What a Moodle Feasibility Study Revealed About The Coming Disruption Wave in On-Line Learning

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  - NC Learning Object Repository Admin
  - NCCC System Office “Moodle Guru”
- Former DL Director Pitt Community College
  - Bb Admin (8 years)
  - Moodle Admin (5 years)
- Lead Writer of the Open Source Collaborative Moodle Assessment Project
  - Moodle Assessment Report
  - Feasibility Study Report
Overview

- Background of Distance Education in North Carolina
- Open Source Collaborative
  - OSC Moodle Assessment Report Part I
  - Feasibility Study (OSC Report Part II)
- Feasibility Study Results
- Disruptive Enrollment Wave
- Conclusion
Background of the NCCCS

- North Carolina Community College System is the 3rd largest system in US.
  - 58 colleges
  - 46 use Blackboard, 9 use Moodle, 3 use other LMSs
  - over 860,000 enrolled students – curriculum and continuing education (08-09)
Background of DL in NC

- Prior to 1998, some NC Community Colleges created their own online courses. (hand-coded HTML based)
- 1998- Blackboard, Inc., became the preferred LMS application provider for NCCCS institutions
- 1998 – Establishment of the Virtual Learning Community: a collaborative body to address college needs for online courses.
- 2006 – NCCCS began investigation of Moodle
- 2006-07 - Establishment of NC Moodle User Group (NCMUG) and the Open-Source Collaborative
- 2009 - OSC Moodle Assessment Report
- 2010 - OSC Moodle Assessment Feasibility Report
Open-Source Collaborative

- OSC Moodle pilot project - provides hosted hardware, application administration, training, and customized programming in critical areas which support a centralized Moodle project, capable of supporting 100,000 online students for multiple community colleges.

- Open-Source Collaborative Moodle Assessment
  - Formative evaluation of the OSC
  - Composed of two research Study Reports
    - OSC Moodle Assessment Report Part I
    - Feasibility Study (OSC Moodle Assessment Report Part II)
Research Question: Is Moodle a viable alternative to Blackboard?

The study targeted academic concerns such as course navigation, ease of use, communication and collaboration tools, course content, assessment, and upload capabilities.

A triangulated study was created to investigate Moodle as an effective learning/teaching platform through (1) student and instructor surveys, (2) functionality comparisons between Moodle and Blackboard, and (3) case studies from institutions which have fully switched to Moodle as their LMS.
OSC Moodle Assessment Rpt Part I: Findings

- Moodle was a viable option to Blackboard for NCCCS.
- The end-of-term student and instructor surveys showed that Blackboard and Moodle are not that different. The real difference is found in student perception of their teachers’ comfort level with the application.
- Application functionality comparison by online administrators (application and network) and online instructors indicated that Moodle 1.9x has a higher perceived functionality than any version of Blackboard evaluated.
- Case studies of four exclusively Moodle institutions indicated that while transition to Moodle was challenging, ultimately the case study students and faculty preferred Moodle over Blackboard.
The study focuses on six components that collectively define "What is the best LMS solution for NC Community Colleges?"

- Interoperability and flexibility
- Cost effectiveness
- Support and training
- Ease of use
- Scalability, and
- Sustainability
A three-part research methodology was used to measure and evaluate these six components.

1. *LMS Compatibility and Interoperability Survey* used to gather information about the general benchmarking statistics of the LMSs in the system, the interoperability of the LMSs with 3rd party applications and services, and a short open-ended LMS needs assessment.

2. *Migration/Upgrade Case Study Survey* to gather information regarding NCCCS colleges' (a) migration from Blackboard to Moodle and (b) upgrade by Blackboard clients to ver.9.x.

3. *Total LMS Vendor Cost Analysis* to review the total cost of LMS ownership by the NCCCS and the individual colleges in regard to vendor LMS license fees, hosting fees and any other additional costs.
Interoperability and Flexibility

- **Interoperability** was defined as the ability of the LMS to integrate with related peripheral applications and services.
  - Integration with SIS (Datatel) most important
  - Most commonly installed third party LMS plug-ins were anti-plagiarism, communication and assessment development tools.

- **Flexibility** was defined as 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.
  - 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.
Cost Effectiveness

- Cost effectiveness was defined as the total value of return on investment of the LMS.
  - Cost Included: License Fees, Vendor Hosting Fees, Additional Fees

### Avg LMS Vendor Hosting Cost (with DL 2009 FTE equivalent colleges)

- **Blackboard Colleges (8)**: $34,437
- **Moodle Colleges (8)**: $12,620

### Avg. Total Cost Per Curr Total FTE (2009)

- **Blackboard**: $15.45
- **Moodle**: $3.79
Support and Training

- **Support and training** was defined as the ability of the colleges and the System Office to be responsive to emerging technologies which enhance LMS utilization.
- The research revealed that 45 (77.5%) of NCCCS colleges have fewer than three staff members to directly support their distance learning departments.

![Number of Support Staff for DL Depts](chart.png)
Ease of Use

• Ease of use was adequately addressed in the OSC Moodle Assessment Report.

• Moodle and Blackboard were found to be comparable. 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.
Scalability

- Scalability was 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.
  - Findings revealed a trend for increased course size
  - Need for massive increase in storage capacity in next 3 years
Average sized LMS-based courses was 20 to 60 MB but revealed a growing trend of increased course size.

Storage Capacity questions revealed a massive growth in the next three years.
Scalability

- 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 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.

- While researching the need to meet the growing enrollment demands of students, a startling discovery was made about enrollment growth.
## Distance Learning & Traditional Curriculum Enrollments 1998 - 2009

<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>
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</thead>
<tbody>
<tr>
<td>1998</td>
<td>1.63</td>
<td>1,009,561</td>
<td>16,740</td>
<td>1,026,301</td>
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<td>1999</td>
<td>2.41</td>
<td>1,080,584</td>
<td>26,695</td>
<td>1,107,279</td>
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<td>2000</td>
<td>3.58</td>
<td>1,008,153</td>
<td>40,392</td>
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<td>2001</td>
<td>4.99</td>
<td>1,116,669</td>
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<td>1,175,261</td>
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<td>2002</td>
<td>6.78</td>
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<td>1,287,369</td>
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<td>2003</td>
<td>8.57</td>
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<td>1,367,678</td>
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<td>2004</td>
<td>10.02</td>
<td>1,295,407</td>
<td>144,217</td>
<td>1,439,624</td>
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<td>2005</td>
<td>16.26</td>
<td>1,201,360</td>
<td>233,230</td>
<td>1,434,590</td>
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<td>2006</td>
<td>21.76</td>
<td>1,106,142</td>
<td>307,639</td>
<td>1,413,781</td>
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<td>2007</td>
<td>27.62</td>
<td>1,013,607</td>
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<td>2008</td>
<td>29.35</td>
<td>1,027,842</td>
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<td>1,454,860</td>
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<td>2009</td>
<td>36.86</td>
<td>1,008,762</td>
<td>588,787</td>
<td>1,597,549</td>
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</tbody>
</table>
Total Distance Learning & Traditional Course Enrollments by Reporting Year
Will DL replace TR Enrollments?

- Clayton, Horn, and Johnson, in their 2008 book *Disrupting Class*, describe a mathematical expression that sets conditions in which a new technology/innovation can eventually replace an older technology/innovation.

- 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 where the first four to five data points lie on the trend line.
Figure 4.2 from Disrupting Class, p.99

The pace of substitution of computer-based learning for monolithic learning*

*Calculations are based on data from the North American Council of Online Learning and the U.S. Department of Education statistics. There are other numbers floating out there as well. In June 2007 the Washington, D.C.-based think tank Education Sector released a report titled, “Virtual High Schools and Innovation in Public Education.” Written by its chief operating officer, Bill Tucker, it said that roughly 1.5 percent of all school enrollment is online today, but it has doubled in the past three years. The report says that, “Virtual schooling is driving the same sorts of transforming changes in public education as Apple’s iTunes has been producing in the way people collect and listen to music.” Virtual schools are, “personalizing student learning and extending it beyond the traditional school day.” (http://www.educationsector.org/usr_doc/Virtual_Schools.pdf)
Pace of Substitution of DL to TR Enrollments
(Logarithmic Scale)

\[ y = 6E^{-281e^{0.321x}} \]
\[ R^2 = 0.9918 \]
Pace of Substitution of DL to TR Enrollments
(Exponential Trend Line)

R² = 0.9918
Disruptive Innovation in NCCCS!

- The percentage ratio of DL to traditional course enrollments plotted over 12 years establishes a growth curve that is compliant with disruptive innovation mathematical constructs identified in *Disrupting Class* by Christensen, Horn, and Johnston, McGraw Hill, 2008, p. 96 – 102.

- The 2009 ratio of DL or LMS-based enrollments to total course (DL and traditional) enrollments was 0.6:1. However, enrollment projections based on the replacement curve indicate a 3:1 ratio of DL to total course enrollments forecast for 2014 and a 6:1 ratio for 2016.
Traditional Enrollment

Distance Learning (LMS) Enrollment

1:1 ratio in 2010.5
2:1 ratio in 2012.5
3:1 ratio in 2014
4:1 ratio in 2015
5:1 ratio in 2015.5
6:1 ratio in 2016
How do you know the predictions are accurate?

- It is all about the Math!
- These predictions have a **0.9918 R-Squared value** (correlation coefficient) - 1.0 being a perfect correlation.

Or

99.18% chance that the correlation between TR enrollments and DL enrollments is correct.
Will there be a 100% Replacement?

- Probably Not!
- As distance learning technology (LMS) innovations becomes the norm a new innovation is likely to disrupt it from ever reaching 100% replacement.
- Possible disrupting technology to LMSs:
  - Mobile Learning (Smartphone content delivery)
  - 3D Holographic Immersive Learning
What does this disruption mean?

- 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.

- Areas impacted:
  - Instructional programs
  - Professional development & staff support
  - Student services
  - IT & network administration
  - Budget & procurement
  - Strategic planning & decision-making
  - Leadership
Study Recommendations

- **Recommendation One:** Two-LMS Solution for NCCCS (for now)

- **Recommendation Two:** Institution Based LMS/Learning Technology Advisor(s)

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

- **Recommendation Four:** Continued Development of Cross-Platform Learning Resources
Discussion/Questions?

Copy of the OSC Moodle Assessment Report Part I is available here:
http://oscmoodlereport.wordpress.com/

The OSC Moodle Assessment Report Part II (Feasibility Study) will be posted to the same site next week.

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