North Carolina Community College System Office: Learning Technology Systems

Learning Management System Feasibility Study

Part II of the Open Source Collaborative Moodle Assessment Report

Bill Randall, Ed.D, Jonathon Sweetin, M.S. Ed.(Lead Writer), Diane Steinbeiser, M.A.
August, 2010  Version 1.3
Contents
Executive Summary ............................................................................................................................................... 3
Introduction ................................................................................................................................................ 10
Background Information ............................................................................................................................. 13
Study Methodology ..................................................................................................................................... 18
Interoperability and Flexibility .................................................................................................................... 21
Cost Effectiveness ....................................................................................................................................... 29
Support and Training .................................................................................................................................. 38
Ease of Use .................................................................................................................................................. 47
Scalability .................................................................................................................................................... 49
Sustainability ............................................................................................................................................... 56
Conclusions ................................................................................................................................................. 70
Recommendations ...................................................................................................................................... 72
References .................................................................................................................................................. 74
Attachments ................................................................................................................................................ 75
  Attachment I: NCCCS Distance Learning Enrollments Explanation ........................................................ 75
  Attachment II: LMS Compatibility & Interoperability Survey Results ..................................................... 77
  Attachment III: Moodle Migration/Blackboard 9 Upgrade Survey Results ............................................ 90
  Attachment IV: Learning Technology Systems Operation and Business Requirements ....................... 112
  Attachment V: 2009 DL100ANN ICR Curriculum Report ...................................................................... 119
Executive Summary
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 inexorably 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.
Introduction

This report is Part Two of the Open Source Collaborative Moodle Assessment Report (Randall, Sweetin and Steinbeiser) by the same assessment team, three staff members of the North Carolina Community College System (NCCCS) Learning Technology Systems Department:

- Jonathon Sweetin (lead writer), Application Integrator
- Diane Steinbeiser, Distance Learning Assessment Coordinator
- Dr. Bill Randall, Associate Vice President

The NCCCS Learning Technology Systems Department published the OSC Moodle Assessment Report 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?" Moodle was found to be a viable alternative to Blackboard in areas of functionality, usability, and total cost of ownership. The Assessment Team recommended that a 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?"

The OSC Moodle Assessment Report investigated on the online course management systems (CMS), Blackboard and Moodle. This report, Learning Management System Feasibility Study: Part II of the Open Source Collaborative Moodle Assessment Report, studies the same software application for delivering online instruction, yet has moved to the more accepted term, learning management system (LMS) in place of the former, course management system (CMS).

Best Learning Management System (LMS) 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 NCCCS 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 and
- Sustainability

Interoperability is defined as the ability of the LMS to integrate with related peripheral applications and services, which is a critical component for planning future learning technology solutions. Flexibility is the ability to (1) easily move learning content in and out of the LMS and the ability to (2) customize applications to meet specific needs of the colleges or System. Flexibility is important in keeping with Learning Technology Systems Operation and Business Requirements (Attachment IV) in anticipation of future upgrades and interoperability of related applications.
**Cost effectiveness** is defined as the total value of return on investment of the LMS to deliver core functionality and usability with consideration of the total financial burden of evaluation; procurement; pilot testing; roll-out; staff and faculty training and support; and coordination of primary and secondary learning technologies that impact specific learning needs.

Support and training enables colleges and the System Office to be responsive to emerging technologies which enhance LMS utilization. Continual improvement through training and access to 24/7 support for faculty, staff and students are two contributing factors for ensuring student success.

**LMS ease of use** includes development of intuitive platforms (1) requiring a minimum of orientation and training, (2) providing uniform access protocol to multiple applications, and (3) minimizing support and maintenance requirements. Ease of use is a major factor in student success in online education. LMS user support for students, faculty, and administrators must be accessible and intuitive. User training is a natural partner of support services.

**Scalability** is defined as the ability of the LMS to efficiently serve both large and small institutions with agile hardware/software solutions at the macro and micro levels.

**Sustainability** is the ability to maintain a consistent level of learning infrastructure and support required to (1) meet the growing enrollment demands of students, (2) meet growing infrastructure needs, and (3) address limitations of funding, faculty training, and support staff now and into the future.

**Feasibility Study Methodology**

The Assessment Team developed three research instruments to address the technical and financial issues not addressed in the *OSC Moodle Assessment Report*: (1) LMS Compatibility and Interoperability survey, (2) Upgrade/Migration Case Study survey, and (3) Total Vendor Cost Analysis.

The purpose of the Compatibility and Interoperability survey was to collect benchmark statistics of Blackboard, Moodle, and other LMSs used throughout the NCCCS - most specifically the number of active courses and the number of active students, in addition to evaluate of the plug-ins that colleges use which are not part of the LMS’s core product. The Moodle Migration and Blackboard Upgrade surveys built upon the *OSC Moodle Assessment Report* Case Study findings to reveal underlying trends and to determine the costs associated with an LMS change - whether it be migrating to Moodle or upgrading to version 9.x of Blackboard. The Total Vendor Cost Analysis was an evaluation of current Blackboard and Moodle costs involving predetermined vendor expenditures to the NCCCS Office and the individual colleges.

**Conditions and Limitations of the Study**

The Feasibility Study Report is an original assessment effort by three staff members of the NCCCS Learning Technology Systems (LTS) Department. The Study only reports on LMS infrastructure (current and future) within the NCCCS. All information collected by the Assessment Team was collected from (1)
surveys directed to distance learning, information technology, and academic administrators at NCCCS institutions; (2) public documents, and (3) vendor websites and publications.

The scope of the study was challenging. Two survey instruments were created, deployed, and analyzed. Contracts approved by the State Board of Community Colleges provided much of the total costs of ownership figures. Web resources and vendor documents were analyzed. Much of this work took place toward the end of spring semester 2010, when community college faculty and support staff were already engaged in end-of-year responsibilities.

Limitations of the study include:

(1) Costs, staff time, and identification of all resources associated with operating a community college LMS proved difficult to report.

(2) LMS management and administration involves several areas of community college operations including academic administration, distance learning, IT support, business office/procurement, and student services. Responses to important questions did not always reflect appropriate input from multiple areas as requested.

(3) Costs related to significant contracts, staff requirements, and planning and implementation strategies were often incomplete. This may be due to the fact that the Case Study survey was distributed toward the end of a very important spring semester when distance learning administrators had competing obligations, thereby necessitating hurried or incomplete responses to the survey. Analysis of survey responses suggests that LMS and distance learning administration does not reflect a high-level, cross-functional administrative authority, which is necessary to effectively manage a mission critical technical infrastructure that directly impacts over one third of all curriculum course delivery across the NCCCS.

Additionally, the two LMSs are difficult to compare cost wise. As such, the study focused on actual costs taken from public documents provided to the State Board of Community Colleges and/or provided by vendors. The Assessment Team sought to provide fair and consistent categories through which LMS comparisons could be made. This was difficult as the two LMSs have different definitions for similar functionality and technical architecture. In addition, individual, autonomous community colleges (1) often have unique distance learning leadership, backgrounds, and cultures and (2) vary in the handling of LMS license fees, hosting, staffing, and support needs.

The Feasibility Study did not address the functionality of Blackboard 9.x., but rather focused on the upgrade process of Blackboard versions 7.x and 8.x to 9.x., as well as focused on migration from Blackboard to Moodle 1.9x.
Background Information

Meeting Need through Collaboration: Distance Learning in the NC Community Colleges

NCCCS distance learning programs have collectively evolved a "culture of collaboration" over the past 20 years. This resulted from extraordinary leadership at both the System Office and key community colleges beginning with coordinated support of telecourses in the 1980s. Additionally, in the late 1980s the North Carolina General Assembly provided funding for satellite dishes and C/KU band receivers for all 58 NCCCS institutions. This technology provided downlinking capability of both (1) commercial educational satellite programs and (2) programs created by NCCCS that took advantage of brokered television production involving volunteer crews from community colleges, augmented with professional uplink services. The savings from utilization of such volunteer crews enabled the NCCCS to create many more productions. In addition, crew members gained valuable collaborative experience through involvement in these productions.

Roll out of the satellite systems, collaboration in satellite-cast production, and a continuing need to share telecourse resources and materials for student orientation and instructor training and support combined to further solidify the culture of collaboration which proved valuable as online learning emerged in the late 1990s.

Emergence of Online Learning: LMSs in NC Community Colleges

Prior to 1998, some NC Community Colleges created their own online courses. Most of these were hand-coded HTML and varied widely in concept and quality across the System. Blackboard, Inc. became the preferred LMS application provider for NCCCS institutions in 1998-99. Blackboard offered a standard online learning/teaching platform where college staff could share best practices, support resources, and courses.

Virtual Learning Community (VLC)

In 1998, academic, administrative and distance learning leadership across the NCCCS established a collaborative body to address the collective production needs for high quality online courses. The goal of this collaboration was to reduce the duplication of costs and effort of individual colleges across the System by concentrating available expertise and funding into a single entity charged with creating high quality courses - beginning with the 10 most used online courses across the System. Online courses developed through this collaboration were available for download, customization, use, and expansion by all 58 NCCCS institutions.

This program became known as the Virtual Learning Community. The VLC has evolved beyond online course development to include (1) creation of learning objects, (2) coordinated assessment of emerging learning technology, (3) emphasis on quality and assessment tools, and (4) production of professional development resources. New courses, now embedded with learning objects, are in continuous
development and available to individual colleges for implementation across the state. As of June 30, 2010, there are 255 curriculum courses and 45 continuing education courses available to all 58 NCCCS institutions. Beginning in fall 2009, VLC all courses are developed in both Blackboard and Moodle LMSs.

Collaboration Leads to Consortium Contracts and Solutions

The NCCCS began negotiating system-wide convenience contracts with Blackboard in 2004 to leverage consortium pricing for all community colleges. The System Office paid the Blackboard license costs in 2006-07 with an “enterprise-Learning Management System” allocation from the NC General Assembly, and continues to at the time of this report. Escalating costs of Blackboard hosting and additional services, however, prompted some NCCCS institutions to investigate open source Moodle as an alternative LMS. Blackboard remains the primary LMS provider for 42 of the 58 NC Community Colleges.

The NCCCS Learning Technology Systems investigated the Modular Object Oriented Dynamic Learning Environment (M.O.O.D.L.E.) open source LMS early in 2006. The open source paradigm allows concurrent input of different functions, approaches and priorities – vastly different from the closed, centralized models of proprietary software development. Open source software licenses guarantee the rights to freely use, modify and redistribute the source code free of charge. Initial investigations were encouraging and led to formation of The North Carolina Moodle Users Group (NCMUG) in 2006-07 which provided administrator and instructor training, hosting of online courses, and system administration through a contract with Remote-Learner, a Moodle partner. NCMUG continued two more years eventually providing Moodle services to a total of 15 community colleges and 2 UNC institutions. Successes of NCMUG directly led to the establishment of the Open Source Collaborative: Moodle Assessment - an extensive two-year pilot of Moodle featuring a comprehensive assessment detailed in the OSC Moodle Assessment Report.

Established in 2006, the Open-Source Collaborative continues to provide hosted hardware, application administration, training, and customized programming in critical areas which support a centralized Moodle implementation project, capable of supporting 100,000 online students and providing a testing platform for multiple community colleges. The cluster servers are housed at the Micro-computing Center of North Carolina (MCNC) but the help desk support and hardware configurations are managed by the Moodle partner, Remote-Learner.net. Most of the NCMUG colleges moved their instances to this clustered center. New colleges were added as NCMUG colleges moved off the cluster to production contracts with a Moodle partner of their choosing. Currently, there are ten colleges that are fully Moodle. There are 15 in the pilot stage that have instances in the Open Source Collaborative Moodle Pilot Cluster. This number is fluid, as once colleges move to full production; they are no longer considered pilot colleges.

State Board of Community Colleges requested the OSC Moodle Assessment Report to formally ascertain the viability of Moodle as an alternative to Blackboard. The full OSC Moodle Assessment Report determined that Moodle is in fact a viable alternative to Blackboard. This conclusion was reached by a team of NCCCS staff using three independent research techniques: functionality comparisons, end-of-term survey results by both instructors and students, and case studies of four NCCCS institutions that
had migrated from Blackboard to Moodle. The study found that the LMSs had similar overall application functionality. Faculty and students were equally satisfied with the LMSs’ ease of use. The case studies revealed that migration from Blackboard to Moodle was challenging and resource intensive at the college level, but the Moodle colleges were uniformly satisfied with the results and reported a reduction in overall costs once the migration was complete.

The OSC Moodle Assessment Report did not fully address the issues of technology and funding framed in terms of scalability, compatibility, and interoperability of all learning technology applications used in the NCCCS. The team recommended a feasibility study to determine the technical and financial aspects of a LMS migration.

Growth in Distance Learning

In 2008-09, distance learning curriculum course registrations totaled 588,787, an increase of 37.9% from the previous year. The majority of classes were taken on the Internet – 310,058 registrations; Web-supported or assisted classes – 167,501 registrations; Hybrid classes that combined online and face-to-face instruction – 94,239.

Occupational and Continuing Education (CE) students also benefited from distance learning resources: 80,822 students took distance learning classes in 2008-09, a 27.5% increase over the previous year. (Attachment I)

**BI Table 1: Distance Learning and Traditional Curriculum Enrollments**

<table>
<thead>
<tr>
<th>Year</th>
<th>DL% of all Enrollments</th>
<th>Traditional Enrollments</th>
<th>Distance learning Enrollments</th>
<th>Total course Enrollments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1.63%</td>
<td>1,009,561</td>
<td>16,740</td>
<td>1,026,301</td>
</tr>
<tr>
<td>1999</td>
<td>2.41%</td>
<td>1,080,584</td>
<td>26,695</td>
<td>1,107,279</td>
</tr>
<tr>
<td>2000</td>
<td>3.58%</td>
<td>1,008,153</td>
<td>40,392</td>
<td>1,048,545</td>
</tr>
<tr>
<td>2001</td>
<td>4.99%</td>
<td>1,116,669</td>
<td>58,592</td>
<td>1,175,261</td>
</tr>
<tr>
<td>2002</td>
<td>6.78%</td>
<td>1,200,070</td>
<td>87,299</td>
<td>1,287,369</td>
</tr>
<tr>
<td>2003</td>
<td>8.57%</td>
<td>1,250,449</td>
<td>117,229</td>
<td>1,367,678</td>
</tr>
<tr>
<td>2004</td>
<td>10.02%</td>
<td>1,295,407</td>
<td>144,217</td>
<td>1,439,624</td>
</tr>
<tr>
<td>2005</td>
<td>16.26%</td>
<td>1,201,360</td>
<td>233,230</td>
<td>1,434,590</td>
</tr>
<tr>
<td>2006</td>
<td>21.76%</td>
<td>1,106,142</td>
<td>307,639</td>
<td>1,413,781</td>
</tr>
<tr>
<td>2007</td>
<td>27.62%</td>
<td>1,013,607</td>
<td>386,738</td>
<td>1,400,345</td>
</tr>
<tr>
<td>2008</td>
<td>29.35%</td>
<td>1,027,842</td>
<td>427,018</td>
<td>1,454,860</td>
</tr>
<tr>
<td>2009</td>
<td>36.86%</td>
<td>1,008,762</td>
<td>588,787</td>
<td>1,597,549</td>
</tr>
</tbody>
</table>
Enrollment Emergency of 2008-10

Record-setting distance learning course enrollments were precipitated by the economic downturn in North Carolina. Contributing factors were the high unemployment rate, when North Carolina lost an unprecedented 240,000 jobs from December 2007 – December 2009 (Economist: NC Unemployment Rate to Hit 13%); record high gasoline prices in 2007-08; and the H1N1 pandemic of 2008-09 where students were hesitant to attend classes in person. This explosive enrollment growth has stretched the limited resources of the NCCCS, necessitating a search for more economical and technological solutions to meet the growing demand for online education.

Solution: Integrated Standards-based Technology and Protocol

To meet these needs the NCCCS LTS Department crafted an integrated e-learning infrastructure composed of broadband connectivity, instructor support and resources, learning content and applications compliant with technical standards, and development of online and distance learning courses for use across the System. Efforts of the LTS are based on:

1. Innovative operational and business requirements and strategies that have evolved over the past five years as the NCCCS has accommodated an unprecedented student demand for more non-traditional instructional delivery methods;
2. Recommendations of the North Carolina e-Learning Commission that focus on providing access to uniform, robust learning opportunities for all North Carolina citizens regardless of age or locale; and
3. The assumption that collaboration and realization of economies-of-scale solutions provide a viable means for the NCCCS to re-allocate public funding to provide uniform, robust learning opportunities to all adult learners across North Carolina.

Learning Technology Systems Operation and Business Requirements (Attachment IV) have been articulated to provide structure for strategic and budget planning, integrate departmental efforts more effectively, improve assessment/evaluation of products and services, and to meet all responsibilities of the department. These business requirements are formulated on three concepts:

- Alignment strategy in which all new learning infrastructure, processes, and methodologies will conform to three conditions (standards, scalability, and consortium-appropriate contracts/financing) to ensure economies-of-scale efficiencies and eventual convergence of all K-20 learning infrastructures.
- Integrated functionality that articulates the overall goal of establishing an array of compatible, interoperable learning technologies that can be selected by individual instructors, departments, or colleges as needed to fully support any learning/instructional requirement – thus providing and focusing macro-leveraged resources at a micro-level.
- Funding/resources matrix in which all learning technology resources and funding sources are categorized into six support areas required to support any community college or K-20 institution. The matrix enables global support to all NCCCS institutions to be articulated as practical categories of service each tagged with individual funding sources. Thus the matrix provides an overview of
the NCCCS support strategy which is uniquely established to directly support and complement individual college learning technology infrastructure.

The ultimate responsibilities of the LTS are to support community colleges; provide for community colleges what they cannot provide themselves; promote quality and assessment; maximize number/quality of flexible resources to colleges by establishing a menu of compatible, integrated resources; establish a protocol that inexorably improves resources over time; and to evaluate and report LTS performance in all areas of service.

Integrated System-Wide Services

In addition to supporting Blackboard and Moodle LMSs, NCCCS institutions now enjoy centralized support and services in other critically needed learning infrastructure areas. These include upgraded broadband connectivity, a System-wide learning object repository, online help desk services for students and faculty, and increased professional development resources. The goal of LTS is to provide an interoperable array of integrated learning technologies that facilitate learning and teaching through cost-effective means.

North Carolina Learning Object Repository (NCLOR)

The NCLOR empowers faculty across North Carolina by providing a central location to manage, collect, contribute, and share digital learning resources for use in traditional or distance learning environments. The NCLOR is designed to increase the efficiency and productivity of K-20 teachers across the state by reducing duplication of effort associated with course development. NCLOR is managed by the LTS department at NCCCS. The NCLOR users include faculty and staff from NCCCS, University of North Carolina (UNC) System, North Carolina Independent Colleges and Universities (composed of 36 private institutions), the North Carolina Department of Public Instruction and North Carolina Virtual Public Schools. The NCLOR is integrated and accessible through both Blackboard and Moodle.

Online Help Desk Services for Students and Faculty

NCCCS LTS provides help desk support services to 43 of the 58 colleges. Online help desk service is required by many distance learners for technical assistance throughout their online learning experience. The first few days are especially critical to the future success of first time online students. Available, accurate, appropriate, updated information and support contributes to the success of online students in general and first time online learners specifically.

These services are delivered at reduced prices when contracted through the System Office rather than through locally supported or outsourced offerings by the individual colleges. Online help desk resources leverage a high tech approach to increase student success and achieve measurable improvements in student performance. Resources include chat, email, telephone, and personalized support portal available 24/7/365. Research indicates that 90% of all online student questions are satisfactorily handled via help desk only. This drastically cuts the number of college staff positions required to provide services and improves the quality of service to those students requiring individual assistance.
Study Methodology

The Feasibility Study focused on six components that collectively define "What is the best LMS solution for NC Community Colleges?" These are identified in the Introduction of this Study:

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

The Assessment Team devised a three-part research methodology to measure and evaluate these six components in an effort to identify the best LMS solution for NCCCS. 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. This approach complements and builds upon the original OSC Moodle Assessment Report of August 2009. The three-part methodology includes:

1. **LMS Compatibility and Interoperability Survey** which gathered information about the general benchmarking statistics of the LMSs in the system, the compatibility and interoperability of the LMSs with third party applications and services, and a short open-ended LMS needs assessment.
2. **Migration/Upgrade Case Study Survey** to collect data regarding NCCCS colleges' (a) migration from Blackboard to Moodle and (b) upgrade by Blackboard clients to version 9.x.
3. **Total LMS Vendor Cost Analysis** to review the total cost of LMS ownership by the NCCCS and the individual colleges in regards to vendor LMS license fees, hosting fees and any other additional costs.

### LMS Compatibility and Interoperability Survey Methodology

The Assessment Team developed a survey instrument that addressed the majority of items outlined in the OSC Moodle Assessment Report recommendations. The main priority was to measure college responses regarding compatibility and interoperability of LMS related applications, resources, and services. The Assessment Team quickly realized, however, that system-wide LMS utilization was unknown. Before a best LMS could be identified for the NCCCS, current utilization needed to be measured in order to forecast future capacity for scalability and sustainability. Thus, the need for a benchmark section of the survey was required and the overall survey structure was completed.

### Item Selection

The survey included clusters of questions measuring:

1. Benchmarking in areas of total LMS capacity - numbers of active courses, active students, average size of LMS based courses, etc.;
2. Compatibility and interoperability of LMS related building blocks, modules, and plug-in applications;
3. Additional issues not addressed in the previous sections regarding core LMS functionality or third party plug-ins.
Audience Selection

The purpose of the LMS Compatibility and Interoperability Survey was to present a snapshot of current LMS utilization across the system. Participation of all NC Community Colleges was required.

Survey Delivery Method

On February 24, 2010, Dr. Saundra Wall Williams, Senior Vice-President and Chief of Technology and Workforce Development, sent a memo to all community college Presidents, Chief Academic Officers, Chief Financial Officers, and Distance Learning Administrators to share the results of the OSC Moodle Assessment Report which verified that the open source LMS Moodle had been found to be a viable alternative to Blackboard, a proprietary LMS.

On February 25, 2010, a link to the online survey tool was emailed to all Distance Learning Administrators, who were instructed to consult with their college President, Chief Academic Officer and Chief Financial Officer before completing the survey. Dr. Williams requested cooperation from each of the colleges. Definitions were provided for common terms such as "plug-in," "additional application," "active courses," and "active students" used throughout the survey to ensure consistency in reporting. The survey was closed on March 12, 2010. (Attachment II).

Migration/Upgrade Case Study Methodology

The main objective of the Migration/Upgrade Case Study survey was to evaluate the overall process of migrating from a legacy LMS to Moodle and the process of upgrading current Blackboard instances to Blackboard version 9.x. The case study methodology addressed areas not assessed in the six key components.

Item Selection

The majority of the items in both the Moodle and Blackboard surveys were taken from the case study section of the OSC Moodle Assessment Report. This allowed for a longitudinal view comparing new data with previously collected data from the OSC Moodle Assessment Report.

Audience Selection

Moodle colleges were selected to participate in the Moodle Migration Survey if they had completed a migration from their legacy LMS within the last year and were currently using Moodle exclusively to deliver distance learning curriculum courses. Participating colleges were Randolph, Surry, Bladen, South Piedmont, and Vance-Granville community colleges. Colleges that participated in the Case Study component of the OSC Moodle Assessment Report did not participate in this survey.

Blackboard colleges were selected to participate in the Blackboard Upgrade survey if they had completed an upgrade to Blackboard 9.x within the last year and were using Blackboard 9 exclusively for delivery of their distance learning curriculum courses. Participating colleges were Beaufort County, Fayetteville Technical, Southwestern, Gaston, Tri-County, Wake Technical, Wilkes, and Piedmont community colleges.
**Survey Delivery Methodology**

An online survey instrument used to collect information for both the Moodle migration and Blackboard 9.x upgrades. The two surveys were developed to allow for differences in terminology, architecture, and operations of each LMS. On April 28, 2010, links to the case study survey instruments were emailed to the DL administrators at the participating colleges. Respondents were instructed to consult with appropriate college staff in charge of the migration/upgrade, as well as with the Chief Academic Officer and Chief Financial Officer when completing the case study surveys. The surveys were closed on May 5, 2010. (Attachment III).

**Total LMS Vendor Cost Analysis**

Data used for the cost analysis were obtained from public documents or provided directly from vendors and then entered into a spreadsheet for analysis. The analysis focused on actual costs associated with utilizing Blackboard or Moodle and not projected costs.

**Item Selection**

The cost comparison items were derived directly from the cost breakdown list supplied to the Assessment Team by the vendors. Additional metrics were added from the NCCCS data warehouse to give context to the costs.

**Audience Selection**

Blackboard Inc, Remote-Learner.Net and Classroom Revolution LLC. were the vendors who supplied cost information. (Due to contractual agreements raw data used in calculations of the Total LMS Vendor Cost Analysis cannot be made available to the public).

**Methodology Summary**

The Assessment Team devised a research methodology to measure and evaluate six components in an effort to identify the best LMS solution for NCCCS. The solution selected was a three-part approach to investigate components that complement and build upon the original OSC Moodle Assessment Report. The *LMS Compatibility and Interoperability Survey* was developed to answer questions regarding Interoperability and Flexibility, Support and training, and Scalability. The *Migration/Upgrade Case Study Survey* was developed to answer questions regarding Support and 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

For the purposes of this study, the Assessment Team utilized the following definitions:

- Interoperability is the ability of the LMS to integrate with related peripheral applications and services. Interoperability is a critical component for planning future learning technology solutions.
- Flexibility is the ability to (1) easily move learning content in and out of the LMS and the ability to (2) customize applications to meet specific needs of the colleges or the System. Flexibility is important in keeping with operation and business requirements in anticipation of future upgrades and interoperability of related applications.

The Assessment Team developed the Compatibility and Interoperability Survey to gather benchmarking statistics for both Blackboard and Moodle, as well as to identify and evaluate LMS related functionality of the two systems.

Overview of LMS Datatel Interoperability

The interoperability of NCCCS colleges' LMSs with Datatel Colleague, the System's student information system, is by far the most important integration for evaluation. The following is a simplified overview of the current LMS integrations with Datatel Colleague. For the purposes of this research, integration is defined as the passing of data from one application to the next. The passing of data could be a one-way process where one application only writes data to another application, or a two-way synchronized process where both applications write to each other. The process of passing data can be designed to be completely automated with no human intervention, completely manual with no automation, or a combination of both. A third component or application could also be introduced as a temporary holding area of data before being passed from one application to another.

In a LMS and Colleague connection, the data being passed includes one or more of the following information types:

1. Courses: course names, dates, descriptions, etc.
2. Users: student and faculty usernames, passwords, email addresses, etc.
3. Roles: information on what the users are permitted to do in the LMS.

In general, there are three ways the LMS Datatel integration process can be completed:

1. Manual flat file process - LMSs can integrate with Datatel through a completely manual process of batch uploading of flat files with data exported from Datatel. The process begins with the Datatel administrator configuring scripts to export the required data from the Datatel database to a flat file. A flat file is plain text which usually contains one record per line. A comma separated file format (CSV) is a type of flat file that can be used to move data from Datatel to the LMS. The LMS administrator takes the file and imports the CSV file into the LMS where a batching process uses the file to create the corresponding course, user or role matching the record on the file. The majority of the colleges in the system currently use this manual flat file process of Datatel to LMS integration.
(2) Automated flat file process - The flat file data transfer process can be set to run automatically. This process eliminates the need for the Datatel administrator to manually start the query to retrieve the needed data from Datatel or to manually import the data to the LMS. To run the automated flat file transfer process, the administrator sets the Datatel query enabling the LMS to import the data automatically at a predetermined time (also known as a Cron job). When setting up any automation, the use of a temporary area to hold the data until each part of the process is complete is needed. Both Blackboard and Moodle have the ability to receive flat file data from Datatel and both have the ability to have the process automated. Blackboard has a "Snapshot" controller tool that automates Colleague data imports to the application based on Datatel scripts. Some of the colleges piloting Moodle while running production Blackboard instances engineered similar scripts to work for their Moodle instance.

(3) Dynamic data transfer - A more robust process of data transfer is the two-way dynamic data transfer, which is more potent and full featured. This type of integration can be achieved through an Application Programming Interface (API) with Datatel and the LMS, or a standardized custom process that moves data to and from the LMS application. This process is most always a completely automated solution.

Current State of Datatel to LMS Interoperability at the Colleges

The first instrument developed to gather interoperability information was the Compatibility and Interoperability Survey. In this survey, the Assessment Team asked two specific questions about the Datatel to LMS integration, and asked one open-ended question about functionality requirements.

The first question was, "How are your users populated from Datatel to your LMSs?" Colleges were to report information on both their primary, and if applicable, secondary LMS. All 58 colleges answered the question for their primary LMS. Of the 58 community colleges, 51 (89.5%) populate students into their primary LMS with a flat file upload. Five (8.8%) use LDAP (Lightweight Directory Access Protocol) authentication to populate users. LDAP authentication is an application protocol for querying and modifying data using directory services as a set of objects organized in a logical manner. Five colleges (8.8%) do not populate students with Datatel at all. One college reported using an external database to populate students from Datatel to the primary LMS. Thirty-four of the 58 colleges reported having a secondary LMS. Only 26 of the 34 reporting colleges answered this question for their secondary LMS. Of the 26, 16 (51.5%) populate students into their secondary LMS with a flat file upload. Five (19.2%) use LDAP Authentication to populate users, and four colleges (15.4%) do not populate their students with Datatel at all. One of the colleges used an external database to populate students from Datatel to the secondary LMS. The flat file integration method is by far the most common method that colleges utilize to integrate the LMSs and Datatel.
The second question from the benchmarking section asked the respondents to give their "Level of satisfaction with their current LMS integration with Datatel." Forty-eight colleges responded to the question. Of those 48 colleges, 30 (62.5%) were satisfied or very satisfied with their current primary LMS integration with Datatel. Eighteen (37.5%) were unsatisfied or very unsatisfied. Curiously, the remaining ten colleges in the system indicated that the question did not apply to them.

Twenty-eight colleges indicated a level of satisfaction for their secondary LMS. Of those 28, eight (38.1%) were satisfied or very satisfied with their current secondary LMS integration with Datatel. Eleven (52.4%) were unsatisfied or very unsatisfied. Nine colleges reported that the question did not apply to them.
The last question in the Compatibility and Interoperability Survey was the open-ended functionality question, "Is there any other functionality or service you would like to see in your LMS that is NOT part of your institution’s LMS core product and NOT accessible by using an additional LMS plug-in?" Thirty-eight colleges responded "yes" to the question. The additional functionality most colleges wanted was a more robust LMS integration with Datatel. Within those 38 responses, 13 requested the integration of Datatel/Colleague into their LMS.

**IF Chart 3: Needed LMS Functionality**

<table>
<thead>
<tr>
<th>Category Name</th>
<th># of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Datatel/Colleague Integration</td>
<td>13</td>
</tr>
<tr>
<td>Course Reporting</td>
<td>7</td>
</tr>
<tr>
<td>Communication Tools</td>
<td>9</td>
</tr>
<tr>
<td>Assessment Tools</td>
<td>4</td>
</tr>
<tr>
<td>No Additional Functionality Requested</td>
<td>5</td>
</tr>
</tbody>
</table>

---
Interoperability of Third Party Applications

The second section of the Compatibility and Interoperability Survey specifically dealt with the interoperability of the LMSs with third party applications. In this section, respondents were asked to give information about the additional plug-ins loaded on their LMS servers that were most important to their college. For this survey, a plug-in was defined as a computer program that interacts with a host application (such as Blackboard or Moodle) to provide a certain, usually very specific, function on demand. Blackboard calls these plug-ins “building blocks” and Moodle refers to them as “modules.” In most cases, plug-ins extend the capability of an application to do something that it was not originally designed to do. An additional plug-in was any plug-in that was not included in the standard installation of the LMS. A list of standard installation plug-ins for Blackboard and Moodle was provided to the respondents for reference.

Survey Section Results:

There were 163 plug-ins reported by the colleges, 61 which were unique. See Table IF 1 below.

IF Table 1: Plug-ins

<table>
<thead>
<tr>
<th>Rank</th>
<th>Plug-in Name</th>
<th>Frequency</th>
<th>Description</th>
<th>LMS Compatibility</th>
<th>Cost</th>
<th>Alternative Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCLOR</td>
<td>30</td>
<td>The NCLOR is the NCCCS k-20 common learning objects repository and the plug-in provides automatic connections to the content through the LMS.</td>
<td>Both</td>
<td>Free</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>SafeAssign</td>
<td>16</td>
<td>Integrated Bb building block that allows instructors to check for plagiarism in student papers.</td>
<td>Blackboard Only</td>
<td>Free for BB9 but a cost for Bb 7 &amp; 8</td>
<td>Turnitin*</td>
</tr>
<tr>
<td>3</td>
<td>Wimba Pronto</td>
<td>13</td>
<td>An instant communication platform designed for educators to advance and promote collaborative learning. Wimba Pronto includes unique features to specifically benefit students, teachers, and educational institutions including: Blended Audio and Video Conferencing, Instant Messaging, Application Sharing and Automatic Population of Classmates and Courses, and more.</td>
<td>Both</td>
<td>Free</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>Respondus</td>
<td>8</td>
<td>Respondus is a tool for creating and managing exams that can be printed to paper or published directly to Blackboard, ANGEL, Desire2Learn, eCollege, Moodle, and other eLearning systems.</td>
<td>Both</td>
<td>Institutional contract</td>
<td>N/A</td>
</tr>
</tbody>
</table>
The Questionnaire Module allows users to complete online feedback forms using a variety of user input methods. It allows users to create their own questions; unlike the Survey Module which has presets to choose from. Questionnaire Module allows for more advanced questionnaires than the simpler and easier Survey Module.

Echo 360 is software that automatically captures class lectures and converts them into podcasts, video, and rich media, for anytime, anywhere playback.

Moodle and Blackboard Flexibility

The Assessment Team defined LMS flexibility as the ability to easily move learning content in and out of the LMS and the ability to customize applications to meet specific needs of the colleges or the System. The following sections reflect the Assessment Team’s research on both LMS applications.

Moving Learning Content In and Out of the LMS

User Authentication

For user authentication both Blackboard and Moodle support LDAP, direct database lookup, Shibboleth protocol, and Student Information Systems tie in. Moodle has alternative authentication methods such as Internet Message Access Protocol (IMAP), Network News Transfer Protocol (NNTP), Central Authentication Service (CAS) or FirstClass. Blackboard has alternative authentication methods of Web-Server Delegation and Passport.

Course Enrollment

For course enrollment, both Blackboard and Moodle support the use of an LDAP server (e.g. Active Directory), IMS Enterprise standard and flat file importing.

Content Importing

For course content, both Blackboard and Moodle support the import of Reusable Learning Objects packaged according to Instructional Management System Standards (IMS) and both also support the importing of Sharable Content Object Reference Model (SCORM) version 1.2 and 2004 content. Only Blackboard 9.1 supports National Learning Network (NLN) - a UK standard for content import.

Course Importing

Both Blackboard and Moodle support the importing of their own course file types for new course creation. At the time of this report, only Moodle supports IMS Common Cartridge import for

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>The Questionnaire Module allows users to complete online feedback forms using a variety of user input methods. It allows users to create their own questions; unlike the Survey Module which has presets to choose from. Questionnaire Module allows for more advanced questionnaires than the simpler and easier Survey Module.</th>
<th></th>
<th>Moodle Only</th>
<th>Free</th>
<th>Blackboard Survey Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Questionnaire Module</td>
<td>5</td>
<td>The Questionnaire Module allows users to complete online feedback forms using a variety of user input methods. It allows users to create their own questions; unlike the Survey Module which has presets to choose from. Questionnaire Module allows for more advanced questionnaires than the simpler and easier Survey Module.</td>
<td></td>
<td>Moodle Only</td>
<td>Free</td>
<td>Blackboard Survey Tool</td>
</tr>
<tr>
<td>6</td>
<td>Echo 360</td>
<td>5</td>
<td>Echo 360 is software that automatically captures class lectures and converts them into podcasts, video, and rich media, for anytime, anywhere playback.</td>
<td></td>
<td>Both</td>
<td>Institutional contract</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Turnitin: Provides anti-plagiarism support for student papers for both Blackboard and Moodle.
experimental purposes only. Neither LMS has the capability to support IMS Common Cartridge imports at the time of this report. This capability is expected to be available for production use in Moodle 2.0 to be released Sept 2010. The North Carolina Blackboard sales representative stated, "Blackboard Learn is not yet compatible with the Common Course Cartridge. There is no information about a specific targeted release, but it is on the plan and not very far off." (Kreft)

**Test/Quiz Import & Export**

For quiz and test questions content, Moodle has the core ability to export questions in the international standards IMS QTI 2, GIFT, Moodle XML format and XHTML Format. Blackboard does not export tests or question pools in its core application and can only be accomplished using a third party tool. Moodle has the core ability to import Aiken, Blackboard, Course Test Manager, Embedded Answers (Cloze), Examview, GIFT, Hot Potatoes, Learnwise, Missing word, Moodle XML, LMS QTI and WebCT format as core functionality.

Blackboard only has the core ability to import test and test pools packages created by other Blackboard instances. However, the ability to import test and test pools packages can be accomplished by using a third party tool, such as Respondus (a tool for creating and managing exams), which was the fourth leading third-party plug-in reported by the colleges. (See IF Table 1)

**Newsfeeds/RSS feeds**

As a part of Moodle core functionality, Really Simple Syndication (RSS) newsfeeds can be integrated into a Moodle site or course. Moodle course forum discussions, glossary entries, and database content can also be accessed with RSS feeds. Blackboard offers RSS integration with the Channels Area. This is available through an extra license, the Community portal.

**Customization of LMS Applications**

Moodle is an open source application thereby giving any user of the application the ability to customize the core source code of the LMS. This ability gives programmers the freedom to redesign the core code of the LMS to whatever means necessary. Blackboard's core code is proprietary intellectual property and thereby not available for customization by any user. Both Moodle and Blackboard give the opportunity for developers to write customized code for plug-ins to the core code. (Case for Moodle), (Blackboardlearn+ Administrators Guide Release 9.0).

Moodle functionality data was retrieved from Moodle Docs (Case for Moodle). Blackboard functionality data was retrieved from Blackboard (Blackboardlearn+ Administrators Guide Release 9.0).

**Interoperability and Flexibility Summary**

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

Cost effectiveness is the total value of return on investment of the LMS to deliver core functionality and usability with consideration of the total financial burden of evaluation; procurement; pilot testing; rollout; staff and faculty training and support; and coordination of primary and secondary learning technologies that impact specific learning needs.

Assessing cost effectiveness of the two LMSs was a critical component of the Feasibility Study. A three-pronged approach was utilized to determine the cost effectiveness of each LMS: (1) Total cost of ownership by vendor (excluding self-hosting costs), (2) review of OSC Moodle Assessment Report case study migration costs, and (3) total cost of migration/upgrade through the Feasibility Study Case Study survey.

Total LMS Vendor Cost Analysis consisted of licensing fees, optional additional fees (Oracle support, Datatel integration, additional license fees, etc.) that colleges elected to purchase, and vendor hosting fees. This data was obtained directly from the vendors or from NCCCS records. Total cost of migration/upgrade information was collected through the Case Study section of the Feasibility study. The case study questions were drawn from the OSC Moodle Assessment Report Case Study questions which allowed for a broader, longitudinal understanding of migration costs. Unfortunately, the Case Study information pertaining to costs of migration and upgrade reported by the colleges in the Feasibility Study proved to be inconsistent and unreliable. As such, the Assessment Team elected not to use that data, and utilized the data collected in March 2009 from the OSC Moodle Assessment Report Case Study section.

Total LMS Vendor Cost Analysis

Data used for the cost analysis was provided directly from the vendors and reflected actual costs accrued by both the NCCCS and the individual colleges - for the 2009 reporting year. For analysis, LMS expenditures were grouped into three main categories: license fees, vendor hosting fees, and additional fees.

License Fees:

The license fee costs reflect the yearly software license fees paid to Blackboard by the NCCCS. There are no license fees associated with Moodle because it is an open source application.

Vendor Hosting Fees:

The hosting fee is an amount paid by a college to a vendor to host the LMS. NCCCS’s contract with Blackboard offers two possible hosting scenarios: (1) The individual colleges can buy server hardware and self-host Blackboard from their campus, or (2) the colleges can contract with Blackboard Inc. Application Service Provider (ASP) hosting service. The Moodle colleges also have the option of hosting Moodle on their campus but do not have to use one particular ASP hosting service. They may choose the Moodle partner with hosting services of their choice. There are currently three Moodle partners offering hosting services in the United States, Remote-Learner, Classroom Revolution, and Moodlerooms. Seven NCCCS Moodle colleges host their LMS with Remote-Learner.Net, one college hosts with Classroom Revolution Inc., and two colleges self-host Moodle on their campus. Twenty-four
colleges are hosted by Blackboard and twenty-one self-host Blackboard. Two colleges host with Campus Cruiser and one college self-hosts WebCT. These three colleges were not included in the Vendor Hosting analysis.

Additional Fees:

The additional fee category included all other college costs (not associated with license fees or vendor hosting fees) reported to the Assessment Team by the vendors. For Blackboard, additional fees included costs associated with Blackboard's Community System and Content System, Oracle Support Fees and ICM/Data Integration Fees. For Moodle colleges, additional fees included costs associated with data integration with the Datatel student information system.

Self-hosting Costs: No self-hosting costs were included in this analysis.

LMS Total Cost

CE Chart 1 shows total costs for operating Blackboard and Moodle for the 2009 academic year for the colleges and the System Office. Blackboard costs include license fees for 52 community colleges paid for by the System Office, vendor hosting fees paid by 24 colleges and additional fees paid by 15 colleges. Moodle costs include vendor hosting fees paid by 12 colleges, vendor hosting fees for NCCCS UNC Open Source Collaborative pilot cluster paid by the System Office, and additional fees paid by 2 colleges. The NCCCS Blackboard contract is in the third year of a three-year contract and did not allow for removal of colleges that no longer use Blackboard as a primary LMS. This chart includes costs associated with both primary and secondary LMSs.

CE Chart 1: Total LMS Vendor Cost

![Total LMS Vendor Cost Chart]
**Cost by Payee**

CE Chart 2 shows the total cost of Blackboard and Moodle by payee. The Blackboard total of $1,540,842 covers only Learning System (enterprise version of Blackboard software) license fees for 52 community colleges and one additional license for the Virtual Learning Community. This $1,540,842 aggregate software license is paid by the System Office. The Blackboard total of $1,202,889 includes the total costs incurred by 24 colleges for Blackboard ASP hosting and additional services beyond Learning System software license. The Moodle total of $97,887 is the vendor hosting annual contract for the pilot cluster. The Moodle total of $140,440 is the vendor hosting fees for 12 colleges and all additional fees.

**CE Chart 2: Total LMS Cost by Payee**

![Total LMS Vendor Cost by Payee](image)

**Vendor Hosting Costs**

CE Chart 3 shows the total vendor hosting costs paid by the colleges. The Blackboard total of $957,383 represents fees that 24 of the 58 colleges paid for Blackboard ASP hosting. The Moodle total of $138,440 represents fees that 12 of the 58 colleges paid for vendor hosting.
CE Chart 3: Total Cost of Vendor Hosting

CE Chart 4 shows the average vendor hosting cost paid by the colleges. Twenty-four colleges paid an average of $39,891 per college in hosting fees to Blackboard in 2009. Twelve Moodle colleges paid an average of $11,537 per college to Moodle partner vendors for hosting fees in 2009.

CE Chart 4: Average Cost of Vendor Hosting

Comparison of Vendor Hosting Costs for Colleges with Equivalent Distance Learning FTEs in 2009

CE Chart 4 does not take into account size of college, nor FTE count. In order to more accurately compare the cost effectiveness of the two LMSs, the Assessment Team selected eight Moodle colleges and eight Blackboard colleges of similar FTE generation for vendor hosting cost analysis. The colleges were selected based on distance learning FTEs generated in 2009. The total DL FTE difference was 2.2%
in the sample. Blackboard colleges in the sample set generated 9,685 distance learning FTEs. Moodle colleges in the sample set generated 9,466 distance learning FTEs. Only colleges using Blackboard ASP hosting and proprietary Moodle partner hosting were included in the sample. No self-hosting colleges were included in this comparison. Each college had to be in full production for either Moodle or Blackboard. CE Chart 5 shows the total cost of vendor hosting for the 16 college sample set.

**CE Chart 5: Total Cost of Vendor Hosting for Distance Learning FTE Equivalent Colleges**

![Total Cost of Vendor Hosting for DL FTE Equivalent Colleges (2009)](chart)

CE Chart 6 illustrates the average cost of vendor hosting for the same 16 college sample set.

**CE Chart 6: Average Cost of Vendor Hosting for Distance Learning FTE Equivalent Colleges**

![Average Cost of Vendor Hosting for DL FTE Equivalent Colleges (2009)](chart)
LMS Cost for Total Curriculum FTE and Total Distance Learning Curriculum FTE

CE Chart 7 illustrates the average total cost of operating either Blackboard or Moodle per curriculum distance learning FTE for 2009. Blackboard costs include licensing, hosting, and additional fees for 47 Blackboard colleges. Those 47 colleges generated 55,963 curriculum DL FTE in 2009. The Moodle costs include hosting and additional fees for nine Moodle colleges. Those nine colleges generated 9,958 curriculum DL FTE in 2009.

Costs not included in the DL FTE and Total FTE calculations:

1. DL FTE generated by 2 colleges were not included because they do not use either Blackboard or Moodle LMS.
2. Costs associated with test or pilot instances or post-migration costs of Blackboard or Moodle were not included in the chart. For example, if a Blackboard college accrued a cost regarding Moodle, that cost was not included in the calculation and vice versa for any Moodle colleges that accrued a Blackboard cost during the reporting period.
3. Continuing Education FTE was not included in the calculations.

Challenges in determining average cost per FTE

It is difficult to compare Moodle and Blackboard costs related to FTE (full time equivalents) because Moodle as an open source application has no license fees, while Blackboard as a proprietary application does have license fees. Blackboard Learning System license fees are paid by the NCCC System Office - pricing based on total curriculum FTE generated by individual colleges; NOT on distance learning FTEs. Blackboard hosting fees are based on the number of active users – i.e.: distance learners. Again, note that Blackboard license fees are based on total college FTE’s; hosting fees are based on distance learning active users (FTEs).

Moodle hosting from Remote-Learner (used by the majority of NCCCS institutions) is charged based on levels of resource allocation that would support all users – i.e.: curriculum FTE. The Assessment Team was not able to verify hosting cost schema for other Moodle Partners at the time of this report.

In sum, hosting fees for Blackboard are based on total distance learning FTE; Moodle hosting is based on total curriculum FTE. Blackboard licensing fees are based on total curriculum FTE; Moodle has no licensing fees.

All FTE figures used in this study are from 2009 total budget FTE annual reports (Attachment V) from the NCCCS Data Warehouse. These numbers include fall, spring, and summer semesters for 2009. The current NCCCS/Blackboard license contract is the third year of a three-year contract. Thus, the costs per FTE reported in this section are valid. A proper adjustment to 2010 FTE figures can be projected by comparing available fall and spring FTEs with those from the 2009 report. Summer FTE required for the 2010 annual FTE report will not be available until September 2010. The fall and spring 2009/2010
comparisons reveal a 14% increase in FTE. Thus, Blackboard cost per FTE should adjust downward when
the reader compares 2010 Blackboard costs per FTE.

CE Chart 7: Average Cost Per Curriculum DL FTE

<table>
<thead>
<tr>
<th>Avg. Total Cost Per Curr DL FTE (2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.00</td>
</tr>
<tr>
<td>Blackboard</td>
</tr>
</tbody>
</table>

CE Chart 8 illustrates the average total cost of operating either Blackboard or Moodle per curriculum
total FTE for 2009. Blackboard costs include licensing, hosting, and additional fees for 47 Blackboard
colleges. Those 47 colleges generated 161,187 total FTE in 2009. The Moodle costs include hosting and
additional fees for nine Moodle colleges. Those nine colleges generated 27,987 total FTE in 2009.

CE Chart 8: Average Total cost of Total Curriculum FTE (2009)

<table>
<thead>
<tr>
<th>Avg. Total Cost Per Curr Total FTE (2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.00</td>
</tr>
<tr>
<td>Blackboard</td>
</tr>
</tbody>
</table>
Other Supporting Cost Information

The Total Cost of Ownership Analysis of this feasibility study is consistent with the results of the Case Study total cost of ownership section of the OSC Moodle Assessment Report. The costs included in the OSC Moodle Assessment Report were associated with license fees, self or vendor hosting, system administration fees, faculty or staff training fees, and Blackboard to Moodle course conversion fees.

CE Chart 9 shows the total cost of ownership of the five Moodle case study colleges broken down by transition year. The chart below shows a 35% increase in total LMS cost from the pre-transition year to the transition year but a 72% decrease from pre-transition year to post-transition year.

Feasibility migration/upgrade survey, total cost section

It is the opinion of the Assessment Team that the Migration/Upgrade Survey responses from participating colleges related to costs, with the exception of hosting fees, were inconclusive and inconsistent. Additionally, costs related to course migration, student orientation, faculty training, and support were under-reported. At the institutional level, learning technology support components are not generally expressed as line items in a budget - rather included in support services, day-to-day job functions by college technical and support staff. This was also evident in the Case Study section of the OSC Moodle Assessment Report. Course migration, faculty training, and additional IT staff workloads were not fully expressed in monetary terms. However, under reporting was not specific to one LMS. Both Moodle and Blackboard colleges reported minimal, if any, costs for planning, training, implementation, and related services.
Limitations of the Cost Effectiveness Component of the Study

Total Vendor Cost Analysis

Costs used in the analysis were actual annual costs supplied by the vendors. Costs reported in the Study pertaining to self-hosting and LMS migration were not included in the analysis. Costs associated with self-hosting a LMS cover hardware purchasing and maintenance, hardware depreciation, and LMS server administrator (salary or percent of salary) etc. Additionally, there are costs associated with LMS migration such as course conversion and user training costs. Participating colleges did not provide detailed costs associated with LMS migration or self-hosting, and as such this data was omitted from the analysis. In contrast, vendor hosting costs are contracted and absolute. Sixty-two percent of NCCCS institutions vendor host their primary LMS, and those figures were included in the cost analysis.

Cost Effectiveness Summary

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 much 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 (Randall, Sweetin and Steinbeiser).
Support and Training

Training for faculty combined with support and orientation for students were two of the most critical performance factors identified in the OSC Moodle Assessment Report. To better understand the dynamics involved, the Assessment Team collected data from all 58 colleges pertaining to LMS support and training received from vendors.

For purposes of this study, the Assessment Team defined support and training as the ability of the LMS to enable the colleges to (1) implement LMS-related learning technologies, (2) apply those technologies to learning and teaching, and (3) fully utilize LMS functionality.

The Assessment Team developed three questions in the Compatibility and Interoperability Survey and one question in the Migration/Upgrade Case Study Survey pertaining to LMS Training and Support. The Assessment Team also researched the vendor related support and training resources available to the NCCCS colleges.

NCCCS LMS Support & Training Information

Virtual Learning Community

The VLC is a collaborative effort of all of North Carolina’s Community Colleges to increase the quality and availability of online learning and support services. The VLC Centers for Professional Development, Technology, and Quality Assessment provide continuity and a comprehensive approach to training on the various technologies and teaching strategies, vetting of technologies, and assessments needed in order to make recommendations on the quality components of the distance learning programs. Training is provided on how to use the NCLOR; how to enhance online courses using learning objects; training related to learning management systems; and training about software applications used in distance learning. As comprehensive as these support services are, colleges still need vendor support and resources to ensure LMS success for students, faculty and staff.

North Carolina Learning Objects Repository

The NCLOR is an online library of instructional resources for North Carolina's K-20 educators. The NCLOR provides a centralized location for the acquisition, collection, sharing, and management of quality learning resources. It is a collection of online digital learning resources for use in online and traditional classes. It also contains a collection of professional development training resources.

Online Help Desk Services for Students and Faculty

The System Office has retained Presidium Learning Inc. to provide support services to meet online student and faculty LMS needs. The service is available to all NCCCS colleges (at no charge to the individual colleges) and is available for Blackboard and Moodle. Resources include chat, email, telephone, and personalized support portal available 24/7/365. Research indicates that 90% of all online student questions are satisfactorily handled via help desk only. Providing this service to the colleges drastically cuts the number of college staff positions required to provide services and improves the quality of service to those students requiring individual assistance. Application and server
administrator support is not covered by Presidium and must be handled by the LMS vendor support help desk.

**LMS Faculty and Student Support at the Colleges**

In the benchmarking section of the Compatibility and Interoperability Survey, the Assessment Team asked the DL Administrators three questions pertaining to LMS support and training at their colleges.

The first question was, "**Approximately how many support staff do you have who directly support your primary and secondary LMSs?**" Respondents were asked to include full- and part-time support staff who work with both the primary and secondary LMS at their colleges. Across the NCCCS, positions are expressed as total percentages of full- and part-time staff. Thus, one full time and one half-time staff member would total 1.5 full time equivalent employees.

Twenty-six (44.8%) of the 58 colleges reported that they had between 0 - (but fewer than) 2 positions that directly support their distance learning departments. Nineteen (32.8%) of the colleges reported between 2- (but fewer than) 3 positions, while 7 (12.1%) have between 3- (but fewer than) 4 staff for distance learning. Two colleges reported between 4-(but fewer than) 5 positions, as well as two colleges that have between 5- (but fewer than) 6 positions. Finally, there were two colleges (3.4%) that reported 7 or more positions to directly support their distance learning department.

Forty-five (77.5%) of the colleges reported between zero and three staff members that directly support their Distance Learning department. This highlights the desperate need for distance learning staff at the colleges. In 2009, there were over 588,000 Distance Learning enrollments across the state in the NCCCS colleges - nearly one-third of all enrollments for the entire community college system for that reporting year.
The next question pertaining to support was, "Who provides help desk support for your students and faculty for your LMSs?"

All 58 colleges answered the question for their primary and secondary LMSs. Twenty-eight (46.6%) run their own help desk while 27 reported using Presidium. Two had no official help desk and one college receives help from the LMS vendor.
The final question regarding support and training, "**How satisfied are you with your current help desk provider?**" received responses from all 58 colleges. Forty-three (81.1%) were satisfied or very satisfied with their current help desk provider for their students. Ten (18.9%) were unsatisfied or very unsatisfied with current help-desk provider for their students. The remaining five colleges in the system stated that the question did not apply to them.

Only 47 colleges reported on level of satisfaction for their current help desk provider for faculty. Thirty-three 33 (78.6%) were satisfied or very satisfied with the current help desk provider for their faculty. Nine (21.4%) were unsatisfied or very unsatisfied with the help desk provider for faculty. The remaining five colleges in the system stated that the question did not apply to them.
Vendor LMS Administrator Support Services

The Migration and Upgrade Case Study Surveys were sent to 13 colleges—five colleges that had migrated to Moodle and eight colleges that had upgraded to Blackboard 9.x in the past year. The colleges were asked, "If your college is hosted by your vendor, please list as much detail as possible about your college's experiences with your vendor's help desk support during your migration/upgrade (This could include information about ticket response times, help-desk availability, professionalism, etc.)."

All of the Moodle case study colleges contract with Remote-Learner.net as their LMS support vendor. Below are the responses pertaining to help desk ticket response time:

"Remote-Learner responded to trouble tickets in a timely fashion..." South Piedmont Community College

"They are very responsive to our help desk tickets and have resolved the issues very quickly..." Vance Granville Community College

"Tickets were usually addressed within 24 hours..." Randolph Community College

"Trouble tickets are seldom open for more than 24 hours, and mysteries are usually solved within the day..." Bladen Community College

The colleges reported the following about Remote-Learner's professionalism and helpfulness:

"Remote-Learner has been very helpful in quick response to trouble tickets, in answering questions, and in completing our first upgrade..." Bladen Community College
"They were very professional and helpful..." South Piedmont Community College

"...have worked with Remote-Learner for set-ups and upgrades and have found their support excellent..." Vance Granville Community College

The colleges reported the following about Remote-Learner’s overall support:

"We did experience a server problem that took R[emote] L[earner] ten days to resolve. However, from this instance they have improved their technical support services and we are currently satisfied with the level of support." Surry Community College

"Overall we are very pleased with their service and support." Vance Granville Community College

Blackboard Inc. doesn’t allow third-party hosting with its LMS licensing. Therefore, colleges must self-host or contract for Blackboard ASP hosting. Four of the eight Blackboard colleges self-host: Wake Technical, Tri-County, Wilkes, and Piedmont community colleges. Three use Blackboard ASP hosting: Fayetteville Technical, Gaston, and Southwestern community colleges. One college, Beaufort County did not respond to the question. Regardless if colleges host with Blackboard, they are still provided with administrative support through the licensing agreement. The colleges reported the following about Blackboard help desk ticket response time:

"The Bb help-desk was quite responsive during the upgrade." Southwestern Community College

"There was no delay in receiving help from their tech staff." Piedmont Community College

"The Blackboard Upgrade Team was very responsive. After a 30-45 day window, the upgrade team was disbanded and we began to contact the regular Managed Hosting support group. This group is not as responsive as I would hope. It may take 36-72 hours for them to respond if it is not a major outage." Gaston Community College

"Response from tech support seemed slow." Fayetteville Technical Community College

"We had no waiting to get issues resolved." Wake Technical Community College

The colleges reported the following about Blackboard help desk’s professionalism and helpfulness:

"...very responsive and always professional." Piedmont Community College

"...conducted business in a very professional manner with a purposeful attitude." Beaufort County Community College

"...provided excellent resources to plan for the upgrade as well including concierge service to help with materials, etc." Wake Technical Community College

"The installation documentation, along with the Administrator's manual, omits several important details. This is especially true if you are installing on a single server. In past versions,
the install process has not been overly problematic. Version 9, however, was very difficult and the documentation was no help at all." Tri-County Community College

The colleges reported the following about Blackboard's overall help desk support:

"No complaints." Southwestern Community College

"Blackboard has always provided great service." Piedmont Community College

"...experience with the Blackboard help-desk can be described as positive." Beaufort County Community College

"I strongly recommend putting the BB help desk on speed dial, and using them." Tri-County Community College

"Blackboard help desk was phenomenal. By far the best support we have received from any company in a while." Wake Technical Community College

On the LMS Compatibility and Interoperability Survey, the colleges were asked, "**Where do your LMS administrators go for help?**" All 58 colleges responded to the question. Respondents could select more than one option, so totals do not equal 100%. Fifty (86.2%) reported that LMS administrators get help from the LMS vendor. Forty-eight (82.8%) figure LMS issues out on their own, while 45 (77.6%) go to LMS forums and Listservs for answers. Lastly, eight (13.8%) colleges go to Presidium for help, while seven (12.1%) contract with another vendor for application administrative help.
Vendor Online Support and Training Services

Blackboard offers access to a wide variety of support and training resources. Instructors, instructional designers and students can find resources about using Blackboard at their website, where they may find resources such as a wiki (a collection of web pages that enables documents to be written collaboratively), knowledge base, subject specific documents, and information regarding Blackboard extensions. Blackboard users are also able to give suggestions for product improvement as well as to the contact the CEO. The online support desk, Behind the Blackboard, is a password protected site where LMS administrators and developers can access the Blackboard knowledge base, read relevant documentation, open a support ticket, download support tools, course cartridges, building blocks, training materials and schedules, as well as join listservs and social communities. Blackboard documentation does not include user interface screenshots that reference the corresponding text; rather, interactive tutorials are available on the Blackboard website, and from the Blackboard Control Panel.

Moodle.org is a website where users can find Moodle docs, the online documentation wiki for Moodle. All Moodle users in the community may contribute to the Moodle docs wiki. The documentation for Moodle has been translated into 28 different languages. At the time of this report, there were 1,914 articles, forums, books and manuals, as well as numerous links to commercial services from Moodle Partners. Moodle docs are the source for the page sensitive system help information built into Moodle.
core functionality. Moodle documentation includes screenshots of the user interface being described in the text as well as links to free online courses on using Moodle.

Support and Training Summary

The NCCCS provides three services to the colleges in regard to LMS support and training: the VLC 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 personalized support portal available 24/7/365; and the NCLOR's 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 are currently taking 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 rapid response time, are professional and helpful and are satisfied with the level of support overall. Vendor online support and training services utilized by both Blackboard and Moodle colleges appear equal.
Ease of Use

LMS ease of use was adequately addressed in the functionality comparison section of the *OSC Moodle Assessment Report*. Students and faculty alike participated in evaluating ease of use for both Moodle and Blackboard, and therefore was not directly covered in the Feasibility Study. The findings are relevant when considering "the best LMS solution for NCCCS," and are discussed below.

*Open Source Collaborative Moodle Assessment Report: Ease of Use Review*

The Student end-of-term survey posed 30 different ease-of-use questions and the Instructor end-of-term survey offered 8 different ease-of-use questions. The results showed that Blackboard and Moodle are not that different in regards to ease of use. The real difference, however, was found in students’ perception of their teachers’ comfort level with the application. There existed a significant correlation between student rankings of both Blackboard and Moodle with the perceived comfort level of instructors when using either LMS. Thus, student perceptions were influenced by instructor experience, training, and skills, regardless of LMS.

In regard to functionality, a modified frequency count was utilized to determine which LMS the respondents believed to have the highest level of functionality. Instructors rated Moodle 1.9.x as having the highest perceived functionally rating with a yes vote total of 220. The instructors believed that Moodle had better functionality in 220 of the 283 total functionality questions. Blackboard 7.x/8.x Academic Suite came in second with 203 yes votes for perceived functionality. Blackboard 7x Learning System finished last with 173 yes votes. Moodle 1.9.x had the highest administrator perceived functionally rating with a yes vote total of 89. The administrators believed that Moodle had the better functionality in 89 of the 111 total functionality questions. Blackboard 7.x/8.x Academic Suite came in a close second place with 87 yes votes. Blackboard 8.x Learning System received 70 yes votes. Blackboard 7.x Learning System finished last with 54 yes votes (Randall, Sweetin and Steinbeiser).

*Limitations of the Open Source Collaborative Moodle Assessment Report*

Blackboard version 9.x and Moodle version 2.x were not evaluated in the end-of-term surveys or the LMS functionality comparison. This was due to the timing of the report and the requirements of the assessment. These versions have undergone major changes in the application capabilities and should be compared in a future study to provide a more accurate assessment of current LMS functionality and ease of use.

Ease of migration and upgrade

As a part of the Migration/Upgrade Case Studies in the Feasibility Study, the Assessment Team asked a series of questions about the ease of upgrading in Blackboard from one version to another as well as the process of migrating from Blackboard to Moodle. The colleges were asked for the time line of the migration or upgrade, whether they were vendor-or self-hosted and level of overall level of satisfaction with the migration/upgrade process. For the 13 colleges that participated in the survey, 12 colleges supplied enough information to detect a distinct correlation between the length of the migration or upgrade, the hosting option, and the college’s overall level of satisfaction with the process. A higher
level of overall satisfaction was achieved by the vendor-hosted colleges that proceeded slowly, regardless if it was migrating to Moodle or upgrading Blackboard.

**EU Chart 1: Satisfaction with Upgrade/Migration by Duration and Hosting Scenario**

![Graph showing level of satisfaction by duration of migration/upgrade compared to hosting option]

**Ease of Use Summary**

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 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**

Scalability is defined as the ability of the LMS to efficiently serve both large and small institutions with agile hardware/software solutions at the macro and micro levels. Colleges were asked to respond to four questions pertaining to scalability in the Compatibility and Interoperability Survey. The Assessment Team also researched vendor resources in regards to scalability of the two LMSs.

Benchmarking efforts were included in the study to determine the total scope of LMS resources used across the NCCCS - generating totals for all primary and secondary LMSs. Survey questions measured the (1) total number of active courses, (2) total number of active users, (3) average size of courses (in megabytes (MB)), and (4) anticipated growth of average course size measured in MB. This data was collected in spring 2010.

**Current College LMS Scalability Needs**

The first question regarding scalability was, *Approximately how many active courses does your institution support on your primary and secondary LMS for both Continuing Education and Curriculum courses per academic year?*

All 58 colleges supplied an answer for their primary LMS. Fifteen (25.9%) reported more than a combined total of 1,000 curriculum and continuing education courses in their primary LMS. Four (6.9%) reported between 801-1,000 combined total in curriculum and continuing education courses in their primary LMS. Six (10.3%) reported 601-800 courses, with 14 (24.1%) reporting between 401-600 courses. Ten (17.2%) colleges had between 201-400 combined total, 7 had between 101-200 courses, and 2 had fewer than 100 courses in curriculum and continuing education programs in their primary LMS.

Thirty-four colleges reported using a secondary LMS. Twenty-eight of the 34 colleges that have a secondary LMS responded to the question. None of the colleges had more than 601 courses in curriculum and continuing education programs in their secondary LMS. One (3.6%) had between 401-600 courses. Three colleges (10.7%) had between 201-400 courses, 3 (10.7%) different colleges reported 101-200 courses, and 21 (75%) colleges reported fewer than 100 courses in curriculum and continuing education programs in their secondary LMS.
SC Chart 1: Approximate Number of Active Courses

The next question pertaining to scalability was, "Approximately how many active students does your institution support on your LMS for both Continuing Education and Curriculum courses per academic year?"

Fifty-seven colleges answered the question for their primary LMS. Seven (12.9%) colleges reported above 14,000 active students in curriculum and continuing education programs in their primary LMS. One (1.8 %) had between 10,001-14,000 active students in curriculum and continuing education programs. Eight (14%) reported between 6,001-10,000 active students while 27 (47.4%) colleges had between 2,001-6,000 active students. Seven (12.3%) colleges had between 1,001-2,000 active students, 6 (10.5%) had between 501-1,000 and 1 (1.8%) college had fewer than 500 active students in curriculum and continuing education programs in their primary LMS. Forty-three of the 57 community colleges reporting had 2,000 active students in their LMS, with seven colleges having over 14,000 active students.

Only 28 of the 58 colleges answered the question for their secondary LMS. No college reported having more than 10,000 active students in curriculum and continuing education programs in their secondary LMS. One (3.6%) college reported between 6,001-10,000 active students. Four (14.3%) had 2,001-6,000 active students while the remaining 24 colleges had fewer than 2,000 active students in curriculum and continuing education programs in their secondary LMS.
The next question, "How much is the estimated storage capacity (in MB) for an average course on your LMS server?" Respondents were instructed to estimate all active and inactive courses for both curriculum and continuing education courses. Fifty-eight colleges supplied an answer for their primary LMS but only 27 of the 34 colleges that have a secondary LMS answered the question.

For their primary LMS, 23 (39.7%) colleges reported average course size was between 20-60 MB, and 11 (18.9%) reported course size was between 10-20 MB. Seven (12.1%) had between 60-100 MB of data in an average course. Six (10.3%) colleges reported an average course size between 100-200 MB. Four (6.9%) reported the average course size was above 300 MB. Lastly, two (3.4%) colleges reported an average course size between 5-10 MB while one (1.7%) reported the average course size was between 0-5 MB for curriculum and continuing education programs.

For their secondary LMS, nine or 33.0% indicated their average course size was between 20-60 MB and five (18.5%) said the average course size was between 10-20 MB. Four (14.8%) had between 5-10 MB of data in an average course. Four (14.8%) reported an average course size between 0-5 MB, two (7.4%) stated average course size on their LMS was between 100-200 MB. One (3.7%) college reported the average course size was between 60-100 MB. Finally, one (3.7%) college reported the average course size was between 200-300 MB while one (3.7%) other college reported the average course size was above 300 MB for curriculum and continuing education programs.

For the majority of the colleges, average course size was between 20-60 MB. Based on the reported low usage by faculty of overall functionality in both Blackboard and Moodle in the OSC Moodle Assessment Report, it is expected that the average course size will increase in correlation with the faculty's increased use of functionality. Utilization of outside services, such as the NCLOR which contains learning objects and professional development resources, could reduce overall course size since storage.
of these high bandwidth files would no longer be stored on the LMS. This could offset the growth in course size.

**SC Chart 3: Average Course Size**

![Chart](chart.png)

The last scalability question was, “**Approximately how much more data storage capacity would you estimate your LMS may need in the next 3 years?**”

For their primary LMS, 57 colleges answered this question. Twenty-one (36.8%) stated a need for more than a 40% increase in LMS storage capacity in the next three years. Seven (12.3%) would need an increase of 31-40%, while 10 (17.5%) of the colleges would need a 21-30% increase. Nine (15.8%) would need an 11-20% increase while six colleges (10.5%) would need 6-10% increase. Only four (7%) of the colleges would require a 0-5% increase in primary LMS storage capacity over the next 3 years.

For their secondary LMS, only 23 of the 34 colleges that have a secondary LMS answered the question. Of those 23, nine (39.1%) would need more than a 40% increase in secondary LMS storage capacity in the next three years. Two (8.7%) would need an increase of 31-40%, while two (8.7%) would need a 21 (30%) increase. One (4.3%) college would need an 11-20% increase while four (17.4%) colleges would need a 6-10% increase. Lastly, five (21.7%) of the colleges would need a 0-5% increase in secondary LMS storage capacity over the next 3 years.

Twenty-one colleges in the system anticipate a 40% or better increase in storage needs. These findings verify the need for immediate action pertaining to storage capacity for LMS utilization over the next three years.
Infrastructure Scalability: Vendor or Self-hosting

In the benchmarking section of the Compatibility and Interoperability Survey, the Assessment Team sought to evaluate the various LMS hosting scenarios within the NCCCS. The colleges were asked to identify which hosting scenario most accurately reflects their situation for both primary and secondary LMSs.

Thirty-six (62%) of NCCCS colleges vendor-host their primary LMS. By contrast, 22 (38%) institutions self-host their primary LMS. Vendor hosting alleviates time-intensive IT support at a cost - that of paying vendors for this service. As previously reported, 45 (77.5%) of the NCCCS colleges have between zero and three staff members that directly support their distance learning departments. This is one of the leading causes of the increase in vendor hosting for both primary and secondary LMSs.
The OSC Moodle Assessment Report recommended investigation of an Application as a Service (AaaS), cloud computing solution for NCCCS LMSs. Thus, scalability also refers to centralized or regionalized virtual instances of LMS software to realize economies-of-scale savings in hardware, IT support, and application integration not available via individual community college LMS installations. AaaS learning technology applications are likely to provide a pivotal transition point in the future to reduce total costs and/or improve overall functionality and effectiveness of LMSs and their integrated applications in the near future.

LMS Scalability Examples

Large Scale Installations:

The largest Moodle installation in the world is the online user community moodle.org which has 933,560 users. The largest educational institution using Moodle as their LMS is the Open University of the United Kingdom. The Open University has 651,727 users in 5,332 courses. Vytauto Didžiojo University in Kaunas, Lithuania has the most Moodle courses for a single installation with 59,920 courses. (Moodle.org: Moodle Statistics)

The Assessment Team was unable to find statistics regarding worldwide Blackboard usage, size of Blackboard installations, etc. Blackboard reports "One of the largest installations of Blackboard is within the Board of Regents for the University System of Georgia. It serves 33 out of the 35 member institutions within the State of Georgia. It supports over 350,000 users and
has over 1,000,000 courses." (Kreft)

**Small Scale Installations**

Moodle has 9,126 installations of registered instances with 100-500 users and 4,101 installations of registered instances with 1,000-5,000 users. Moodle has the ability to be loaded to a USB drive which enables users to completely use Moodle without the need to connect to the Internet. Moodle is compatible with mobile devices with the use of web and native apps for iPhone. A project is currently underway for development of an Android integration (Moodle.org: Moodle Statistics).

Blackboard no longer offers a USB drive version of its LMS. Instead, Blackboard has a mobile learn application that allows learning on a mobile device via Blackboard’s Learn environment. Blackboard offers both free and cost-based application options for iPhone, iPad and iTouch devices as well as Android and Blackberry operating systems.

**Scalability Summary**

The colleges were asked to report on active courses, users, average course size, and storage capacity of their LMS. 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**

Sustainability is the final component when asking, "What is the best LMS solution for the NCCCS?" For this study sustainability was defined as the ability to maintain a consistent level of learning infrastructure and support required to (1) meet the growing enrollment demands of students, (2) meet growing infrastructure needs, and (3) address limitations of funding, faculty needs, and support staff now and into the future.

**Current and Expected LMS Changes in the NCCCS**

Four questions regarding the current status of the LMSs and one regarding expected changes in LMSs were included in the Benchmarking Section of the Compatibility and Interoperability Survey.

The first question concerned current LMS status at each college. "**What is the primary Learning Management System (LMS) your institution is currently using?**" (Primary LMS was defined as delivering 50% or more of college courses). Forty-six colleges use Blackboard as their primary LMS, 9 use Moodle, 2 use Campus Cruiser and 1 uses WebCT.

**SU Chart 1: NCCCS Primary Learning Management Systems**

The second current status question was, "**What if any secondary LMS is your institution using?**" This would include any piloting, testing or reviewing of an LMS. (Secondary is defined as delivering 49% or less of courses).

Twenty-four colleges use Moodle as a secondary LMS, six use Blackboard, and four use Campus Cruiser.
The next question, "Have you upgraded your LMS in the past year?" Thirty-five (60.3%) out of 58 had upgraded their LMS in the last year. Twenty-three (39.7%) had not upgraded their LMS in the last year, and 24 (41.3%) reported plans to upgrade in the near future.

The last current status question was, "What hosting scenario best describes your college?" The respondents were able to select from four scenarios, (1) the vendor hosts all of the LMSs for the
college, (2) college self-hosts all of the LMSs, (3) college self-hosts primary but vendor-hosts secondary LMS and (4) vendor-hosts primary but the college self-hosts secondary LMSs.

Thirty-three (56.9%) of the 58 respondents reported that a vendor hosts all of the LMSs used by the college. Sixteen (27.6%) colleges self-host all of the LMSs. Six (10.3%) colleges self-host primary but vendor-host their secondary LMS, while three (5.2%) vendor-host primary but self-host their secondary LMS (SC Chart 5).

Vendor hosting survey results were included in the Scalability section of this Report and are equally important to Sustainability. Vendor hosting results indicate that the majority of the colleges now use a vendor to host their LMS. The benefits of vendor hosting include (1) LMS server support staff supplied by vendor, (2) utilization of available bandwidth and (3) 24/7/365 help desk services. Vendor hosting is attractive for colleges due to shortage of distance learning support staff - previously reported in the Support and Training section of this Report.

Another question in the benchmarking section was, "At this time, is your institution planning on moving from one LMS to another?"

Sixteen (27.6%) out of 58 respondents indicated they were planning on moving from one LMS to another while 42 (72.4%) indicated they were not planning on moving from one LMS to another. SU Chart 4: Number of colleges planning on moving from one LMS to another

Evidence collected in the survey suggests that LMS utilization in community colleges is not only rapidly expanding but also evolving. Thirty-two colleges now have a secondary LMS for pilot or production use. Thirty-four colleges now use Moodle as a primary or secondary LMS. The majority of colleges have upgraded their LMS in the past year. Over a quarter plan to migrate to a different LMS in the upcoming
year. An increasing number of colleges are choosing vendor hosting as demands on DL and IT staff continue to escalate and LMS up-time becomes even more critical.

Growing Enrollment Demands

Curriculum enrollment growth trends and projections
A chart containing remarkable distance learning curriculum course enrollments from 1998 through 2009 for all NC Community Colleges was included in the Background section of this Report. That chart included all distance learning course enrollments, traditional course enrollments, total distance learning and traditional enrollments, and the annual percentage of distance learning enrollments compared with total enrollments.

For purposes of this Report, total curriculum distance learning enrollments were used. Distance learning instructional delivery is made up of the following instructional delivery methods; Internet, hybrid, web-supported, telecourse, teleweb, two-way video and digital media. Telecourse, teleweb, two-way video, and digital media frequently do not utilize LMS technology. However, these delivery methodologies only account for 3% of total DL enrollment delivery. Thus, 97% of the following DL figures are LMS-centric and important to this Report. For more information see (Attachment I).

SU Table 1: NCCCS Distance Learning Curriculum Enrollment 1998-2009

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>8,039</td>
<td>18,330</td>
<td>33,901</td>
<td>59,316</td>
<td>90,335</td>
<td>119,096</td>
<td>138,565</td>
<td>166,197</td>
<td>200,746</td>
<td>245,642</td>
<td>310,658</td>
<td></td>
</tr>
<tr>
<td>Telecourse</td>
<td>15,047</td>
<td>16,254</td>
<td>16,928</td>
<td>18,685</td>
<td>16,718</td>
<td>15,133</td>
<td>15,595</td>
<td>8,655</td>
<td>6,192</td>
<td>5,186</td>
<td>4,571</td>
<td></td>
</tr>
<tr>
<td>Teleweb</td>
<td>-</td>
<td>372</td>
<td>926</td>
<td>978</td>
<td>834</td>
<td>1,071</td>
<td>1,741</td>
<td>2,213</td>
<td>2,357</td>
<td>2,955</td>
<td>1,915</td>
<td></td>
</tr>
<tr>
<td>Two-way Video</td>
<td>3,609</td>
<td>5,056</td>
<td>6,837</td>
<td>8,320</td>
<td>9,551</td>
<td>8,917</td>
<td>8,681</td>
<td>7,476</td>
<td>8,516</td>
<td>8,300</td>
<td>10,058</td>
<td></td>
</tr>
<tr>
<td>Hybrid</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16,221</td>
<td>30,216</td>
<td>46,404</td>
<td>67,409</td>
<td>94,239</td>
<td></td>
</tr>
<tr>
<td>Web-supported</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>59,327</td>
<td>92,689</td>
<td>122,208</td>
<td>98,028</td>
<td>157,501</td>
<td></td>
</tr>
<tr>
<td>Digital Media</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>200</td>
<td>287</td>
<td>515</td>
<td>398</td>
<td>445</td>
<td></td>
</tr>
<tr>
<td>All DL Methods</td>
<td>16,740</td>
<td>26,695</td>
<td>40,392</td>
<td>58,592</td>
<td>87,299</td>
<td>117,229</td>
<td>144,217</td>
<td>233,230</td>
<td>307,639</td>
<td>386,738</td>
<td>427,018</td>
<td>588,787</td>
</tr>
<tr>
<td>% Growth</td>
<td>n/a</td>
<td>59.5%</td>
<td>51.3%</td>
<td>45.1%</td>
<td>49.0%</td>
<td>34.3%</td>
<td>23.0%</td>
<td>61.7%</td>
<td>31.9%</td>
<td>25.7%</td>
<td>10.4%</td>
<td>37.9%</td>
</tr>
<tr>
<td>Traditional</td>
<td>1,009,551</td>
<td>1,080,584</td>
<td>1,008,153</td>
<td>1,116,689</td>
<td>1,200,070</td>
<td>1,250,449</td>
<td>1,295,407</td>
<td>1,201,350</td>
<td>1,106,142</td>
<td>1,015,607</td>
<td>1,027,842</td>
<td>1,008,762</td>
</tr>
</tbody>
</table>

See annual enrollment figures in SU Chart 5.
Note traditional course enrollments dropped over the 12 year period while distance learning enrollments increased dramatically.

**Curriculum enrollment growth trends and projections - A Classic Example of Disruptive Innovation**

Clayton, Horn, and Johnson describe a mathematical expression that sets conditions in which a new technology/innovation can eventually replace an older technology/innovation in their book *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns* (Christensen, Horn and Johnson). These conditions form what is termed a “disruptive innovation.” One qualifying condition stipulates that when ratios of the new-technology-compared-with-the-old are plotted on a logarithmic scale (vertical axis), a straight line is created. Dates and corresponding DL-to-traditional enrollment ratios were created from the table above to obtain the following:

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-8</td>
<td>0.016581465</td>
</tr>
<tr>
<td>1998-9</td>
<td>0.024704234</td>
</tr>
<tr>
<td>1999-0</td>
<td>0.040065347</td>
</tr>
<tr>
<td>2000-1</td>
<td>0.052470338</td>
</tr>
<tr>
<td>2001-2</td>
<td>0.072744923</td>
</tr>
<tr>
<td>2002-3</td>
<td>0.093749525</td>
</tr>
<tr>
<td>2003-4</td>
<td>0.111329489</td>
</tr>
<tr>
<td>2004-5</td>
<td>0.19413831</td>
</tr>
<tr>
<td>2005-6</td>
<td>0.278118903</td>
</tr>
<tr>
<td>2006-7</td>
<td>0.3815463</td>
</tr>
<tr>
<td>2007-8</td>
<td>0.415451013</td>
</tr>
<tr>
<td>2008-9</td>
<td>0.583672858</td>
</tr>
</tbody>
</table>
These dates and ratios were then plotted against a logarithmic scale vertical axis in the SU Chart 6.

**SU Chart 6: Ratio of Distance Learning to Traditional Enrollments**

Thus, an expected growth curve or innovation S-curve (if complete) has been linearized. In this mathematical situation, a straight line is a compelling driver for substitution, or replacement. Thus the straight line above is an indicator that DL enrollments will replace traditional enrollments at some point in time - the amount of replacement expressed in a ratio. A linear expression only identifies the data set as conforming to the disruptive innovation expressed model. In actuality, full 100% replacement is unrealistic. The S-curve eventually created will have a long tapering tail where 100% replacement is never fully realized.

In order to more easily view the ratios of DL enrollments to traditional enrollments, a different graphic expression is required – one that creates an exponential trend line against a vertical axis identifying the ratio of DL to traditional enrollments. The results of this graph would be a changing ratio of DL-to-Traditional enrollments over time.
The R-squared value (correlation coefficient) for these trend lines is 0.9918. R-Squared is a statistical term depicting how accurate one term is at predicting another. A high R-Squared value is a better predictor that a lower value.

Thus, the 2009 ratio of DL or LMS-based enrollments to total course (DL and traditional) enrollments is 0.6:1. However, enrollment projections based on the replacement curve indicate a 2:1 ratio of DL to traditional enrollments forecast for 2012 and 6:1 in 2016. These predictions have a .9918 R-Squared value with a 1.0 being a prefect correlation. This projection of LMS-based instructional delivery represents a formidable challenge to sustainability of LMS resources facing NC Community Colleges in the next 6.5 years.

Validation of methodology
Conference calls and email exchanges between Michael Horn, the Assessment Team and NCCCS Distance Learning Director, Wanda Barker took place from May through July 2010. Barker and the Assessment Team shared with Horn the data set composed of traditional course enrollments, distance learning enrollments, and the percentage ratio of distance learning to the total enrollments for years 1998 through 2009 for all 58 North Carolina community colleges. The NCCCS team used the data set to (1) construct a linear expression of those enrollments arrayed on a logarithmic scale and (2) followed-up with a graphic enrollment projection, assuming the data set conformed to the disruptive innovation replacement curve detailed in Horn’s book. Horn determined the disruptive innovation replacement curve generated by 12 years of NCCCS curriculum enrollment data was valid. Horn determined that the disruptive innovation replacement curve generated by 12 years of NCCCS curriculum enrollment data was valid.
Integration rather than replacement

Replacement is a misnomer in the context of future distance learning enrollment growth. Rather, LMS-centric technology is expected to integrate with traditional course delivery such that in 6 years, effective learning technology will be present in the majority of courses offered by comprehensive community colleges. The Assessment Team views learning technology as complementary to bricks-and-mortar facilities, functioning to magnify and extend the effectiveness of a physical campus to encompass every home, business, library, and public PC lab in a college’s service area. Learning technology is not in competition with bricks-and-mortar, rather a cost-wise means to maximize the effectiveness of those structures.

Growing Infrastructure Needs

Sustaining anticipated online and distance learning growth

In the previous Scalability Section, totals for all NC Community College LMS servers were reported at approximately:
- 38,000 active online courses with an average size of 35MB per course
- 350,000 active student users

The Flexibility and Interoperability Section indicated that LMS/Datatel interoperability was functioning at a basic manual-flat-file-level, yet was deemed satisfactory by most respondents. Both LMSs were reported to have successful interoperability with a number of plug-ins, modules, and building blocks. Administrators have a variety of resources for assistance in gathering information required for their responsibilities.

Limitations of Funding

System-wide funding support for LMS

Sustaining LMS resources is a function of funding, support, planning, and operational protocol. System-wide funding is provided by the System Office via a recurring allocation of $1.37 million to provide enterprise LMS services to colleges. These recurring allocations supporting LMS and Virtual Learning Community are not expected to increase in the next three years. They may however, be reduced as they were in 2009 due to lost state revenue brought about by the economic crisis. Currently, these funds are contracted to Blackboard, Inc. on a total curriculum-based FTE formula. Procuring additional LMS services and/or hosting currently are the responsibility of individual colleges. Hosting costs for Blackboard are based on curriculum DL FTE as hosting costs are determined by the number of active students on LMS databases. Moodle hosting costs which include system administration services are based on levels of service of increased sophistication, but are configured for all students, hence total FTE. Blackboard costs are a composite of license costs (total curriculum FTE) plus hosting costs (DL-based FTE). Support for LMS operations, maintenance, student orientation, and faculty training are also the responsibility of colleges. The System Office does provide additional support for community college distance learning programs through a recurring allocation of $800,000 funded through the Virtual Learning Community including an additional $750,000 managed by the Learning Technology Systems Department that supports distance learning. These funds provide:
1. Fully developed online courses complete with learning objects contained in the NCLOR
2. ADA compliant online course templates for customization by colleges,
3. Professional development resources
4. A technology center to identify "best of breed" emerging learning technology and establish "best practices" for their use and integration
5. A quality assessment center to provide constant evaluation and incremental improvement of all systems and protocol related to learning technology

**Faculty Needs and Staff Support**

In order to evaluate the effects of sustainability in regard to faculty and staff support, the Assessment Team used information gathered in the SuccessNC Listening Tours to analyze current faculty and staff opinions on learning technology. The Assessment Team also used the LMS Migration/Upgrade Survey results to determine the underlying reasons and decision making of colleges which were migrating to Moodle or upgrading Blackboard.

**SuccessNC Listening Tours Analysis**

During the fall of 2009, the North Carolina State Board of Community Colleges, working in association with leaders from the North Carolina Association of Community College Presidents and the North Carolina Association of Community College Trustees, endorsed a significant planning initiative to foster guiding goals that will positively impact student success. The goal of SuccessNC is to facilitate the sharing of best practices, initiate statewide policies to foster student success while removing those that inhibit student success, and develop new performance-based student success measures between now and 2013, the year of our System’s 50th anniversary. For more information regarding SuccessNC visit: [http://www.nccommunitycolleges.edu/Planning/successnc/index.aspx](http://www.nccommunitycolleges.edu/Planning/successnc/index.aspx).

To help uncover successful best practices as well as barriers to success, Listening Tours are being held at all 58 North Carolina community colleges. At these Listening Tours, individual community college leadership teams showcase their successes and discuss problems with the executive leadership team from the NC Community College System Office composed of the System President and Vice Presidents. Notes taken in the first 29 SuccessNC Listening Tours provided valuable commentary and suggestions that impact learning technology in general and the LMS Feasibility Study specifically.

**From a sustainability perspective Listening Tour notes indicated that:**

- Colleges differ on LMS preferences but want continued support from the System Office;
- Learning technology offers an effective and flexible means to facilitate learning;
- Increased enrollments have negatively affected instructors, strained facilities, and encouraged creative interventions to maximize resources.

The following are summary notes from Listening Tour participants that support the three trends listed above:
NCCCS institutions are divided regarding their preference for Blackboard or Moodle LMSs

“Some colleges are highly vested in their specific online learning platforms and emphasized their desire for continued state level support. Several have expressed concern about any plans to move away from Blackboard, in particular. Some small colleges are particularly concerned that they do not have the programming expertise on staff to manage Moodle. However, other colleges report they contract with external vendors to manage and host their online Moodle classes at reasonable cost.”

Perceived value for LMS and related learning technology

“Using technology to effectively teach and creatively engage students….also equips them with marketable workplace skills. This is particularly valuable to returning older students who often lack these skills.”

“Using an online platform to create a ‘one login’ space where students and faculty connect with each other for learning and campus information.”

Factors related to increased LMS capacity demand on college operations, budget and instructors

“Due to funding cuts, faculty workloads are very high and colleges expressed concern about high burnout, as well as potential negative findings from SACS accreditation processes.”

"Colleges report large increases in their online course offerings in particular, partly because their physical facilities are maxed out and partly because online courses may be taught by less expensive adjuncts. Best practices have been identified to maximize the quality of courses, instruction, and student support."

LMS Migration/Upgrade Survey

An online survey tool was the instrument used to gather data for the case studies. The Assessment Team gathered information regarding the migration efforts of five colleges that moved from a legacy LMS to Moodle and the upgrade efforts of 8 colleges upgrading to Blackboard version 9.x. The purpose of the survey was to compare Moodle migration and Blackboard upgrade in eight key measures. Key measures composing the case studies survey were:

- Reasons and decision making for the migration/upgrade
- Development of a migration/upgrade plan
- Implementation strategy for the migration/upgrade
- Training and orientation of students and faculty
- Courses and resources of migration/upgrade strategy
- Barriers and obstacles encountered in migration/upgrade processes
- Best practices and lessons learned
- Total cost of ownership involved for migration/upgrade
The key measure regarding sustainability was **Reasons and decision making for the migration/upgrade.** This measure in essence reflects the college's decisions about their current LMS situation versus their future LMS situation. In the responses to the survey question, "Please list in detail the reasons and decision making process for your college's migration/upgrade," the Assessment Team ranked the recurring issues identified in survey responses by frequency of occurrence. Rankings of these issues for both Moodle migrations and Blackboard upgrades were nearly identical with the exception of the number one reason for Moodle migration - cost. The trends identified were:

- Cost,
- Need for LMS user friendliness/intuitiveness,
- Bugs or version issues, and
- Need for enhanced functionality features.

**Cost or Expense**

In the Moodle survey section, cost was the highest reported reason colleges moved from Blackboard to Moodle. Some comments from the community colleges about Moodle costs from the colleges follows: South Piedmont reported, "[Moodle] was more cost effective." Surry stated, "The main issue was cost." Vance-Granville echoed those sentiments, "The growing cost of Blackboard was also of concern." Bladen concurred by stating, "Factor one is the cost savings realized by the conversion." One college participating in the migration survey, Randolph, was not migrating from Blackboard, but rather from Educator, another proprietary LMS. They reported, "The Educator LMS and service was very expensive." Cost was not reported as an issue regarding the Blackboard version 9 upgrade.

**User Friendly or Intuitive Use**

Another trend of note for this question was the ease of use of the two LMSs. South Piedmont stated that they found Moodle to be "more user friendly" than Blackboard. Vance-Granville reported, "Moodle is easy to learn and students [have] found it to be very easy to use....We found the system to be very flexible both administratively and on the user side." Surry reported, "...the environment [was] intuitive to use." Bladen observed "...greatly reduced student issues with Moodle."

**Bugs and Version Issues**

Bugs and version issues were another highly reported reason for migrating/upgrading. Piedmont stated that they upgraded to the Blackboard 9 to get the "Blackboard bug fixes from previous versions." Beaufort County reported, "Blackboard 8 was problematic and not user friendly." This was reiterated by Wake Tech who stated, "[they]began to have issues with Internet Explorer 8 and Microsoft automatic updates." Both Gaston and Tri-County said, "Blackboard announced end-of-life support for Blackboard 7" was a reason they upgraded to Blackboard 9. Moodle colleges also stated that the older versions of Blackboard had bugs and version issues which factored into their migration decision.

**Need for Enhanced Features**

The need for new features and functionality was listed many times by the Blackboard colleges and one Moodle college as a reason for upgrading/migrating their LMS. Piedmont CC stated that, "The new features of Bb 9 including SafeAssign, blogs and journals, and improvements in usability" were included
in their decision making process. The new grade center and the new Web 2.0 tools (blogs and journals) were one of the reasons for upgrading to Blackboard 9. Wilkes reported that Blackboard 9 had "a lot more features." This same opinion was shared by Beaufort County when they stated they wanted to "take advantage of new functionality/components, and enhanced compatibility with other technologies [of Blackboard 9]."

With the exception of cost, the reasons given for migration were virtually the same as for upgrading. The overriding factor in the sustainability decision to migrate to Moodle over upgrading Blackboard appears to be cost. Blackboard license fees are paid by the NCCC System Office. Therefore, the costs Moodle colleges refer to are primarily Blackboard hosting. To a (much) lesser extent, these costs could include additional Blackboard services - specifically Blackboard Community or Blackboard Content Management System. In the Cost Effectiveness section of this report, the research shows that Moodle hosting is about one third the cost of Blackboard ASP hosting. One way to offset Blackboard hosting cost is to self-host Blackboard. However, in the Support and Training section of this report, the research indicates that the colleges are dramatically understaffed in support of their Distance Learning Departments. Therefore self-hosting is not a feasible option for many of the NCCCS colleges. Migration to open source solutions such as Moodle is in many cases the only option for colleges with little staff support and inadequate funding to pay Blackboard ASP hosting costs.

Quality of Online and Hybrid Learning
The most important aspect of sustainability is the overall quality of the learning experience and student performance. Fortunately, current research literature has fully addressed this issue. For example:

“A systematic search of the research literature from 1996 through July 2008 identified more than a thousand empirical studies of online learning. Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size. As a result of this screening, 51 independent effects were identified that could be subjected to meta-analysis. The meta-analysis found that, on average, students in online learning conditions performed better than those receiving face-to-face instruction. The difference between student outcomes for online and face-to-face classes—measured as the difference between treatment and control means, divided by the pooled standard deviation—was larger in those studies contrasting conditions that blended elements of online and face-to-face instruction with conditions taught entirely face-to-face. Analysts noted that these blended conditions often included additional learning time and instructional elements not received by students in control conditions. This finding suggests that the positive effects associated with blended learning should not be attributed to the media, per se.” (US Department of Education, Planning, Evaluation and Policy)

Administration and decision making
Across the U.S. administration and decision making related to LMS-centric learning and teaching lags behind effective instruction practiced at many institutions of higher learning. “The distance education landscape is changing rapidly, and the need for relevant data and information has never been more
important. This is new ground for most senior college administrators—they are being asked to support new staffing, space, and budget requests—often with a fixed or shrinking budget. Often they have little, if any, direct experience managing distance education programs.” (Instructional Technology Council)

**Sustainability Summary**

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 varies as to staffing and emphasis on distance learning by college leadership. However, at the System level and across the NCCCS, support staff and available funding is woefully inadequate in the face of DL course enrollment projections. Disruptive innovation mathematical application of NCCCS 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 .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 of supporting LMS and Virtual Learning Community funds are not expected to increase in the next three years to support these rapidly changing ratios. The overriding factor revealed in the Migration/Upgrade Survey regarding the colleges’ decisions to migrate to Moodle over upgrading Blackboard version appears to be cost. Information from the 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 (Instructional Technology Council) 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.

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

Interoperability and Flexibility
The Datatel Colleague-to-LMS interoperability is the most important integration facing NCCCS institutions. Manual flat file process for data integration is the most adopted procedure. A standard LMS data integration process is needed. The colleges are using a wide range of third party plug-ins for both LMSs. Moodle is a more flexible LMS appearing to better facilitate movement of learning content in and out of the LMS and is 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
Moodle is the most cost-effective solution if one only considers licensing, hosting and cost per DL FTE. There are costs associated with LMS migration such as course conversion and user training which were not evaluated in this study. Cost alone does not determine the best LMS solution for the NCCCS. Moodle was roughly one third the cost of Blackboard in hosting and has no licensing fees. The NCCCS Blackboard contract only allows for self-hosting or hosting with Blackboard ASP. The Moodle colleges also have the option of self-hosting, but do not have to use one particular ASP hosting service. This precludes the option of centralized or regionalized LMS hosting, which could lower overall costs, facilitate standardization of learning technology for the entire System, and streamline integration of all learning technology applications.

Support and Training
Staffing for LMS and total DL support is insufficient now and will be a more critical problem in the near future. 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 inadequate to meet the current, let alone growing, needs of NCCCS’s distance education programs. Only 27 of the 58 colleges are currently taking advantage of the LMS online help desk services paid for by the system, yet the majority of the colleges report being satisfied or very satisfied with their current help desk provider.

Ease of Use
The OSC Moodle Assessment Report adequately addressed the LMS ease of use component. However, investigation of current releases of both LMSs (Moodle 2.x & Blackboard 9.x) is needed in order to get updated functionality information. Findings suggest that ultimate satisfaction with LMS migration or update is a function of time. Colleges taking a minimum of 10.5 months to migrate and/or upgrade report a consistently higher level of satisfaction. That level of satisfaction was even greater for schools which are vendor hosted, as opposed to self hosted.

Scalability
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 address the issue of scalability, many colleges are outsourcing LMS hosting to vendors. Thirty-six (62%) 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 for integration with mobile devices.

**Sustainability**

Enrollment projections indicate a 2:1 ratio of DL to traditional enrollments forecast for 2012 + 6 months and 6:1 in 2016. This will eventually become a significant factor for the majority of instructional programs across NCCCS. 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. These allocations may very well be reduced due to the budget shortfalls facing the state North Carolina. Cost was the overriding factor revealed in the Migration/Upgrade Survey regarding the college’s decision to migrate to Moodle rather than upgrade to the newest version of Blackboard. Information from the NCSuccess Listening Tour notes indicates 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.

**The best LMS solution for the NCCCS**

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, the Assessment Team has determined that a mandated System-wide migration of Blackboard-to-Moodle is neither advised nor feasible at this time. While 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 at 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 SIRSI/CCLINC consortium that governs and manages 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. Traditionally, DL and IT are separate and distinct areas at most community colleges often report 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 inexorably
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 regards to student instruction, emerging learning technology compatible with both Blackboard and Moodle LMSs should be actively investigated. These technologies include web conferencing applications, immersive technology (Second Life), blogs, wikis, social networking applications, 3-D applications, applications that support all math courses, foreign languages, and public speaking. More, not less learning technology is needed in the next few years. Any adoption of these emerging technologies should be 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.
References


Instructional Technology Council. ITC 2009 Distance Education Survey Results. Washington, DC, 2010.

Kreft, Scott. Sales Representative Jonathon Sweetin. 29 June 2010.


Attachments

Attachment I: NCCCS Distance Learning Enrollments Explanation

Each year the NCCCS Data Warehouse generates total student (duplicated) course registrations and Full Time Equivalent (FTE) by method of instruction where:

1. Total student course registration indicates every course taken by every student;

2. FTEs indicate a composite course enrollment number comprised of (a) part-time enrollments converted into full time equivalents - plus (b) full time enrollments

3. Method of instruction or instructional delivery modalities include:

   - **Internet courses** – College credit or continuing education course where the instructor and students meet face-to-face, according to designated dates/times/location and where there is no Internet or other method of delivery requirement.

   - **Hybrid** – College credit or continuing education course where the primary delivery is on-line with a requirement that students also meet in traditional face-to-face sessions as determined appropriate by the college.

   - **Telecourse** – College credit or continuing education courses where video, television or cassette delivers 100% of the instruction.

   - **Teleweb** – College credit or continuing education course where the primary delivery of instruction is via telecourse and also requires Internet accesses as a supplemental part of the course.

   - **Web-supported** – College credit or continuing education course where the primary delivery is via traditional face-to-face method with a requirement that students have Internet access as a supplemental part of the course.

   - **Digital media** – College credit or continuing education course where 100% of the instruction is delivered by non-telecourse digital video or media resources.

   - **Two-way Video** – College credit or continuing education courses where 100% of the instruction is delivered by interactive video.

   * These methods are thought to be miscoded by the colleges and frequently include a requirement of Internet access to e-learning technologies.

4. NCCCS utilizes the Southern Association of Colleges and Schools (SACS) criteria defining distance education as, “a formal educational process in which the majority of the instruction (interaction between students and instructors and among students) in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous. A distance education course may use the internet; one-way and two-way transmissions through open broadcast,
closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices; audio conferencing; or video cassettes, DVD’s, and CD-ROMs if used as part of the distance learning course or program.”

The following total delivery of instruction student enrollment figures were derived from NCCCS Data Warehouse publication DL100ANN that includes data from “College Year 2009 (Fall, Spring, and Summer Semesters).”

All Distance Learning Methods – 588,787

Possible-LMS centric enrollments:

- Telecourse 4,571
- Teleweb 1,915
- Two-way Video 10,058
- Digital Media 445

Total possible LMS enrollments = 16,989

Known LMS centric enrollments:

- Internet (online) 310,058
- Hybrid 94,239
- Web-Supported 167,501

Total Known LMS centric enrollments = 571,798

Percentage of Known LMS centric enrollments compared with total Distance Learning enrollments 97.1%.
Attachment II: LMS Compatibility & Interoperability Survey Results

Section I: Benchmarking Statistics

Questions 1-18 of the survey were designed to help the assessment team get an overall picture of the current state of LMS usage, services, hosting, staff and future plans of all the institutions in the system.

Questions #1

**Please give your name, phone number, email address and job title or job role in the spaces provided.**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td>100.0%</td>
<td>58</td>
</tr>
<tr>
<td>Phone:</td>
<td>100.0%</td>
<td>58</td>
</tr>
<tr>
<td>Email:</td>
<td>100.0%</td>
<td>58</td>
</tr>
<tr>
<td>Title/Role:</td>
<td>100.0%</td>
<td>58</td>
</tr>
</tbody>
</table>

answered question 58  
skipped question 0

Question #2

What is the name of the institution you represent?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All NCCCS Colleges were represented</td>
<td>100%</td>
<td>58</td>
</tr>
</tbody>
</table>

Question #3

**What is the primary Learning Management System (LMS) your institution is currently using?**  
(Primary is defined has 50% or more of your college courses are offered on this LMS.)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 7.x</td>
<td>36.2%</td>
<td>21</td>
</tr>
<tr>
<td>BB 8.x</td>
<td>31.0%</td>
<td>18</td>
</tr>
<tr>
<td>BB 9.x</td>
<td>12.1%</td>
<td>7</td>
</tr>
<tr>
<td>Moodle 1.9</td>
<td>15.5%</td>
<td>9</td>
</tr>
<tr>
<td>Campus Cruiser</td>
<td>3.4%</td>
<td>2</td>
</tr>
<tr>
<td>WebCT</td>
<td>1.7%</td>
<td>1</td>
</tr>
</tbody>
</table>

answered question 58  
skipped question 0

Question #4

What if any secondary LMS is your institution using? This would include any piloting, testing or reviewing of an LMS.  
(Secondary is defined has 49% or less of your college courses are offered on this LMS.)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
</table>


| Campus Cruiser | 11.8% | 4 |
| BB 7.x        | 8.8%  | 3 |
| BB 8.x        | 5.9%  | 2 |
| BB 9.x        | 2.9%  | 1 |
| Moodle 1.7x   | 2.9%  | 1 |
| Moodle 1.9x   | 64.7% | 22|
| Moodle 2.0x   | 2.9%  | 1 |
| Other (please specify) | | 8 |

**answered question**: 34  
**skipped question**: 24  

- Moodle Support  
- Contacts at other colleges.  
- Contact either Technical Support or Distance Learning Coordinator  
- Remote-Learner  
- Google  
- Collaboration in-house  
- Other administrators  
- other colleges and system office  
- Cohorts from other NCCCS institutions  
- VLC  
- cooperation with other members of our consortium  
- Moodle: Remote Learner (through NCCCS)

**Question #5**

**Have you upgraded your LMS in the past year?**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>60.3%</td>
<td>35</td>
</tr>
<tr>
<td>No</td>
<td>39.7%</td>
<td>23</td>
</tr>
</tbody>
</table>

If no, do you have plans to upgrade your LMS in the near future? (give details below)

**answered question**: 58  
**skipped question**: 0  

1. Yes, summer 2010  
2. Only version 7 upgrades. Plan to migrate to at least 8 this summer, possibly 9  
3. Yes - we will upgrade to Bb 9.1 in May 10  
4. We are evaluating BB9 and Moodle 2.0 - we hope to choose an LMS and transition by July 2011  
5. We will be updating to a different series in Blackboard 7.3.  
6. We plan to upgrade to Blackboard version 9 and possibly Moodle 2.0 for summer 2010.  
7. Bb9 upgrade for Summer 2010  
8. We plan another upgrade to 9 in May, 2010.  
9. Actually CCCC will be upgrading to Blackboard Learn 9.0 LS in May 2010.  
10. President & Vice President have decided to wait on Bb upgrade 9.0.  
11. No plans to upgrade beyond 7.3 based on conversion to Moodle  
12. No, we are currently migrating our courses to Moodle 1.9.  
13. Yes, it was a minor upgrade. Future BB upgrade decisions will depend on whether the state renews BB contract in July, 2011 for another 3 yrs.  
14. We currently use WebCT 4.1 and desperately need an upgrade. There are no budgetary resources or plans at our institutional level, however, to accomplish this.
15. Planning to update Blackboard to version 9 at the end of spring semester.
16. going to go to 9 (end of summer)
17. Scheduled Upgrade to Bb 9 by summer semester...
18. NCC is upgrading to Blackboard Learn 9 for Summer 2010.
19. We plan to either move fully to Moodle or to Blackboard 9 in the next year or two. We are on the last semester of our Moodle pilot, after which input from students and faculty will determine our choice. That said, if the state strongly endorses Bb9 or Moodle, that would help us to make our decision.
20. saas upgrades automatically
21. Yes - we will be moving to Moodle 2.0 at some point this year.
22. No plans to upgrade
23. No
24. may 15, 2009 BB 7.3 to BB 8.0.422

Question #6

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>27.6%</td>
<td>16</td>
</tr>
<tr>
<td>No</td>
<td>72.4%</td>
<td>42</td>
</tr>
</tbody>
</table>

If yes, then name the LMS to which you’ll be transitioning, and the expected transition date.

answered question 58
skipped question 0

1. BCCC is investigating Moodle if funding prohibits renewing BB license.
2. Moodle 1.9 - Spring 2011
3. We are evaluating BB9 and Moodle 2.0 - we hope to choose an LMS and transition by July 2011
4. Investigating Moodle via MoodleRooms
5. We are currently in the process of migrating from Blackboard to Moodle. The expectation date will be Fall 2010.
6. Moodle 1.9.6 or higher
7. Moodle 1.9, currently in transition and plans to be fully migrated for the Fall 2011 semester.
8. This also depends on whether the state renews the BB contract. If they don’t, we will probably move to Moodle.
9. Because of the budgetary constraints listed above we are currently piloting Moodle and are in the process of training faculty and designers on that LMS. Our spring, 2010 offerings include 52 Moodle courses representing 72 sections of curriculum and con ed classes. Since our WebCT license expires in August, 2010, we will have all courses migrated to Moodle at that time.
10. Maybe. We are considering moving to Moodle gradually. We are in the process of training faculty and moving a few courses to Moodle. We currently have no timeline as to if/when Moodle will be our primary LMS.
11. 9 Blackboard and will add Moodle in future
12. Currently, a team of faculty is exploring multiple options and will present a report to our college's president recommending a future path for our LMS.
13. We plan to either move fully to Moodle or to Blackboard 9 in the next year or two. We are on the last semester of our Moodle pilot, after which input from students and faculty will determine our choice. That said, if the state strongly endorses Bb9 or Moodle, that would help us to make our decision.
14. to moodle if the test sites ever get the single sign on, to email and webadvisor worked out
15. We are in the process of leaving Blackboard and moving to Moodle. We will be 100% Moodle starting Spring 2011 semester.
16. We are moving from Blackboard to Moodle. We should be fully migrated by Fall 2010.
17. We are in the preliminary discussion phase of considering a move from BlackBoard to Moodle. Should we enact such move, we are looking at a transition of August 2011 start date.
18. A plan is currently being developed to transition all Web-enhanced courses from Blackboard to Moodle by the end of the Summer 2010 semester. The college is also examining the feasibility of transitioning the online and hybrid courses to Moodle as well, which if decided, would likely occur over the following academic year.

19. We are doing a pilot initiative with 10 faculty as part of a Title III Grant. I have trained them on Moodle and we have migrated 12 courses to our Moodle instance. Our administration wants to stay with Blackboard until 2012 - 2013 and then most likely will move to Moodle. We have invested a great deal of time and money with our blackboard boot camp certifications and don’t want to switch gears on the faculty with asking them to switch LMS’s - this will be a slow incremental process for CCC.

20. Moodle. Our plan is to gradually implement Moodle beginning with a limited number of Hybrid courses in Summer '10 and progressing from there over the course of a year.

Question #7

Please select the hosting scenario that best describes your college.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor-hosted all LMSs</td>
<td>56.9%</td>
<td>33</td>
</tr>
<tr>
<td>Vendor-hosted primary but self-hosted secondary LMS</td>
<td>5.2%</td>
<td>3</td>
</tr>
<tr>
<td>Self-hosted primary but vendor-hosted secondary LMS</td>
<td>10.3%</td>
<td>6</td>
</tr>
<tr>
<td>Self-host all LMSs</td>
<td>27.6%</td>
<td>16</td>
</tr>
</tbody>
</table>

Please list hosting vendor (if applicable):  

1. Remote Learner  
2. Bb ASP  
3. Remote Learner  
4. Classroom Revolution  
5. Blackboard/Remote Learner  
6. Blackboard Managed Hosting  
7. Remote Learner  
8. Blackboard and Remote Learner  
9. Blackboard  
10. Blackboard  
11. Blackboard  
12. Blackboard, Inc.  
13. Remote-Learner  
14. Blackboard ASP  
15. Bb - Moodle (MCNC)  
16. Remote-Learner  
17. Blackboard-Blackboard/Remote-Learner-Moodle  
18. Current Moodle pilot is hosted by Remote-Learner. Will self-host production LMS.  
19. Remote Learner  
20. Remote-Learner  
21. Blackboard/Remote Learner  
22. I've been very happy with Remote Learner's responsiveness and stability.  
23. Blackboard  
24. Remote Learner  
25. campus cruiser
26. Remote Learner
27. Blackboard
28. Blackboard and for Moodle, NCCCS (Remote Learner)
29. Time Cruiser
30. We host BB and Remote Learner for Moodle

Question #8

Approximately how many active courses does your institution support on your LMS for both Continuing Education and Curriculum courses per academic year? Please list primary and secondary LMSs (if needed)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>0-100</th>
<th>101-200</th>
<th>201-400</th>
<th>401-600</th>
<th>601-800</th>
<th>801-1000</th>
<th>above 1000 courses</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary LMS</td>
<td>2</td>
<td>7</td>
<td>10</td>
<td>14</td>
<td>6</td>
<td>4</td>
<td>15</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>3.4%</td>
<td>12.1%</td>
<td>17.2%</td>
<td>24.1%</td>
<td>10.3%</td>
<td>6.9%</td>
<td>25.9%</td>
<td></td>
</tr>
<tr>
<td>Secondary LMS</td>
<td>21</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>75.0%</td>
<td>10.7%</td>
<td>10.7%</td>
<td>3.6%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

answered question 58
skipped question 0

Questions #9

Approximately how many active students does your institution support on your LMS for both Continuing Education and Curriculum courses per academic year? Please list primary and secondary LMSs (if needed)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>0-500</th>
<th>501-1000</th>
<th>1001-2000</th>
<th>2001-6000</th>
<th>6001-10000</th>
<th>10001-14000</th>
<th>above 14000 students</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary LMS</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>27</td>
<td>8</td>
<td>1</td>
<td>7</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>1.8%</td>
<td>10.5%</td>
<td>12.3%</td>
<td>47.4%</td>
<td>14.0%</td>
<td>1.8%</td>
<td>12.3%</td>
<td></td>
</tr>
<tr>
<td>Secondary LMS</td>
<td>17</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>60.7%</td>
<td>17.9%</td>
<td>3.6%</td>
<td>14.3%</td>
<td>3.6%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

answered question 58
skipped question 0

Question #10

Approximately how many do you have who directly support your LMS? Include both primary & secondary LMSs and part-time staff (if needed)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>44.8%</td>
<td>26</td>
</tr>
<tr>
<td>2-3</td>
<td>32.8%</td>
<td>19</td>
</tr>
<tr>
<td>3-4</td>
<td>12.1%</td>
<td>7</td>
</tr>
<tr>
<td>4-5</td>
<td>3.4%</td>
<td>2</td>
</tr>
<tr>
<td>5-6</td>
<td>3.4%</td>
<td>2</td>
</tr>
<tr>
<td>6-7</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>7 and above</td>
<td>3.4%</td>
<td>2</td>
</tr>
</tbody>
</table>

answered question 58
skipped question 0
Question #11

How much is the estimated storage capacity (in MB) for an average course on your LMS server? (Include all active and inactive courses in your estimation for both Curriculum and ConEd courses. Does not need to be a precise estimation.)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>0-5MB</th>
<th>5-10MB</th>
<th>10-20MB</th>
<th>20-60MB</th>
<th>60-100MB</th>
<th>100-200MB</th>
<th>200-300MB</th>
<th>above 300MB</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary LMS</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>23</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>58</td>
</tr>
<tr>
<td>Secondary LMS</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>27</td>
</tr>
</tbody>
</table>

Answered question: 58
Skipped question: 0

Question #12

Approximately how much more data storage capacity would you estimate your LMS may need in the next 3 years? Please list primary and secondary LMSs (if needed)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>0-5%</th>
<th>6-10%</th>
<th>11-20%</th>
<th>21-30%</th>
<th>31-40%</th>
<th>above 40%</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary LMS</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>10</td>
<td>7</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td>Secondary LMS</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Answered question: 58
Skipped question: 0

1. possibly more!
2. High estimate for secondary is based on our Moodle transition.
3. I have no idea how to determine the average size of courses, since we do not host them ourselves. I randomly archived some and averaged the size of the zip files. Consequently, I don’t have a sense of how much more storage we might need. As more and more faculty use video, it certainly is increasing.

Question #13

Do you plan on using the North Carolina Learning Objects Repository (NCLOR) to supplement your LMS storage needs?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63.8%</td>
<td>37</td>
</tr>
<tr>
<td>No</td>
<td>36.2%</td>
<td>21</td>
</tr>
</tbody>
</table>

Comments:

1. Already linked from BlackBoard site.
2. We'll use our own data servers.
3. Don't know yet
4. No plans at this time but may change in the future due to financial limitations.
5. Although we have been intrigued by the NCLOR we have not been able to fully utilize. We will evaluate training time and implementation scenarios as we evaluate an LMS transition.
6. While our institution is aware of this capacity and is planning a big roll-out of NCLOR training for Summer 2010, we do not anticipate this feature will be adopted widely enough to impact our LMS storage needs to any great extent within the next two years.

7. Available to faculty but not heavily used on our campus, faculty want to use it to store their content but there are concerns regarding sharing content.

8. We are using the NCLOR for instructors to obtain and contribute if desired. This is not being required for any instructor.

9. We encourage the use of the NCLOR in Moodle. Use is currently negligible but expected to increase with training and stability of the Equella plug-in.

10. We plan to offer training to faculty in using the NCLOR and encourage contribution to this repository. Ideally, faculty will be willing to publish content into the NCLOR instead of directly into their course.

11. Plan too

12. Faculty are aware of this resource, however, we do not have any contributing members at this time.

13. I did not know that this was a possibility. We certainly might do this in the future, but there are no immediate plans to do so.

14. if they ever get a hook in for campus cruiser like the ones for bb and moodle

15. Word of mouth / awareness on campus of LOR availability to faculty creating coursework

16. As conversion decisions are made and completed, we will proceed with plans to implement a promotion plan for the NCLOR campus-wide.

17. Simply have not had time to share with Faculty and I’m in contact with 1 fac member who asked directly.

Question #14

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>External Database</th>
<th>LDAP Authentication</th>
<th>Flat File uploads (csv or txt)</th>
<th>No connection w/ DataTel</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary LMS</td>
<td>0</td>
<td>1</td>
<td>51</td>
<td>5</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>1.8%</td>
<td>89.5%</td>
<td>8.8%</td>
<td></td>
</tr>
<tr>
<td>Secondary LMS</td>
<td>1</td>
<td>5</td>
<td>16</td>
<td>4</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>3.8%</td>
<td>19.2%</td>
<td>61.5%</td>
<td>15.4%</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Blackboard = Snapshot</td>
</tr>
<tr>
<td>2. Users are populated manually, but has LDAP authentication after their added.</td>
</tr>
<tr>
<td>3. Programmer on site has developed a batch program for both users and courses.</td>
</tr>
<tr>
<td>4. With the help of another college institution, I take datatel information and convert to Excel, process the information, then transfer to notepad, to batch upload to Bb. The Secondary LMS Moodle we will be keying in individual students to each class for summer.</td>
</tr>
<tr>
<td>5. We use a in-house program to query Datatel and create a text file which is manually uploaded into the LMS. We plan to integrate with Datatel this summer.</td>
</tr>
<tr>
<td>6. &quot;Blackboard: Snapshot Integration with Datatel</td>
</tr>
<tr>
<td>7. Moodle: Populated Manually&quot;</td>
</tr>
<tr>
<td>8. Authenticating them to LDAP upon login does not populate user data...Student data is populated into the LMSs by custom integrations scripts for both Blackboard and Moodle.</td>
</tr>
</tbody>
</table>
Please give your level of satisfaction with your current LMS integration with Datatel.

<table>
<thead>
<tr>
<th></th>
<th>Very Satisfied</th>
<th>Satisfied</th>
<th>Unsatisfied</th>
<th>Very Unsatisfied</th>
<th>N/A</th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary LMS</td>
<td>16.7%</td>
<td>45.8%</td>
<td>22.9%</td>
<td>14.6%</td>
<td>10</td>
<td>2.65</td>
<td>58</td>
</tr>
<tr>
<td>Secondary LMS</td>
<td>14.3%</td>
<td>23.8%</td>
<td>28.6%</td>
<td>23.8%</td>
<td>9</td>
<td>2.32</td>
<td>28</td>
</tr>
</tbody>
</table>

**Answer Options**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS Vendor</td>
<td>1.7%</td>
<td>1</td>
</tr>
<tr>
<td>Presidium</td>
<td>46.6%</td>
<td>27</td>
</tr>
<tr>
<td>Institution runs own helpdesk</td>
<td>48.3%</td>
<td>28</td>
</tr>
<tr>
<td>No official helpdesk</td>
<td>3.4%</td>
<td>2</td>
</tr>
<tr>
<td>If other vendor (please specify)</td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

**Question #16**

Who provides helpdesk support for your students and faculty for your LMS(s)?

1. Presidium is our back-up but it isn’t very helpful but does provide 24/7 coverage.
2. Presidium is a backup for 24/7 support
3. and we use Presidium
4. But we also take advantage of Presidium Learning. Our staff and Presidium tag-team on technical support.
5. We do not get good support from Presidium.
6. combination of Presidium (faculty/students do not like) and our own. Primarily our own.
7. Presidium
8. We also provide local support above and beyond Presidium
9. and Presidium
10. On-site support is provided through the DL department
11. Presidium available for after-hours support.
12. We also have in-house support from our IT & BB administration.
13. Also provide Presidium Support
14. I also field calls; however, not as many as students become more aware of Presidium.
15. we also provide campus on line support
16. some presidium...very litte
17. It is necessary for local staff to handle many support requests. However, the help desk does reduce the number of calls we have to take for simple login issues.
18. has not been a problem with campus cruiser (easy to use)
19. The primary helpdesk is run by VGCC.
20. I also provide assistance
21. DL Coordinator and Instructional Server Admin currently is providing the majority support.
22. plus, secondary support is Presidium for our after hours calls

**Question #17**
How satisfied are you with your current help desk provider?

<table>
<thead>
<tr>
<th>Very Satisfied</th>
<th>Satisfied</th>
<th>Unsatisfied</th>
<th>Very Unsatisfied</th>
<th>N/A</th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Students</td>
<td>12</td>
<td>31</td>
<td>7</td>
<td>3</td>
<td>2.98</td>
<td>58</td>
</tr>
<tr>
<td>For Faculty</td>
<td>9</td>
<td>24</td>
<td>5</td>
<td>4</td>
<td>2.90</td>
<td>47</td>
</tr>
</tbody>
</table>

Comments:

1. Seldom return calls.
2. DL Staff provides assistance via f-2-f, email and phone. Email on weekends.
3. We have a new person who is helping faculty.
4. For Presidium - there are still areas to work on for our students and college.
5. See comments on 16.
6. Our students come in house to get help more often than they use presidium and faculty do not use presidium at all.
7. We have not had many instances where Presidium resolved faculty issues, we do not have feedback from students.
8. Would like to use Presidium and have tried three times with no success. Students and faculty complain. The level of support is not the quality Surry expects. But the concept of outsourcing technical support is great.
9. It took over two weeks to resolve an issue with a disappearing test.
10. They do a great job with the limited resources they have.
11. The amount of time spent assisting students and faculty takes up a large amount of time for the DL staff. The college is currently exploring options to combine all technical help desks into one centralized area which would help alleviate some of the work load.
12. I still learn (from time-to-time) about actions taken that agents are not sanctioned to perform, but we work these out.
13. Provided incorrect information at beginning of semester. Hold time for assistance needs improvement.
14. The In house....helpdesk
15. Faculty also contact my department for assistance troubleshooting. They continue to prefer in-person support for advanced issues.
16. It is nice to have a 24/7 resource for basic questions. However, Presidium’s service and response times have deteriorated over the last few semesters. Also, there are still unresolved issues with the accuracy of monthly report data.
17. Ideally, we would have the manpower to staff the Help Desk 24-7, but other than that we are satisfied.
19. Would like to add Presidium as an optional resource.

Question #18

Where do your LMS administrators go for help? (You can select more than one answer.)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS Vendor</td>
<td>86.2%</td>
<td>50</td>
</tr>
<tr>
<td>Presidium</td>
<td>13.8%</td>
<td>8</td>
</tr>
<tr>
<td>Support contract with other vendor</td>
<td>12.1%</td>
<td>7</td>
</tr>
<tr>
<td>Forums and Listservs</td>
<td>77.6%</td>
<td>45</td>
</tr>
<tr>
<td>Figure it out on own</td>
<td>82.8%</td>
<td>48</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

answered question 58

skipped question 0
1. Moodle Support
2. Contacts at other colleges.
3. Contact either Technical Support or Distance Learning Coordinator
4. Remote-Learner
5. Google
6. Collaboration in-house
7. Other administrators
8. other colleges and system office
9. Cohorts from other NCCCS institutions
10. VLC
11. cooperation with other members of our consortium
12. Moodle: Remote Learner (through NCCCS)

Section II: Additional Plug-ins

The second section of the Compatibility and Interoperability Survey specifically dealt with the interoperability of the LMSs with third party applications. In this section, respondents were asked to give information about the additional plug-ins loaded on their LMS servers that were most important to their college. For this survey, a plug-in was defined as a computer program that interacts with a host application (such as Blackboard or Moodle for example) to provide a certain, usually very specific, function "on demand." Blackboard calls these plug-ins “building blocks” and Moodle refers to them as “modules.” In most cases, plug-ins extend the capability of an application to do something that it was not originally designed to do. An "additional plug-in" was any plug-in that was not included in the standard installation of the LMS. A list of standard installation plug-ins for Blackboard and Moodle was provided to the respondents for their reference.

There were 163 plug-in reports completed by the colleges. Of the 163 reports, 61 plug-ins were unique. The table below shows the top six plug-ins reported by the colleges that were not included in core LMS functionality.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Plug-in Name</th>
<th># of Reports</th>
<th>Description</th>
<th>LMS</th>
<th>Cost</th>
<th>Alternative Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCLOR**</td>
<td>30</td>
<td>The NCLOR is the NCCCS k-20 common learning objects repository and the plug-in provides automatic connections to the content through the LMSs.</td>
<td>Both</td>
<td>Free</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>SafeAssign</td>
<td>16</td>
<td>Integrated Bb Building Block that allows instructors to check for plagiarism in student papers.</td>
<td>BB Only</td>
<td>Free for BB9 but a cost for BB 7 &amp; 8</td>
<td>Turnitin*</td>
</tr>
<tr>
<td>3</td>
<td>Wimba Pronto</td>
<td>13</td>
<td>An instant communication platform designed for educators to advance and promote collaborative learning, Wimba Pronto includes unique features to specifically benefit students, teachers, and educational institutions including: Blended Audio and Video Conferencing, Instant Messaging, Application Sharing and Automatic Population of Classmates and Courses...etc.</td>
<td>Both</td>
<td>Free</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Respondus is a powerful tool for creating and managing exams that can be printed to paper or published directly to Blackboard, ANGEL, Desire2Learn, eCollege, Moodle, and other eLearning systems.

The Questionnaire module allows users to complete online feedback style forms using a variety of user input methods. It allows you to create your own questions, unlike the Survey module which has presets to choose from, and it allows for more advanced questionnaires than the simpler and easier.

Echo 360 is a software that automatically, affordable, and reliably captures class lectures and converts them into podcasts, video, rich media, and more for anytime, anywhere playback.

**North Carolina Learning Object Repository**

* Turnitin: Provides anti-plagiarism support for student papers for both Blackboard and Moodle.

**Section III: Identification of LMS-related functionality not included in standard install.**

The last question in the survey was the open-ended question: "Is there any other functionality or service you would like to see in your LMS that is NOT part of your institution’s LMS core product and NOT accessible by using an additional LMS plug-in? * The responses to this open-ended question seems to fall into four main categories; Datatel/Colleague Integration, Course Reporting, Communication tools, and Assessment tools.

**Datatel/Colleague Integration:**
Thirty-eight colleges supplied an answer to this question. Within those 38 responses, the 13 requested the integration of Datatel/Colleague into their LMS.

The responses regarding Datatel/Colleague included the following:
• "1) Datatel integration: a) enrollment b) grade reporting c) improved report generation    2) Federated Identity Management"
• "Automated enrollment from Colleague."
• "Automatic integration with Datatel. Remote-Learner has a solution but it is not completely automated. Also, while the Exabis E-portfolio plugin is great as a free plugin it needs additional capabilities concerning file sharing. Remote-Learner could write the code for these features at a minimal cost. This would be a great system-wide plugin if upgraded."
• "Datatel Integration Module"
• "Datatel's Intelligent Learning solution for automated enrollment to Moodle"
• "Integration of Student Database w/ LMS database."
• "Integration with Datatel enabling the creation of accounts, registration of students, and withdrawing students of in Moodle. Moodle batch course creation integrated with Datatel."
• "Internal course specific e-mail, Automated Datatel Integration, Sharing Repository (Similar to "Content Manager" in Blackboard.)"
• "More comprehensive functionality with Datatel."
• "Real time integration with Datatel"
• "Snapshot"
• "We are one of the Beta sites for Moodlerooms, so I am looking forward to seeing how they can help increase our ease of creating/recycling courses and connecting in a more efficient manner with Datatel."
• "We need a state-wide approach for information going two ways from Datatel and Moodle. This means daily enrollments. This means attendance stored electronically. This means 10% reports are pulled from Moodle sites as a campus and provided to auditors in mass. This means delivery of grades from Moodle to Datatel is seamless."

Communication Tools:
Within those 38 responses, the 9 respondents requested improved student to faculty communication tools. The responses regarding improved communication tools included the following:

• "Automatic integration with Datatel. Remote-Learner has a solution but it is not completely automated. Also, while the Exabis E-portfolio plugin is great as a free plugin it needs additional capabilities concerning file sharing. Remote-Learner could write the code for these features at a minimal cost. This would be a great system-wide plugin if upgraded."
• "Blogging Capability in BB"
• "Collaborative tools that integrate easily"
• "Content System option in order to have access to E-Portfolios - This is cost prohibitive on our campus at this time."
• "Integration with Google Apps for Education; Blog and Wiki tools that work well and are intuitive (Moodle's don't/aren't!); eportfolios for students; low-cost voice tools (similar to the expensive ones available from Wimba)."
• "Since we will be migrating to Moodle by Fall, 2010, these are all Moodle "wish-list" items. Audio activities. I would like to be able to have the instructor AND students record from the WYSIWYG window. Have not found a stable plug-in for this...."
• "...There are 3 products that I would like to see in our LMS that is not part of our institution's LMS core product even though these are accessible by using an additional LMS plug-in: Respondus, Respondus LockDown Browser, and Wimba."
• "We would like to have audio tools such as Wimba."
• "There are a couple that come immediately to mind. First, I would like to be able to track the amount of time a student actually spends online and active in a course. Secondly, I would like to see SMS incorporated in the LMS to give instructors the ability to send text messages to students"
enrolled in their specific classes, without having to jump through hoops to create groups on an external server”.

Course Reporting:
Within those 38 responses, the 7 respondents requested improved course reporting. The responses regarding improved reporting included the following:

- “1) Datatel integration: a) enrollment b) grade reporting c) improved report generation 2) Federated Identity Management”
- “Attendance plug-in”
- “Internal course specific e-mail, Automated Datatel Integration, Sharing Repository (Similar to "Content Manager" in Blackboard.)”
- “Ten percent reporting Blackboard building block with ability to report combined class section statistics by groups, such as CIS110-41, CIS110-42, instead of having to select individual users for each class.”
- “There are a couple that come immediately to mind. First, I would like to be able to track the amount of time a student actually spends online and active in a course. Secondly, I would like to see SMS incorporated in the LMS to give instructors the ability to send text messages to students enrolled in their specific classes, without having to jump through hoops to create groups on an external server.”
- “We need a state-wide approach for information going two ways from Datatel and Moodle. This means daily enrollments. This means attendance stored electrocially. This means 10% reports are pulled from Moodle sites as a campus and provided to auditors in mass. This means delivery of grades from Moodle to Datatel is seamless.”
- “We would like a better identity system for our LMS to ensure students are verified and doing their own work. Acxiom is not a complete solution.”

Assessment Tools:
Within those 38 responses, the 4 respondents requested improved assessment tools. The responses regarding improved assessment tools included the following:

- "SafeAssign or feasible alternative"
- "testing analysis that would satisfy the new nursing standards"
- "The way the question is formed limits my ability to share information; therefore, I have chosen to respond all the same. There are 3 products that I would like to see in our LMS that is not part of our institution’s LMS core product even though these are accessible by using an additional LMS plug-in: Respondus, Respondus LockDown Browser, and Wimba."
- "Would like to see plagiarism checking functionality in Moodle."
Attachment III: Moodle Migration/Blackboard 9 Upgrade Survey Results

Section I: Contact Information

<table>
<thead>
<tr>
<th>College Personnel Information:</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>College Name:</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>Title:</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>Years in this position:</td>
<td>100.0%</td>
<td>12</td>
</tr>
</tbody>
</table>

Answered question 12
Skipped question 0

Question: What is the version of the current primary LMS used at your college?

Blackboard Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 7.x</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>BB 8.x</td>
<td>12.5%</td>
<td>1</td>
</tr>
<tr>
<td>BB 9.x</td>
<td>87.5%</td>
<td>7</td>
</tr>
</tbody>
</table>

Answered question 8
Skipped question 0

Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moodle 1.9.5</td>
<td>60.0%</td>
<td>3</td>
</tr>
<tr>
<td>Moodle 1.9.7</td>
<td>20.0%</td>
<td>1</td>
</tr>
<tr>
<td>Moodle 1.9.8</td>
<td>20.0%</td>
<td>1</td>
</tr>
</tbody>
</table>

Answered question 5
Skipped question 0

Question: Of the LMSs listed below, which version has your college upgraded from in the past year?

Blackboard Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 7.x</td>
<td>50.0%</td>
<td>4</td>
</tr>
<tr>
<td>BB 8.x</td>
<td>37.5%</td>
<td>3</td>
</tr>
<tr>
<td>BB 9.x</td>
<td>12.5%</td>
<td>1</td>
</tr>
</tbody>
</table>
Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 7.x</td>
<td>80.0%</td>
<td>4</td>
</tr>
<tr>
<td>Educator</td>
<td>20.0%</td>
<td>1</td>
</tr>
</tbody>
</table>

Question: What were the beginning and ending semesters of your college's Blackboard upgrade/Moodle Migration?

Blackboard Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100.0%</td>
<td>8</td>
</tr>
</tbody>
</table>

1. Fall 2009 Spring 2010
2. Spring 2009 Summer 2009
3. Spring 2009 Fall 2009
4. Fall 2009 Spring 2010
5. Spring 09 Summer 09
6. Spring 09 Summer 09
7. Upgrade will be preformed on May 16, 2010 Between Spring and Summer semester
8. Summer 2009 Spring 2010

Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100.0%</td>
<td>5</td>
</tr>
</tbody>
</table>

1. Summer 09 Fall 09
2. Summer 08 Fall 09
3. Summer 09 Summer 10
4. Spring 2009 Spring 2010
5. SU 09                   SU10

|answered question| 5 |
skipped question| 0 |

Question: Select the hosting option below that best fits your college.

**Blackboard Survey**

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-host all instances of Bb</td>
<td>57.1%</td>
<td>4</td>
</tr>
<tr>
<td>Vendor-host all instances of Bb</td>
<td>42.9%</td>
<td>3</td>
</tr>
<tr>
<td>Vendor-host some instances but self-host some instances</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

**Moodle Survey**

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-host all instances of Moodle</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Vendor-host all instances of Moodle</td>
<td>80.0%</td>
<td>4</td>
</tr>
<tr>
<td>Vendor-host some instances but self-host some instances</td>
<td>20.0%</td>
<td>1</td>
</tr>
</tbody>
</table>

**Moodle Survey Only**

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>80.0%</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>20.0%</td>
<td>1</td>
</tr>
</tbody>
</table>

If yes, how did being a part of those efforts influence your decision making or migration efforts?

1. Provided a first hand look at Moodle to determine if it was a viable option for Surry.
2. NCMUG helped us to make the transition to Moodle with little to no cost. We were provided with both administrative and user training and were provided with a hosted site. The free hosted site allowed us to develop internal training for both faculty and students as well as providing a location for us to begin the migration process. With this site were able to migrate approximately 80% of our courses and run three semesters of classes before moving to a Level III service. The support group was also very helpful when we were developing both faculty and student Moodle training and when we were learning to administer the system.
3. We were able to test and learn the Moodle system and give faculty an opportunity to pilot the system before going live with it.

4. Joined this group SP 2010, but this group had no influence on the decision to migrate.

**Section II: Migration Strategies**

**Question:** What is the current status of Blackboard/Moodle at your college? This could include information about number of courses in curriculum and continuing education, any 3rd party integrations, any customizations implemented, etc.

<table>
<thead>
<tr>
<th>Blackboard Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answers</td>
</tr>
</tbody>
</table>

1. "We currently have 360 active classes on our Bb server serving about 3500 students (duplicated). We have LDAP single-sign-on through our MySCC portal."

2. "Fall 2009 - 786 courses with Blackboard shells, Spring 2010 - 784 courses with Blackboard shells, 3rd party integrations include EchoSystem Content Creator, NCLOR, and SoftChalk"

3. "1034 total courses of which 665 are active this semester, 7400 active student users and 312 instructor users Building blocks installed include: Scholar, Safe Assign, Equella, Blackboard Mobile Web Services, and Echo 360"

4. During spring semester 2010, BCCC offered 70 online curriculum courses, 69 hybrid courses, and 120 web-enhanced courses. Thirty-seven full-time faculty and 34 part-time faculty are using Blackboard; the number of active enrolled users is 1,386, and the unduplicated headcount for online courses is 776. Seventy five percent of the student population is using Blackboard. During the spring semester, no Continuing Education courses were offered via Blackboard.

5. "Number of current spring courses = Number of Students =Number of Total courses =Number of Instructors ="

6. Bboard 9.0.505 running the default set of plugins, along with Wimba Pronto, 165 curriculum courses

7. Upgrade to v9.1 is scheduled for May 16th. approx 20 couses are continuing education; 217 courses are in development; 107 sites are permenant sites; remaing sites are curriculum

8. Wake Tech currently hosts up to 2600+ active classes per semester including both Curriculum and Continuing Education as well as internal training and collaboration sites. We integrate using the Blackboard Snapshot system and update over 90,000 records every two hours. The integration process takes less than 5 minutes and has no impact on performance. The file and database servers combine for almost 1TB of data. We have 4 load-balanced application servers running Red Hat Linux. The database server is Oracle 10.2.0.4. The server utilizes approximately 5-10TB of network bandwidth per week.
Moodle Survey

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. We are currently running 416 curriculum courses in one instance. We recently created a second instance for Continuing Education. Courses are being migrated to this instance now. We are currently running approximately 10 courses in this new instance. We have 2997 Moodle student users.</td>
<td>5</td>
</tr>
<tr>
<td>2. Surry currently has 1248 curriculum and continuing education courses on Moodle. We contracted services for a customized theme, integration to Datatel and plugin to block student login.</td>
<td></td>
</tr>
<tr>
<td>3. Summer 2010 will be the last semester that we will offer any classes on Blackboard all remaining courses are to be migrated to Moodle by the beginning of Fall semester of 2010. Between Spring and Summer semesters we will be moving to our own hosted server, upgrading to version 1.9.8 and adding two (2) additional Moodle sites. We currently have Moodle sites for curriculum and ConEd and will be adding a site for Adult and Basic Skills and a VGCC training site. We currently have 300+ courses migrated in curriculum and will continue to migrate courses through the summer. We will begin in developing in Fall semester classes for the other three sites.</td>
<td></td>
</tr>
<tr>
<td>4. &quot;We are in the process of moving to our new Level III hosting service which should be completed on May 13th. After we move to the new server infrastructure, Remote-leaner will begin adding 3rd party integrations such as walled garden email, ELIS Content Repository, Datatel integration and LDAP authentication. For the Spring 2010 semester we have approximately 169 Curriculum courses and 20-25 Continuing Education courses.&quot;</td>
<td></td>
</tr>
<tr>
<td>5. We have successfully migrated to Moodle 1.9.5. We have adjusted our Presidium (awful service) to the Moodle database. Remote Learner is hosting (excellent service) and we recently renewed and upgraded to Level II service. For SP10 we had 135 distance sections totaling 45.5% of total curriculum FTE for SP 10. Our curriculum enrollment was at an all time high of 1778 head count and of that number 1445 was in one or more distance classes. We have integrated test banks from all major publishers, and are using publisher products such as the Pearson My Math Lab, etc.</td>
<td></td>
</tr>
</tbody>
</table>

Question: Please list in detail the reasons and decision making process for your college's upgrade/migration from your current version of your LMS.
### Question: Give as much detail as possible about your college's planning process for upgrade to Bb 9/Migration to Moodle.

#### Blackboard Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There was no planning process. It was not a big deal. We informed the academic</td>
<td>8</td>
</tr>
</tbody>
</table>

#### Answers

1. We upgraded because we wanted the current version. No overriding reason to upgrade.
2. "Blackboard bug fixes from previous versions, New features of Bb 9 including SafeAssign, blogs and journals, and improvements in usability"
3. The discontinued support of version 7.3 by Blackboard in the near future and the new features Blackboard Learn 9.0 has to offer. These included the enhanced grade center (included in Blackboard 8.0) and the new Web 2.0 tools (blogs and journals).
4. The instructors, DL staff, and Network Administrator agreed that BB 8 was problematic and not user friendly; therefore, upgrading to BB 9 was the logical next step. In general, BCCC regards software upgrades as part of the continuous quality improvement process and strives to install them as often as feasible. Other reasons for the BB 9 upgrade include the chance to solve problems, enhance and improve the teaching/learning process, implement patches, utilize the new environment, take advantage of new functionality/components, and enhanced compatibility with other technologies. Other factors include greatly improved technical support and documentation from BB. Ease of use for faculty and students is another improvement inherent to this release. The decision to migrate was made by the Dean of Instruction, DL staff, and Network Administrator with input from the Technology Committee, the DL Workgroup, and faculty.
5. We were on BB 7 and most of the other colleges were in BB 8 and BB 9 came out so we decided to skip over BB 8 and go into BB 9 since it had a lot more features that we thought would be helpful.
6. The decision to upgrade from v.7 to v.9 was made when Blackboard announced end-of-life support for BB v.7. Version 9 had been available for some months, so I made the decision to skip version 8 and go directly to version 9.
7. Faytech CC endeavors to be at the forefront of technological innovation. After having previewed the version 9 of Bb with the new features the decision was made by the Vice President of Learning Technologies in concert with the Distance Learning staff to migrate to V9.
8. Blackboard 7.2 was very stable and caused a minimum of problems until Summer 2009. At that point, we began to have issues with Internet Explorer 8 and Microsoft automatic updates that forced users to use IE 8. Students with new computers could not use the older browsers, preventing them from completing their work. We investigated Bb 9 and decided to upgrade.
administration and all stakeholders well beforehand and conducted a number of workshops. There was some reluctance, only to the extent that we were unsure as to the System’s Moodle plans, but we went forward w/ Bb 9.0 nevertheless.

2. Blackboard 9.0 was loaded on our test server Spring of 2009. All distance learning faculty were provided the opportunity to test the new version and provide feedback. The academic deans and the VP were included to encourage and promote the testing of the new version. Blackboard 9.0 was piloted during the summer semester of 2009. The upgrade to version 9.0 was dependent upon feedback from the faculty (likes, dislikes, problems, etc.).

3. Blackboard provided numerous resources and support during the process. The Blackboard Learn Release 9 Skills Inventory enabled our institution to identify the appropriate team members for the upgrade. The Director of Distance Education facilitated the upgrade process, as directed by the Chief Distance Education Officer. The Blackboard Managed Hosting team provided the system and network administration and database management functions. The College Technology Services network department provided assistance in uploading large files and provided the programming services for integrating Datatel (student registrations) with Blackboard Learn 9.0 under the direction of the Chief Technology Officer. The Director of Distance Education provided faculty training, coordination of upgrade with Blackboard, and faculty help desk issues. In addition, Presidium provided help desk support for students.

4. Typical upgrades for BCCC occur at the end of a semester prior to a break to minimize downtime. Once the decision was made to transition to BB 9, the roll out was scheduled for the beginning of spring semester, 2010. The DL staff and Network Administrator began planning for the upgrade; preparing training, documentation, and necessary maintenance to ensure a trouble-free process. The Network Administrator designated a server for testing and preliminary work.

5. Once we made the decision to go to BB 9 the IT dept reviewed it and decided what hardware we needed, we purchased it and then made the switch. There was not a huge plan since we were already using BB - we were not considering another system so it was just the planning of an upgrade.

6. There wasn't any formal plan. Once the decision was made to upgrade, the plan consisted entirely of when and how to train faculty and how to introduce students to Bb9.

7. Post ticket with Bb ASP technical support, follow up with phone call, lock in date. Arrangements made for faculty professional development to support upgrade.

8. Planning for the upgrade was a collaborative effort among the Distance Education Support Department, the IT Division, and College administrators. Our planning process included going through the complete installation of Bb 9 on a testing and development server, following the recommended steps in late June 2009. Faculty and staff tested the new version in the T&D environment Fall 2009. Problems were minimal at that point, and Firefox updates helped with the browser issues. Training began the semester before the upgrade on the production server. Faculty attended preview sessions for Bb 9 that were available Fall 2009 and early Spring 2010. The actual upgrade required 2 days with a minimal impact on course content. An updated version of the College’s online student orientation was completed and available in mid December 2009, and students were automatically added to their courses in Bb 9 the first day of spring semester.
### Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. We actually migrated slowly over approximately 3 semesters. We had an initial pilot group of about 15 instructors who received Moodle training from Remote-Learner, who taught courses in Moodle in Fall 2008, while all other Web courses were in Blackboard. Prior to the Summer of 2009, a few additional instructors migrated their courses and taught in Moodle in Spring 2009. During this time period, faculty members were informed that Blackboard would be going away, and all courses had to be migrated. Some instructors migrated their own courses to Moodle for the upcoming semester. However, we selected a team of instructors who were paid to migrate most of the courses during May-June of 2009. We paid Remote-Learner for migration training for these instructors. All Blackboard online and hybrid courses were migrated by the migration team by the end of June 2009. We went entirely live with Moodle in Fall 2009. At this time (Spring 2010), most SPCC courses (98%) are either online, hybrid, or Web-enhanced.</td>
<td></td>
</tr>
<tr>
<td>2. &quot;Surry has a standing Distance Education committee made up of faculty, instructional deans, staff, student services personnel and the distance education director. The pilot group presented the findings to this committee. The committee made a recommendation to the division chairs and academic council. After numerous question/answer sessions with these groups and their personnel the college made the decision to change to Moodle as an LMS. The President’s Council approved the recommendation. Once approved the Distance Education committee determined a two-year phase in would be best based on the amount of course content that needed to be converted. The Distance Education office would be in charge of overseeing the phase over and offering Moodle faculty training.&quot;</td>
<td></td>
</tr>
<tr>
<td>3. We created a migration team that included the VP of Curriculum, VP of IT and Director of Distance Education, and several top online instructors. Together we put together a timeline for the complete migration. The timeline identified the migration frame (Summer 2009 – Summer 2010), the order in which areas would be migrated and when those areas would be migrated. We also developed training for both faculty and students. The first semester pilot courses identified and instructors trained to begin the migration. Those courses were monitored throughout for performance issues and faculty and students were surveyed several times throughout the semester to try and identify any problems or concerns that they had while facilitating or participating in the Moodle course. During the first semester additional instructors were trained and targeted courses were migrated. Each semester the process was evaluated and adjustments made to the migration process as needed.</td>
<td></td>
</tr>
<tr>
<td>4. &quot;In consultation with BCC’s DL Advisory Comittee made a one year plan to convert. For a full semester prior to beginning the conversion we practiced with a sandbox instance we created locally. We developed a series of ten one-hour training sessions for faculty; and researched with other schools and on Moodle Docs. In January 2009 we kicked off the conversion holding training sessions, offering PTOI classes through con-ed and signed a contract with Remote Learner. For Summer 09 we had all distance classes in Moodle. For Fall 09 we had over 100 sections in Moodle. By Spring 2010, all classes previously taught in spring semester BBD were converted to Moodle. All faculty using Moodle have completed basic training, and we continue to hold sessions --very focused topic specific--whenever the need arises. DL staff completed all course conversions using the LSU converter, with faculty doing the clean-up work and all conversion related updates and changes to their courses. For</td>
<td>4</td>
</tr>
</tbody>
</table>
SU10 the last of the courses will be updated and revised. We created a Moodle site for the DL Advisory Committee with a Faculty resource section in which we have Moodle Tips. We have a SACS/COC section and a resource section. The manual we use is a generously donated basic version from Jonathan Sweetin that was revised for Bladen-- and will be revised yet again in Summer 2010."

**Question:** Please give as much detail as possible about the implementation strategy that your college used for the upgrade/migration.

<table>
<thead>
<tr>
<th>Blackboard Survey Results</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answers</strong></td>
<td><strong>Count</strong></td>
</tr>
<tr>
<td>1. We trained instructors over several weeks before and after the upgrade. No hassles. We started during the end of fall semester and completed the upgrade during Christmas break.</td>
<td>1</td>
</tr>
<tr>
<td>2. Blackboard 9.0 was loaded on our test server Spring of 2009. All distance learning faculty were provided the opportunity to test the new version and provide feedback. The academic deans and the VP were included to encourage and promote the testing of the new version. Blackboard 9.0 was piloted during the summer semester of 2009. There were no objections raised, no major bugs or problems reported, and we went live with Blackboard 9.0 Fall of 2009. There was no collaboration necessary with other institutions.</td>
<td>1</td>
</tr>
<tr>
<td>3. &quot;Few, if any, other institutions had made the move to Blackboard Learn 9 so there was no opportunity for collaboration. A project time line was created with the assistance of the Blackboard support team for faculty training, course development/migration of courses to 9.0 platform, upgrade and followup. We were provided a test/development server (sandbox) for a minimal number of faculty to access simultaneously to build their courses for the fall semester and/or familiarize themselves with the new platform. This helped with faculty buy-in.&quot;</td>
<td>1</td>
</tr>
<tr>
<td>4. &quot;Implementation of the upgrade was relatively easy. The DL staff and the Network Administrator worked together to ensure a smooth transition, consulting with Blackboard and other colleges to try to identify any known issues and resolve problems. Blackboard has developed special course migration tools to help upgrade to Blackboard Learn™, Release 9 by guiding you through moving courses, connecting your instance through course migration tools to Blackboard Consulting services. The Faculty was notified 2 months ahead (November, 2009) of the roll out and were asked for feedback. The majority of the faculty was receptive to the change and eager to migrate from version 8. The BB administrator developed the training resources and scheduled sessions with faculty; all faculty were required to participate in a 2 hour session before they could access their courses in the new version. During the two week break between semesters, faculty had the chance to update and refine their courses. The DL staff archived the version 8 courses and asked the instructors to save their own files as a backup. The test server was used for training and other trouble-shooting. The production environment was initiated the first week in January, 2010.&quot;</td>
<td>1</td>
</tr>
<tr>
<td>5. Once we had decided to move to BB 9, then we looked at doing it during the slowest time which is the break between spring and summer classes so we could work out any bugs during a slower term. We rolled out training as soon as possible, created a Professional Development course inside BB for the faculty, did a marketing campaign letting the students know about the switch and that they would need new ids/passwords since it would be a new system and then tested the system and went</td>
<td>1</td>
</tr>
</tbody>
</table>
online in Summer 2009. We did everything within the Spring semester and went live for Summer 09.

6. Our faculty was a bit hesitant to move to Bb9, as anyone would be, but with the end of support for version 7 looming, everyone realized the importance of the upgrade. The Bb9 server was built in Jan. 2009, and was made available for faculty to explore in February, with training scheduled shortly thereafter.

7. Test server upgraded to v9 August 2009. Multiple sessions of a professional development "What’s New in Nine?" overview were scheduled. Faculty were encouraged to request their v8 course to be put on the test server to see how it rendered in v9 and become familiar with the features.

8. We upgraded our T&D environment at the start of summer (late June 2009) to allow for revising and testing the training content. The production environment was upgraded in a two-day window at the end of fall semester before Christmas 2009. We were live with Blackboard 9.0 starting Spring 2010.

Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
</table>
| 1. As stated above, the migration team for Moodle was trained by Remote-Learner. We migrated over 3 semesters (time-line as stated above). We used numerous tools in the conversion process. (We used BFree to extract and load site files for courses. We used the LSU/SFSU tool for Discussion Boards. We used Respondus to convert most tests and test pools.) Buy-in was facilitated by the pilot group. Having some instructors who were already experienced in Moodle helped with the resistance to change.
2. "With a two-year phase over planned, the Distance Education office scheduled a series of Moodle workshops from the basic features of Moodle, differences between Moodle and Blackboard to best practices using specific Moodle options. These sessions were taught monthly, per division and per one-on-one requests. Amy Brown, from GTCC, Greg Simmons and Jeff Church from ASU were hired to present 4 days of various Moodle training. The Early Childhood online instructors agreed to move their program courses over first and began teaching with Moodle for Fall, 08. Next, the Distance Education office worked on course conversions for courses in degrees that were offered completely online. Guildford Tech, Blue Ridge CC and Isomethal CC were contacted concerning the best ways to convert Blackboard content to Moodle. Two people in the Distance Education office worked full time for one and half years to move all course content over to Moodle. The phase over was completed with a year and a summer session due to students who were taking classes on both LMSs complaining about needed to use two different platforms. So the move to completely using Moodle began in Fall, 09." | 4 |
| 3. Because there is no real migration tool that can be easily used to move Blackboard courses into Moodle a manual migration was used. This is very time consuming and could be a burden on an already overloaded faculty we decided to create core courses that contained all the content and that could easily be adapted by individual instructors after the migration. After our pilot faculty group migrated their courses they shared in our training sessions best practices that they had developed during the process. This was helpful to the faculty to have the input from their peers. Our migration process has been successful and despite the extra workload placed on instructors and the Distance |
Education staff it has been accepted well overall and was worth the effort. After using Moodle for several semesters I have been told by faculty that “Moodle has made them a better instructor.”

4. "Jan. 09: Kick off event, faculty given overview of the conversion, a demo site to play in and a list of conversions and semesters. Sandbox created. FEB-May 2009 training sessions held and courses to be offered SU09 and F09 converted. Received much advise from BRCC and Southeastern CC and from Remote Learner. Admin attended Moodle Admin Training in Raleigh and at Wake Tech. For the first classes offered using Moodle we created both test and live instances. Frequent updates on the progress of the conversion and user testimonials from faculty members helped those less inclined to adventure buy-in. We went live in May 09 with summer classes."

---

**Question:** Please list as much detail as possible about your college's training and orientation of students/faculty on Bb 9/Moodle.

---

**Blackboard Survey Results**

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Our student orientation went smoothly. Students had little problem with the new interface.</td>
<td></td>
</tr>
<tr>
<td>2. Both the face-to-face and online orientation for students were changed to reflect the new version of Blackboard (our online orientation is housed in Blackboard to reflect a real course). Flyers were provided and emails were sent to notify students of the change. The login page for Blackboard was enhanced to reflect new information. Multiple workshops were provided to faculty to introduce them to the changes and new features in Bb 9.0. A powerpoint presentation was prepared, but face-to-face, hands-on training worked best for faculty. Other instructional handouts and videos were posted on our web site for DL faculty.</td>
<td></td>
</tr>
<tr>
<td>3. Students did not experience a major difference in their use of Blackboard. Training was offered to faculty during the semester prior to upgrade (summer) on the new grade center and the new user interface. Numerous sessions were held to familiarize faculty with the new Blackboard. Since our upgrade, Blackboard has developed workshops/webinars to assist with the upgrade process.</td>
<td></td>
</tr>
<tr>
<td>4. &quot;Multiple training resources were developed and provided for faculty and students regarding version 9. Blackboard offers numerous tutorials, webinars, FAQs, and information to inform and teach users about this product. The BCCC BB administrator created presentations, streaming videos, web-tutorials, and online orientations to assist users with learning the new interface. Faculty and students have access to a myriad of online resources, which can be accessed on the BCCC Distance Learning web page. Five on-campus orientations were offered for students as well as an online version. Eighteen individual classes scheduled BB specific orientations presented by the DL staff. All new online students are required to take an assessment to help ascertain their readiness for this type of learning environment&quot;</td>
<td></td>
</tr>
<tr>
<td>5. All faculty who teach online were required to attend 3 &quot;upgrade&quot; training sessions of 3 hours each, before being allowed to teach on Bb 9. The training actually went from the ground up, and included each faculty member beginning development of a course that they would be using. After the initial 9 hours of training, we held several smaller workshops covering specific topics such as the gradebook, assignment creation, course maintenance, exams and pools, and multimedia content.</td>
<td></td>
</tr>
<tr>
<td>6. Student interface deemed sufficiently similar as not to require additional orientation.</td>
<td></td>
</tr>
</tbody>
</table>
Presidium will provide support.

7. The training program began Fall 2009 with seventeen 2-hour What’s New in Bb 9 sessions available throughout the semester. A total of 343 faculty attended. Blackboard Basics training (online in Bb over the course of 7 weeks) was available in Version 9 fall semester prior to the upgrade. An additional six What’s New in Bb 9 sessions were provided January 4 and 5, 2010, with 126 faculty attending. Faculty and student help desk support has been available through the Distance Education Support Department help desks, IT help desks and Bb administrators, and Presidium. An updated version of the College’s online student orientation was completed and available in mid December 2009. Tips sheets, how-to videos, and other instructions for Bb 9 were made available to faculty Fall 2009 in a course in Blackboard in which all faculty are enrolled entitled the Blackboard Forum.

Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
</table>
| 1. "Faculty - Our initial Moodle pilot group and our conversion team were trained in Moodle and "Blackboard to Moodle" conversion by Remote-Learner. We now have an in-house developed online Moodle training course for online instructors, as well as a separate online training course for instructors teaching Web-enhanced courses. We have found online Moodle training to be more effective due to the difficulty of coordinating schedules. The training for online instructors takes approximately 20 hours to complete. The Web-enhanced training takes about 10 hours. Students - We are working on Moodle training for students right now. The library staff is currently a source for Moodle help for students who are on campus. Other students receive help via phone calls to the Moodle administrator. Some hybrid instructors provide Moodle orientation during their first seated class."
| 2. "Training is provided on a monthly basis for specific Moodle features, per requests by divisions or one-on-one for faculty. An online Moodle bootcamp was developed for Surry's online adjunct faculty. Students must complete a Moodle orientation online prior to taking an Internet course for the first time. Also, student and faculty support is offered through the Distance Education office as requested."
| 3. When we first began training faculty we did everything face-to-face. But while we were doing this we began developing an online course that we could use to do the training. This course is very detailed and covers all aspects of course development, ADA compliance, course quality, copyright requirements and of course Moodle. We included audio, video, and text components to help faculty to understand the process. We also added pre-test and post-test to help measure their understanding. Upon completion of the training the instructors receive a certificate of completion in online instruction using Moodle. A very basic student orientation was developed at the beginning of the process and now being revised.
| 4. "We immediately began offering numerous face-to-face Moodle training sessions along with an introductory on-line training course for all RCC employees (regardless of full-time or part-time status). We also developed a student resource site for FAQs, how-to videos and technical support."
| 5. "Faculty had training available both online and in face-to-face sessions spread February through May 2009. The online PTOI class is offered every semester and
currently, all faculty both full time and adjunct who teach on line have completed training. For SU 09 we offered five one hour orientations sessions for students. For Fall 09, we offered 8 orientation sessions face-to-face and developed an online orientation for student users. Students have had far less trouble navigating and using Moodle than they did with Blackboard. Our in-house trouble calls dropped from over 100 per day at beginning of a typical fall semester to less than 20. Seriously. The online orientation is used by faculty almost as much as by students. The Faculty resource site on the DL Advisory site is well used."

Question: Please list as much detail as possible about your college's course and resource upgrade strategy to Bb 9/Migration to Moodle.

<table>
<thead>
<tr>
<th>Blackboard Survey Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answers</strong></td>
</tr>
<tr>
<td>1. There were no conversions necessary. It was a simple upgrade from Bb 8.0 to Bb 9.0. No course conversions were required. We did move to a new server and it was necessary for faculty to export/import course content, as opposed to using the course copy feature. There were no new issues with vendor/publisher resources integration moving from Bb 8.0 to Bb 9.0, as publishers are slow to update their materials.</td>
</tr>
<tr>
<td>2. We did not have any &quot;conversions&quot; to worry about with the upgrade to 9.0 (as compared to those conversions needed to move to Moodle). However, some publishers were not ready for the Blackboard Learn 9 product. We experienced some difficulty with a few publishers' content, but they eventually were able to provide workable content. As stated previously, the students do not experience much difference from 7.3</td>
</tr>
<tr>
<td>3. &quot;Due to the fact that BCCC has progressively upgraded and was using BB version 8, the conversion for us was not difficult. Version 9 was designed to fix known problems and improve the user interface. The conversion of the courses presented very few problems. However, we did use a new server pair (front end IIS with a Backend SQL box) for a &quot;fresh install&quot;. The B88 server was online until we could make sure the new BB 9 servers were working correctly. As a precaution two full backups were made. The system was installed and tested before creating accounts and loading courses from B88 and course archives. The DL staff handled the actual course migration making it a relatively seamless move for the faculty. Blackboard recommends a review of the Blackboard and Dell Hardware Sizing Guide, Blackboard and Sun Hardware Sizing Guide, and Supported Server Software Configurations available in the Documentation section at Behind the Blackboard. Some issues that have presented integration problems are related to test banks and course cartridges not being supported by version 9. The new iteration of BB 9 makes it much easier to integrate social media and NCLOR, all with less clicks.&quot;</td>
</tr>
<tr>
<td>4. We didn’t actually convert any courses or upgrade an existing server. I did a clean install of Blackboard. Courses on the previous server were exported, then imported on the new version. We did this in order to start Bb9 with the cleanest database set that we could.</td>
</tr>
<tr>
<td>5. Courses will be converted by the server upgrade</td>
</tr>
<tr>
<td>6. We had to follow the upgrade path as follows: From 7.2 -&gt; 7.3 -&gt; 8.0 -&gt; 9.0 -&gt; 9.0 SP 1. No course conversions were required. The only vendor issue was with Campus Pack from Learning Objects (blogs, wikis, journals, podcasts, and expo); we had to upgrade the blocks and still had issues. Learning Objects finally released a fully compatible version a few weeks into Spring 2010.</td>
</tr>
</tbody>
</table>
Moodle Survey Results

1. Please see # 9 and 10 above.
2. Converted approximately 450 courses over a year and a half period as courses were to be offered online. All conversions were completed in house my the Distance Education office staff. Faculty were not involved in the conversion process. Faculty were asked to verify that their content had been moved to their Moodle courses.
3. As stated earlier we created core courses by migrating a single course that could then be adapted by each instructor. We also had a few courses that were built with publisher resources and several that were pulled down from the VLC.
4. All faculty and adjuncts were given access to both Moodle and Educator and were required to migrate their own courses over.
5. "We did the migration in stages: Summer, Fall, Spring, Summer. By May 12, we will have converted 180 different courses. This has been done with a 1.5 person staff. We decided as a team on the format we would use, number of topics, etc. We experimented until we had a handle on what conversion took and then proceeded course by course. The way we did it as a small school would be cumbersome for a large institution, but it worked. If training could be held, faculty could easily convert their own courses, but this was not the most efficient way for us. We selected a 17 topic format. At the time of conversion, faculty who chose to do so sat with us and chose conversions locations for course components and helped decide which things not to migrate. Those who did not were left with the task of clean-up after conversion. We used our usual course assessment instrument as a way to check readiness."

Blackboard Survey Results

1. The Bb help-desk was quite responsive during the upgrade. No complaints.
2. Blackboard has always provided great service. We did submit a couple of problem tickets with this upgrade and there was no delay in receiving help from their tech staff.
3. "During the upgrade process, the Blackboard Upgrade Team was very responsive and always professional. Presidium (24/7 helpdesk) was on board also. After a 30-45 day window, the upgrade team was "disbanded" and we began to contact the regular Managed Hosting support group. This group is not as responsive as I would hope. It may take 36-72 hours for them to respond if it is not a major outage."
4. BCCC’s experience with the Blackboard help-desk can be described as positive; we noticed a definite improvement in response time and a willingness to rapidly assist with problem-solving. The Blackboard help-desk staff (Behind the Blackboard) has conducted business in a very professional manner with a purposeful attitude. Behind the
Blackboard provides access to release notes which are very helpful prior to and during the process.

5. I strongly recommend putting the BB helpdesk on speed dial, and using them. The installation documentation, along with the Administrator's manual, omits several important details. This is especially true if you are installing on a single server. In past versions, the install process has not been overly problematic. Version 9, however, was very difficult and the documentation was no help at all.

6. Initial request for upgrade posted on Apr 12; response from tech support seemed slow, contacted tech support on Apr 15 and 19 trying to lock down a date for upgrade; emailed Karianne McKnoughton at bb for assistance. Project Coordinator called that day to set a date. License was requested on Apr 20; Will update after upgrade.

7. Blackboard helpdesk was phenomenal. By far the best support we have received from any company in a while. They were all geared up and ready to support clients on the move to the new version. We had no waiting to get issues resolved. Once they saw that it was regarding upgrade to Bb 9 it was expedited. Blackboard provided excellent resources to plan for the upgrade as well including concierge service to help with materials, etc.

Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. During our conversion, Remote-Learner responded to trouble tickets in a timely fashion (especially compared to Blackboard assistance we had been receiving.) They were very professional and helpful.</td>
<td>5</td>
</tr>
<tr>
<td>2. Surry currently uses Remote-Learner for hosting. Until last semester we had not experienced any downtime or server issues. Surry did experience a server problem that took RL ten days to resolve. However, from this instance they have improved their technical support services and Surry is currently satisfied with the level of support.</td>
<td>5</td>
</tr>
<tr>
<td>3. We have both a hosted site and a non hosted site. With both of these sites we have worked with Remote-Learner for set-ups and upgrades and have found their support excellent. They are very responsive to our help desk tickets and have resolved the issues very quickly. We have also had our sites upgraded and that was done with little to no downtime. Overall we are very pleased with their service and support.</td>
<td>5</td>
</tr>
<tr>
<td>4. &quot;Our Moodle instance(s) are hosted with Remote-Learner. Remote-Learner was incredibly helpful during the NCMUG pilot and during our migration process. Tickets were usually addressed within 24 hours.&quot;</td>
<td>5</td>
</tr>
<tr>
<td>5. We chose to partner with Remote Learner largely because of their relationship with the NCCCS. We were excited to have our server hosted so that there is 24-hour monitoring of service. Remote has been very helpful in quick response to trouble tickets, in answering questions, and in completing our first upgrade over the 09 Christmas break. Trouble tickets are seldom open for more than 24 hours, and mysteries are usually solved within the day.</td>
<td>5</td>
</tr>
</tbody>
</table>

Question: Please identify and prioritize any obstacles or barriers encountered during your upgrade/migration.
### Blackboard Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No obstacles or barriers.</td>
<td></td>
</tr>
<tr>
<td>2. There are none to mention.</td>
<td></td>
</tr>
<tr>
<td>3. Known issues in Blackboard Release 9.0 are not easily perused. We experienced the usual &quot;bugs&quot; in as .0 version of software. The browser compatibility was not an easy task. The information is now included in the upgrade package from Blackboard. Please take note of the operating system being used and the browser compatibility.</td>
<td></td>
</tr>
<tr>
<td>4. One ever-present barrier is time – time for instructors to devote to training, time for the DL staff to thoroughly prepare, and time for the IT area to assess the technology infrastructure. Often instructors’ schedules do not allow for much flexibility making it difficult to find enough time to set aside a block hours for training. The two most commonly identified issues with BB 9 are the Grade Center and the new Control Panel. Taking time to plan and develop appropriate training materials is crucial to a successful migration as is the upkeep of the hardware/software/connectivity.</td>
<td></td>
</tr>
<tr>
<td>5. Our installation is on a single server, as we only have approx. 130 courses and fewer than 1300 students enrolled in online courses each semester. Although the documentation says that a single server install is supported, I later came to find that it is not easy. The BB installer will not create several directories in Windows Server, and the installation fails. This was not documented. After several attempts, I manually created those directories before installing Bboard. That did allow the install to proceed. However, a single line of text in the install instructions would have saved me several hours of frustration. Later, after one of the service pack installs, the course statistics stopped recording student access in any areas except Content and Discussion Boards. Blackboard support has yet to provide a solution to this problem.</td>
<td></td>
</tr>
<tr>
<td>6. Upgrade will be preformed on May 16</td>
<td></td>
</tr>
<tr>
<td>7. Time was the number one obstacle. For the amount of updates we had to do we should have scheduled a week. It was hard enough to get two days of downtime.</td>
<td></td>
</tr>
</tbody>
</table>

7 answered question
1 skipped question

### Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The only real obstacles during our migration were the normal resistances to change and the small number of migration team members available during the summer.</td>
<td></td>
</tr>
<tr>
<td>2. The main issue was course conversion. It is simply a time-consuming task and with minimum resources it was a labor intensive task to make the move to Moodle. However, now that this is complete the advantages and cost savings of Moodle make it worth the effort.</td>
<td></td>
</tr>
<tr>
<td>3. The largest obstacle that we had to overcome was faculty overload and lack of Distance Education staff.</td>
<td></td>
</tr>
<tr>
<td>4. Faculty buy-in and resistance to change has been the biggest obstacle to overcome.</td>
<td></td>
</tr>
<tr>
<td>5. Lack of available administrator training is an ongoing problem. With huge class loads and heavy student demand, time for faculty training is scarce. Resources are always available.</td>
<td></td>
</tr>
</tbody>
</table>
scarce, and we spent lots of time determining how to do something with no funding. We did it, but it was intense. LMS admin resigned in March 2009 but was not related migration.

Question: Please share any lessons learned and/or best practices regarding your upgrade.

Blackboard Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bb did all the work. We just told them when to perform the upgrade. For us it was no big deal.</td>
<td>7</td>
</tr>
<tr>
<td>2. With the next upgrade, we will provide faculty with extra time to test the new Bb version (so that no one feels rushed). The best practice for us is to take advantage of Blackboard's test license and put the upgrade on a test server. This allows all DL faculty to be involved in the decision-making process.</td>
<td>7</td>
</tr>
<tr>
<td>3. &quot;Get a sandbox for faculty to experiment with the new technology on their own time. Provide a vigorous training program for all faculty. Be a strong support system for your faculty with the right attitude and all will eventually learn to love Learn!&quot;</td>
<td></td>
</tr>
<tr>
<td>4. &quot;Review and validate technology infrastructure; release 9 is a heavier load necessitating robust hardware. Thoroughly understand upgrade and configuration of the application and new components. Develop comprehensive training/orientation materials for faculty and students. Market/Highlight new release improvements. Involve stakeholders in decisions. Seek input from colleges that have experience with upgrading to BB9. Keep college administrators informed and up-to-date with timeline/implementation plan.&quot;</td>
<td></td>
</tr>
<tr>
<td>5. Overall, both myself and our faculty have been less than impressed with Blackboard 9. I would suggest that anyone thinking of upgrading to Bb 9 also give Moodle a close look. We recently made the decision to migrate to Moodle over the course of the next year. Our faculty who have looked at and experimented with Moodle would make the switch today, if that were possible.</td>
<td></td>
</tr>
<tr>
<td>6. Will update after May 16 upgrade</td>
<td></td>
</tr>
<tr>
<td>7. Lessons-learned document will be e-mailed to Jonathan Sweetin today, May 5.</td>
<td></td>
</tr>
</tbody>
</table>

Moodle Survey Results

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would strongly recommend the Remote-Learner migration training provided by Elizabeth von Briesen. She provided valuable insight and helpful strategies for the conversion process. It was also good to have a pilot group of early adopters. This helped with assistance and acceptance for the &quot;new&quot; product.</td>
<td>4</td>
</tr>
<tr>
<td>2. If had to do over I would have hired co-op or work-study students to help with the course</td>
<td></td>
</tr>
</tbody>
</table>
conversions. Guildford Tech recommended this a little too late for Surry to use.

3. Put a reasonable time line in place, identify key online instructors and have them move first and then have them share their experiences during faculty training sessions. Also put together as much material as possible for self paced training. But most important keep a very positive attitude, always pointing out the advantages of the migration.

4. "The one-hour training sessions targeting specific topics worked great to ease faculty through the initial conversion process. The Moodle Tips we make available as we learn and become more adept in the platform as crowd pleasers. As admins, we were not nearly prepared enough for the conversion on the back end, but we have survived just fine."

Question: Please indicate your level of satisfaction regarding the following...

<table>
<thead>
<tr>
<th>Blackboard Survey Results</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answers</td>
<td>Very Satisfied</td>
<td>Satisfied</td>
<td>Unsatisfied</td>
<td>Very Unsatisfied</td>
<td>No Opinion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upgrade:</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3.29</td>
<td>8</td>
</tr>
<tr>
<td>Training:</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3.57</td>
<td>8</td>
</tr>
<tr>
<td>Implementation:</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3.43</td>
<td>8</td>
</tr>
<tr>
<td>Student Satisfaction:</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2.83</td>
<td>8</td>
</tr>
<tr>
<td>Instructor Satisfaction:</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.86</td>
<td>8</td>
</tr>
<tr>
<td>Bb 9 Overall:</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3.14</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moodle Survey Results</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answers</td>
<td>Very Satisfied</td>
<td>Satisfied</td>
<td>Unsatisfied</td>
<td>Very Unsatisfied</td>
<td>No Opinion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migration:</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3.50</td>
<td>5</td>
</tr>
<tr>
<td>Training:</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3.20</td>
<td>5</td>
</tr>
<tr>
<td>Implementation:</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3.40</td>
<td>5</td>
</tr>
<tr>
<td>Student Satisfaction:</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.40</td>
<td>5</td>
</tr>
<tr>
<td>Instructor Satisfaction:</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2.80</td>
<td>5</td>
</tr>
<tr>
<td>Moodle Overall:</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.60</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section III: Total Cost of Ownership</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Please give the total cost of ownership involved for upgrade to Blackboard/Migrate to Moodle in the following training and course conversion areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Blackboard Survey Results

<table>
<thead>
<tr>
<th>College</th>
<th>Faculty Training Costs</th>
<th>Student Training Costs</th>
<th>Course Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>2</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>3</td>
<td>$0 additional ($0 incurred)</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>4</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>5</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>6</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>7</td>
<td>$2,500.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>8</td>
<td>$0--Training accomplished by existing College staff.</td>
<td>$0--same as above</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,500.00</strong></td>
<td><strong>$0.00</strong></td>
<td><strong>$0.00</strong></td>
</tr>
</tbody>
</table>

### Moodle Survey Results

<table>
<thead>
<tr>
<th>College</th>
<th>Faculty Training Costs</th>
<th>Student Training Costs</th>
<th>Course Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1700</td>
<td>$0.00</td>
<td>$8250.00</td>
</tr>
<tr>
<td>2</td>
<td>$5000.00</td>
<td>No direct costs</td>
<td>No direct costs</td>
</tr>
<tr>
<td>3</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>4</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>5</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$6700.00</strong></td>
<td><strong>$0.00</strong></td>
<td><strong>$8250.00</strong></td>
</tr>
</tbody>
</table>

**Question:** Please give the total cost of ownership involved for upgrade to Blackboard in regards to hosting and staffing cost.

### Blackboard Survey Results

<table>
<thead>
<tr>
<th>College</th>
<th>Vendor hosting costs: (annually)</th>
<th>Self-hosted Server Hardware cost: (example: initial hardware set-up costs, ongoing maintenance cost)</th>
<th>Staff cost: (example: salary or % of salary of any additional staff used during upgrade, any staff compensation cost, etc.)</th>
<th>Self-hosted Server Admin cost: (example: salary or % of salary for Bb server admin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Our hosting costs with Bb ASP increase 5% annually</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0 (no new position required)</td>
<td>0 (no new position required)</td>
</tr>
<tr>
<td>3</td>
<td>Year 1: $65K, Year 2: $66.5K, Year 3: $68K</td>
<td>$20K</td>
<td>No additional staff required</td>
<td>Not applicable</td>
</tr>
<tr>
<td>4</td>
<td>purchased new server, approximately $8,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>New Server</td>
<td>0</td>
<td>$35,000-$40,000 per year</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Approx. $1000/year</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>N/A</td>
<td>Approximately 12 days comp time for IT staff and admin.</td>
<td>see above</td>
<td>see above</td>
</tr>
</tbody>
</table>
### Moodle Survey Results

<table>
<thead>
<tr>
<th>College</th>
<th>Vendor hosting costs: (annually)</th>
<th>Self-hosted Server Hardware cost: (example: initial hardware set-up costs, ongoing maintenance cost)</th>
<th>Staff cost: (example: salary or % of salary of any additional staff used during upgrade, any staff compensation cost, etc.)</th>
<th>Self-hosted Server Admin cost: (example: salary or % of salary for Bb server admin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7540</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>$9,000 for level III support</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>$9,995.00 per year</td>
<td>$5,500.00 one time set up cost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>9995</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>~$4000</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
</tr>
</tbody>
</table>

Question: Please give the total cost of ownership involved for upgrade to Blackboard in regards to any additional costs not previously reported.

### Blackboard Survey Results

<table>
<thead>
<tr>
<th>College</th>
<th>Cost 1 - name; amount : (if any)</th>
<th>Cost 2 - name; amount : (if any)</th>
<th>Cost 3 - name; amount : (if any)</th>
<th>Cost 4 - name; amount : (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>External drives for storage and archive transport $200</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$200</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

### Moodle Survey Results

<table>
<thead>
<tr>
<th>College</th>
<th>Cost 1 - name; amount : (if any)</th>
<th>Cost 2 - name; amount : (if any)</th>
<th>Cost 3 - name; amount : (if any)</th>
<th>Cost 4 - name; amount : (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Question: Do you have any additional information you would like to share with the assessment team?

**Blackboard Survey Results**

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Blackboard 9.0 is a welcome change from previous versions of Blackboard. I look forward to seeing Blackboard 9.1.</td>
<td>5</td>
</tr>
<tr>
<td>2. Instructors were encouraged to &quot;re-build&quot; their courses in Blackboard Learn 9.0 instead of importing content from courses built in previous versions. (We may not have experienced some of the minor issues had the instructors done this.) Blackboard was very supportive during the upgrade process. We requested weekly project meetings once we neared the upgrade date. Documents at Blackboard: Getting Started with the Grade Center and Supported Browsers. They most likely have more to share now.</td>
<td>5</td>
</tr>
<tr>
<td>3. Many hours have been dedicated to the use of Blackboard as an LMS at this College and others in the NCCCS. Instructors, students, and staff have focused years of work on utilizing this software for teaching/learning, resulting in unprecedented success with distance learning. The continued use of BB for us is a top priority. The new release represents Blackboard’s commitment to responding to consumer input and customer service. Blackboard’s new versions reflect the company’s attention to the importance of the integration of new technologies and ease of use for both faculty and students. Hopefully, NCCCS will give serious consideration to maintaining a contract with Blackboard.</td>
<td>5</td>
</tr>
<tr>
<td>4. For value received, Bb 9 is not what we expected, wanted, or needed. The improvements over Bb 7 are minimal, and it is much less user-friendly to both faculty and students.</td>
<td>5</td>
</tr>
<tr>
<td>5. Will send supporting documents of v9 training.</td>
<td></td>
</tr>
</tbody>
</table>

**Moodle Survey Results**

<table>
<thead>
<tr>
<th>Answers</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Moodle has been a viable option for a LMS for Surry. Faculty and students have been satisfied with the change from Blackboard.</td>
<td>5</td>
</tr>
<tr>
<td>2. The faculty who has made the migration to Moodle has found that it is very easy to use and that students have little to no trouble using this system. The faculty has also found that the design of Moodle is very flexible and allows them to become a better online instructor.</td>
<td>5</td>
</tr>
<tr>
<td>3. The quizzing feature of Moodle is not quite as robust as with other LMS systems such as Blackboard. However, it will allow the import of questions and assessments from Blackboard and other LMS, which is still a somewhat cumbersome process.</td>
<td>5</td>
</tr>
<tr>
<td>4. &quot;These costs reflect that the work was done by staff and faculty with no additional compensation (or release time). We used free products such as the LSU converter and multiple instances of the 30 day free trial of Respondus. We use free web products such as AuthorStream and Jing. This</td>
<td>5</td>
</tr>
</tbody>
</table>
project was a huge one for us, but now, we would not go back if you paid us to use BBd. The student friendliness alone is worth all the efforts.”

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>5</td>
</tr>
<tr>
<td>skipped question</td>
<td>3</td>
</tr>
</tbody>
</table>
Learning Technology Systems Operation and Business Requirements:  

Macro-centric Resources Applied at the Micro level  

Dr. Bill Randall  
Associate Vice President, Learning Technology Systems  
North Carolina Community College System  
June 25, 2010  

Overview  

The North Carolina Community College System (NCCCS) Learning Technology Systems (LTS) Department provides e-learning infrastructure, library resources, learning content, standards, and support for online and distance learning course registrations that totaled 588,000 curriculum and 80,000 occupational and continuing education across the state during the 2009 academic year (source: NCCCS Data Warehouse). Efforts of the LTS are based on  

1. Innovative operation and business requirements and strategies that have evolved over the past five years as the NCCCS has accommodated an unprecedented increased student demand for non-traditional instruction;  
2. Recommendations of the North Carolina e-Learning Commission that focus on providing access to learning opportunities for all North Carolina citizens regardless of age or locale; and  
3. The assumption that collaboration and realization of economies-of-scale solutions provide a viable means for the NCCCS to re-allocate public funding to provide uniform, robust learning opportunities to all adult learners across North Carolina.  

LTS Operation and Business Requirements have been articulated to provide structure for strategic and budget planning, integrate departmental efforts more effectively, improve assessment/evaluation of products and services, and meet all responsibilities of the department. These Business Requirements integrate or comply with the Goals, Culture of Assessment, Responsibilities, and Infrastructure Objectives of the department. Further, these business requirements are formulated on three concepts:  

Alignment Strategy in which all new learning infrastructure, processes, and methodologies will conform to three conditions (standards, scalability, and consortium-appropriate contracts/financing) to insure economies-of-scale efficiencies and eventual convergence of all K-20 learning infrastructures.  

Integrated Functionality that articulates the overall goal of establishing an array of compatible, interoperable learning technologies that can be selected by individual instructors, departments, or colleges as needed, to fully support any learning/instructional requirement – thus providing and focusing macro-leveraged resources at a micro-level.
Funding/Resources Matrix in which all learning technology resources and funding sources are categorized into six support areas required to support any community college or K-20 institution. The matrix enables global support to all NCCCS institutions to be articulated as practical categories of service, each tagged with individual funding sources. Thus the matrix provides an overview of System Office support strategy uniquely established to directly support and compliment individual college learning technology infrastructure.

Learning Technology Systems Operation and Business Requirements

Drawing upon the components articulated in the overview, the following business requirements have been developed:

- Provide a basis for planning and resource management
- Comply with State and System visions, missions, and strategic plans
- Provide a template for integration, coordination, and cost savings
- Collectively and over time serve to transform independent components into an Integrated Learning System supported by a culture of assessment
- Provide NCCCS advantages in vendor contract negotiations by:
  - Improving efficiency of vendor/client relationships & communications
  - Fostering a culture of assessment
  - Streamlining business processes
- Provide appropriate language for business analysts, legislators, and administrators
- All e-learning infrastructure, content development, and support components must support and/or be in alignment with
  - Recommendations of the NC e-Learning Commission & PreK-20 focus
  - An Alignment Strategy that places emerging e-learning infrastructure and support services of different educational entities on converging paths
  - Integrated Functionality concept
  - Good stewardship of public funds – reduce duplication of development costs
  - Culture of collaboration and resource sharing
  - A Culture of Assessment
- Learning technology planning, expansion, and evaluation accommodate the following
  - Centralized or regionalized scalable solutions
  - Minimized risks
    - Security
    - Technical issues/complexity/upgrades/patches/maintenance
  - Expansion solutions for increased capacity involving
    - Memory
    - Hardware array
    - IT support
  - Support, assessment, and monitoring tools & strategies
  - K-20 expansion
• Short-term & long-term “road maps” consistent with NCCCS and K-20 goals and objectives
• Strategic implementation processes that take advantage of technical evolution (leveraging emerging technologies over time)
• Consideration of value-added components
  • Identification of hidden costs including
    • Faculty, student, and staff training
    • Security testing and security response planning
    • Industry standard support processes
    • Product maintenance and upgrade maintenance
    • Student authentication and plagiarism detection
    • Customized development and design
    • Ongoing performance and scalability testing
    • Duplication of services within the NCCCS

**Balanced Learning Technology Infrastructure**

Six resources are required by all comprehensive community colleges to fully support learning technology. Should any of the six not be present, support for learning technology is jeopardized. These resources must be “balanced” and compatible.

**Six Resources Required at all Community Colleges**

1. Data network and broadband connectivity
2. Instructional content
3. Ability to deliver content
4. Support services for students, instructors, and support staff
5. Means to collaborate and communicate at departmental, discipline, and college levels
6. Learning support and resources – including library automation and cataloging services

**Six Resources Required to Support Community Colleges at a Systems Level**

1. Broadband connectivity
   a. Expanding NCCCS data network and migration to MCNC
   b. Access to applications hosted on the state backbone
2. Learning & teaching content
   a. Capacity to develop and deliver digital learning content (VLC courses & Learning objects)
   b. Use of commercial learning content (example: NROC)
   c. Use of STEM supplements (example: LateNiteLabs)
3. Delivery vehicles
   a. Course management system (Blackboard & Moodle) to conduct online teaching & learning
   b. Learning object repository for cataloging, accessing, acquiring and sharing content
   c. Collaboration tools – webinar & communication resources
4. **Support services**
   a. Online help desk (students)
   b. Professional development (VLC & NC-NET)

5. **Collaboration**
   a. Establish best possible planning, support & infrastructure
   b. Realize economies of scale solutions (VLC Centers)
   c. Development of partnerships internal and external

6. **Library resources**
   a. Online resources, e-books, NCLIVE
   b. Library automation services – SIRSI/CCLINC
   c. Cataloging services

---

**Funded Infrastructure Components 2009**

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>Content</th>
<th>Delivery</th>
<th>Support</th>
<th>Collaboration</th>
<th>Library Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralized services</td>
<td>Learning objects</td>
<td>Blackboard Proprietary CMS</td>
<td>Online Help Desk</td>
<td>VLC Support &amp; Development Centers</td>
<td>Books, e-books, journals</td>
</tr>
<tr>
<td>LEA, CC &amp; UNC partners</td>
<td>Learning modules</td>
<td>Moodle Open Source CMS</td>
<td>Online Student Orientation</td>
<td>SIRSI/CCLINC Consortium</td>
<td>digital content &amp; learning objects</td>
</tr>
<tr>
<td>Satellite campuses</td>
<td>Online courses</td>
<td>Elluminate Web Conferencing</td>
<td>VLC staff development</td>
<td>2+2 NCCCS/UNC</td>
<td>NCLIVE</td>
</tr>
<tr>
<td>Regional networks</td>
<td>SAS Curriculum Pathways</td>
<td>ITV Video services</td>
<td>NC-NET</td>
<td>NC-NET</td>
<td>Other Instructional resources</td>
</tr>
<tr>
<td>Uniform services</td>
<td>LateNiteLabs Science Lab</td>
<td>NCLOR</td>
<td>LEARN NC</td>
<td>NCLOR</td>
<td>Help Desk</td>
</tr>
<tr>
<td>Future expansion at local level</td>
<td>National Repository for Online Content</td>
<td>LTS Staff Positions</td>
<td>Open Source Collaborative</td>
<td></td>
<td>Virtual Computing Lab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LEARN NC</td>
</tr>
</tbody>
</table>
Examples of Resources Compliant with LTS Business Requirements

**North Carolina Learning Object Repository**

- Centralized on state backbone
- Economies of scale savings – hardware, software license, IT support
- System-wide, state-wide distribution
- Standards based – can “federate” with other state & regional LORs
- Developed by PreK-20 leadership group
- Contract and scope of project created for total PreK-20 expansion
- CMS independent learning content repository
- Reduces cost/effort of duplication
- Enables educators to share work
- Based on quality standards
- Supports individual, group, & commercial items and/or collections

**SIRSI/CCLINC Consortium**

- Fully functional, expandable Integrated Library System serving 46 community colleges
- Prototype for NCCCS consortium solutions – identified by ITS as “best legacy consortium” in NC 2005
- Customized RFP vendor selection process progressing to consortium contract and organization
- Economies of scale savings – hardware, software license, IT support
- Integrates/supports Cataloging Services
- Streamlines library services
- Excellent example of vendor/client cooperation/collaboration
- 99.99% up time record
- Mature resource complete with assessment strategies and client-controlled governance

**North Carolina e-Learning Commission Phase Two Recommendations 2006**

- Recommendation #2: Provide comprehensive e-learning opportunities for all North Carolina Citizens…and …ensure coordination and seamless access to all e-learning opportunities for all citizens
- Recommendation #9: Establish the NC Learning Object Repository (LOR) to support PreK-20 e-learning
- Recommendation #12: Identify and implement a common online learning platform LMS (CMS) statewide
  - Must contain multimedia, collaboration tools and assessment tools
  - Must support interactive learning objects, and have tracking capabilities
  - Must accommodate age appropriateness and be easy to use by all including developmentally and intellectually challenged users
- Recommendation #13: Exercise economies of scale purchasing to reduce the cost per student in all instructional technologies
  - Negotiate single contracts for all instructional and distance learning technologies with licensing determined by an FTE/enrollment formula encompassing all educational systems
More flexible procurement, including multi-year contracts to maximize cost effectiveness
Invest in appropriate “open source” learning technologies to eventually replace proprietary systems and avoid escalating costs

**Supplemental Information**

**Goals of an Alignment Strategy**

- To replace institutional-centric (silo effect) instructional technology with System-centric instructional technology solutions
- To evolve procurement strategies that place institutions (and Systems) on converging technical paths utilizing the "best of breed" and/or best value technologies based on common standards and volume purchases/discounts; Contracts reflect true consortium solutions
- Emphasis placed on technology that promotes collaboration and sharing of resources while reducing duplication of time, effort, and cost
- Provide robust and uniform learning technology services to all community colleges
- Collaborate with PreK-20 North Carolina partners to establish technology platforms that support consistent, seamless instructional technology
- Establish partnerships with regional and national leaders in sharable instructional technology and systems
- Explore alternative solutions and economic models for mission critical technologies
- Transition from traditional proprietary to open source instructional technology and/or scalable, proprietary technology that accommodates consortium licensing & networked access
- Establish a state-wide Learning Object Repository for digital learning and teaching content
- Develop tracking of digital content use for ROI calculations
- Develop consistent policy and funding models that facilitate learning technology
- NCCCS staff will continuously evaluate current & emerging solutions
- Goal of single sign-on, permissions-based, ever improving array of applications
- All hosted applications to reside on the NC State “Backbone”

**Integrated Functionality** – process of migration to instructional technology solutions that

- Are standards-based
- Are scalable
- Are open source or licensed via aggregate FTE/enrollment basis
- Vendor interoperability
  - Open APIs, available to all NCCCS vendors
  - Avoid “vendor lock-in” situation in which a single vendor has exclusive contract with NCCCS
- Provide a menu of learning/teaching/sharing resources in which
  - All e-learning infrastructure/support components must be compatible
  - Collective components will form a menu of solutions to maximize flexibility and increase choices for colleges, departments, and instructors
Goals of LTS Operation and Business Requirements

- Enhance “opportunity and access” of learning to NC adult learners
- Improve quality of instruction, learning content & delivery tools
- Ensure that NCCCS LTS is a good steward of public money
- Network the 58 NCCCS institutions to realize economies-of-scale solutions
- Establish “macro-centric” resources that apply to “micro-learning environments”. In other words, all LTS resources will eventually migrate to cost-effective cloud computing solutions that provide maximum flexibility and utility at the student/instructor interface – the point at which learning and teaching takes place

Culture of Assessment

- All aspects/components of NCCCS e-learning/distance learning infrastructure will undergo an assessment process to ensure accountability and document performance
- This culture of assessment will form the foundation of how e-learning/distance learning infrastructure, content development, and support services evolve over time (based on the effectiveness of existing assessment protocol of Library Automation and Cataloging Services)
  - Within LTS to establish an ongoing assessment and incremental improvement process to measure and report performance of all LTS services – engaging internal and external stakeholder/client groups
  - Within the NCCCS to connect and streamline efforts of individual departments such that programs are interconnected and coordinated – further reducing duplication of effort
  - Connect & integrate NCCCS with K-12 & UNC in areas of infrastructure, standards, planning, procurement, and student services

Responsibilities of LTS

- Support community colleges
- Provide for community colleges what they cannot provide themselves
- Promote quality and assessment
- Maximize number/quality of flexible resources to colleges – establish a menu of compatible, integrated resources
- Establish a protocol that inexorably improves resources over time
- Evaluate and report LTS performance in all areas of service

Infrastructure Objectives

- Establish robust/uniform learning/teaching tools and resources state-wide
- Realize economies-of-scale in all investment of new public allocations
- Reduce duplication of development costs, networking, & effort
- Adopt protocols that utilize an “alignment strategy” and “integrated functionality” to fully realize economies of scale while simultaneously upgrading learning/teaching technology System wide
## North Carolina Community College System
### ICR Curriculum - Course/FTE Universe

#### Total Students (Duplicated) and FTE by College by Method of Instruction

**Report:** DL100ANN  
**College Year:** 2009 (Fall, Spring, and Summer Semesters)  
**Last Refreshed on:** 3/14/2010

<table>
<thead>
<tr>
<th>College Name</th>
<th>Internet Course</th>
<th>Telecourse</th>
<th>Teleweb</th>
<th>Two-Way Video</th>
<th>Hybrid</th>
<th>Web-Supported</th>
<th>Digital Media</th>
<th>Other Non Distance Learning (TR, CP, IS)</th>
<th>All Distance Learning</th>
<th>Percentage of DL Method to All Methods (Traditional, CP, IS and Distance Learning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alamance CC</td>
<td>3,396</td>
<td>348</td>
<td>945</td>
<td>4,660</td>
<td>612</td>
<td>23,912</td>
<td>2,909</td>
<td>5,803</td>
<td>1,067</td>
<td>26.91% 26.64%</td>
</tr>
<tr>
<td>Asheville-Buncombe TCC</td>
<td>6,429</td>
<td>601</td>
<td>5,162</td>
<td>777</td>
<td>12,979</td>
<td>1,571</td>
<td>22,657</td>
<td>2,835</td>
<td>24,570</td>
<td>2,950 52.21% 50.99%</td>
</tr>
<tr>
<td>Beaufort County CC</td>
<td>2,089</td>
<td>211</td>
<td>1,723</td>
<td>190</td>
<td></td>
<td>8,057</td>
<td>1,131</td>
<td>3,812</td>
<td>401</td>
<td>32.09% 26.19%</td>
</tr>
<tr>
<td>Bladen CC</td>
<td>2,058</td>
<td>339</td>
<td>521</td>
<td>546</td>
<td>55</td>
<td>5,638</td>
<td>813</td>
<td>4,747</td>
<td>628</td>
<td>48.72% 32.38%</td>
</tr>
<tr>
<td>Blue Ridge CC</td>
<td>2,199</td>
<td>212</td>
<td>434</td>
<td>41</td>
<td>1,400</td>
<td>239</td>
<td>10,374</td>
<td>1,287</td>
<td>4,033</td>
<td>492 27.99% 27.57%</td>
</tr>
<tr>
<td>Brunswick CC</td>
<td>1,242</td>
<td>138</td>
<td>156</td>
<td>14</td>
<td>559</td>
<td>115</td>
<td>1,595</td>
<td>2051</td>
<td>5,556</td>
<td>3534 38.86% 44.65%</td>
</tr>
<tr>
<td>Caldwell CC and TI</td>
<td>3,627</td>
<td>364</td>
<td>37</td>
<td>318</td>
<td>37</td>
<td>460</td>
<td>436</td>
<td>5,670</td>
<td>1,082</td>
<td>13,654 1,774 17,371 1,969 56.28% 52.60%</td>
</tr>
<tr>
<td>Cape Fear CC</td>
<td>8,555</td>
<td>827</td>
<td>3,216</td>
<td>376</td>
<td></td>
<td>49,290</td>
<td>6,113</td>
<td>11,771</td>
<td>1,202</td>
<td>19.26% 16.44%</td>
</tr>
<tr>
<td>Carteret CC</td>
<td>3,134</td>
<td>304</td>
<td>671</td>
<td>55</td>
<td>3,171</td>
<td>459</td>
<td>4,820</td>
<td>664</td>
<td>6,976</td>
<td>849 59.14% 56.08%</td>
</tr>
<tr>
<td>Catawba Valley CC</td>
<td>6,906</td>
<td>698</td>
<td>761</td>
<td>693</td>
<td>668</td>
<td>2,849</td>
<td>468</td>
<td>2,307</td>
<td>3,189</td>
<td>11,146 1,273 25.65% 25.59%</td>
</tr>
<tr>
<td>Central Carolina CC</td>
<td>7,723</td>
<td>800</td>
<td>1,461</td>
<td>49</td>
<td></td>
<td>23,144</td>
<td>3,116</td>
<td>9,233</td>
<td>974</td>
<td>28.52% 23.83%</td>
</tr>
<tr>
<td>Central Piedmont CC</td>
<td>25,803</td>
<td>2,644</td>
<td>170</td>
<td>114</td>
<td>1,141</td>
<td>114</td>
<td>8,833</td>
<td>667</td>
<td>28.09% 23.28%</td>
<td></td>
</tr>
<tr>
<td>Cleveland CC</td>
<td>4,351</td>
<td>480</td>
<td>102</td>
<td>18</td>
<td>2,229</td>
<td>242</td>
<td>5,224</td>
<td>242</td>
<td>17,118</td>
<td>5,205 25.75% 25.43%</td>
</tr>
<tr>
<td>Coastal Carolina CC</td>
<td>7,050</td>
<td>669</td>
<td>102</td>
<td>18</td>
<td>2,193</td>
<td>48</td>
<td>2399</td>
<td>147</td>
<td>7,120</td>
<td>677 18.02% 16.32%</td>
</tr>
<tr>
<td>College of the Albemarle</td>
<td>5,031</td>
<td>455</td>
<td>227</td>
<td>26</td>
<td>1,092</td>
<td>139</td>
<td>5,665</td>
<td>743</td>
<td>11,336</td>
<td>5,665 66.65% 63.25%</td>
</tr>
<tr>
<td>Craven CC</td>
<td>7,731</td>
<td>770</td>
<td>2,846</td>
<td>497</td>
<td></td>
<td>11,894</td>
<td>1,351</td>
<td>11,022</td>
<td>1,305</td>
<td>48.10% 49.14%</td>
</tr>
<tr>
<td>Davidson County CC</td>
<td>6,280</td>
<td>620</td>
<td>631</td>
<td>62</td>
<td>4,352</td>
<td>665</td>
<td>7,719</td>
<td>914</td>
<td>7,601</td>
<td>1,909 2,265 71.43% 69.29%</td>
</tr>
<tr>
<td>Durham TCC</td>
<td>4,513</td>
<td>435</td>
<td>1,653</td>
<td>207</td>
<td></td>
<td>28,352</td>
<td>3,307</td>
<td>6,196</td>
<td>642</td>
<td>16.69% 16.27%</td>
</tr>
<tr>
<td>Edgecombe CC</td>
<td>3,998</td>
<td>447</td>
<td>37</td>
<td>3</td>
<td>1,116</td>
<td>124</td>
<td>10,885</td>
<td>1,588</td>
<td>5,151</td>
<td>574 32.12% 25.58%</td>
</tr>
<tr>
<td>Fayetteville TCC</td>
<td>25,558</td>
<td>2,500</td>
<td>255</td>
<td>33</td>
<td>579</td>
<td>75</td>
<td>6,336</td>
<td>769</td>
<td>43,740</td>
<td>32,768 42.98% 38.11%</td>
</tr>
</tbody>
</table>
## North Carolina Community College System

### ICR Curriculum - Course/FTE Universe

**Total Students (Duplicated) and FTE by College by Method of Instruction**

**Report:** DL100ANN  
**College Year:** 2009 (Fall, Spring, and Summer Semesters)  
**Last Refreshed on:** 3/14/2009

**NOTE:** Summer (02) data is non-budget FTE. Fall (01) and Spring (01) are budget FTE.

<table>
<thead>
<tr>
<th>College Name</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>Other Non Distance Learning (TR, CP, IB)</th>
<th>All Distance Learning Methods</th>
<th>Percentage of DL Method to All Methods (Traditional, CP, IB, and Distance Learning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forsyth TCC</td>
<td>12,410</td>
<td>1,289</td>
<td>330</td>
<td>29</td>
<td>3,834</td>
<td>492</td>
<td>5,813</td>
<td>950</td>
<td>33,196</td>
<td>4,094</td>
<td>22,367</td>
<td>2,760</td>
<td>40.26%</td>
<td>40.27%</td>
<td></td>
</tr>
<tr>
<td>Gaston College</td>
<td>8,379</td>
<td>862</td>
<td>117</td>
<td>12</td>
<td>2,974</td>
<td>325</td>
<td>2,253</td>
<td>295</td>
<td>27,030</td>
<td>3,545</td>
<td>13,732</td>
<td>1,495</td>
<td>33.69%</td>
<td>29.66%</td>
<td></td>
</tr>
<tr>
<td>Guilford TCC</td>
<td>10,460</td>
<td>1,019</td>
<td>262</td>
<td>2</td>
<td>754</td>
<td>121</td>
<td>12,089</td>
<td>1,607</td>
<td>59,334</td>
<td>7,193</td>
<td>23,565</td>
<td>2,772</td>
<td>28.43%</td>
<td>27.82%</td>
<td></td>
</tr>
<tr>
<td>Halifax CC</td>
<td>1,947</td>
<td>185</td>
<td>130</td>
<td>13</td>
<td>1,639</td>
<td>213</td>
<td>2,757</td>
<td>394</td>
<td>3,884</td>
<td>576</td>
<td>6,473</td>
<td>804</td>
<td>62.50%</td>
<td>58.26%</td>
<td></td>
</tr>
<tr>
<td>Haywood CC</td>
<td>4,236</td>
<td>440</td>
<td>37</td>
<td>3</td>
<td>424</td>
<td>69</td>
<td>14</td>
<td>1</td>
<td>10,726</td>
<td>1,329</td>
<td>4,710</td>
<td>514</td>
<td>30.51%</td>
<td>27.87%</td>
<td></td>
</tr>
<tr>
<td>Isothermal CC</td>
<td>1,921</td>
<td>196</td>
<td>11</td>
<td>1</td>
<td>1,185</td>
<td>153</td>
<td>15</td>
<td>1</td>
<td>14,014</td>
<td>1,863</td>
<td>3,106</td>
<td>349</td>
<td>18.14%</td>
<td>15.78%</td>
<td></td>
</tr>
<tr>
<td>James Sprunt CC</td>
<td>842</td>
<td>80</td>
<td>114</td>
<td>11</td>
<td>510</td>
<td>59</td>
<td>969</td>
<td>182</td>
<td>6,480</td>
<td>792</td>
<td>2,435</td>
<td>331</td>
<td>27.31%</td>
<td>29.47%</td>
<td></td>
</tr>
<tr>
<td>Johnston CC</td>
<td>6,475</td>
<td>668</td>
<td>73</td>
<td>7</td>
<td>1,587</td>
<td>207</td>
<td>378</td>
<td>51</td>
<td>19,574</td>
<td>2,821</td>
<td>8,513</td>
<td>932</td>
<td>30.31%</td>
<td>24.84%</td>
<td></td>
</tr>
<tr>
<td>Lenior CC</td>
<td>6,902</td>
<td>700</td>
<td>350</td>
<td>4</td>
<td>350</td>
<td>47</td>
<td>15</td>
<td>1</td>
<td>15,445</td>
<td>2,016</td>
<td>7,252</td>
<td>747</td>
<td>31.95%</td>
<td>27.03%</td>
<td></td>
</tr>
<tr>
<td>Martin CC</td>
<td>988</td>
<td>94</td>
<td>48</td>
<td>5</td>
<td>665</td>
<td>95</td>
<td>861</td>
<td>114</td>
<td>1,860</td>
<td>279</td>
<td>2,592</td>
<td>307</td>
<td>58.22%</td>
<td>52.40%</td>
<td></td>
</tr>
<tr>
<td>Mayland CC</td>
<td>950</td>
<td>95</td>
<td>50</td>
<td>5</td>
<td>335</td>
<td>25</td>
<td>50</td>
<td>6</td>
<td>8,547</td>
<td>1,228</td>
<td>1,289</td>
<td>131</td>
<td>12.96%</td>
<td>9.69%</td>
<td></td>
</tr>
<tr>
<td>McDowell TCC</td>
<td>791</td>
<td>69</td>
<td>54</td>
<td>7</td>
<td>596</td>
<td>72</td>
<td>122</td>
<td>17</td>
<td>7,764</td>
<td>1,177</td>
<td>1,656</td>
<td>175</td>
<td>17.58%</td>
<td>12.93%</td>
<td></td>
</tr>
<tr>
<td>Mitchell CC</td>
<td>2,365</td>
<td>238</td>
<td>58</td>
<td>7</td>
<td>1,538</td>
<td>178</td>
<td>4,207</td>
<td>590</td>
<td>11,576</td>
<td>1,366</td>
<td>8,265</td>
<td>1,012</td>
<td>41.66%</td>
<td>42.58%</td>
<td></td>
</tr>
<tr>
<td>Montgomery CC</td>
<td>1,149</td>
<td>110</td>
<td>137</td>
<td>15</td>
<td>472</td>
<td>75</td>
<td>15</td>
<td>1</td>
<td>4,190</td>
<td>612</td>
<td>1,808</td>
<td>200</td>
<td>30.14%</td>
<td>24.60%</td>
<td></td>
</tr>
<tr>
<td>Nash CC</td>
<td>2,430</td>
<td>256</td>
<td>490</td>
<td>6</td>
<td>490</td>
<td>61</td>
<td>580</td>
<td>91</td>
<td>13,754</td>
<td>1,848</td>
<td>3,500</td>
<td>408</td>
<td>20.25%</td>
<td>18.07%</td>
<td></td>
</tr>
<tr>
<td>Pamlico CC</td>
<td>775</td>
<td>79</td>
<td>11</td>
<td>1</td>
<td>775</td>
<td>10</td>
<td>70</td>
<td>23</td>
<td>21,444</td>
<td>3,057</td>
<td>5,712</td>
<td>614</td>
<td>29.79%</td>
<td>27.06%</td>
<td></td>
</tr>
<tr>
<td>Piedmont CC</td>
<td>3,685</td>
<td>364</td>
<td>572</td>
<td>54</td>
<td>1,454</td>
<td>156</td>
<td>6</td>
<td>1</td>
<td>14,246</td>
<td>1,850</td>
<td>5,756</td>
<td>595</td>
<td>28.74%</td>
<td>24.43%</td>
<td></td>
</tr>
<tr>
<td>Pitt CC</td>
<td>10,148</td>
<td>988</td>
<td>429</td>
<td>4</td>
<td>4,297</td>
<td>494</td>
<td>5,592</td>
<td>706</td>
<td>32,583</td>
<td>4,240</td>
<td>20,037</td>
<td>2,188</td>
<td>38.08%</td>
<td>34.04%</td>
<td></td>
</tr>
<tr>
<td>Randolph CC</td>
<td>3,675</td>
<td>365</td>
<td>308</td>
<td>30</td>
<td>617</td>
<td>71</td>
<td>439</td>
<td>51</td>
<td>11,692</td>
<td>1,570</td>
<td>5,039</td>
<td>517</td>
<td>30.12%</td>
<td>24.76%</td>
<td></td>
</tr>
<tr>
<td>Richmond CC</td>
<td>1,562</td>
<td>165</td>
<td>942</td>
<td>72</td>
<td>1,383</td>
<td>197</td>
<td>9,521</td>
<td>1,051</td>
<td>3,857</td>
<td>434</td>
<td>28.87%</td>
<td>29.24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roanoke Chowan CC</td>
<td>1,045</td>
<td>100</td>
<td>583</td>
<td>65</td>
<td>583</td>
<td>65</td>
<td>583</td>
<td>65</td>
<td>3,690</td>
<td>494</td>
<td>1,528</td>
<td>166</td>
<td>30.61%</td>
<td>25.09%</td>
<td></td>
</tr>
</tbody>
</table>
## North Carolina Community College System

### ICR Curriculum - Course/FTE Universe

**Total Students (Duplicated) and FTE by College by Method of Instruction**

**Report:** DL100ANN  
**College Year:** 2009 (Fall, Spring, and Summer Semesters)  
**Last Refreshed on:** 9/14/2009

**NOTE:** Summer (S) data is non-budget FTE. Fall (F) and Spring (S) are budget FTE.

<table>
<thead>
<tr>
<th>College Name</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>No. of Students</th>
<th>Total FTE</th>
<th>Percentage of DL Method to All Methods (Traditional, CP, IS and Distance Learning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robeson CC</td>
<td>3,200</td>
<td>347</td>
<td>10</td>
<td>1</td>
<td>345</td>
<td>40</td>
<td>945</td>
<td>127</td>
<td>12,604</td>
<td>1,805</td>
<td>4,500</td>
</tr>
<tr>
<td>Rockingham CC</td>
<td>1,354</td>
<td>139</td>
<td>15</td>
<td>1</td>
<td>886</td>
<td>106</td>
<td>2,332</td>
<td>253</td>
<td>12,570</td>
<td>1,646</td>
<td>2,332</td>
</tr>
<tr>
<td>Rowan-Cabarrus CC</td>
<td>5,746</td>
<td>566</td>
<td>379</td>
<td>36</td>
<td>922</td>
<td>253</td>
<td>41,842</td>
<td>4,388</td>
<td>7,915</td>
<td>937</td>
<td>9,372</td>
</tr>
<tr>
<td>Sampson CC</td>
<td>904</td>
<td>92</td>
<td>219</td>
<td>21</td>
<td>1,065</td>
<td>144</td>
<td>21</td>
<td>12</td>
<td>7,356</td>
<td>962</td>
<td>2,209</td>
</tr>
<tr>
<td>Sandhills CC</td>
<td>5,805</td>
<td>534</td>
<td>2,447</td>
<td>298</td>
<td>76</td>
<td>7</td>
<td>22,233</td>
<td>2,803</td>
<td>8,333</td>
<td>840</td>
<td>27.26%</td>
</tr>
<tr>
<td>Southeastern CC</td>
<td>4,441</td>
<td>451</td>
<td>64</td>
<td>5</td>
<td>27</td>
<td>2</td>
<td>5,152</td>
<td>741</td>
<td>7,440</td>
<td>915</td>
<td>8,674</td>
</tr>
<tr>
<td>South Piedmont CC</td>
<td>5,233</td>
<td>541</td>
<td>365</td>
<td>35</td>
<td>634</td>
<td>86</td>
<td>6,265</td>
<td>829</td>
<td>2,699</td>
<td>254</td>
<td>12,497</td>
</tr>
<tr>
<td>Southwestern CC</td>
<td>3,156</td>
<td>320</td>
<td>754</td>
<td>73</td>
<td>1,713</td>
<td>234</td>
<td>10,209</td>
<td>1,375</td>
<td>5,623</td>
<td>628</td>
<td>39.52%</td>
</tr>
<tr>
<td>Stanly CC</td>
<td>8,969</td>
<td>905</td>
<td>615</td>
<td>108</td>
<td>2,135</td>
<td>296</td>
<td>716</td>
<td>87</td>
<td>7,773</td>
<td>1,001</td>
<td>12,435</td>
</tr>
<tr>
<td>Surry CC</td>
<td>4,719</td>
<td>495</td>
<td>406</td>
<td>38</td>
<td>932</td>
<td>121</td>
<td>9,934</td>
<td>1,118</td>
<td>8,886</td>
<td>1,214</td>
<td>15,991</td>
</tr>
<tr>
<td>Tri-County CC</td>
<td>1,705</td>
<td>173</td>
<td>306</td>
<td>26</td>
<td>948</td>
<td>149</td>
<td>5,326</td>
<td>686</td>
<td>2,969</td>
<td>349</td>
<td>35.72%</td>
</tr>
<tr>
<td>Vance-Granville CC</td>
<td>6,849</td>
<td>681</td>
<td>386</td>
<td>36</td>
<td>1,039</td>
<td>121</td>
<td>22,076</td>
<td>2,890</td>
<td>8,274</td>
<td>838</td>
<td>27.26%</td>
</tr>
<tr>
<td>Wake TCC</td>
<td>19,410</td>
<td>2,119</td>
<td>4,070</td>
<td>511</td>
<td>48,370</td>
<td>5,584</td>
<td>34,570</td>
<td>3,436</td>
<td>71,800</td>
<td>7,621</td>
<td>82,155</td>
</tr>
<tr>
<td>Wayne CC</td>
<td>5,896</td>
<td>578</td>
<td>3,687</td>
<td>399</td>
<td>1,689</td>
<td>262</td>
<td>14,377</td>
<td>1,648</td>
<td>11,361</td>
<td>1,250</td>
<td>24,188</td>
</tr>
<tr>
<td>Western Piedmont CC</td>
<td>4,928</td>
<td>491</td>
<td>2,173</td>
<td>238</td>
<td>2,189</td>
<td>355</td>
<td>14,606</td>
<td>1,676</td>
<td>9,290</td>
<td>1,084</td>
<td>39.88%</td>
</tr>
<tr>
<td>Wilkes CC</td>
<td>2,295</td>
<td>230</td>
<td>1,141</td>
<td>110</td>
<td>1,377</td>
<td>152</td>
<td>4,261</td>
<td>478</td>
<td>10,965</td>
<td>1,483</td>
<td>9,074</td>
</tr>
<tr>
<td>Wilson CC</td>
<td>3,660</td>
<td>362</td>
<td>1,049</td>
<td>115</td>
<td>1,053</td>
<td>115</td>
<td>9,553</td>
<td>1,258</td>
<td>6,268</td>
<td>615</td>
<td>38.88%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>310,058</strong></td>
<td><strong>31,232</strong></td>
<td><strong>4,571</strong></td>
<td><strong>429</strong></td>
<td><strong>1,915</strong></td>
<td><strong>206</strong></td>
<td><strong>10,058</strong></td>
<td><strong>1,019</strong></td>
<td><strong>94,235</strong></td>
<td><strong>11,354</strong></td>
<td><strong>167,501</strong></td>
</tr>
</tbody>
</table>

Page | 121