions</i>
1	Integration with Grouper/OZ
2	Availability of supporting tools to do integration
2	Integration for single sign-on
2	Overall load / performance issues with different modules (sustainability)
2	Support for RSS (standard and media)
2	Support for XML
3	Support for real-time interactions

Priority	Environmental scan
1	product maturity, sustainability, lack of dependence on grant funding
1	Stable customer base
