

# LMS Feasibility Study (Executive Summary)

## Part II of the Open Source Collaborative Moodle Assessment Report

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### Introduction

The North Carolina Community College System Learning Technology Systems Department published the *Open Source Collaborative: Moodle Assessment Report* (Randall, Sweetin and Steinbeiser) in August 2009. The Report, available at <http://oscmoodlereport.wordpress.com> was designed to answer the research question, "Is Moodle a viable alternative to Blackboard?" The Report concluded that Moodle was a viable alternative to Blackboard in areas of functionality, usability, and total cost of ownership. The Report also recommended that a Learning Management System (LMS) Feasibility Study be conducted to answer the follow up research question, "What is the best LMS solution for the North Carolina Community College System?"

### Best Learning Management System Defined

The best LMS solution is defined in this study as one in which all LMS components are considered within the total learning infrastructure of North Carolina Community Colleges such that maximum student success is ensured from both an institutional and System perspective. Aspects of these components within the frame work of student success were assessed by the following attributes:

- Interoperability and Flexibility
- Cost effectiveness
- Support and Training
- Ease of Use
- Scalability
- Sustainability

### Methodology

The Assessment Team devised a research methodology to measure and evaluate these six components in an effort to identify the best LMS solution for NC Community Colleges. The solution selected was a three-part approach to investigate components that complement and build upon the original *OSC Moodle Assessment Report*. The general time line for instrument development and data collection was from January to April of 2010 with completion of data analysis in May of 2010. The *LMS Compatibility and Interoperability Survey* was developed to answer questions regarding interoperability, flexibility, support, training, and scalability. The *Migration/Upgrade Case Study Survey* was developed to answer questions regarding support, training, sustainability, ease of use, and cost effectiveness. Lastly, the *Total LMS Vendor Cost of Analysis* was developed to answer questions regarding cost effectiveness. All additional research included in this study was obtained from public documents or provided directly from vendors.

## Interoperability and Flexibility

Currently, the Datatel Colleague-to-LMS interoperability is the most important integration facing NCCCS institutions. Of the three basic Datatel integration types: manual flat file, automated flat file, and dynamic data transfer; the most adopted procedure is the manual flat file process. All indications are that the majority of the colleges are satisfied with this current level of Datatel integration. However, improved Datatel integration was the most requested additional feature reported by DL administrators. The most commonly installed third party plug-ins were anti-plagiarism tools, communication tools and assessment development tools. Moodle is a more flexible LMS appearing to better facilitate movement of learning content in and out of the LMS and more customizable than Blackboard. Conversely, Moodle's open source code provides the ability for Moodle to be very specialized. That specialization also comes with the risk of customization to the degree that branching of Moodle code takes place and future Moodle.org updates could be problematic.

## Cost Effectiveness

Total cost figures included in this report represent a current snapshot of LMS expenditures excluding self-hosting and migration costs reported to the Assessment Team. Moodle is clearly the most cost-effective solution if one only considers licensing, hosting and cost per DL FTE. However, cost alone does not determine the best LMS solution for the NCCCS. The current state budget shortfall facing North Carolina is one of many components which factor into the best solution for LMS determination. Ease of use, functionality and interoperability, support and training as well as scalability and sustainability all factor into the equation as well. Moodle requires no license fees. This could allow for reallocation of funds to support other LMS-related services such as vendor hosting, application development, or investment in third party plug-ins - without exceeding current funding levels. Blackboard license fees have increased significantly over the past six years. This requires that the NCCCS routinely adjust upward the enterprise-LMS budget to sustain status quo or aggressively negotiate contracts to cap spending costs. In addition, vendor hosting costs for Moodle are considerably less expensive than Blackboard, as proprietary Moodle partners compete for Moodle hosting business. Since Blackboard Inc. does not allow third party hosting services, there is no competition to drive down cost to the consumer. Lastly, data from the *OSC Moodle Assessment Report* revealed that total cost including migration and self-hosting during the transition year, accounted for a 35% increase in case study colleges' total LMS cost. This increase was eliminated; however, once the migration was completed showing a 72% decrease in total cost for the case study colleges from pre-transition year to post-transition.

## Support and Training

The NCCCS provides three services to the colleges in regard to LMS support and training. The Virtual Learning Community provides student orientation templates and professional development resources for faculty; Presidium Inc. provides online help desk services for students and faculty that includes chat, email, telephone, and a personalized support portal available 24/7/365; and the North Carolina Learning Object Repository's (NCLOR) online library of instructional resources offers educators professional

development for North Carolina's K-12 instructors across the state.

The research revealed that 45 (77.5%) of NCCCS colleges have fewer than three staff members to directly support their distance learning departments. This is not adequate to meet the current, let alone growing, needs of NCCCS's distance education programs. There is a dire need for distance learning staff at the colleges. Only 27 of the 58 colleges currently take advantage of the LMS online help desk services paid for by the system, yet the majority of the college indicate they are satisfied or very satisfied with their current help desk provider. The Migration and Upgrade Case Study colleges indicate that the vendor help desks for both Blackboard and Moodle have a rapid ticket response time, are professional and helpful and are satisfied with the level of overall support. Vendor online support and training services utilized by both Blackboard and Moodle colleges appear equal.

## Ease of Use

The *OSC Moodle Assessment Report* adequately addressed the LMS ease of use component, and no additional instrument questions were developed. The *OSC Moodle Assessment Report* end-of-term survey showed no statistically significant differences in regards to ease of use while the functionality comparison indicated that Moodle had a higher level of instructor and administrator perceived application functionality. The Migration/Upgrade Case Studies revealed a correlation between the length of the migration or upgrade, the hosting option, and the college's overall level of satisfaction with the process.

## Scalability

The Assessment Team asked four questions to evaluate the scalability needs of the colleges in the benchmarking section of Compatibility and Interoperability Survey. The colleges were asked to report on active courses, users, average course size, and storage capacity of their LMS. Of the responding colleges, 24 reported they had between 401-1,000 active courses and 15 colleges reported having over 1,000 active courses in their primary LMS. Forty-three of the 57 community colleges reporting indicated that they have over 2,000 active students in their LMS, with seven colleges having over 14,000 active students. The majority of the colleges reported their average course size was between 20-60 MB. Results gathered in the *OSC Moodle Assessment Report* revealed a low usage of overall functionality in both Blackboard and Moodle. The Assessment Team anticipates that the average course size will increase in correlation with the faculty's increased use of functionality. Twenty-one colleges in the system expect to see a 40% or greater increase in storage capacity needs, which underscores the need for immediate planning for growth in LMS capacity in the next three years. To deal with the issue of scalability, many colleges are outsourcing LMS hosting to vendors. Thirty-six (62%) of NCCCS colleges vendor-host their primary LMS. Both Moodle and Blackboard are suited for large and small installations. Moodle has the ability to be loaded to a key drive to be used without connection to the Internet but Blackboard has more options related to the integration with mobile devices.

## Sustainability

The sustainability of an LMS is paramount to the future growth of distance learning in the NCCCS. The research into the current LMS situation revealed that:

- 46 colleges use Blackboard as their primary LMS while 10 use Moodle and 2 use Campus Cruiser
- 24 colleges use Moodle as a secondary LMS while 6 use Blackboard, 4 use Campus Cruiser
- 60.4% of the colleges upgraded their LMS in the past year
- 27.6% of the colleges will migrate to a different LMS this coming year
- 62% of the colleges contract for vendor hosting

Combined with the previous Scalability Section, this Sustainability Section has reported an impressive increase of LMS-centric courses, students, and DL course enrollments. Juxtaposed to the ballooning enrollment totals, community college staff required to maintain the LMS infrastructure and provide student support and instructor training are too few in number (as reported in the Support and Training Section). Therefore, the System-wide capability to support LMS-centric learning technology is challenging in both the short and long terms. Support at the institutional level by college leadership varies across the state in regards to staffing and emphasis on distance learning. However, at the System level and across the NCCCS, funding and support staff is woefully inadequate in the face of DL course enrollment projections. Disruptive innovation mathematical application of NC Community College distance learning enrollment trends indicates a rapidly changing ratio of LMS-centric distance learning curriculum course enrollments compared to traditional course enrollments such that:

- The ratio in 2009 was 0.6:1
- In 2011 the ratio will be 1:1
- In 2012 + 6 months the ratio will be 2:1
- In 2014 the ratio will be 3:1
- In 2016 the ratio will be 6:1

The recurring allocations of \$1.37 million for LMS support and \$800,000 for Virtual Learning Community support are not expected to increase in the next three years to sustain these rapidly changing ratios.

The overriding factor revealed in the Migration/Upgrade Survey regarding the colleges' decision to migrate to Moodle over upgrading to the newest Blackboard version appears to be cost. Information from the SuccessNC Listening Tour notes indicated that: (1) Colleges differ on LMS preferences but want continued support from the System Office, (2) Learning technology offers an effective and flexible means to facilitate learning and, (3) Increased enrollments have negatively affected instructors, strained facilities, and encouraged creative interventions to maximize resources.

A convincing body of research supports the conclusion that (1) online instructional delivery has been proven to be as effective as traditional instruction and (2) hybrid instructional delivery has been proven to be more effective than traditional instruction. In North Carolina, an ever growing percentage of community college students prefer online and hybrid courses. We now know that LMS-centric learning technology works well and is in high demand by our students. Results from both surveys reveal an

inadequate representation from finance, information technology, student services, and academic sectors from many colleges. College decision makers often do not have operational understanding of learning technology while evidence suggests that staff members responsible for learning technology at colleges are not always part of strategic planning and decision making at the institutional level (Instructional Technology Council).

Thus the emergence of learning technology as the ubiquitous learning/teaching platform for the near future promises to be a major disruption - requiring reallocation of resources and restructuring or adjusting of many community college functions, policies, and support mechanisms. Disruptive innovation cannot be ignored. But, the disruption can be managed through more inclusive strategic planning, collaboration and cooperation.

## Conclusions

The Assessment Team has determined that the best LMS solution for the NCCCS at this time is to simultaneously support the two LMSs, Blackboard and Moodle. The research revealed limitations in areas of DL support staff, LMS funding, and increased work load of faculty and staff. Given these factors, a mandated System-wide migration of Blackboard-to-Moodle is neither advised nor feasible at this time. Total migration costs to Moodle are thought to be under-reported by Moodle colleges. Without additional funds and increased central support for course migration tools, services, professional development, and training, the total effect on Blackboard colleges would be disruptive, if not chaotic in the short term. Colleges simply need sufficient time, funding, and resolve to manage a successful LMS migration.

## Recommendations

### **Recommendation One: Two-LMS Solution**

If functionality, ease of use, and cost were the only factors to consider, Moodle would be the best overall LMS solution for NC Community Colleges. However, enforced migration to Moodle at this time is not advised due to (1) course migration costs, (2) faculty training requirements, and (3) sufficient time and resolve to migrate. Therefore, a two-LMS solution is advised for NC Community Colleges until further study is completed or sufficient funding for migration is obtained. The System Office is encouraged to provide funding to support both Moodle and Blackboard installations, providing NC Community Colleges with a funded LMS choice. A work group composed of NC Community College System Office staff and Office of State Budget and Management representatives have previously met and will continue to meet to discuss appropriate two-LMS financial support options. It is further recommended that two steering committees of DL professionals from the community colleges, supported by SO staff, be established to support a Blackboard consortium and a Moodle consortium to coordinate and support each LMS. These steering committees would function in a similar manner to the other NCCCS consortiums that govern and manage the integrated library system used by 46 of our institutions.

### **Recommendation Two: Institution Based LMS/Learning Technology Adviser**

Total costs of LMS services include DL and IT staff positions at both the System and individual college levels. Obviously, DL and IT are traditionally separate and distinct services at most community colleges often reporting to different administrators. Clearly, the rapid increase in LMS-centric learning technology requires a realignment of support personnel and services. Therefore, given the disruptive nature and explosive growth of LMS-centric learning technology, an individual or DL advisory team responsible for LMS/learning technology should be created and/or given increased influence in the decision-making and strategic planning processes at each institution. It is advised that this individual or advisory team integrate cross-disciplinary interests to better plan, support, promote, and coordinate learning technology solutions for each college. This individual or advisory team will need to consider needs and coordination of IT, academic administration, student services, DL, and finance. It is further advised that institutional IT support be subservient to the overall academic learning technology needs and goals in keeping with and support of overall institutional planning and performance objectives.

### **Recommendation Three: Adoption of Operational and Business Requirements by all NCCCS Institutions**

Integration of learning technology applications is now and will continue to be a challenge for NC Community Colleges. The NCCCS Learning Technology Systems Department has developed and will continue to incrementally improve a set of operational and business requirements that will systematically (1) select emerging learning technology that represents best-of-breed learning technology applications, (2) create professional development resources to assist in training for instructors and administrators in the use of these applications, (3) provide ever-improving templates for LMS-based courses and learning objects available to all colleges, and (4) establish a culture of assessment through which all processes and resources related to learning technology will inexorable improve over time. Therefore, adherence to the Operational and Business Requirements found in Attachment IV of this Report is recommended for adoption. System-wide adoption will inevitably lead to convergence of learning technology based on:

1. Universally recognized standards to promote integration of all learning technology,
2. Scalability to provide robust, high quality resources to all colleges while reducing IT staff and hardware costs, and
3. Either consortium contracts or open source solutions to control overall costs.

### **Recommendation Four: Continued Development of Cross-Platform Learning Resources**

Professional development was identified as a major factor in student perceptions of instructor effectiveness in LMS-centric courses. Professional development is one area where consolidation of funding and effort can take place. Instructor and staff training needs can be prioritized. Effective modules that are designed to be flexible and agile can be developed and disseminated via the NCLOR such that individual colleges can easily customize these modules into effective Blackboard or Moodle

training courses to address specific needs. The LMS steering committees and the VLC would aid in the organization and governance of these resources.

In regard to student instruction, emerging learning technology compatible with both Blackboard and Moodle LMS(s) should be actively investigated. These technologies include web conferencing applications, immersive technology (Second Life), blogs, wikis, social networking applications, 3-D applications, and applications that support all math courses, foreign languages, and public speaking. We will need more learning technology, not less in the next few years. Any adoption of these emerging technologies should in accordance with the college's Operational and Business Requirements.

### **Recommendations for further study**

- a) Conduct functionality comparisons of Blackboard 9.x and Moodle 2.x.
- b) Investigate System Office funding solutions that support a 2-LMS choice for NCCCS institutions.
- c) Establish consortium governance strategies to insure college input and participation for a 2-LMS solution.
- d) Investigate Application as a Service (AaaS) cloud computing solution for LMS applications.