

**Learning Management Systems Evaluation for the University of Alberta**  
**Scott Delinger and Raj Boora**  
**Draft 1.23 — September, 2010**

## **1. Executive Summary**

The University of Alberta must select a Learning Management System (LMS) to serve as the engine within eClass as a replacement for Blackboard Vista; Blackboard Corp. announced in summer 2009 that support for Vista will be terminated January, 2013. Blackboard's expectations are that the University will move to their Learn product. However, Learn is a completely different product from Vista; it is not just an upgrade. All users—instructors and students—will have to be re-trained. This opens the door for the University to consider other LMS products.

In April 2010, the Vice Provost (Information Technology) created an LMS Evaluation Team (LMSET) to consult with the University community on the choice of the next LMS. The committee operated at arm's length from the Vice Provost (Information Technology). The recommendation put forward by this team is independent of the VP(IT), whose only involvement during the review process was to provide resources for hospitality and access to information from other institutions.

This document presents what LMSs were considered, the pedagogical considerations that went into the evaluation, how the migration can be accomplished, some of the challenges faced, further recommendations, and financial considerations. These recommendations come as the result of consultation across the University and background research.

The key recommendations are as follows:

*Based on information gathered from the 2009 LMS Review document,<sup>1</sup> as well as from consultations with University faculty and staff that work with educational technology, the LMSET recommends that the University adopt Moodle as the next LMS used to power eClass.*

*The LMSET also recommends that the processes required to move the University from the current eClass engine, Blackboard Vista, to Moodle be initiated starting the summer of 2010. Priority should be given to creating a migration framework that will determine where and how the service will be hosted, determine the time line for the redevelopment of the middleware layer that will help to automate user level administration of the system, and setup the framework required for a single sign on portal for users to be able to move between both systems through the migration period to facilitate early adopters and pilot testing.*

Reasons for the recommendation include:

- pedagogically, Blackboard Learn and Moodle are roughly equal
- a majority of Alberta K-12 districts have moved to Moodle
- Athabasca University has used Moodle for many years
- University of Lethbridge has announced they are switching to Moodle
- more expertise at the University of Alberta for Moodle than Blackboard Learn

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1. [http://www.vpit.ualberta.ca/lms/pdf/LMS\\_Report\\_Draft\\_2009\\_0909.pdf](http://www.vpit.ualberta.ca/lms/pdf/LMS_Report_Draft_2009_0909.pdf)

- Moodle will be less expensive in the long run than Blackboard Learn

## 2. Background

“While there are several definitions of a learning management system (LMS), the basic description is a software application that automates the administration, tracking, and reporting of training events.”<sup>2</sup>

From that basic definition, the use of an LMS at the University of Alberta facilitates the coordinated delivery of, and discussion about, course materials using a web-based system. This system can also be used to administer quizzes, exams, and assignments. These systems also provide for secure viewing and distribution of unofficial grades.

The University began migrating online teaching materials from static HTML websites to a centrally supported WebCT Campus Edition LMS instance in the spring of 1998. Having outgrown the Campus Edition, a migration to WebCT Vista 3 was accomplished in the summer of 2004. Blackboard Inc purchased the WebCT company in 2006 and Blackboard Vista 4 was trialed and then made the production version of Vista for the University in 2007. Blackboard encouraged institutions to brand their installations, so in 2008, the University of Alberta's Vista installation was branded eClass. This move not only complied with the suggestion of the Blackboard company, but also made the name of the central LMS stable as it was not linked to the software "under the hood". In summer 2009, Blackboard announced the end-of-support for Blackboard Vista, effective January, 2013.

While the University has seen considerable success in the adoption of the eClass LMS, through its various iterations, some within the University community have not made any changes from the pre-1998 model, while others have adopted and independently supported other LMS solutions: Business uses Blackboard Learn, Law uses TWEN, Medicine and Dentistry developed Homer, and Arts, Augustana, Campus Saint-Jean, Computing Science, Engineering, and Science use Moodle. Use of the centrally supported LMS is not mandated. These smaller systems came to be as a result of individual interest, lack of features in the centrally supported LMS, a lack of support for the central LMS at a local level, or a mistrust of the central system due to poor user experiences.

## 3. Discussion

The number of individuals who will be directly impacted by the LMS decision is significant; every student and academic staff member who uses the centrally supported LMS will be impacted, in addition to many support staff. Each group will have their individual concerns and issues that they hope will be properly addressed through the process of evaluation and adoption. Those staff currently tasked with supporting eClass seem more concerned with the migration process, with emphasis placed on the level of support that will be provided over the course of transition. This process will be resource intensive as support staff will be supporting the existing eClass system while they develop materials or processes for the new system as it moves through development. This effort on the part of several dozen support staff across campus will have to reach out to thousands of users, both students and instructors. Regardless of the recommendation made by the LMSET, current eClass users will have to learn a new interface and to check to ensure their courses migrated properly before teaching with them for the first time. This

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2. [http://www.astd.org/NR/rdonlyres/12ECDB99-3B91-403E-9B15-7E597444645D/23395/LMS\\_fieldguide\\_20091.pdf](http://www.astd.org/NR/rdonlyres/12ECDB99-3B91-403E-9B15-7E597444645D/23395/LMS_fieldguide_20091.pdf)

concern is the most common heard from instructors and those who directly support instructors in eClass who gave input to the LMSET. Even with this most basic description of what will be required, it can be appreciated that this migration will not be a simple process.

As mentioned earlier, no support will be available for Vista beyond January, 2013. This sets an ambitious deadline for migration of thousands of course sections, some of which make significant use of Vista. Those who made a significant effort to adopt eClass and use it fully are faced with the largest migration challenge; those who just use eClass for a simple resource for file, syllabus, and grade distribution will not face as large a migration hurdle. Once the migration is complete, teaching instructors how to further engage students by utilizing the appropriate tools within the new eClass will only help improve the teaching and learning experience by increasing the engagement of both students and instructors.<sup>3</sup>

The change in branding from WebCT to eClass was helpful to some degree in removing the stigma that has been associated with the central LMS as it moved through its various versions over the past decade. Despite the branding, many are still reluctant to use the "upgraded" version of the system that they had once trusted. Many of these individuals have no such reservations with Moodle, which they see as being more aligned with the way they work.<sup>4</sup> Many have commented that part of the reason why they are not willing to make use of the Vista-powered eClass is because they do not like the commercial or proprietary nature of the system. These concerns would be addressed by a Moodle environment. Indeed, the experience of other institutions, such as Royal Roads University<sup>5</sup> have found that Moodle was well received by new LMS users after the migration process was complete.

Switching the eClass engine to Moodle over Blackboard Learn will also enable the University to leverage the work of many individuals in Faculties and Departments distributed across the University. Indeed, this local support model is what drew users to Moodle in the first place and the University would do well to leverage and extend this local support model to make the migration as smooth as possible. Where local support does not exist, a "Train the Trainer" model could be deployed to further improve the migration process. Moving to any new system will require training for even those staff who are currently supporting Moodle to help ensure all staff have the same knowledge base. The open-source nature of Moodle also allows for commercial and non-commercial entities around the world to integrate their own products with the system, notable examples include Microsoft, who has developed a plugin<sup>6</sup> for their Office suite that allows users to directly edit their documents from their native desktop environment as well as projects that integrate Google Apps (Gmail, Calendar etc) into Moodle directly.<sup>7</sup> Blackboard Learn supports integration with Google Apps as well. Regardless of the system selected, investing in the professional development of the support staff will help to ensure that they are engaged and able to leverage their strengths for the better University community.<sup>8</sup> This desire for

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3. Sclater, Niall. "Large-Scale Open Source E-Learning Systems at the Open University UK" (Research Bulletin, Issue 12). Boulder, CO, USA: EDUCAUSE Center for Applied Research, 2008, available from <http://www.educause.edu/ecar>

4. Campus interviews conducted by the LMSET.

5. Ining Tracy Chao. "Moving to Moodle: Reflections Two Years Later" <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/MovingtoMoodleReflectionsTwoYe/163101>

6. <http://www.educationlabs.com/Projects/moodleproduct/Pages/default.aspx>

7. <http://code.google.com/p/moodle-google/>

training of instructors was also put forward by the Students' Union.<sup>9</sup>

### *LMS use in Alberta*

A majority of K-12 school districts polled in May 2010 by ACET (Advisory Committee on Educational Technology) report their primary LMS is Moodle (see Appendix C). Second is Desire2Learn (D2L); Blackboard Learn is in use by one district. In Spring 2010, ACET also polled post-secondary institutions and received 17 responses: 6 use Moodle, 6 use WebCT-derived systems from Blackboard, 3 use Blackboard Learn, and 1 uses D2L. Post-secondary institutions in Alberta use a mix of systems.

Moodle institutions include:

- Athabasca
- Lethbridge (transition to be complete January 2011)
- Concordia
- Kings University College
- Grand Prairie Regional College
- Keyano (transitioning from Blackboard Learn)
- NAIT (transition in progress)

Blackboard Learn institutions include:

- Calgary
- Mount Royal

Blackboard Vista/Campus Edition (formerly WebCT) institutions include:

- MacEwan

Desire2Learn institutions include:

- SAIT (transition in progress)

In less than five years, Moodle has gone from almost no presence in Alberta to the LMS of choice today.

### *LMS use in PSE institutions outside Alberta*

Nationally, Alberta, McGill, Waterloo, and Western Ontario are evaluating LMS systems: Alberta, McGill, and Waterloo because they're using Vista and Western Ontario because they're using Angel, which has also been dropped by Blackboard as an active development project, with support ending in 2014. Regina recently switched from WebCT to Moodle. UBC completed an upgrade from WebCT Campus Edition 4 to Vista, and they've just begun an LMS review project due to Vista support ending in 2013. The University of Minnesota is migrating from Vista to Moodle. Open University (UK) runs on a localised version of Moodle. Blackboard Learn sites include Toronto and Chicago.

### *Migration timeline and the need for urgency*

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8. Julie Buehler (University of Rochester) and Jeffrey Carpenter (University of Rochester) - "Attract, Retain, and Engage the Best: Building an Inclusive IT Culture through Professional Development" - <http://www.educause.edu/Resources/AttractRetainandEngagetheBestB/206023>

9. Campus Interview - J Eastham, VP Academic, Students' Union

Given the January 2013 deadline, the decision regarding the selection of an eClass engine needs to be made quickly, so as to afford as much migration time as possible for all courses. Instructors and educational technology support staff need to continue to teach courses in the intervening period, leaving only two summers before Vista support is withdrawn. Delays will result in an increased workload for the support staff as the extra load resulting from their assigned migration tasks that must be carried out in addition to their already significant tasks related to the current eClass system.

The LMSET recommends the University start putting in place the framework required to move the existing content in Blackboard Vista to the appropriate version of Moodle over the span of Summer 2010 to Summer 2011. This framework should address, at a minimum, adjustments to the middleware between registration system (PeopleSoft) and the LMS. Other custom middleware that handles functions such as course creation and backup must also be redeveloped. During this first year, the best method of hosting the new system should be determined, and a student portal should be developed, providing a single sign-on system for all students to access their courses regardless of which LMS delivers the material. If at all possible, it would be advisable to allow early adopters onto the new system so they may start to learn it and provide feedback as to what may or may not be working. These early adopters will be important to the migration process as they will likely be willing and able to help others move through the process at the later stages. Having this early adoption option in place as soon as possible will be important to help mitigate the concerns that some instructors have expressed that they don't want to develop for the old system when they know the new system is on the horizon.

Between Summer 2011 and Summer 2012, the team recommends that the University put into place the infrastructure needed to complete the transition to, and testing of, the most appropriate version of Moodle using the hosting methodology that is found to be most appropriate. The complete transition of all courses should be completed by the summer of 2012 as to allow each instructor to examine their course well in advance of the first time the course will be run on the new system. The complete transition by summer 2012 also facilitates the use of Moodle for full-year courses. The middleware and single login systems should be complete by September 2012 and be ready for use in January 2013. Over this span of time, the creation of virtual Moodle environments for the development of innovative, customized modules in a safe and scalable manner should be created and integrated into the single login system. These environments are crucial to the success of Moodle as they will allow individuals or groups to create solutions for their specific needs and do so in an expedient manner without endangering the central system as a whole.

Finally, from Summer 2012 to Winter 2013, the newly commissioned Moodle system should be running in parallel with Blackboard Vista and that students should be able to access their courses running on either LMS through a single portal. Winter 2013 will see the decommissioning of Blackboard Vista as the eClass engine and a complete transition of eClass to Moodle.

### *Challenges to the migration*

Challenges to the migration include:

- short timeline for migration of 5,000 courses to a new production LMS in 2.5 years
- redevelopment of current middleware for use with Moodle while continuing to use and maintain current the current version for Vista until the shutdown
- perceived shortcomings in the evaluation process, such as the lack of a "trial period" for a selection of LMSs and tests of migration automation
- expediency required in determining a hosting solution

- ensuring a hierarchical structure for LMS administration is in place to afford the "integrated-distributed system of support and services" recommended in 2006 by the Committee on the Learning Environment (CLE) Subcommittee on Teaching, Learning and Technology Innovation and Leadership in a report<sup>10</sup> to the CLE and echoed by the LMS Review of 2009
- migration of current courses and LMS adoption in new courses or by new instructors will occur while the current Vista LMS is still in operation and requiring support
- instructors unwilling to adopt LMS use on the current system as they hear of a new system being adopted
- approximately 24 current staff at the University are currently faced with re-training as well as direct involvement in the migration while continuing their duties supporting current courses

#### *Further recommendations*

During the discussions, we found that instructors, Chairs, and the Registrar are all interested in the development of an automated process of mark submission from the instructor to the Registrar's office with the appropriate pause for approval by the Chair or delegate within the instructor's unit. This development should be kept in mind when the gradebook portion of the LMS is evaluated; the export of data for oversight signature as well as submission to the Registrar is desired at all levels at the University and would greatly improve end-of-term business processes. Also, the use of virtual machines (VM) for development and testing should be considered so that units involved in extension of the LMS tools available (e.g., Campus Saint-Jean, Physics) can continue that development and testing without risk of trouble from other developers, which might occur if multiple units were sharing a physical server. Also, while Extension has begun a project of migrating their registration to PeopleSoft and thereby facilitating CCID use for their students, other units such as Nursing may still have need for non-CCID holders to have access in continuing professional development, so a determination of how to handle those people outside formal University registration mechanisms needs to be made. Integration of synchronous tools, such as eClass Live! (Elluminate), is needed but available from both Moodle and Blackboard Learn. Once the selection is made, a phased but expeditious announcement is essential, as buy-in from instructors and courses not currently in an LMS will be at a stand-still until the announcement is made. The Centre for Teaching and Learning (CTL) must know as soon as possible so as to afford them time to look at what changes they need to make in order to support a new LMS.

#### **4. 2009 LMS Report**

The 2009 LMS Review recommended that there be two systems supported on campus, one of which should be Open Source:

*The current central LMS licensed from Blackboard serves the majority of campus well. However, some departments and individual instructors have found that it has limitations in terms of desired customizations or innovations. Also, there is concern regarding the direction of the LMS marketplace, with Blackboard being the dominant player. There could be risks to the University with future licensing costs potentially rising unchecked, or motivation for product development and quality support being reduced. Open source systems offer a hedge against these limitations and uncertainties and can offer different product strengths. The campus needs a future LMS environment that provides both a stable ongoing service and opportunities for research and development.*

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10. <http://www.ualberta.ca/~univhall/vp/vpa/AcademicPlan/CLETLTIL.pdf>

This leads to the following recommendation in that report:

**Recommendation A.2:**

*While continuing to provide a centrally supported LMS system, add central support for an open source LMS.*

- *The LMS marketplace is volatile and the University of Alberta would do well to invest in an open source alternative; support for multiple LMSs mitigates marketplace risk.*
- *Many participants in the LMS open forums and other meetings are already exploring open source alternatives or are interested in doing so in the future.*
- *Ensure that our central system(s) are highly flexible, adaptable platforms that users can mould to suit their purposes: enable unexpected use of tools that designers never envisioned (e.g. student mash-ups); develop a repository of gadgets, from social networking tools to pedagogical resources, that community members can attach or add to their portal or LMS pages; subject-specific resources are important and need to be allowed.*
- *Prepare the LMSs for mobile delivery (e.g. students want to access the LMS while commuting). We need a stripped-down version for access on small mobile devices.*

The LMSET recommends that this 2009 LMS report, prepared before the Blackboard Vista end-of-support announcement and the current budgetary restraints were announced or fully understood, still be followed but in a phased fashion: first, the open-source LMS be adopted as a replacement for the current Blackboard Vista, and then an evaluation of the situation when budget corrections occur to determine when the commercial LMS be adopted and centrally supported.

## **5. Choosing an LMS**

A review of commonly used LMSs by large North American institutions of higher education resulted in the following list:

- Blackboard Learn
- Blackboard Angel
- Desire2Learn
- Moodle
- Sakai

Blackboard has announced the 2014 end of support for Angel, so this package was quickly eliminated from consideration. Of the remaining four packages, two are proprietary and two are community-based. Blackboard Learn is in production use at the University of Alberta's School of Business; Desire2Learn (D2L) is not currently used on campus. Due to the timeline for migration, and despite their well-regarded customer support, the lack of a local user group familiar with the operation and support of D2L leads the LMSET to recommend against its adoption at this time. Of the two community-based products, Sakai has no local user base and Moodle has a significant presence on campus, with over 300 courses offered per term. The community use of Moodle extends beyond campus to several other higher education institutions within Alberta and to institutions of similar size in the US and the UK. Therefore, the viable LMS candidates for the University are Blackboard Learn and Moodle.

When interviewing stakeholders across campus, several important themes arose. Chief among them was the need for local support. The units with existing Moodle implementations enjoy an impressively

high support:user ratio and each one of them was keen to point out that the ability to get support locally and in a timely manner was as much a contributor to the success of Moodle as their LMS as any other factor, ranging from interface to pedagogy. The local support for Blackboard Learn in the School of Business is similarly valued as an important factor for the success of Bb Learn. The 2006 "integrated-distributed system of support and services" recommendation to the CLE<sup>11</sup> and echoed in the 2009 LMS Review will be critical in the acceptance of the replacement engine for eClass: several units list distributed/local administration and support as a requirement; the instructors of a given unit need to be able to "go down the hall" and discuss ideas for LMS use in their course or a problem they're having in their course site with someone local.

The LMSET requested an analysis of the WebCT Vista tool usage from CTL technical staff in order to determine what tools the new system must offer to maintain a similar level of functionality. The results of this analysis indicated that any new system would need to have a facility for:

- internal mail
- grades
- calendaring
- announcements
- links and files
- student storage
- content organization
- SCORM 1.2 support
- specialized support tools (screen readers, etc.)
- synchronous tool (Elluminate) connections

Twenty-one additional functionalities desired by the community consulted included:

- automated marking
- automated plagiarism detection
- Centers integration (eg Centre for Writers)
- collaboration tools
- distributed administration
- external users
- flexible course/personal calendar
- intuitive UI
- library integration (e-readings, e-reserve, refworks)
- peer review tools
- provisions for group work
- public/shared content for both students and instructors
- robust document management
- robust gradebook, tying into an automated submission to Registrar w/one-over signature
- robust multimedia support
- RSS reader/aggregator
- selective release
- setup wizard
- single signon/profile manager
- synchronous and asynchronous discussions

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11. <http://www.ualberta.ca/~univhall/vp/vpa/AcademicPlan/CLETLTIL.pdf>



- templates

Some of these functions are available in Blackboard Vista and Blackboard Learn, as well as in Moodle. A majority of them would have to be present in any new system deployed at the University of Alberta.

## 6. Blackboard Learn vs Moodle - Functionality and Pedagogy

Table 1 compares Blackboard Learn and Moodle on a number of important functionality and pedagogical considerations.

<b>Functionality</b>	<b>Bb Learn</b>	<b>Moodle</b>
internal mail	X	X
gradebook	X	X
calendaring	X	X
announcements	X	X
links and files	X	X
student file storage	X	X
content organization	X	X
SCORM 1.2 support	X	X
accessibility tools (screen readers, etc)	X	X
synchronous tool (Elluminate) connections	X	X
automated marking	X	X
automated plagiarism detection	X	X
Centres integration (e.g., Centre for Writers)	X	X
collaboration tools	X	X
distributed administration	X	X
external users (i.e., non-CCID accounts)	X <sup>a</sup>	X
flexible course/personal calendar (hooks for external calendaring)	X <sup>b</sup>	X <sup>b</sup>
intuitive UI	X <sup>c</sup>	X <sup>d</sup>
library integration (e-readings, e-reserve, refworks)	X <sup>e</sup>	X <sup>e</sup>
peer review tools	X	X
provision for group work	X	X
granular access permissions for students and instructors	X	X
robust document management	X <sup>f</sup>	X <sup>f</sup>
robust gradebook tying into automated grade submission system	X	X
robust multimedia support	X	X

RSS reader/aggregator	X	X
selective release	X	X
course setup wizard	X <sup>g</sup>	X <sup>g</sup>
single sign-on/profile manager	X	X
synchronous and asynchronous discussions	X	X
templates	X	X
Google Apps integration	X	X
Microsoft Office Plugin		X
Mobile Access	X <sup>h</sup>	X

Table 1. Blackboard vs Moodle

- a) Possible, but might require a separate "institution" as is the case in the current implementation of Vista
- b) Possible through the Google Apps project<sup>12</sup>
- c) UI is icon driven, and appreciated by many users
- d) UI can be modified to be icon based, tab based or text based per user
- e) Possible through plugins or building block functions
- f) Possible through the use of connectors to third party services, ease of implementation will vary according to the document management system
- g) Would have to be developed as a middleware by CTL
- h) Modern web browsers should be able to access Blackboard Learn, but native applications are restricted by device or mobile network<sup>13</sup>

As Table 1 shows, there are very few differences between the functional and pedagogical features between the two systems. The systems are both extensible, but Moodle is much more so as it is open to be freely modified by any institution that wishes to commit the resources to do so. An example of these customizations that have been done by the Technical Services Group at Campus Saint-Jean on their Moodle that have helped increase adoption of the system greatly by not only users within the Faculty, but by users from other Faculties as well. Blackboard Learn is also extensible, but to a lesser degree. The one differentiating point between Moodle and Blackboard Learn according to Table 1 is the Microsoft Office plugin. While this might seem like an insignificant feature, it means that instructors have a greatly reduced learning curve with respect to file storage and updating, the most used feature of eClass and likely any other LMS installation. This reduced learning curve was a common request from both the instructional and support community. Without a reasonable learning curve, the adoption rate on the part of the instructors will likely not be as high as it could be. But to Moodle's credit, even before the Office plugin was available, users coming to Moodle from other LMS systems or new to an LMS found that Moodle was an easy system to learn and use. This was true across campus when the LMSET consulted with users and support staff in Engineering, Arts, Physics, Computing Science and Campus Saint-Jean, all of which have Moodle installations. These groups also report that their students enjoy using Moodle for their courses or find it easy to use.<sup>14</sup> It should be noted that many staff and students

12. <http://code.google.com/p/moodle-google/>

13. <http://www.blackboard.com/Mobile/Resources/FAQ.aspx>

using Blackboard Vista (the current eClass deployment) also report that the system is easy to use.

There are two caveats on the Blackboard Learn vs Moodle experience. The first is that many instructors and students may not have an opportunity to try more than one system. Whereas, at least on campus, many of the Moodle users have chosen to make use of Moodle after trying the eClass system. This ability to choose systems suggests that the instructor is more engaged with wanting to make the most out of their online content. The second caveat is that Moodle users report an enhanced experience largely due to the skilled **local** support they receive, which isn't universally available for Blackboard Vista users across the University.

## **7. Recommendations**

Based on the above analysis, the LMSET recommends the University adopt Moodle as the next engine for eClass. While we do not recommend mandating the use of the centrally supported LMS for all courses at the University, those units not adopting the new eClass should be responsible for technical and financial support of the LMS product of their choosing, and receive no central support. Migration of current materials, adaptation of CTL's middle layer of software between PeopleSoft and eClass, development of a student portal, incorporation of eClass Live! (Elluminate), and provision of e-portfolios are all aspects of educational technology that need to be addressed over the next two years. A project for electronic submission of grades to the Registrar, with an appropriate stop for one-over signature by the Chair or a designate, should also commence. Consideration of adopting a commercial LMS as per the 2009 LMS Review report should occur when budgetary constraints ease. The 2009 LMS Review report recommends a five-year review of LMSs, and the LMSET concurs with this recommendation.

## **Appendices**

- A. LMSET members, people and units consulted during LMS selection process
- B. References consulted
- C. K-12 LMS in use for much of Alberta
- D. Blackboard Learn vs Moodle - Financial
- E. LMS course "main page" screen shots from Blackboard Learn and Moodle

### **Appendix A.** LMSET members, people and units consulted during LMS selection process

#### LMS Evaluation Team

The Vice-Provost and Associate Vice-President (Information Technology) has assigned the review of available LMSs to an *ad hoc* LMS evaluation team: Scott Delinger, the IT Strategic Initiatives Officer, and Raj Boora, an educational technology consultant who had worked at the University of Alberta for seven years in the Faculties of Education and Science.

#### University of Alberta consultations

AICT Security (B Beck)

Arts (M Engel, M Marvin, H Quamen, A Schwarzer, J Simpson, M Whitecotton-Carroll, G Wiebe, E Zhang)

Augustana (N Haave)

Business (M Getz)

Campus Saint-Jean (D Ipperciel, P Thibaudeau)

Centre for Teaching & Learning (A Aziz, B Boufford, B Bray, C Goetz, D Laurie, D Sun)

Computing Science (R Johnson)

Engineering (F Brochu, V Gaudet, J Gibeau, S McEvoy, N Minderman, P Musilek, R Patsula, J Sit, E Tiong)

Law (S Kassam)

Medicine & Dentistry (Y Ip)

Nursing (L Candy, W Caplan, W Kelly)

Online Program Support Group (Arts, Biological Sciences, Business, Cameron Library, Centre for Teaching and Learning, Education, Extension, Human Resources, Nursing, Occupational Therapy, Physical Therapy)

Physics (R Moore)

Specialized Support & Disability Services (C Dodd, T Sheridan)

Students' Union (J Eastham)

#### External consultations

Alberta Association in Higher Education for Information Technology (AAHEIT) (Doug Baker)

Open University UK (Ross MacKenzie)

University of Minnesota Moodle Support Group (Elena Ivanova)

### **Appendix B.** References consulted

Ament, C; Ivanova, E. "Moodle: Open Source in the Enterprise" Minneapolis, MN, USA: University of Minnesota, Office of Information Technology presentation, 2009.

Athabasca University. "Learning Management System (LMS) Evaluation Committee Final Report" Athabasca, AB, Canada: August, 2005.

AAHEIT Advisory Committee on Educational Technology. "Learning Management Systems - the Impact of Open Source Software" Calgary, AB, Canada: 2007.

### Appendix C. K-12 LMS in use for much of Alberta

#### Southern Alberta

<b>District</b>	<b>Primary LMS</b>	<b>Other</b>
Canadian Rockies	Moodle	
Foothills	Moodle	
Golden Hills	Blackboard	php web pages
Grasslands	Moodle	
Holy Spirit	Moodle	
Horizon	none	Moodle
Lethbridge Public	Moodle	
Livingstone Range	none	Moodle
Medicine Hat Catholic	Breeze (CMS)	php web pages
Medicine Hat Public	Moodle	ePearl, QuestA+
Palliser	Moodle	
Prairie Rose	Moodle	
Prairieview	Moodle	
Rockyview	Moodle	
Westwinds	Moodle	

#### Central Alberta

<b>District</b>	<b>Primary LMS</b>	<b>Other</b>
Battle River	Moodle	
Buffalo Trail	Moodle	
Calgary Catholic	D2L	
Calgary Public	D2L	
Chinook's Edge	Moodle	
Christ the Redeemer	SharePoint (CMS)	
Clearview	FirstClass (CMS)	
East Central Catholic	Moodle	
Edmonton Catholic	D2L	
Edmonton Public	Moodle	
Red Deer Catholic	none	Moodle, D2L

Red Deer Public	eClass (CMS)	
Wetaskiwin	none	php web pages
Wild Rose	Citrix (CMS)	
Wolf Creek	PowerSchool (SIS)	

Moodle: 19/30 (63%)  
D2L: 4/30 (13%)  
Blackboard: 1/30 (3%)  
Other: 5/30 (17%)  
None: 1/30 (3%)

#### Appendix D. Blackboard Learn vs Moodle - Financial

A financial comparison of the two final candidates also needs to be made, given the financial situation the University faces during this migration time, but also with an eye to the costs of steady-state operation. The table below (Table 2) offers four options to consider for Bb Learn and Moodle.

If hosted internally, the University will need to cover hardware capital costs, salary and benefits for support staff, electricity costs, and consumable costs for such items as tapes for data backups. The AICT annualized capital costs on a four-year hardware replacement cycle is \$175,000, with HR costs of \$295,000 annually.

The University may wish to explore external LMS hosting services and perform a cost/benefit analysis and compare the outcome with self-hosting. For example, Blackboard offers hosting for Blackboard Learn LMS systems, with data centres in Australia, the Netherlands, and the USA. Several vendors offer hosting for Moodle as well: Remote-Learner hosts Moodle for the University of North Carolina and the Ontario Real Estate Association, and has data centres in Waterloo, ON, Kansas, and North Carolina. Our commercial network bandwidth is being supplemented independent of this project, so external hosting will not place an excessive burden on our network capacity.

	<b>Bb Learn self-hosted</b>	<b>Bb Learn hosted externally<sup>15</sup></b>	<b>Moodle self-hosted</b>	<b>Moodle hosted externally<sup>16</sup></b>
<b>Software Licensing</b>	\$205,900 p.a.	\$205,900 p.a.	\$0 p.a.	\$0 p.a.
<b>Database Licensing</b>	\$127,896 p.a.	\$0 p.a.	\$0 p.a.	\$0 p.a.
<b>3 Support FTEs<sup>17</sup></b>	\$295,000 p.a. <sup>18</sup>	\$0 p.a.	\$295,000 p.a. <sup>19</sup>	\$0 p.a.

15. Proposal from Blackboard Corp. Primary if not sole vendor of Blackboard hosting. Privacy Impact Assessment required: data centres in US, NL, AU.

16. Rough estimate from one Canadian Moodle hosting firm. Multiple vendors in the market. Privacy Impact Assessment may or may not be required: one vendor has a Canadian data centre in Waterloo, ON.

17. Hardware, OS, and application patching support supplied by AICT Managed Services. Does not include seven CTL FTEs which would be present in all four scenarios.

<b>Hardware</b>	\$175,000 p.a. <sup>20</sup>	\$0 p.a.	\$175,000 p.a. <sup>21</sup>	\$0 p.a.
<b>Hosting</b>	\$0 p.a.	\$258,100 p.a., 5% inc p.a.	\$0 p.a.	\$80,000 p.a. <sup>22</sup>
<b>Hosting Mgmt</b>	n/a	\$67,000 p.a.	n/a	\$0 p.a.
<b>Electricity</b>	\$10,000 p.a. <sup>23</sup>	\$0	\$10,000 p.a. <sup>24</sup>	\$0 p.a.
<b>Migration<sup>25</sup></b>	included	included	Could be contracted	\$226,590 once <sup>26</sup>
<b>Implementation</b>	\$98,920	\$35,000 once		\$10,500 once
<b>Networking<sup>27</sup></b>	\$0	\$0	\$0	\$0
<b>ONE-TIME COSTS</b>	\$98,920	\$35,000	migration	\$237,090
<b>ANNUAL COSTS</b>	\$813,796	\$531,000 Y1 5% inc p.a.	\$480,000	\$80,000
<b>3-yr TOTALS</b>	\$2,540,308	\$1,667,360.25	\$1,440,000 <sup>28</sup>	\$477,090

Table 2. Rough financial estimates for four LMS options

Institutional adoption of Blackboard Learn as the eClass engine would save the School of Business \$72,000 p.a., and migration of all current Blackboard Vista and Moodle sites to Blackboard Learn could save roughly an additional \$72,000 p.a. by optionally migrating current Moodle sites to Blackboard Learn. Institutional adoption of Moodle as the eClass engine would save roughly \$72,000 p.a. by incorporating current Moodle sites into the central service, and the School of Business could choose to save \$72,000 p.a. by adopting Moodle as well.

Blackboard Learn most often stores data in an Oracle database; the cost associated with the database depends on whether the LMS is self-hosted or externally hosted by Blackboard. In a University-hosted

18. Will increase as NASA pay grid receives contracted adjustments.

19. Will need review, we may be paying above market. Carried across current annual expense for AICT Managed Services. Will increase as NASA pay grid receives contractual adjustments.

20. Will need review. Estimate simply used current annual expense for Vista hardware on 4-year refresh cycle.

21. Will need review. Estimate simply used current annual expense for Vista hardware on 4-year refresh cycle.

22. informal quote from one vendor was \$37,000; the LMSET is concerned the vendor perhaps did not understand the scale of our LMS request even though that information was provided.

23. Estimate for electricity for hardware and air conditioning.

24. Estimate for electricity for hardware and air conditioning.

25. Migration or conversion costs will vary depending on if it's done in-house or contractually and for what percentage of the courses or course material we convert for the instructors.

26. Greatest expense estimate: if all material in all 5,000 courses are migrated by the vendor.

27. The University is upgrading network bandwidth independently from this project, so bandwidth concerns in an externally hosted situation will already have been addressed.

28. Does not include migration costs.

scenario, the Oracle licensing cost is \$127,896 annually. In a Blackboard-hosted scenario, the Oracle license is included in the hosting cost. For Moodle, hosting location is immaterial as to database costs. Moodle stores data in either MySQL or PostgreSQL, even at large-scale universities such as University of Minnesota or Open University UK, and those databases do not have licensing costs: \$0. Concerns expressed on the Internet about the longevity of MySQL are overstated.<sup>29</sup>

Regardless of the LMS engine selected, migration of the 5,000 courses currently in Blackboard Vista to the selected candidate will require checking of transfer completeness, accuracy, and speed. Either product has migration tools available for automating much of the transfer. Vendors may offer migration or conversion as a service, enabling local staff to concentrate on development of middleware (CTL) or proceeding with course material development (OPSG, other teaching support staff). Instructors with simple eClass needs may just upload material to the new eClass as a term progresses, saving money.

Retraining instructors and support staff in best practices in the use of the selected LMS is critical, as a good first impression with the new environment can foster a warm reception by word-of-mouth. Training CTL staff to administer the LMS is offered by vendors: web-based training for Moodle administration can cost \$2,000. Vendors offer on-site or web-based training, and once a core group such as CTL is trained, this group can "train the trainers" in other units.

Financial events such as inflation, exchange rate swings, and budget cutbacks are all risks that should be evaluated for their effects on the LMS selection.

## Appendix E. LMS Course screen shots

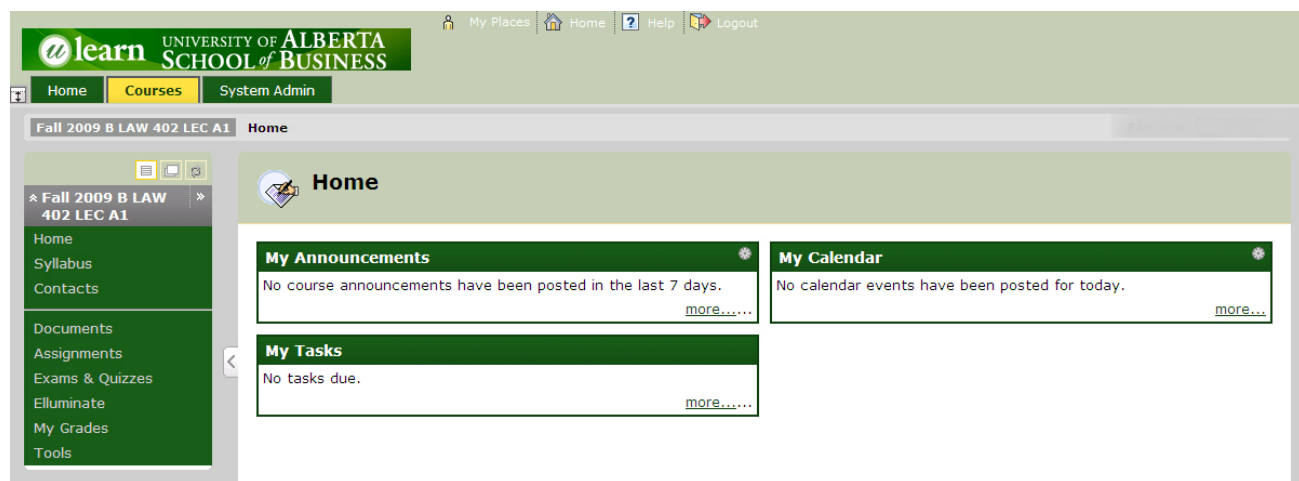


Figure 1. School of Business uLearn Course Template

29. <http://www.itworldcanada.com/news/oracle-chief-architect-unveils-mysql-roadmap/140415>





Figure 2. Campus Saint-Jean-developed Moodle Interface