MEMBERS OF THE eLEARNING AND LEARNING SPACES STANDING COMMITTEE

Director of Centre for Advancement of Teaching and Learning (W/Professor Denise Chalmers) – Chair
Nominee of the Executive Director, Finance and Resources (Ms Rowan Maclean)
Nominee of the University Librarian and Director of Information Management (Ms Margaret Jones)
President of the Guild (Ms Emma Greeney)
Associate Dean (Teaching and Learning) (Faculty of Architecture, Landscape and Visual Arts), Mr Philip Goldswain
Associate Dean (Teaching and Learning) (Faculty of Arts, Humanities and Social Sciences), Dr Alexandra Ludewig
Associate Dean (Teaching and Learning) (Faculty of Life and Physical Sciences), Dr Peter Whipp
Associate Professor Nick Spadaccini (Faculty of Engineering, Computing and Mathematics)

BY INVITATION (STANDING INVITEE)
Ms Rebecca Cameron, Manager, (Construction and Development Services) (Facilities Management Directorate)
Mr Romesh Goonewardene, MArch/LArch Honours Co-ordinator (Faculty of Architecture, Landscape and Visual Arts)
Asst/Professor Shannon Johnston, Higher Education Development (eLearning) (Centre for Advancement of Teaching and Learning)

eLEARNING AND LEARNING SPACES STANDING COMMITTEE MEETING – MONDAY 18TH OCTOBER 2010

This is to confirm that the next meeting of the eLearning and Learning Spaces Standing Committee will be held from 2pm – 3.30pm on Monday 18th October 2010 in Winthrop Tower, meeting room W1.

Part 1 of the agenda is to be dealt with en bloc by motion of the Chair. There are no items in Part 2. Part 3 is for discussion. A member may request the transfer of an item from Part 1 to Part 3.

Jan Cardy
Executive Officer
AGENDA

WELCOME

The Chair will welcome members to the last meeting of 2010.

APOLOGIES

The Chair will record any apologies. Members are reminded that apologies should be forwarded to the Executive Officer prior to the meeting as this may have an impact on the Committee proceeding inquorate.

DECLARATIONS OF POTENTIAL FOR CONFLICT OR PERCEIVED CONFLICTS OF INTEREST

The Chair will invite members to declare potential for conflict or perceived conflicts of interest, if applicable, with regard to items on the agenda.

1. MINUTES – REF: 29380

Confirmation of the minutes of the eLearning and Learning Spaces Standing Committee meeting held on Wednesday 4th August 2010.

2. ITEMS/BUSINESS IN PROGRESS – REF: F28401, F22828

Members are asked to note the following items as ‘business in progress’.

<table>
<thead>
<tr>
<th>No</th>
<th>ITEM/BUSINESS IN PROGRESS</th>
<th>ACTION</th>
<th>RESPONSIBLE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F28401</td>
<td>Terms of Reference 1: Formulation of an evidence-based framework for developing protocols regarding adoption of new technologies at UWA at both the faculty and central levels.</td>
<td>Mr Brian Greene, Associate Director, Policy and Planning Information Technology Services from Oct 2010</td>
<td>In progress – due end of 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terms of Reference 2: Undertake preliminary scoping study of the University’s online learning needs</td>
<td>W/Professor Denise Chalmers from August 2010</td>
<td>In progress - ‘Student IT Needs Study’ - refer to Item 8</td>
</tr>
<tr>
<td>B</td>
<td>The Built Learning Environment</td>
<td>Teaching Fellowship Project</td>
<td>Ms Rebecca Cameron</td>
<td>In progress. Report due in 2010 – refer to Item 10</td>
</tr>
<tr>
<td>C</td>
<td>Campus Plan 2010</td>
<td>Draft Campus Plan considered by Committee in August 2010 and feedback provided. Progress report on draft Campus Plan</td>
<td>Ms Rowan Maclean</td>
<td>Consultation underway</td>
</tr>
<tr>
<td>No</td>
<td>ITEM/BUSINESS IN PROGRESS</td>
<td>ACTION</td>
<td>RESPONSIBLE</td>
<td>STATUS</td>
</tr>
<tr>
<td>----</td>
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<td>------------------------------</td>
</tr>
<tr>
<td>D</td>
<td>ELearning Strategy at UWA</td>
<td>Development of a draft eLearning Strategy</td>
<td>Chair, W/Professor Denise Chalmers</td>
<td>In progress. Report due in 2010.</td>
</tr>
<tr>
<td>E</td>
<td>Impact on learning spaces of the Future Framework</td>
<td>Monitoring of issues associated with learning spaces as they develop within the context of the Future Framework</td>
<td>Chair, Professor Denise Chalmers</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

PART 1 - ITEMS FOR COMMUNICATION TO BE DEALT WITH EN BLOC

3. THE UNIVERSITY’S LEARNING MANAGEMENT SYSTEM (LMS) AND LECTURE CAPTURE SYSTEM (LCS) – UPDATE FROM CATL – REF: F5397, F22828

The attached report (Attachment A) provides an update on the University’s Learning Management System (LMS) and Lecture Capture System (LCS) usage for semester 2, 2010.

For noting

4. UWA LECTURE CAPTURE SYSTEM MIGRATION BUSINESS CASE: F22828

Members will be aware that UWA is currently using Lectopia, which was originally developed by staff at UWA, as a Lecture Capture System. The development of Lectopia officially ceased as of the beginning of 2009 and the product is now in ‘maintenance’ mode until the end of 2011 at which point all maintenance and support will cease.

A business case recommending that UWA fully migrates to the EchoSystem by the end of 2011 is attached (Attachment B) for members’ information.

For noting

5. FUTURE MEETING DATES FOR 2011 – REF: F29380

Future meetings of the eLearning and Learning Spaces Standing Committee for 2011 are confirmed as:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th March 2011</td>
<td>10.00am-11.30am</td>
<td>Meeting Room W1 Winthrop Tower</td>
</tr>
<tr>
<td>14th June 2011</td>
<td>10.00am-11.30am</td>
<td>Meeting Room W1 Winthrop Tower</td>
</tr>
<tr>
<td>9th August 2011</td>
<td>10.00am-11.30am</td>
<td>Meeting Room W1 Winthrop Tower</td>
</tr>
<tr>
<td>11th October 2011</td>
<td>10.00am-11.30am</td>
<td>Meeting Room W1 Winthrop Tower</td>
</tr>
</tbody>
</table>

The Chair requests that members note these dates in their diaries for 2011.

For noting
6. LEARNING SPACE DESIGN SUMMIT – REF: F13756

Members are advised that the Inaugural Learning Space Design Summit will be held 29th – 30th November 2010 in Sydney. Further information on the summit can be found from the website http://www.informa.com.au/conferences/education/learning-space-design-summit

The Chair will attend the summit and report back to the Committee at its first meeting in 2011.

For noting

PART 2 - ITEMS FOR DECISION EN BLOC

No items

PART 3 - ITEMS FOR DISCUSSION

7. LEARNING SPACE EVALUATION – REF: F33728

At the eLearning and Learning Spaces Standing Committee meeting held on 8th December 2009, it was suggested that Ms Rowan Maclean and Ms Rebecca Cameron consider and formulate a brief discussion paper on how to get student feedback on learning spaces (both construction and refurbishment) for consideration by the Committee.

Space at UWA, in and around buildings, is a significant investment into its Teaching and Learning, particularly when you consider it in the context that the life of a building on the University Campus can reasonably be considered as 50 years. A building will typically require a significant refurbishment every 10 -15 years depending on use, changes in use, change in technology, building services and infrastructure.

Evaluation of this space, learning from and application of the data collected through the evaluation process is critical in informing future building and space design to suit a wide range of University stakeholders.

Ms Rowan Maclean has prepared a discussion document titled ‘Learning Space Evaluation’ which is attached to the agenda (Attachment C). The document provides options on how to seek input to the design of, and feedback on the construction or refurbishment of learning spaces from students.

For discussion

8. STUDENT INFORMATION TECHNOLOGY NEEDS STUDY 2010 – REF: F28401, F33885

By way of background, in January 2010 the Information Services Division proposed a Student IT Needs Study. The proposal was designed to gather information relating to students’ learning-related-information technology needs at UWA with the objective of enabling the development of recommendations regarding the minimum requirements for IT infrastructure and services for students, particularly in preparation for New Courses 2012.

The study also gathered information about academic staff perspectives on IT for teaching and learning.

Members have before them a draft report (Attachment D) for their consideration. Ms Margaret Jones, Associate Librarian Reader Services, will introduce the report and invite feedback from members on the content of the draft report.

For discussion
9. UWA LEARNING MANAGEMENT SYSTEM (LMS) – REF: F28027

A review of the University’s current Learning Management System (LMS) is being undertaken by the Centre for the Advancement of Teaching and Learning (CATL), in collaboration with Information Technology Services (ITS), and under the auspices of the eLearning and Learning Spaces Standing Committee.

At its meeting in August members noted the content of a report from the LMS Review working group and endorsed eight ‘UWA Actions’ outlined in the Report as an appropriate way forward.

An update on the progress of the review and product selection process is at Attachment E. As part of the selection process, Information Technology Services (ITS) were asked to investigate infrastructure implications for software and hardware products selected. Their report ‘Infrastructure Implications of the LMS Review’ is attached at Attachment F.

For discussion

10. ITEMS IN PROGRESS – UPDATES

The Chair will invite members to provide a brief verbal update on progress to date and will include:

- ‘Draft Campus Plan 2011’ Rowan Maclean will provide an update on progress Campus Plan since the committee last met in August 2010.
- ‘The Built Learning Environment’, progress report from Rebecca Cameron. A background document is included for members’ information at Attachment G.
- Feedback from members who attended the Australian Learning and Teaching Council seminar and workshop program on ‘Evaluation Learning Spaces’ on Thursday 16th September 2010 at Curtin University.

For information

11. INFORMAL REPORT FROM THE CHAIR

The Chair will summarise the activities of the Committee during 2010 and discuss forthcoming items for 2011.

12. NEXT MEETING

The next meeting of the eLearning and Learning Spaces Standing Committee will be held on 8th March 2011 from 10am – 11.30am in Winthrop Tower, meeting room W1.
Learning Management System (WebCT) Semester 2, 2010

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Semester 2, 2010 Units</th>
<th>Special Teaching Period Units</th>
<th>Total Units (01/07/2010 - 31/01/2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHSS</td>
<td>139</td>
<td>8</td>
<td>147</td>
</tr>
<tr>
<td>ALVA</td>
<td>13</td>
<td>N/A</td>
<td>13</td>
</tr>
<tr>
<td>BUS</td>
<td>82</td>
<td>24</td>
<td>106</td>
</tr>
<tr>
<td>ECM</td>
<td>68</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>EDU</td>
<td>14</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>LAW</td>
<td>32</td>
<td>7</td>
<td>39</td>
</tr>
<tr>
<td>LIBRARY</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>LPS</td>
<td>85</td>
<td>13</td>
<td>98</td>
</tr>
<tr>
<td>MDHS</td>
<td>50</td>
<td>4</td>
<td>54</td>
</tr>
<tr>
<td>NAS</td>
<td>51</td>
<td>N/A</td>
<td>51</td>
</tr>
<tr>
<td>SIS</td>
<td>7</td>
<td>N/A</td>
<td>7</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>542</strong></td>
<td><strong>51</strong></td>
<td><strong>601</strong></td>
</tr>
</tbody>
</table>

Lecture Capture System (Lectopia) Semester 2, 2010 * and **
(data as of 1st October 2010 but subject to change)

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Semester 2, 2010 Units</th>
<th>Number of Lectures Recorded</th>
<th>Total Hits - Streamed Media</th>
<th>Total Hits - Podcasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHSS</td>
<td>70</td>
<td>896</td>
<td>36024</td>
<td>11750</td>
</tr>
<tr>
<td>ALVA</td>
<td>2</td>
<td>18</td>
<td>3819</td>
<td>6</td>
</tr>
<tr>
<td>BUS</td>
<td>54</td>
<td>815</td>
<td>85184</td>
<td>8784</td>
</tr>
<tr>
<td>ECM</td>
<td>59</td>
<td>1506</td>
<td>120087</td>
<td>34828</td>
</tr>
<tr>
<td>EDU</td>
<td>1</td>
<td>5</td>
<td>948</td>
<td>101</td>
</tr>
<tr>
<td>LAW</td>
<td>17</td>
<td>258</td>
<td>33491</td>
<td>298</td>
</tr>
<tr>
<td>LPS</td>
<td>45</td>
<td>939</td>
<td>62456</td>
<td>22776</td>
</tr>
<tr>
<td>MDHS</td>
<td>26</td>
<td>407</td>
<td>28259</td>
<td>4124</td>
</tr>
<tr>
<td>NAS</td>
<td>24</td>
<td>446</td>
<td>13221</td>
<td>4900</td>
</tr>
<tr>
<td>SIS</td>
<td>4</td>
<td>63</td>
<td>345</td>
<td>26</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>302</strong></td>
<td><strong>5353</strong></td>
<td><strong>383834</strong></td>
<td><strong>87593</strong></td>
</tr>
</tbody>
</table>

*The number of lectures uploaded by staff using the Self Service Upload tool has also been steadily increasing
- Semester 2, 2009 – 12
- Semester 1, 2010 – 71
- Semester 2, 2010 – 49

** From July 13th 2010 when the new Streaming Server was commissioned, there have been 328,608 unique hits to the server, of which 4295 have come from a mobile device such as an iPhone, Blackberry, iPad, Android etc.
Executive Summary

The University of Western Australia (UWA) is currently using the Lectopia product to support the central Lecture Capture Service.

As a result of a reorganisation of this service at the beginning of 2010, the Centre for the Advancement of Teaching and Learning (CATL) has responsibility for the overall directions, management, training and administration of the system with Information Technology Services (ITS) managing the technical “back-end” infrastructure including the capture appliance equipment in supported venues, through the Teaching Infrastructure Services (TIS) team in a cooperative agreement.

Lectopia (previously known as the iLecture System) was originally developed by staff from the University of Western Australia (UWA). In 2007, it and associated UWA staff were acquired by the Education division (Apreso) of a company called Anystream to form Echo360 Inc. Since then Echo360 has extended their enterprise lecture capture offering with a next generation product, called EchoSystem. This product incorporates the fundamentals of the original products (Lectopia and Anystream Apreso).

Development of the Lectopia product officially ceased as of the beginning of 2009 and the product is now in “maintenance” mode. It will continue in this mode until the end of 2011, at which point all development, maintenance and support will cease.

This document recommends that UWA fully migrates to the EchoSystem by the end of 2011 in order to continue to deliver a quality lecture capture service to staff and students. This will ensure that the Lecture Capture (Echo) system is in full operation for Semester 1, 2012. To achieve this it is recommended that a production pilot of the EchoSystem be undertaken during 2011.

The key reasons for this recommendation are:
1. The maintenance and support provisions for our current Lecture Capture (Lectopia) system will be discontinued at the end of 2011. Therefore a replacement system must be introduced.
2. UWA has a perpetual no cost software license for the EchoSystem product as a consequence of the acquisition of Lectopia by Echo360. The major costs of transition will be associated with CATL and ITS staff time to manage the technical migration, integration with related UWA systems, administration processes and staff and student training. Incurring these costs will ensure an improvement to the lecture capture experience for UWA staff and students.
3. The EchoSystem platform is the leading enterprise lecture capture platform in the market – the lecture capture landscape has evolved in recent years. This system will provide the most appropriate solution for the University based on its functionality and operational scale characteristics. Since the introduction of EchoSystem, three Australian universities have already deployed and are using the platform. This includes Monash University where the system is deployed at a similar scale to UWA.
4. EchoSystem provides significant benefits over the current Lectopia product for all users of the system with a richer playback experience for students, editing for academic staff and simpler operation for technical staff. While there are some functionality “gaps”, these are not significant and will be addressed by Echo360 in future planned releases in 2010 and 2011.
5. Echo360 provides strong local support and service for their products. The majority of the team that joined Echo360 from UWA continue to provide Australian-based support and service for our current lecture capture service operations.

Budget Implications

The following is a summary of the budget implications for migrating to EchoSystem.
There is no annual license cost for the EchoSystem software itself. However, there will be costs incurred for UWA to migrate from the Lectopia system to the EchoSystem.

- **Hardware Infrastructure.**
  - Additional Processors will be required. These machines convert the raw recorded file into compressed and deliverable media formats for students to view. The cost of a processor is approximately $7000. Two processors will be required at a total cost of $14,000.
  - Additional Storage will be required. The exact cost of which is still pending (ITS to provide).

- **Installations of the EchoSystem and Integrations with related UWA Systems.**
  - **Installation of the EchoSystem.**
    This will involve the installation and configuration of the EchoSystem application itself. Staff time is the main resource which will be required to undertake this task. The associated costs are yet to be finalised.
  - **Integration with the Timetabling System.**
    This will involve developing middleware to enable lecture recordings to be automatically scheduled based on information held within the timetabling system. This automatic scheduling will make the administration of the Lecture Capture system much more efficient for all involved, particularly academic staff and reduce the number of lecture capture failures due to human intervention. Staff time is the main resource which will be required to undertake this task. The associated costs are still to be finalised.
  - **Integration with the Learning Management System.**
    This will involve developing middleware to automatically publish captured lectures to the appropriate unit in the Learning Management System for student viewing. Staff time is the main resource which will be required to undertake this task. The associated costs are yet to be finalised.
  - **Integration with the LDAP Directory (Staff and Student Authentication).**
    This will involve integrating the Echo and LDAP systems to restrict access to captured lectures to only the appropriate students and staff based on enrolment and teaching responsibilities. Staff time is the main resource which will be required to undertake this task. The associated costs are still to be finalised.
  - **Integration with the AMX (Lecturn Consoles).**
    This will involve reprogramming the Lecturn Consoles in venues that are lecture capture supported to enable staff to obtain greater feedback as the quality of their lecture recording and to extend a recording if necessary. This task is to be completed by the Universities Audio Visual contractor. The associated costs are yet to be finalised.

The budget for piloting and migrating to the EchoSystem has yet to be fully costed. The university currently allocates $400,000.00 for the support and maintenance of the current Lecture Capture system (Lectopia).

A full budget projection for initial migration and ongoing operation for the EchoSystem will be prepared shortly.
## Proposed Migration Timeline

The following is a summary of the proposed timeline for migrating to EchoSystem.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity/Task</th>
<th>University Responsibility</th>
<th>Echo360 Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept-Oct 2010</td>
<td>Finalise business case for implementing EchoSystem in 2012 after piloting in 2011.</td>
<td>Develop a business case for the implementation of the EchoSystem Lecture Capture Software. Include this project in the ITS 2011 project plans. Submit the business case to the eLearning and Learning Spaces Committee of the Teaching and Learning Committee, and Information Technology Programme Committee. Responsibility: CATL in conjunction with ITS and TIS.</td>
<td>N/A</td>
</tr>
<tr>
<td>Jan 2011</td>
<td>EchoSystem 2.6 test installation built and evaluated with two capture appliances, a dedicated database infrastructure and separate processors/delivery servers – hosted solution shadow recording. Note: Upgrade to EchoSystem 3.0 as appropriate once it is released.</td>
<td>Determine the venues for EchoSystem testing. Configure pilot lecture theatre hardware. Test operation and core workflows Scope development of required integrations with other systems. Develop and test integrations with other systems e.g. LDAP, AMX, LMS, Timetable. Responsibility: ITS and TIS in conjunction with CATL.</td>
<td>Loan UWA two capture appliances. Arrange for hosted EchoSystem environment, including software. Provide advice to UWA regarding development of integrations with other systems.</td>
</tr>
<tr>
<td>Jan-Feb 2011</td>
<td>Prepare associated user training materials and resources. Disseminate information to a limited number of UWA Staff and Students about the EchoSystem. This is dependent on the venues chosen for EchoSystem testing.</td>
<td>Develop and update end-user training materials and associated resources and keep UWA Staff and Students informed as to progress. Responsibility: CATL.</td>
<td>Provide advice and templates for end-user training materials and associated resources.</td>
</tr>
<tr>
<td>Feb-Jun 2011</td>
<td>EchoSystem piloted in two venues.</td>
<td>Functionality and workflow testing from each of the stakeholder perspectives, e.g. student, academic staff, CATL administration, ITS infrastructure administration, TIS configuration and monitoring. Revise technical and operational practices as necessary. Responsibility: CATL, ITS and TIS.</td>
<td></td>
</tr>
</tbody>
</table>
Use of Lectopia at UWA

UWA began using Lectopia (originally known as the iLecture System) in the Faculty of Arts in 1999. Since then, the service has had consistent yearly growth, both in terms of the number of weekly captures and the volume of student viewings. Table 1 presents the total number of captured lectures, supported venues and total hits by format from 2007 to 2010.

Table 1: Growth in Lectopia use at UWA

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captured Lectures</td>
<td>13,895</td>
<td>15,709</td>
<td>17,226</td>
<td>18,504</td>
</tr>
<tr>
<td>Enabled Venues</td>
<td>-</td>
<td>-</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>Total Hits</td>
<td>779,699</td>
<td>1,166,552</td>
<td>1,769,310</td>
<td>1,675,117</td>
</tr>
<tr>
<td>Streaming</td>
<td>N/A</td>
<td>656,179</td>
<td>779,914</td>
<td>695,280</td>
</tr>
<tr>
<td>Download</td>
<td>N/A</td>
<td>336,562</td>
<td>453,111</td>
<td>413,558</td>
</tr>
<tr>
<td>Podcast</td>
<td>N/A</td>
<td>173,638</td>
<td>536,270</td>
<td>566,270</td>
</tr>
</tbody>
</table>

*Data for 2010 is correct as of September 6th 2010.
Table 1 shows that the number of captured lectures has increased by approximately 1200 recordings each year. To cater for this demand the number of teaching spaces that have been lecture capture enabled has also consistently increased. In 2010, 70 venues are lecture capture enabled.

The total number of hits or student viewings has also increased every year. Figure 1 presents a breakdown of total hits by delivery format – Streaming, Download or Podcast per year.

As many academics choose to make their captured lectures available only via the streaming delivery format, it continues to have the largest number of hits or student viewings. However, in the last three years there has been a significant increase in the use of the podcast delivery format. This format automates the download process and enables students to review lecture materials on mobile devices such as iPhones, iPads and iPods.

The Lecture Capture Landscape

The “lecture capture” market consists mostly of commercial vendors, some of which have emerged out of Higher Education, as well as many home-grown initiatives that meet the needs of particular universities. In the commercial landscape in the US, the following are the principle vendors:

- Echo360
- Sonic Foundry
- Panopto
- Tegrity

Significantly, the Australian landscape continues to lead enterprise lecture capture in terms of the scope of deployments and extent of usage by academic staff and students. The majority of Australian universities are using Echo360 (EchoSystem or Lectopia product), with the balance operating a “home-grown” alternative.

Echo360 Overview

Echo360 ([http://www.echo360.com](http://www.echo360.com)) is an internationally renowned educational technology company, currently providing automated lecture capture and publication solutions to over 500 educational institutions.
institutions around the world. The principle focus of Echo360 is Higher Education and the company employs over 100 personnel, mostly located in the USA head office. In the Echo360 Perth office there are currently five full-time personnel employed who support Echo360 clients in Australia and New Zealand.

Echo360 has been a leader in the enterprise “lecture capture” domain, based on combined heritage of Anystream and Lectopia. Anystream brought a rich enterprise video encoding heritage, having developed technology for many of the world’s leading broadcast media providers in the US. Anystream’s media technology foundations are strong, evidenced by the creation of the industry’s first purpose-built lecture capture appliance. Lectopia has pioneered lecture capture at scale – both within a university and across the Australian sector. It was a winner of a number of awards in 2007, including the Institutional Award for Services Supporting Students from the Australian Awards for University Teaching.

A small selection of Echo360's EchoSystem international clients can be found at: http://www.echo360.com/customers/

A full list of Echo360's EchoSystem and Lectopia clients in Australia and New Zealand can be found at: http://www.lectopia.com.au/licensing.lasso

**EchoSystem Functionality**

This section provides a summary of the key benefits associated with migrating from Lectopia to EchoSystem; particularly in terms of the improved administrative and user experience.

- **Richer playback experience**
  Based on the ubiquitous Flash format, the EchoSystem Player provides a functionally rich experience of synchronised rich media playback. Students can view the presentation from any computer using any standard web browser. The visual experience incorporates the option to display synchronised presenter video and screen-based visual material – both in motion video enabling the screen material to be gradually revealed. Students are able to easily navigate the recording via the simple timeline controls, the auto-generated thumbnails or by searching for keywords derived by OCR indexing.

![EchoSystem's Rich Media Player](image)

*Figure 2: EchoSystem’s Rich Media Player*

The EchoSystem Player also incorporate the option to include closed captioning using university based transcribing facilities or in conjunction with a third part closed captioning provider.
• **Presentation editing and increased automation for academic staff**

  The EchoSystem also supports post-recording web-based editing and is available to academic or support staff that wish to perform top-and-tail or cuts-based editing. Post-recording review/editing can be either an optional or a required step in the recording workflow.

*Figure 3: Web-Based Editing View*

EchoSystem provides very similar functionality to Lectopia with respect to the automation of capture and processing. From a processing perspective, the EchoSystem automates the encoding of recordings into a range of pre-defined formats including streamed and downloadable/podcast formats for student playback. Additionally, publishing of these formats into a university’s Learning Management System (LMS) environment (e.g. Blackboard, Moodle) is also completely automated. This eliminates the need for academic staff to copy and paste links into their online units.

*Figure 4: EchoSystem automated workflow*

• **More flexibility with back-end infrastructure**

  Echo360 has made a commitment to support a range of platforms for the back-end components of the EchoSystem product. This is one of its many product strengths. The system is able to operate on Linux, Windows and Mac OS X, thereby enabling flexibility in the way the University integrates future hardware investment with our existing enterprise architecture.

  This proposal does not recommend the purchase of additional back-end infrastructure as the infrastructure that was purchased in 2010 to refresh existing Lectopia back-end infrastructure (maintained and supported by ITS) is considered suitable for the EchoSystem migration.
• **Simplification of operations for technical staff**
The EchoSystem platform offers a more modern and streamlined administrative experience. Like Lectopia, much of the application administration is performed via a central web-based interface. The overall overhead of administration is lower due to features such as centralised software updates for all system components, simplified server upgrade processes, draft schedules, automated publishing, and a reduction in the overall configuration possibilities.

• **Potentially automate lecture capture scheduling**
Integrating the UWA Timetable with EchoSystem will greatly ease the administrative burden on lecturers and administrative staff because lecturers will no longer need to submit paper-based lecture capture booking forms prior to the beginning of each semester, for manual processing by CATL.

Instead the unit timetable will be automatically published in draft format to the EchoSystem at the beginning of each semester, for academics to activate and then maintain.
Learning Space Evaluation

TRIM File No: F 33728  Date: September 2010

<table>
<thead>
<tr>
<th>To:</th>
<th>Winthrop Professor Denise Chalmers</th>
<th>Chair, eLearning &amp; Learning Spaces Standing Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author:</td>
<td>Rowan Maclean</td>
<td>Director Strategic Project Management</td>
</tr>
</tbody>
</table>

ATTACHMENTS:

PURPOSE

To advise the eLearning & Learning Spaces Standing Committee (eLLSSC) on options to seeking input to the design of, and feedback on the construction or refurbishment of learning spaces from students.

BACKGROUND

Learning spaces in universities are changing. Shifts in student mobility, pedagogy, curriculum management and technological tools are beginning to impact directly on the planning and development of campus learning spaces. However, building new spaces and refitting existing ones is an expensive and potentially risky enterprise. An inappropriate space is not only costly in financial terms, but also for the reputation of the institution, student experience and staff confidence in the driving educational principles. Both pre- and post-occupancy evaluations are important tools in understanding learning spaces and their impact on the curriculum, the institution, and most importantly, the people who use them.

The underlying aim of learning spaces innovation is to improve the student learning experience, and by association, student learning outcomes. Over recent years, there has been a shift away from transmission models of learning to constructivist approaches that emphasise active, collaborative, peer and social learning (Lee 2006, Brown 2005). Reflecting this adoption of constructivist approaches of learning nationally and internationally, there is a broadening of the types of learning spaces from the concentration on lectures and classrooms to now include collaborative, informal and social learning spaces.

(ref 1 : Evaluation of Learning Spaces Project: a partnership project between Swinburne University of Technology, Victoria University and University of Queensland, funded by ALTC. The project aims to provide a framework for a full evaluation cycle, from conceptualisation and design to implementation and post-occupancy)

Teaching and Learning at UWA

The University provides a learning environment of the highest quality to meet individual, state and national needs and internationally recognised standards. (http://www.teachingandlearning.uwa.edu.au/)

Learning spaces contribute to the learning environment and at its December 2009 meeting, the eLLSSC ……suggested that Ms Rowan Maclean and Ms Rebecca Cameron consider and formulate a brief discussion paper on how to get student feedback on learning spaces – both construction and refurbishment – for consideration by the Committee. Possibilities included surveying the students in the venues, and/or inclusion of questions in SPOT. It was noted that the Library had a well established system of seeking feedback for students on their venue and facilities. Extract Minutes of December 2009 Meeting (eLLSSC).

The evaluation of a space requires the consideration of a range of issues from conceptualisation, design, construction and occupation, through to the operation and use of the space by staff and students, property or facilities managers and those staff at the University striving to improve Teaching & Learning. Feedback from a single stakeholder group would skew the outcome of the evaluation process and not necessarily provide appropriate information for integration into future design and construction of learning spaces.

On this basis, the discussion around seeking student feedback has been broadened to include all stakeholders with a range of evaluation tools offered; to be selected on a space by space basis to best suit the information sought and the target audience.
THE PROCESS OF EVALUATION

Space at the University, in and around buildings, is a significant investment in to its Teaching and Learning, particularly when you consider it in the context that the life of a building on the University Campus can reasonably be considered as 50 years. This building will typically require a significant refurbishment every 10-15 years depending on use, changes in use, change in technology, building services infrastructure, etc.

Lifetime of Building Components

![Diagram showing the lifetime of building components](http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume40/FutureoftheLearningSpaceBrea
ki/157992)

**Source:** S. Kelsey, Anshen+Allen, LA, Architects.

http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume40/FutureoftheLearningSpaceBrea
ki/157992

**Future of the Learning Space: Breaking Out of the Box**

© 2005 Phillip D. Long and Stephen C. Ehrmann. The text of this online article is licensed under the Creative Commons Attribution 2.0 License; see [http://creativecommons.org/licenses/by/2.0/](http://creativecommons.org/licenses/by/2.0/).

Evaluation of this space, learning and application of the data collected through the evaluation process is critical in informing future building and space design to suit a wide range of University stakeholders and increasingly, external stakeholders when contributing to construction, paying for naming rights, etc.

By definition, *the Post Occupancy Evaluation involves systematic evaluation of opinion about buildings in use, from the perspective of the people who use them. It assesses how well buildings match users’ needs, and identifies ways to improve building design, performance and fitness for purpose*. [http://www.postoccupancyevaluation.com/](http://www.postoccupancyevaluation.com/) Incorporation of the findings of a POE into future projects, space management and teaching methodology should ultimately improve the teaching and learning environment for students and staff.

A brief overview of the POE process is:

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
<th>Step 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify POE Strategy</td>
<td>Decide Which Approach</td>
<td>Brief for the POE</td>
<td>Plan the POE</td>
<td>Carry out the POE</td>
<td>Prepare the Report</td>
<td>Action in Response to POE</td>
</tr>
<tr>
<td>Identify the need for the evaluation and probable aspects of the evaluation</td>
<td>Identify what issues the evaluation must address</td>
<td>Succinct statement setting out the purpose of the POE and how it is to be achieved</td>
<td>Select approaches that will meet your needs (including defining the best evaluation tools to suit the POE)</td>
<td>Distribute and collect survey questionnaires, carry out interviews, meetings and observations, etc.</td>
<td>Feedback of findings</td>
<td>Feed information into university policies. Feed information into the next project</td>
</tr>
</tbody>
</table>

Guide to Post Occupancy Evaluation, Association of University Directors of Estates, 2006
EVALUATION TOOLS

Steps 4 and 5 of the POE Process involve the planning for and carrying out of the data collection process. Illuminative Evaluation is the preferred method for evaluation, taking into consideration the wider context of an evaluation, utilising multiple tools and primarily concerned with description and interpretation by multiple stakeholders.

Illuminative Evaluation is ‘...a general research strategy ... with characteristically three overlapping stages within which the evaluator observes, enquires further and then seeks to explain, drawing as and where appropriate on quantitative and qualitative methods. ...A successful Illuminative Evaluation should never spring any surprises at its conclusion. The ongoing collaborative process of collecting information and gathering participants’ perspectives should incorporate also feedback and discussion of a regular nature such that the final illuminations are made up of a number of small candles, or even fireworks, that have been lit along the way, rather than one big bang or flash of light... what this approach does emphasise is a preference for exploring attitudes, perceptions and attributions over assessing attributes and attainments.’ Chapter 11, Illuminative Evaluation by Bob Burden, Frameworks for Practice in Educational Psychology, 2008.

Suggested tools for use in the collection of data through the evaluation process are listed below and should be selected to suit the purpose, participants and target audience for the findings. Most either exist or could be readily adopted into existing University administration systems and processes.

Key stakeholders include:
- academics and other educational designers
- students and alumni
- librarians and other information professionals
- educational technologists
- AV/IT professionals
- colleagues in the Vice Chancellery & Registrars Office
- colleagues and consultants associated with Facilities & Venues Management.

<table>
<thead>
<tr>
<th>EVALUATION TOOLS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal:</td>
<td></td>
</tr>
<tr>
<td>Student Focus Groups</td>
<td>Select via reward process/self nominate/promote via relevant student cohort e-mail</td>
</tr>
<tr>
<td>Staff Focus Groups</td>
<td>Select to suit space type, use</td>
</tr>
<tr>
<td>Stakeholder Interviews</td>
<td>Select to suit space type, use</td>
</tr>
<tr>
<td>User Evaluations</td>
<td>Select to suit space type, use</td>
</tr>
<tr>
<td>Observations</td>
<td>Select to suit space type, use</td>
</tr>
<tr>
<td>Surveys</td>
<td>Work into existing recognised surveys/systems:</td>
</tr>
<tr>
<td>1. Planning Services, Registrars Office</td>
<td></td>
</tr>
<tr>
<td>2. SPOT (Student Perceptions of Teaching)</td>
<td></td>
</tr>
<tr>
<td>3. Web 2.0/Facebook, Dr Lisa Cluett, Student Services</td>
<td></td>
</tr>
<tr>
<td>Case Studies</td>
<td>As and when appropriate</td>
</tr>
<tr>
<td>Peer Review</td>
<td>As and when appropriate</td>
</tr>
<tr>
<td>Room Booking Data</td>
<td>Centrally timetabled space booking information can be obtained from Venues Management and Faculty managed spaces, through the relevant Faculty.</td>
</tr>
</tbody>
</table>
EVALUATION TOOLS (cont.)

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFORMAL:</strong></td>
</tr>
<tr>
<td>Teaching &amp; Learning Grants</td>
</tr>
<tr>
<td>Staff Development Workshop Feedback (formal &amp; informal)</td>
</tr>
<tr>
<td>Promotional Events</td>
</tr>
<tr>
<td>Support Requests</td>
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</tbody>
</table>

Refer toolkit to support the evaluation process:

http://www.cerlim.ac.uk/projects/efx/toolkit/index.html

All pages and Content © Manchester Metropolitan University 2002, unless otherwise stated

The key findings from the evaluation need to be ‘….strategic, focussed, attributable, neutral, transparent, feasible, economic, repeatable, reliable, valid, actionable (Cerlim, et al 2006)’ to assist the target audiences transform the data into outcomes that will change the way they do things; more specifically utilising different teaching methods in a space and how students may respond, the impact of elements of light, structure, environmental conditions on teaching and learning and how to design a space for particular teaching and learning outcomes, for example.

Projects need to be able to explain the logic of the relations between their outputs and outcomes and to say how they plan to help other people/agencies transform project outputs into desired outcomes.

Refer http://www.cerlim.ac.uk/projects/efx/index.html EFX Workshop Manchester 26th Feb 2003, Professor Peter Goodyear, CSALT Lancaster University

NEXT STEPS

It is proposed that select facilities are nominated for POE given their learning space type, use and condition.

<table>
<thead>
<tr>
<th>SPACE TYPE</th>
<th>PROPOSED LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking/conceiving spaces (spaces for deliberating)</td>
<td>Business School Case Study Rooms</td>
<td>In use for 18 months</td>
</tr>
<tr>
<td>Designing spaces (spaces for putting structure, order, and context to free-ranging ideas)</td>
<td>Monadelphous ILC, ground floor workshops</td>
<td>To be used, suggest assess mid 2011</td>
</tr>
<tr>
<td>Presenting spaces (spaces for showing things to a group)</td>
<td>Botany &amp; Biology u/g lab AV link</td>
<td>In use 12 months</td>
</tr>
<tr>
<td>Collaborating spaces (spaces for enabling team activities)</td>
<td>Library Meeting rooms</td>
<td>In use for 18 months</td>
</tr>
<tr>
<td>Debating or negotiating spaces (spaces for facilitating negotiations)</td>
<td>Monadelphous ILC, first floor meeting rooms</td>
<td></td>
</tr>
<tr>
<td>Documenting spaces (spaces for describing and informing specific activities, objects, or other actions)</td>
<td>Monadelphous ILC, first floor teaching spaces</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Example</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Implementing/associating spaces (spaces for bringing together related</td>
<td></td>
<td></td>
</tr>
<tr>
<td>things needed to accomplish a task or goal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practicing spaces (spaces for investigating specific disciplines)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensing spaces (spaces for pervasively monitoring a location)</td>
<td>Sleep Disorder Clinic</td>
<td></td>
</tr>
<tr>
<td>Operating spaces (spaces for controlling systems, tools, and complex</td>
<td>ECU Bunbury Dental Clinic</td>
<td></td>
</tr>
<tr>
<td>environments)</td>
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</tbody>
</table>
5 October 2010

STUDENT INFORMATION TECHNOLOGY NEEDS STUDY 2010

Overview
The Information Services Student IT Needs Study was designed to gather information relating to students’ learning-related information technology needs at UWA.

The objective was to enable the development of recommendations regarding the minimum requirements for IT infrastructure and services for students across campus, particularly in preparation for New Courses 2012. In gathering information about student needs, the study also gathered information about academic staff perspectives on IT for teaching and learning.

Data was gathered by:
- Seeking input from UWA staff and students via surveys, interviews and focus groups
- Reviewing IT and Online services offered at a selection of top ranked Universities (Matariki Network of Universities and ARWU top 50)
- Studying IT policies and provision at selected UWA feeder schools to gauge what students from these schools might expect in terms of IT when they commence at UWA
- Utilising existing data from UWA sources and other organisations such as CAUDIT
- Reviewing recent literature.

Key Findings

Prospective Students
Incoming students from WA schools will be familiar with the use of IT in teaching and learning, although the IT infrastructure and support provided by high schools varies considerably. A small number of students are likely to have very high expectations of IT at UWA, as they are accustomed to using laptops and other devices daily to communicate, collaborate and access learning resources. These students are likely to want to use their own devices, with the requirements for the infrastructure and support that this implies.

Current Students
Provision of IT infrastructure and services at UWA is inconsistent across the campuses.

Student expectations of IT at UWA include:
- wireless internet access available anywhere, anytime
- 24/7 access to any computer lab on campus
- greater provision of up to date equipment
- online and face-to-face technical advice provided in a clear, courteous manner
- video recordings available for all university lectures (for review and/or back-up)
- easy access to online resources (single sign-on) from anywhere.
Selected Teaching and Learning Staff

Staff noted a need for the provision of centrally provided and supported tools for online teaching and learning, and training and support to use them effectively. This might include tools for online conferencing, publishing and collaboration (e.g. Wiki platform, Blogs, RSS), LMS, ePortfolio, and lecture capture, some of which are already available.

Benchmarking

UWA performs relatively well by comparison with other Australian universities in terms of computer to student ratios according to CAUDIT (1: 5.6 in 2009, compared with the Group of Eight universities, where UNSW has the next best ratio with 1: 6.2). In investigating the IT services and facilities available in the Matariki Network of Universities and a selection of the Top 50 ranked universities from the ARWU list, the following services and applications were identified as relevant:

- Provision of campus wide Wi-Fi access
- Provision of Eduroam wireless network
- Provision of services to mobile and handheld devices
- Provision of 24/7 access to student PC Labs
- Provision of enhanced IT support to students (in person, video chat and via floor walkers)
- Provision of out of hours IT helpline for students
- Online submission of assignments through learning management system e.g. via Assignment Manager for Blackboard
- Provision of centralised online data storage facility for students
- Provision of centralised student printing system
- Provision of anti-virus software to all students at no cost (negotiated through campus license)
- Provision of a comprehensive IT self-help FAQ site for students
- Provision of virtual collaboration environments to students
- Provision of a consistent level of service to students (Future Framework 2012).

1. Introduction

In January 2010 the Information Services Division proposed a Student IT Needs Study. The proposal was to gather information relating to students’ learning-related information technology needs at UWA in order to develop recommendations regarding minimum requirements for IT infrastructure and services for students. The University has a decentralised approach to IT infrastructure and services, where there is a range of organisational units with responsibility for pockets of computing. Computer laboratories are maintained by faculties, and Information Services through the libraries; support for students is explicitly provided by Information Services through SISO (Reid and Science Libraries), by Student Services, to an extent through the Faculty IT staff, and may also be provided by teaching staff depending on the units being taught. CATL is responsible for the LMS (currently under review), and Information Services provides support for IT in teaching venues.

1.1 Terms of reference

The strategy of the project was to prepare for the New Courses 2012, taking a whole of University perspective but at the same time planning for disciplinary variations. This was to be done by:

- Comparing IT infrastructure and services at UWA with that provided by other universities
- Seeking input from UWA individuals and reference groups, including students
- Studying IT policies and practices from UWA feeder schools to gauge what students from these schools might expect in terms of IT when they commence at UWA
- Utilising existing data from UWA sources and from organisations such as the Council of Australian University IT Directors (CAUDIT), and the Council of Australian University Librarians (CAUL)
- Literature review.
2. Environmental Scan (Review of the Literature)

Developments in mobile and social networking technologies have changed the way students communicate and access information. A 2006 study of over 2,500 first year students at three Australian universities (Kennedy et al., 2009) found that nearly 100% of students had access to mobile phones (many with camera) while only nine students had no access to a desktop computer or a laptop. The 2009-2010 NODE survey of 634 first year students at UWA indicated that 99% of respondents owned a mobile phone, 84% owned a laptop, 75% had a mobile internet device and 95% had a broadband connection at home. (Cluett 2010)

Students are spending more time on the internet than they did five years ago. Studies on the changing attitudes and experiences of first year students at nine Australian universities over 15 years (James et al., 2010) showed a significant increase in the time spent each week on the web for study and recreation in 2009 compared to 2004.

- use of the web for study
  2004 mean: 4.2 hours (SD: 3.74)
  2009 mean: 6.5 hours (SD: 6.32)

- use of the web for recreation
  2004 mean: 4.0 hours (SD: 5.70)
  2009 mean: 9.1 hours (SD: 9.14)

At UWA 97% of first year respondents access the internet at least once a day (Cluett, 2010).

With this increase in time spent on the Web and recent developments in mobile devices, it is not surprising that student expectations and learning preferences at university are changing. The portability of these technologies and their ability to connect to the internet makes them ideal for a range of activities such as storing references, undertaking fieldwork and accessing recorded lectures. (Johnson et al, 2010).

The 2010 Horizon report listed ‘Mobile computing’ (i.e. use of the network-capable devices students are already carrying) as a technology likely to enter into mainstream use in the next twelve months. Students already expect to be able to use their own technology (i.e. what they own/what they are used to) at university. “Learners expect institutions to support their use of technology, for example by providing robust, reliable and accessible networks and 24/7 access to course materials” (JISC 2009).

Emerging technologies will significantly impact the way that universities provide services and learning opportunities. Course materials online, videoed lectures and email communication are already widespread. “The students are the new drivers of change for more flexible education and communications delivery platforms – not the universities. Students are expecting if not demanding universities to adapt quickly in adopting technology in teaching modes” (Fahey 2010). Nevertheless, despite using collaborative tools such as email, Google apps, Flickr, Facebook, wikis, and blogs widely, students still value face to face contact with peers and academic staff (Turner, 2009).

There is a growing gap between students’ view of technology and that of academic staff. According to Hughes (2009) “Staff capability with ICT is a further dimension of the digital divide, and effective use of technology, i.e. to enhance learning, is as much of an issue as practical operation, i.e. getting it to work.” Many academic staff require training and in-house support to use IT technologies effectively and confidently. So far, the deployment of Web 2.0 technologies in universities has come mainly from the professional interest and enthusiasm of individual members of staff.

3. Data Collection
3.1 Data from Existing Surveys

The NODE Project: Networking Online to Diversify Engagement 2009-2010
This is the fourth annual survey undertaken by Student Services staff into UWA students’ experiences with access to and expectations of ICT. “Students who had completed 50 per cent or more of their first year units were surveyed at the end of their first year of study. The survey was emailed to students’ university email addresses with a link to an online form” (Cluett, 2007). A total of 634 First Year students responded to the 2009-10 survey, providing a response rate of 15% (Cluett, 2010).

The First Year Experience in Australian Universities: 2009
This is the fourth national study carried out by the Centre for the Study of Higher Education at five yearly intervals since 1994. A total of 2,422 students from nine Australian universities (including UWA) responded to a mailed survey sent in August 2009 to a stratified random sample of students undertaking their first year of higher education (James, 2010).

3.2 Survey of IT Provision in UWA Feeder Schools
In order to provide a sense of what future UWA students will expect from our IT services and facilities, a selection of independent and government high schools from the Perth Metropolitan area were invited to complete a short survey form. Most of the schools targeted were from the top ten feeder schools providing enrolments to UWA, and one was from the ASPIRE schools. The survey aimed to determine just how embedded IT is in the teaching and learning culture of the schools.
A selection of school websites was also scanned to provide an overview of approaches to ICT provision and use.

The WA Department of Education web site was also viewed for information relating to IT in schools, while the web pages related to the Digital Education Revolution program provided information about planned nation-wide IT infrastructure developments.

3.3 Survey of IT Provision in UWA Faculties
All faculty managers were sent a survey containing 20 questions about the provision of IT services in their area. Questions related to infrastructure, access, support, computer literacy and teaching and learning. Responses were received from five faculties including four separate schools from within Engineering, Computing and Mathematics. The survey was followed up by an interview with the Policy Officer at ITS to match our survey results against GO8 survey results.

3.4 Online Review of IT Services at the Matariki Network of Universities
Several key areas of IT services delivered to students were identified.

3.5 Online Survey of UWA Students
An online survey was mounted on the UWA Library Web site in June-August 2010 to gather responses to the three main questions used in the study:
- What do you like about IT facilities at UWA?
- What problems have you experienced with IT at UWA?
- How could UWA improve the IT facilities it provides to students?

3.6 Student Focus Groups
Five focus groups were held in the Library during May-August 2010. Students provided responses to four main questions:
- What do you like about IT facilities at UWA?
- What problems have you experienced with IT at UWA?
- How could UWA improve the IT facilities it provides to students?
- On a scale 1-10 how would you rate UWA IT facilities and support?
3.7 Interviews - Teaching and Learning staff

Twelve interviews were conducted between May and August 2010 with a range of teaching and learning staff from six of the faculties, plus staff from the Centre for the Advancement of Teaching and Learning. Participants responded to four main questions:

• What role do you see information technology playing in your teaching now?
• What role do you see information technology playing in your teaching in the future?
• What are the minimum IT requirements that UWA should be supplying to support your teaching programmes now (in terms of both infrastructure and support)?
• What IT requirements do you envision will be required to support your teaching programmes in the future (in terms of both infrastructure and support)?

3.8 Interviews - Student Support Staff

Two interviews were conducted between May and July 2010 with a representative from the Postgraduate Students Association and from Student Services. Participants responded to three main questions:

• What parts of the current UWA IT infrastructure and support work well for students?
• What are the main issues students have with the current UWA IT infrastructure and support?
• How could UWA improve its IT infrastructure and support for students?

4. Results and Analysis

4.1 Results from Data from Existing Surveys

The NODE Project: Networking Online to Diversify Engagement (2006-2010) UWA

Key Findings from the 2009-10 survey

• Students continue to have high expectations about the availability of computers, internet and lecture recordings at UWA
• Suggestions made about lending network cables, restricting access to social networks and laptop recharge stations
• Discussion boards, Facebook and YouTube consolidate their place as the tools most used by UWA First Year students
• Students see discussion boards and podcasts as useful for teaching while Facebook belongs ‘outside the classroom’
• Although students indicate they benefit from online delivery, they confirm that they prefer face-to-face teaching
• Student comments again warn against using technology ‘for the sake of it’
• Uptake of less ‘mainstream’ tools (such as Google Wave, Twitter, RSS, virtual worlds) remains relatively low
• Ownership of devices is approaching saturation — but students care about face-to-face communication and e-skills. (Cluett, 2010)

CSHE Research into the First Year Experience, 1994 to 2009

From list of important findings:

• One of the standout changes over time is the number of hours students spend online. In 2009, students report spending 6.5 hours online per week for study purposes compared with 4.2 hours in 2004. In 2009, UWA students spent one hour less time (significant difference at 0.1) than the national mean although results for recreational use were the same as the national figure.
• Nearly two-thirds of students agree that their lecturers make good use of the internet, compared with 60 per cent in 2004.

2009 snapshot of students use of ICTs

• Used an online Learning Management System 92% (UWA students 96%)

Attachment D 5
- Used internet-based resources and information designed for the course 98%
- Used podcasts of lectures 75% (UWA students 84%)

4.2 Results from Survey of IT Provision in Schools
The results of the survey displayed a wide variation in approaches to IT, though the impact of the Digital Education Revolution program on the government high schools who responded to the survey was evident. These schools are required to ensure a 1:1 computer to student ratio in senior school by December 2011, and are currently growing their fleet to meet this target. The program is expected to have a significant effect on schooling over the next few years, with the following objectives:

- provide for new information and communication technology (ICT) equipment for all secondary schools with students in years 9 to 12 through the National Secondary School Computer Fund
- support the deployment of high speed broadband connections to Australian schools
- support systemic change to increase the level of ICT proficiency for teachers and school leaders across Australia to embed the use of ICT in teaching and learning and support the development of innovative projects and research that enable professional learning in the use of ICT
- provide for online curriculum tools and resources that support the national curriculum and specialist subjects such as languages
- enable parents to participate in their child education through online learning and access
- support mechanisms to provide vital assistance for schools in the deployment of ICT.


At least one of the independent schools has quite deliberately sought to embed IT into the whole life of the school, has clearly planned access and support for ICT, and encourages experimentation. Students are expected to bring their laptops to school every day for use in class (1:1 ratio of laptops to students from Year 5), and Years 11-12 all have an iPod Touch (with a class set available in the Library). A number of iPads are available for loan on a trial basis. Technology is integrated into all areas of the curriculum; teachers use blogs and discussion forums, and administration and teaching staff contact students via email; assignments are submitted to Turnitin for plagiarism detection; a variety of software packages are available for use, and training and support is available, including onsite hardware repairs. The use of IT for teaching and learning is a given for these students from kindergarten to Year 12, and they will have very high expectations. Their survey respondent notes that their students will want to “connect easily and wirelessly to all facilities on any device (mobile phone, iPhone, iPad, laptop etc) and be fully mobile. They will not want boundaries on type of device nor platform [and will want] 24/7 guaranteed access time and fully reliable services”.

Survey responses from the other schools showed some variation in focus on IT, and in availability of hardware and support. All schools have wireless access and computer to student ratios ranging from 1:1 to 1:3.7. Availability of computers also varies, with most providing access through libraries, fixed computer labs and from trolleys that can be moved from room to room. Most teachers communicate with students via email, though administrative staff may not; hand held devices are not available to students in the government schools. All schools provide a variety of software packages with specific packages nominated by DET for the government schools. It was noted that the government schools are moving towards MacBooks to meet the expectations of the DER program. In response to a question about how IT is integrated into teaching and learning, a number commented that it’s up to individual teachers, or is focused on specific areas (business, media, IT). Others, however, have sought to integrate IT across the curriculum. Responses from the survey of schools are available in Attachment 1.

4.3 Results from Survey of IT Provision in UWA Faculties
The low rate of response to this survey means that an overall picture of the provision of IT facilities for students at UWA is not available via the survey alone.

However, it appears that faculties provide between 1 and 18 computing laboratories each with between 16 and 48 machines in each. There are a total of 90 computing laboratories across UWA, including the Albany Centre and the Library. The majority of the laboratories are open 24/7. There is a total of 2,307 desktop machines available for undergraduate use (2,024 PCs and 283 Macs) and 86 printers.

Faculties provide the full range of course related software. Instruction in how to use this software is provided by teaching staff as part of their course delivery. Other support is provided by Student Services and by SISO staff. Some schools have student licences that allow copies of the software to be loaded onto students’ personal machines. Applications and application plug-ins installed on the Library’s Client SOE in addition to the MS Office Suite include EndNote, Adobe Acrobat Reader, iTunes, MathPlayer and MicroGDS Viewer.

Printing quotas vary from school to school. Across UWA there are 6 different methods of providing this quota including UniCard. This means that students are restricted on where they can use their quotas. Adding value for printing in particular laboratories is determined by which method the quotas are provided. UniCard loaders are available across campus while other systems depend on the students visiting school offices within restricted time periods.

No faculty provides power points in lecture theatres for those who bring their own laptops and only one faculty provides lap-top storage facilities. Power and data connections as well as powered lap-top storage facilities are available in each library.

In 6 of 18 cases, passwords are not synchronized with Pheme. Students need multiple passwords depending on which facilities they are using.

IT services that are available via mobile devices such as telephones are not faculty driven. The Web Office recently provided a mobile template using a single sign on which authenticates against e-mail accounts.

The on-line submission of assessments is available for some units only at the discretion of the lecturers. This is also true of e-mail communication between lecturers/tutors and students.

Professional staff in all faculties support e-mail communication with students.

Not all course content is available through WebCT. There are at least four other methods of providing it online. In some cases WebCT only points to the content which is hosted elsewhere. Depending on where this is, students may not be able to access the material when they are off-campus.

4.4 Results from Online Review of IT Services at the Matariki Network of Universities

The online review of IT and Online services offered at a select number of universities which are members of the Matariki Network of Universities and a number of universities from the Top 50 ranked universities (as ranked by ARWU) revealed a number of key areas where UWA can learn from the experiences of other universities. The types of services and applications listed in this section are presented as being highly desirable in the provisioning of students’ learning-related information technology needs at UWA. Details of universities reviewed are listed in Attachments 2 and 3.

- Provision of campus wide Wi-Fi access
- Provision of Eduroam wireless network
- Provision of services to mobile and handheld devices
• Provision of 24/7 access to student PC Labs
• Provision of enhanced IT support to students (in person, video chat and via floor walkers)
• Provision of out of hours IT helpline for students
• Online submission of assignments through learning management system e.g. via Assignment Manager for Blackboard
• Provision of centralised online data storage facility for students
• Provision of centralised student printing system
• Provision of anti-virus software to all students at no cost (negotiated through campus license)
• Provision of a comprehensive IT self-help FAQ site for students
• Provision of virtual collaboration environments to students
• Provision of a consistent level of service to students (Future Framework 2012).

4.5 Results from Online Survey of UWA Students
Survey questions were answered by a total of 58 students (39 undergraduates and 19 postgraduates) from a wide range of faculties. The low response rate was probably due to the low website access during the mid-year break. The top responses (in descending order) to the online survey questions were:

What do you like about IT facilities at UWA?
• SNAP/ Wireless access (41%)
• Availability of PCs
• Staff support
• Services such as MyUWA, new webmail, Lectopia, WebCT

What problems have you experienced with IT at UWA?
• Wireless/SNAP is not reliable (e.g. drops in and out) (66%)
• Not enough PCs
• Slowness of services – log-ons, sluggish WebCT, PCs,
• Staff/technical support is poor

How could UWA improve the IT facilities it provides to students?
• Snap/Wireless access coverage and reliability needs to be improved (53%)
• Access to more PCs including 24/7 access
• Improve IT support
• Single sign-on needed

Further Comments
It was interesting to see that the responses to the three main questions covered the same IT facilities and services in almost the same priority.

Wireless Access
Students liked wireless access because it was useful, widely available and, in the words of one student, “super handy”. However, it also scored the greatest number of responses for both problems and suggestions for improvement. SNAP was described as “ridiculously unreliable” with poor coverage and slow connections.

It should be noted that these comments preceded the recent roll-out of improvements to the wireless network.

PC Availability
Availability of computers on campus received the second highest number of responses for all three questions. Responses varied from “lots of PCs available” to “there are never enough computers in the library and there are too few labs”.

8
IT Support
There was a wide variety of responses related to IT support. Comments ranged from the “ridiculous” orientation process to the need for greater access to IT support during busy times. Students described IT support staff as “very helpful”, “competent” and “quite good” but there were a couple of comments about lack of communication skills. One student remarked “Staff at the IT desk are impersonal and incapable of addressing student inquiries, not because they lack the expertise, but because they are missing the personal and social skills necessary for problem solving”. Further samples of students’ responses to all questions are available in Attachment 4.

4.6 Results from Focus Groups
Five focus groups were attended by a total of 28 students (24 undergraduates and 4 postgraduates).

Most students were very complimentary about the provision of IT facilities at UWA, particularly first year students who had not experienced anything similar in high school. On a scale 1-10 nearly every participant rated UWA IT facilities and support at eight.

The most frequent answers (in descending order) given to the focus questions were:

What students like
- Lectopia
- WebCT
- SNAP (when it works)
- Download allocation
- Science Library PCs, headphones, power points, communication ports.
- New Google email

Problems
- Wireless/SNAP availability and reliability are both very poor
- WebCT (various software issues)
- Faculty computer labs have outdated hardware and software
- Faculty computer labs are not well maintained – broken furniture and equipment
- Logging into different websites for various courses is annoying
- Online class registration is time-consuming and frustrating

Recommended improvements
- SNAP/Wireless access coverage and reliability needs to be improved
- Upgrade PCs and printers in faculty computer labs
- Lectopia is needed for all lectures (videotaped – not just sound recorded)
- More PCs needed in computer labs and in Reid Library
- All WebCT pages should have the same content management

Further comments

Wireless network
Wireless access was a common topic in all focus group discussions. It was described as great when it worked, annoying and inconvenient when it didn’t. Complaints included: ‘dodgy’ access with waits of 15-30 minutes to get a connection; frustration that ‘SNAP keeps falling out’; varied reception around the University. There is an expectation that wireless access should be available everywhere on campus, i.e. in the Library, in tutorial rooms, outdoors, and in lecture theatres. Students claim that having access to WebCT material supports tutorial situations and enhances presentation by academics. A second year Law student said
“When you’re on SNAP, you can download the lecture notes online, download from WebCT, and you’re making your own notes, it turns lectures into a magical learning experience. I remember everything she [the lecturer] said for that lecture.”

WebCT
There were mixed responses to WebCT. Some students were impressed with having access to an online learning management system while others were frustrated by WebCT software and/or the lack of uniformity across the various schools. Students asked for consistent page design across faculties and less clicks to find resources. They expect downloads to work and they expect 24/7 access from home. The latter is not always possible if the faculty or school has loaded material onto their LAN.

Faculty Computer Labs
Labs were described as dark, outdated and poorly maintained. Female students didn’t feel comfortable in some labs after hours. Students complained that there were different versions of software e.g. MS Word around campus which made submission of assignments difficult when academic staff were unable to open students’ documents. There were also complaints about equipment being out of order as well as reports of missing chairs and damaged furniture.

Lectopia
Students find Lectopia useful for revision or as a convenient back-up if they miss the original presentation. Complaints were mostly confined to technology failure when lectures were not recorded successfully. Although some students skip lectures knowing that they can catch up with the recorded version, there are other students who prefer to take notes during the presentation in a theatre and then review the recorded version to ensure that they have captured all the details. There is an expectation that there will be a video recording available for all lectures.

Samples of students’ responses to all questions are available in Attachment 5.

4.7 Results from Interviews with Teaching and Learning Staff

Twelve staff were interviewed and responses to the four questions were:

Current role of information technology in teaching
All staff interviewed stressed the important part technology played in their teaching both now and in the future. Currently it was being used in a number of ways including:
- To deliver complimentary information to students in support of face to face teaching
- To facilitate communication between students and with staff
- To develop and administer some forms of assessment.

Future role of information technology in teaching
Into the future the interviewees saw an increasing use of technology in teaching through:
- Greater online collaborative work by students
- Greater use of mobile devices to access course materials, podcasts, and other associated learning materials
- More online evaluation of teaching
- More interactive content as students become more familiar with this in other areas of their lives.
- Increased use of online simulation, virtual reality, gaming in teaching and learning – this will take a significant amount of infrastructure and support to set up and be effective.
Importantly though, it was felt that online teaching and learning would still only be part of a broader blended learning environment where face to face teaching would still have an important part to play. A strong emphasis was also placed on the pedagogy driving the technology rather than vice versa.

Further responses to these questions and the two questions concerning current and future IT requirements that UWA should be supplying to support teaching, were categorized as follows:

**Lectopia**
Teaching and learning staff acknowledged that students liked recorded lectures, but some felt the way this technology was currently conceived focused mostly on convenience rather than pedagogical principles. There was some comment that Lectopia could be enhanced to improve its quality or to give more control to the lecturer. Mention was made of arrangements at Curtin where they have provided integrated control of some aspects of Lectopia into lecterns in lecture theatres. This means lecturers can pause and extend recordings. Software like Echo 360 and other lecture capture software give the lecturer even more control and flexibility. More information can be captured from the lecture and it can sometimes be edited before going online. This software removes some administrative activity from the process as there is no booking required and the recording is done independently by the lecturer.

**Consistency**
It was observed that at the moment there are silos between different areas of the university and the IT infrastructure. It was felt that these silos will provide significant barriers to students in 2012 and beyond where they will be working in a structure that does not operate according to these silos.
A similar problem was reported by staff as well. Faculties have their own IT systems and this causes incompatibility problems when staff across faculties try to work together. This will increasingly become a problem in the new course structure where faculty will be working together more often.

**Wireless network**
Staff want a wireless network that they can connect to simply and consistently everywhere on campus.

**Professional development for staff**
Almost all staff interviewed stressed the significant need for high quality and regular professional development to support academics in utilising technology in teaching and learning. Importantly, it was emphasised that this development needed to cover both sound pedagogical use of IT in teaching in addition to purely technical information and support.

**Virtual Learning Environments**
A number of issues were identified with WebCT including:
- Reliability
- Frequency with which units had to be migrated to newer versions of the platform.
- Problems with loading podcast and video content into WebCT
- Teaching content not being well organised, archived or reused.

Mention was made of the current international debate about whether VLEs are even necessary. Web CT is a first generation web technology and there was a feeling that students experience with Web CT was akin to entering a ‘walled garden’, in contrast to their experiences elsewhere online. However, open source VLEs (such as Moodle) offered far greater flexibility and were seen as a halfway point between first generation VLEs and web 2.0 options.

**Toolbox**
There needed to be a suite of tools provided and supported centrally for use in teaching and learning. Tools would include:
- Online conferencing
- Web 2.0 tools such as wikis, blogs, RSS that integrate with the LMS
- LMS (properly integrated with Callista, so that grades can be fed back to Callista from the LMS)
- Online quiz and assessment
- Eportfolio
- Flexible learning spaces (perhaps laptops in classroom and equipped to allow collaborative learning)
- Lecture capture and presentation tools.

All of these need to integrate with the LMS. The value of having programmers available to make tools able to ‘plug in’ was mentioned. It was felt that a system that provided this integrated suite of tools centrally was important but that it was equally important to allow experimentation and the use of other tools.

**Teaching spaces**
- Data projectors or smart boards available in every lecture room/teaching space.
- A ‘teacher’s computer’ in each lecture room/teaching space. The short changeover time between lectures was a problem if a computer had to be set up in support of the lecture.
- Introduce a “Clickers” loan scheme, where they were provided to students at enrolment or alternatively they could be built into lecture theatres.

**Student spaces**
- Needs to be more after–hours access to computer labs for students. Some labs are only available for students to use during the day, and only when it is not already being used for teaching and workshops. This places considerable limitations on student access.
- Some labs are too small. Ideally, labs should have at least 25 PCs.
- The labs should support both MAC and PC users.

**Storage and backup**
Students and staff have an increasing need to store and host large data files – especially multimedia files that can be edited, reviewed etc. Current systems (WebCT, Lectopia) are not appropriate for this. It was felt there was a need for central storage which had appropriate back up systems.

**Technical infrastructure**
- At the moment, different faculties and areas of the university find and pay for their own IT tools. This means there is duplication across the university in licences and effort. This should be centralised.
- It is important to settle on standards across the university. Problem solving and integration of systems would be much easier if there was a standard operating environment. For example, WebCT works differently and has different problems according to the browser being used. Where there is not standardisation, transparency would be a workable substitute. The difficulties involved in arriving at a single standard were acknowledged as well as the importance of allowing flexibility for innovation, experimentation or specific needs.
- Staff on and off campus should have identical access. For example, clinical lecturers at the hospitals can’t upload to Lectopia and WebCT. There needs to be some communication between the hospital and UWA networks.
- It was suggested the University set a minimum set of standards for hardware and software supported on campus.
IT Support
It was critical to have high quality IT support staff to ensure that computers are kept in good running order and are up-to-date in terms of software and hardware. IT staff need to be well informed as to the tasks associated with teaching activities and support these.

Digital Divide
There was an increasing digital divide between students from different secondary schools. Some private schools have had individual student laptops as standard for many years and are now adding mobile devices to this while some public schools may only have students in a computer lab once a week. Students will come to UWA with a wide range of expectations and skills in IT. Some of these students will feel constrained by our IT environment while others will need to catch up. Some suggestions put forward to address this included:

- University support and training for students on how to “learn online”
- Providing basic information to parents about what IT requirements are required at University (i.e. what laptop, what type of internet access, etc).
- Establishing what the minimum IT competencies a new student should have (eg. should be able to download a document from the web, open a word document, copy and paste, etc). Once these have been established digital literacy classes can be offered to ensure students meet these requirements.

4.8 Results from Interviews with Student Support Staff
Two staff were interviewed and responses to the three areas of inquiry were:

Lectopia
From the student perspective there was a desire to have all lectures recorded. Mention was made that the University promotes Lectopia to students on the basis it can provide flexibility to students. However, not all lectures are recorded. In some cases, even if it is indicated on the Unit timetable that lectures will be recorded this does not necessarily occur in practice. Where there is this disparity between the advertised service and the reality of the service, it is a great cause of annoyance for students.

Consistency
Students want a consistent IT experience across the campus, similar to the school environment many of them have recently come from. That is, they want:

- Single sign on
- Access to any computer lab on campus (no matter their faculty affiliation)
- Computer facilities across campus with up to date hardware and software.

Wireless network
Staff and students want a wireless network that they can connect to simply and consistently everywhere on campus.

Support for laptops on campus
More students are bringing laptops and other portable devices to campus and therefore support and connectivity for these devices is required. Types of campus wide infrastructure support include:

- Laptop lockers
- Access to power and data points.

IT Support
It was critical to have high quality IT support staff to ensure that computers are kept in good running order and are up-to-date in terms of software and hardware.

**Promotion**
There needs to be greater promotion of what IT services are available to students across campus. At present, much of this knowledge is spread only through word of mouth.

5. **Conclusions**
A number of common themes emerged from the study.

**Access**
Student want 24/7 access to computing facilities. They are looking for safe, quality environments where they don’t have to queue for equipment. A well supported mobile environment offering ease of access, including single sign on, from anywhere on campus is also a very high priority. The desire for online access to resources anywhere, including from home, and at anytime, was a recurring theme throughout the study.

**Standard and consistency of service**
The study highlights the fragmented nature of UWA’s IT facilities. The provision and maintenance of computer labs across campus is inconsistent. There are variations in the age and reliability of equipment (some machines more than five years old), and software provided; labs are frequently not accessible by students from other faculties; and the provision of furnishings and equipment in good working order varies. Personal security is also a concern in some areas after dark.

Students expect uniform management of online course content, though this is currently made available through a variety of mechanisms, requiring multiple authentication methods, and is not always available off campus. They are frustrated that they cannot use their printing credits everywhere on campus.

Lecture theatres and teaching spaces are not equipped with the same standard IT facilities, creating difficulties for teaching staff.

The lack of a defined set of tools provided centrally to support teaching was noted by teaching staff interviewed. This leads to duplication of licences, inconsistency in presentation of materials and learning activities, and inefficiencies in training and support. Postgraduates also noted that it can be difficult to acquire access to the specific software packages required for their research.

Greater integration of facilities and services would lead to improved delivery of online teaching and learning, and enhance the student and staff experience.

**Support for students**
Depending on their previous experience with IT at home and at high school, students come to UWA with different expectations of the facilities likely to be provided. Initially many students don’t know what types of IT facilities are available or how to find out about them. They rely on word of mouth from other students. Technical support for students is adequate, but not always available when required, and not always customer-focused. The number of first years students responding to the NODE survey for 2009-10 who expressed a desire for training in ICT to improve study techniques declined to 46% (from 68% in 2008), though this still represents a significant number of students who might benefit from more support than is currently available.

Improved promotion of the IT services and facilities available, as well as consideration for the provision of more training opportunities, should be considered.

**Staff development**
The study has revealed possible gaps in staff development. Firstly, there may be a need for more training
opportunities covering both the pedagogical and technical aspects of using technology effectively in teaching and learning. Secondly, customer service skills training should be provided for staff working in IT support.

6. Where to from here
The Student IT Needs Study coincided with a review of Information Services, and issues arising from this study should be viewed in light of recommendations emanating from the IS Review. In particular, Recommendation 21 from the IS Review (That Information Services, in conjunction with faculty ICT providers, takes action to ensure that all students and staff have uniform and campus-wide access to IT services, including network access (wired and wireless), desktops, printing and data storage), covers a number of areas of concern raised by students and staff surveyed during the study. The Study also coincided with a review of the University's current LMS, and its outcomes should be provided to CATL to assist in the process of selecting a new LMS.

Resolutions to the most pressing issues identified should be addressed prior to the commencement of the new courses in 2012.

A study of student IT needs should be conducted on a regular basis in order to inform planning for infrastructure, facilities and support.

7. References


The final report of the independent Committee of Inquiry into the Changing Learner Experience, looking into the impact on higher education of students’ widespread use of Web 2.0 technologies


## ATTACHMENT 1

### Survey of Selected Schools

<table>
<thead>
<tr>
<th>Questions</th>
<th>1</th>
<th>2</th>
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<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the ratio of students to PCs at your school?</td>
<td>Nearly 1:1, approx 1:2</td>
<td>1:3.7</td>
<td>1:1 from Year 5; 1:2 PK-4</td>
<td>Yrs 7-12, 1:3</td>
<td>1:2 by end 2010</td>
<td>1:1.4 by end 2010</td>
<td>1:2 by July 2010 and 1:1 end of 2011</td>
<td>1:2, 1:1 by 2011</td>
</tr>
<tr>
<td>Where are your PCs located?</td>
<td>Lower Primary, Year 3, Junior Library, Senior Library, DT, Geography, Commerce, Maths, Admin, Computer suite, Boarding houses</td>
<td>Across school, learning areas and labs</td>
<td>Shared facility between classes for PK-4, and with child 5-12</td>
<td>Computer labs, library, trolleys moved from room to room for Middle and Junior years</td>
<td>3 computing labs, Senior School Media, Middle School Media, D&amp;T, Photography, 10x12 trolleys of laptops, 5 computer pods in Middle School, Library, Student Services</td>
<td>Fixed in labs and classrooms, mobile depending on teacher needs</td>
<td>Library, labs, classrooms, notebook trolleys. Over next two years, will provide students with their own MacBooks which they can carry and take home</td>
<td>All learning areas, 6 designated computer labs</td>
</tr>
<tr>
<td>Are your computing facilities on open access?</td>
<td>Senior Library, all other areas used by specific teaching &amp; learning areas, a few bookable spaces</td>
<td>No</td>
<td>5-12 Student 100% access; PK-4 teacher-directed media lab/Library when open</td>
<td>Open access in labs and library</td>
<td>Only computers in Library &amp; Student Services, always supervised</td>
<td>Yes, subject to adequate supervision</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Are your computing facilities available for use before and after school?</td>
<td>Senior Library and boarding houses</td>
<td>By students if there’s a teacher available to supervise</td>
<td>Yes</td>
<td>Computer labs available 8am – 4pm; Library 8am – 6pm</td>
<td>In Library and Student Services</td>
<td>Yes</td>
<td>No</td>
<td>Yes, in Library</td>
</tr>
<tr>
<td>What software do you provide for student use?</td>
<td>MS Office, Adobe CS4, Inspiration, Corel Draw, and many subject specific applications</td>
<td>MS Office2007; Adobe CS3; +</td>
<td>Adobe suite; iLife; iWorks; MS Office; Sibelius; Sketchpad etc</td>
<td>MS Office 2007; Adobe CS5; Comic Life, Inspiration, Google Earth, and other subject-specific</td>
<td>MS Office 2007; Adobe CS3, iMindmap, Clickview iTunes ++</td>
<td>MS Office, Adobe, iLife</td>
<td>MS Office, Adobe CS3, others</td>
<td>Dept Ed approved programs</td>
</tr>
<tr>
<td>What is your refresh cycle for IT equipment?</td>
<td>PCs 4 years; laptops 3 years; network/servers 4-5 years</td>
<td>4 years</td>
<td>2 years student laptops, up to 3 years loan/classroom sets</td>
<td>3 years</td>
<td>4 years</td>
<td>Tablets 3 years, Notebooks 4 years, Desktops 5 years</td>
<td>4 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Are hand held web enabled devices made available to students?</td>
<td>No</td>
<td>No</td>
<td>All Year 11-12 have iPod Touch and class set in Junior School Library. 5 iPads on loan around the school on trial</td>
<td>No, but engaged in a trial of iPod Touches</td>
<td>No</td>
<td>No, but not discouraged</td>
<td>No, not permitted by DET</td>
<td>No</td>
</tr>
<tr>
<td>What student support to use the equipment and software do you provide?</td>
<td>IT Support Centre for hardware and software support; Education Technology Team to assist in integration of technology and use in the classroom</td>
<td>Unlimited software support for students before school or at lunch break. School is IT academy and offers Microsoft eLearning courses</td>
<td>Technical and training support, 2nd level technical support and onsite hardware repairs</td>
<td>3 full time Tech Support staff, teachers assist in class</td>
<td>Software tutorials on intranet, 2 full time technicians</td>
<td>Timetabled training, HelpDesk Office hours 8.30am – 4.30pm</td>
<td>Specialist teachers and 2.2 ICT staff</td>
<td>IT Technician on site plus specialist Computing teachers</td>
</tr>
<tr>
<td>Is this support available to all students or only to those who are taking relevant subjects?</td>
<td>Available to all staff and students</td>
<td>All students</td>
<td>All students PK-12</td>
<td>All students</td>
<td>Students taking relevant subjects, Technicians assist students in non-IT subject areas</td>
<td>All students</td>
<td>All</td>
<td>All students</td>
</tr>
<tr>
<td>In what ways are your computing facilities integrated with your teaching</td>
<td>See above</td>
<td>Depends on teacher, school-wide LMS available and network</td>
<td>Digital curriculum packages, wikis/blogs, podcasting, peer review, iTunes U – integrated</td>
<td>Varies from teacher to teacher, from word processing and web browsing, Computers available for IT and Media subjects, trolleys of laptops and computer hubs</td>
<td>Every way possible</td>
<td>Using Moodle; business studies, media studies, ICT all computer-based</td>
<td>16 classrooms have interactive whiteboards, integration</td>
<td></td>
</tr>
<tr>
<td>and learning program?</td>
<td>resources available to students on campus and from home</td>
<td>technology into all areas of the curriculum</td>
<td>to units of work involving webquests, movie editing etc</td>
<td>available</td>
<td>encouraged and supported in all subjects</td>
<td></td>
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<tr>
<td>Do you encourage students to bring laptops to school?</td>
<td>Only Years 7-9 1:1 student owned computer program</td>
<td>No</td>
<td>Compulsory, laptop must be at school every day</td>
<td>No; students bring laptops to school at their own risk, may not connect to school network, no secure storage other than their lockers</td>
<td>Yes, but not permitted to connect their own devices to the network or internet</td>
<td>No, no internet access unless they join the network, which is not supported</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Do you provide facilities for recharging laptops?</td>
<td>Many classrooms have additional GPOs for this purpose</td>
<td>No</td>
<td>Laptops have 7 hour battery life, must be backed up and recharged every night. Library has loan rechargers if required</td>
<td>No</td>
<td>No</td>
<td>No, but planned for the next 12 months</td>
<td>Only the school laptops</td>
<td></td>
</tr>
<tr>
<td>Do you allow students to use their laptops in classrooms for not taking?</td>
<td>Years 7-9</td>
<td>Some students in 2010, many more in 2011</td>
<td>Expectation</td>
<td>No, other than students with special needs</td>
<td>Yes</td>
<td>N/A</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you have wireless internet access at your school?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>In all buildings</td>
<td>Yes, but only for staff laptops</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Do you allow online submission of assignments?</td>
<td>Yes to a degree</td>
<td>Yes</td>
<td>Yes, and that assignments are submitted to Turnitin for plagiarism check</td>
<td>Some emailing of assignments, but no other facility for online submission</td>
<td>Some subjects, using Moodle</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Do your</td>
<td>Yes, teachers as</td>
<td>Yes</td>
<td>Yes, Teachers</td>
<td>Yes</td>
<td>Individual</td>
<td>Yes</td>
<td>Teachers – yes,</td>
<td>Yes,</td>
</tr>
<tr>
<td>teachers/admin staff engage in formal email communication with students?</td>
<td>required. Admin staff rarely.</td>
<td>also use blogging and discussion forums</td>
<td>teachers, Year Coordinators</td>
<td>but limited; Admin staff No</td>
<td>teachers, no admin staff – against code of conduct</td>
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<tr>
<td>What expectations do you believe students from your school will have for provision of computing facilities at UWA?</td>
<td>Wireless internet; portal access, printing, podcasting etc.</td>
<td>Online presence to access university resources with single signon and access from anywhere</td>
<td>Computers widely available for student use; bring their own laptop and other devices and connect to the network; ample recharge facilities; reliable, timely help available; reliable, fast network; flexibility</td>
<td>Email facility for communication with lecturers, submit assignments online, lecture notes available online, network access for laptops and mobile devices, IT services for software support, access to workstations 24x7</td>
<td>Fully equipped high performance computers in open access laboratories, omnipresent WLAN access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you provide online textbooks for student use?</td>
<td></td>
<td></td>
<td></td>
<td>Online learning environment similar to Moodle (online submission of assignments, online documents), support for Apple (most schools will be adopting MacBooks and Apple platform, and will enter University owning MacBooks, All schools required to have 1:1 computer to student ratio by December 2011, which will be achieved by students having their own notebook for school and home use)</td>
<td>Same or significantly better</td>
<td></td>
<td></td>
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</tbody>
</table>

Course materials uploaded for students
## Matariki Network of Universities

<table>
<thead>
<tr>
<th>University</th>
<th>University Website</th>
<th>Student Printing</th>
<th>Student Software</th>
<th>WiFi Access</th>
<th>Powered Lockers</th>
<th>Additional Services</th>
<th>Access Hours</th>
<th>IT Support to Students</th>
<th>Online Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dartmouth College (USA)</td>
<td><a href="http://www.dartmouth.edu/">http://www.dartmouth.edu/</a></td>
<td>18 Mono 01 Colour</td>
<td>See <a href="#">here</a> IE, Firefox, Safari</td>
<td>Campus wide wireless network</td>
<td>Not listed</td>
<td>Data storage Web site hosting Computer Rental Computer Sales &amp; Service Banner – Student Self-service portal</td>
<td>Students Mon – Fri 0700 - 1730</td>
<td>Yes Students Mon – Fri 0700 - 1730</td>
<td>Assignment Manager is available through Blackboard</td>
</tr>
<tr>
<td>Durham University (UK)</td>
<td><a href="http://www.dur.ac.uk/">http://www.dur.ac.uk/</a></td>
<td>20 Mono 05 Colour</td>
<td>See <a href="#">here</a></td>
<td>Many public areas and rooms with WiFi in addition to many individual departments and colleges <strong>Eduroam is NOT available</strong></td>
<td>Not Listed</td>
<td>Comprehensive FAQ site Skype 200MB of managed file storage on the NPCS file server system Duplex Printing LTT Blog</td>
<td>Students Mon – Fri 0900 - 1700</td>
<td>Yes Students Mon – Fri 0830 - 1730</td>
<td>Online assessment is available through DUO</td>
</tr>
<tr>
<td>University of Otago (NZ)</td>
<td>University Website</td>
<td>Printing</td>
<td>Software</td>
<td>Access</td>
<td>Lockers</td>
<td>Services</td>
<td>Hours</td>
<td>Support to Students</td>
<td>Submission</td>
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<tr>
<td>University of</td>
<td><a href="http://www.otago.ac.nz/">http://www.otago.ac.nz/</a></td>
<td>3 zones (red, orange &amp; yellow) Numbers of printers in each zone is not listed 2009 report lists 28 mono and 03 colour printers</td>
<td>See here</td>
<td>Wireless network coverage in all Libraries</td>
<td>Not Listed</td>
<td>Chat to a Student IT Advisor Live (online) Floor walker in each library (Student IT Advisor) Memory Card Readers</td>
<td>0830 – 2300 12 Labs are 24 hour access 7 days a week</td>
<td>Yes</td>
<td>Yes – via Blackboard</td>
</tr>
<tr>
<td>Queen’s University</td>
<td><a href="http://www.queensu.ca/">http://www.queensu.ca/</a></td>
<td>03 Mono in IT Services Computer Sites</td>
<td>See here</td>
<td>Campus wide wireless network Eduroam</td>
<td>Not Listed</td>
<td>AV Equipment Rentals Campus Computer Sales &amp; Service Clickers – TurningPoint Software Emerging Technology Centre</td>
<td>Students Mon – Fri 0830 – 2300 Sat – Sun 1200 - 1900</td>
<td>Yes Students Mon – Fri 0830 - 1630</td>
<td>Yes (TBC) via Moodle</td>
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<tr>
<td>(Canada)</td>
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<tr>
<td>University</td>
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<td>Services</td>
<td>Hours</td>
<td>Support to Students</td>
<td>Submission</td>
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<tr>
<td>University of Tubingen (Germany)</td>
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<td><a href="http://www.uni-tuebingen.de">http://www.uni-tuebingen.de</a></td>
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<td>Access Hours</td>
<td>IT Support to Students</td>
<td>Online Submission</td>
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<tr>
<td>University of Western Australia (Aus)</td>
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<td><a href="http://www.uwa.edu.au">http://www.uwa.edu.au</a></td>
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<td>Additional Services</td>
<td>Access Hours</td>
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<td>Online Submission</td>
</tr>
<tr>
<td>Uppsala University (Sweden)</td>
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<td></td>
<td><a href="http://www.uu.se/en/">http://www.uu.se/en/</a></td>
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</tbody>
</table>

- The university has installed a wireless network (WLAN) in various university buildings.
  - Eduroam
- Library opening hours
  - Yes
  - SISO
Dartmouth College (USA)

- Dartmouth College requires all incoming students to own a personal computer and it must work on the Dartmouth network.

- 18 Mono Green Print Release Stations (Printers) available to Dartmouth Students. Not all of these can print in duplex mode.

- 01 Colour Green Print Release Stations (Printers) available to Dartmouth Students.


- Supported software [http://www.dartmouth.edu/comp/soft-comp/software/supported.html](http://www.dartmouth.edu/comp/soft-comp/software/supported.html)

- Blackboard is the LMS in use at Dartmouth College [https://www.dartmouth.edu/~blackboard/cas_index.php](https://www.dartmouth.edu/~blackboard/cas_index.php)

- Mobile Learn is now available at Dartmouth College [http://blackboard.dartmouth.edu/webapps/portal/frameset.jsp](http://blackboard.dartmouth.edu/webapps/portal/frameset.jsp) (announcements, discussion boards, grades, blogs, tasks, roster, media & journals)

- Mobile Learn is available for iPad, iPod Touch, iPhone, Blackberry & Android devices


- Facebook, YouTube and Flickr and many more social media Sites at Dartmouth are listed [http://www.dartmouth.edu/home/about_site/social.html](http://www.dartmouth.edu/home/about_site/social.html)

Durham University (UK)

- Durham University advertises their MNU membership on their homepage

- QR codes are used on the Durham University website [http://www.dur.ac.uk/its/duo/](http://www.dur.ac.uk/its/duo/)

- Durham University uses Blackboard re-branded as Duo (Durham University Online)

- **Out of Hours Helpline** service available for students and staff which operates between 17:30 and 08:30, Monday to Friday and 24 hours at weekends and on bank holidays, including Christmas Day, Boxing Day and New Year's Day. All calls to the IT Service Desk are automatically transferred to this service at these times.

- Durham was an early adopter of Blackboard, starting in the year 2000. Today it is an integral part of learning and teaching at Durham.

- Durham University Online (duo) strives to enhance the experience of the University community for all aspects of their connection with Durham University by:
  - Enabling communication and information sharing for teaching, learning, research, administration and community
  - Enriching the University experience including formal and informal collaboration and communication
  - Facilitating simple and effective management of University processes
  - Enhancing knowledge sharing and discovery
  - Fostering inter-disciplinary learning and research communities
  - Learning Technologies Team (LTT) Blog [http://www.dur.ac.uk/lt.team/blog/](http://www.dur.ac.uk/lt.team/blog/)

Queen's University (CAN)

- iTunes U
- Clickers - After an extensive evaluation of various student response systems, TurningPoint has been selected for use at Queen's University. The technology can be used to provide students in large classes with a more interactive learning experience: it enables instructors to integrate questions into PowerPoint Presentations, view student responses in real-time, and modify the lecture based on student feedback.

- Wireless Internet access is continually expanding across the campus

- Free anti-virus software available to all students (Queen's has purchased a site license for Symantec Endpoint Protection (SEP) for use by every member of the Queen's community.)

- The Emerging Technology Centre (ETC) is a multimedia lab and resource centre. It offers a host of services to students, all free of charge, including:
  - Computers loaded with updated multimedia software which are available for working on academic or personal projects;
  - Access to Atomic Learning online training modules for over 120 of the most commonly used software applications;
  - Scanning equipment (for slides and documents);
  - Video capturing equipment (VHS and DVD); and
  - A podcasting / vodcasting studio.

University of Otago (NZ)
- There are 30 computer areas run by Student IT Services (a total of over 700 computers in these areas)

- The University Library provides additional desktop computers for the use of Library Patrons (these PCs are not administered by Student IT Services)

- University of Otago advertises their MNU membership on their homepage

- University of Otago has a student IT website http://www.its.otago.ac.nz/students

University of Tubingen (GER)
- The majority of the content on the university website is in German und Ich verstehe nicht!!

University of Western Australia (AUS)

Uppsala University (SWE)
- Information for students is available through a student portal which requires authentication (i.e. you must be a registered student to access this content)

- One of northern Europe's most highly ranked universities

- Founded in 1477

- Within the scope of UpUnet-S - the student network at Uppsala universitet - the university has installed a wireless network (WLAN) in various university buildings. All students and employees at Uppsala universitet can use the network, if they have a student or employee account.
<table>
<thead>
<tr>
<th>University</th>
<th>1. The University of Manchester *(UM) 41</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. New York University *(NYU) 32</td>
</tr>
<tr>
<td></td>
<td>3. Vanderbilt University *(VU) 41</td>
</tr>
<tr>
<td></td>
<td>4. Stanford University *(SU) 02</td>
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<td></td>
<td>5. University of British Colombia *(UBC) 36</td>
</tr>
<tr>
<td></td>
<td>6. University of Chicago EME *(UC) 09</td>
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<tr>
<td></td>
<td>7. University of Queensland *(UQ)</td>
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<tr>
<td></td>
<td>8. University of Maryland *(UoM) 38</td>
</tr>
<tr>
<td></td>
<td>9. Duke University *(DU) 31</td>
</tr>
<tr>
<td></td>
<td>10. University of Pittsburgh *(UP) 50</td>
</tr>
<tr>
<td></td>
<td>11. Cornell University *(CU) 12</td>
</tr>
<tr>
<td></td>
<td>12. University of North Carolina *(UNC) 39</td>
</tr>
</tbody>
</table>

### Web address

**ARWU Ranking 2009**

1. **IT Services to Students**
   a. Is IT support provided to students?
      - Yes *(UM)*
      - Yes *(NYU)*
      - Yes *(VU)*
      - Yes *(SU)*
      - Yes *(UBC)*
      - Yes *(UC)*

1. **IT Services to Students**
   b. How is IT support provided to students?
      - In person, KB, SD, by phone & web form *(UM)*
      - Helpdesk, by phone, online help, email response, in person, Ask ITS & FAQs *(NYU)*
      - In person, email, phone, Skype & Digital Life *(VU)*
      - Service Desk, Residential Computer Consultants (RCC) & FAQs *(SU)*
      - Reference Desk, by phone, learning commons assistant, technical assistance form, KB, FAQs & Twitter feed *(UBC)*
      - Email, by phone, in person, online troubleshooting documentation & mailing list announcements *(UC)*

1. **IT Services to Students**
   - Monday to Friday 0900 - 1700 *(UM)*
   - Monday to Friday 0800 – 0000, Sat & Sun 1200 - 0000 *(NYU)*
| c. What are the opening hours for IT support? | Monday to Thursday 0800 – 0000, Friday 0800 – 1700, Sunday 1900 - 0000 (VU)  
Monday to Thursday 0900 – 0000, Friday 0900 – 1700, Saturday 1300 – 1700, Sunday 1300 - 0000 (SU)  
Monday to Friday 0830 - 1700 (UBC)  
Monday 0930 – 1630, Tuesday to Friday 0830 - 1630 (UC) |
| 1. IT Services to Students | Preferential Pricing, NDNA (UM)  
Student Laptop Assisted Purchase Scheme (NYU)  
Apple & Dell discounts (VU)  
Computer purchase programs for Apple, Dell & Lenovo (SU)  
No, laptop lending is available (UBC)  
Authorised Campus Reseller (UC) |
| d. Is there a student assisted laptop purchase scheme available? | Yes – 24 X 7 computer facilities on campus (UM)  
No - Monday – Friday 0830 – 2230, Saturday – Sunday 1200 - 2000 (NYU)  
No - Monday – Thursday 0800 – 2200, Friday 0800 – 1900, Saturday 0800 – 1700, Sunday 1200 - 2200 (VU)  
Yes – 24 X 7 computer facilities on campus (SU)  
No – Monday – Thursday 0800 – 0000, Friday 0800 – 2000, Saturday 1000 – 2000, Sunday 1000 - 0000 (UBC)  
Yes (UC) |
| 1. IT Services to Students | Online secure file storage, colour poster printing service, laptop rental scheme, student net & portal (UM)  
Borrow a laptop, NYU-TV (NYU)  
Network storage space, file sharing service, anti-virus software (VU)  
Meyer Tech Desk Blog and a Meyer Wiki (SU)  
Laptop lending (UBC)  
Computer repair, computer recycling program, IT Training (MS Office 2007, Adobe & University specific s/w packages) (UC) |
| e. Are 24 hour access PC labs available and if not what are the access hours for the PC labs? | Yes – 24 X 7 computer facilities on campus (UM)  
Borrow a laptop, NYU-TV (NYU)  
Network storage space, file sharing service, anti-virus software (VU)  
Meyer Tech Desk Blog and a Meyer Wiki (SU)  
Laptop lending (UBC)  
Computer repair, computer recycling program, IT Training (MS Office 2007, Adobe & University specific s/w packages) (UC) |
| 2. What additional IT services are provided to students at the University? | University Outlook Live email can be accessed via smart phones (UM)  
Unofficial NYU courses app for iPhone, NYU Campus Map for iPhone, NYU WSN app for the iPhone (NYU Student Newspaper) (NYU)  
Vanderbilt Mobile page, Vanderbilt Mobile site, Vanderbilt Library – Go Mobile, standalone apps for iPhone and Android (VU)  
iStanford for iPhone & iPod Touch, Stanford Mobile Web, Stanford Mobile for Blackberry – coming soon, GoTourIT virtual tour, |
| **4.** Is there an A – Z listing of IT & Online services offered to students provided on the University website? | **Yes (UM)** [A - Z Index](http://library.umd.edu)  
**Yes (NYU)** [A - Z Index](http://library.nyu.edu)  
**Yes (VU)** [A - Z Index](http://library.vcu.edu)  
**Yes (SU)** [A - Z Index](http://library.syr.edu)  
**Yes (UBC)** [A - Z Index](http://library.ubc.ca)  
**Yes (UC)** [A - Z Index](http://library.uchicago.edu) |
| **5.** What online options are there for general client services such as:  
  **a.** Booking group study rooms | **Bookings must be made via the Student Portal (UM)**  
**Reserving a group and or individual study room via electronic reservation form (NYU)**  
**Google calendars show availability, booking first come first served (VU)**  
**Group study rooms are not bookable (SU)**  
**Online room bookings, online class booking system, FindMe tool (UBC)**  
**Procedures vary, email, phone first come first served (UC)** |
| **5.** What online options are there for general client services such as:  
  **b.** Paying fines | **E-payment system (UM)**  
**Pay at the circulation desk by cash, personal cheque, credit or debit card (NYU)**  
**Online course registration (VU)**  
**Fines can only be paid in person (SU)**  
**Online check loans, holds and DocDel and Online payment of library fines and charges (UBC)**  
**No online option for paying fines. Fines can be paid by cash, check or university departmental order (UC)** |
| **6.** What online options are there for general client services such as:  
  **a.** Finding information on when your books are due back or if your requested books are available for loan? | **The My Account Option on the Library Catalogue (UM)**  
**Login to Acorn (the Library’s online catalogue), renew items by email, request to receive all your library announcements by email (VU)**  
**The My Account Option on the Library Catalogue (SU)**  
**The My Account Option on the Library Catalogue, Online check loans, holds and DocDel and Online payment of library fines and charges (UBC)**  
**The My Account Option on the Library Catalogue, the Library uses the current email address on file to contact clients. Clients can update their email address by logging into My Account (UC)** |
| **7.** How can you contact the Library and get help or guidance? | **Generic “ask a Librarian” online service (UM)**  
**Ask a Librarian, reference desk, via email (4 hour response time** |
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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</thead>
</table>
| 8. What assistance is there for enabling collaboration between groups of users such as researchers or undergraduate students who are working on a common task? | - 32” LCD screens in GSR’s, DVD/video player, 15 + Access Grid Nodes on campus (UM)  
- Peer to peer file sharing, NYU Wikis, video conferencing (NYU)  
- ’Vshare’ file sharing service, Students use Gmail as student email system and presumably have access to Google Apps for collaboration purposes (VU)  
- Yes see link (SU)  
- Group study rooms, collaboration in a digital sphere, ‘Get Together’ page (UBC)  
- ‘WebShare’ file sharing tool, support for IM & chat (UC) |
| 9. What IT or online services have you seen offered as part of this review that you would like to be made available at UWA? | - Extensive software suite available on all public PCs (UM)  
- Student Laptop Assisted Purchase scheme, ITS Network & System Status Blog (NYU)  
- Widespread usage of iTunesU, Flickr photostream, mobile website & applications which are optimised for mobile devices (VU)  
- No response provided (SU)  
- More and improved use of Web 2.0 to promote services and support at a more granular level, simple immediate contact help to a person or service, FAQ database (UBC)  
- 24 hour computer labs, schedule an appointment with a Librarian form, ‘Text Us’ service, IM service, increased storage (WebShare), IT training for University community (UC) |

- Not Library specific but as a whole site level there’s a lot of emphasis on an imaginative ‘brand’ and by line with support materials in all formats – use of videos, Flickr and Web 2.0 generally is much richer. ‘A place of mind’ has so much more potential than ‘Achieve International Excellence’. (UBC)
## Results from Student Online Survey

### In which faculty or faculties are you enrolled?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Architecture, Landscape and Visual Arts</td>
<td>1.7%</td>
<td>1</td>
</tr>
<tr>
<td>Faculty of Arts, Humanities and Social Sciences</td>
<td>31.0%</td>
<td>18</td>
</tr>
<tr>
<td>Faculty of Economics and Commerce (UWA Business School)</td>
<td>12.1%</td>
<td>7</td>
</tr>
<tr>
<td>Faculty of Education</td>
<td>3.4%</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Engineering, Computing and Mathematics</td>
<td>22.4%</td>
<td>13</td>
</tr>
<tr>
<td>Faculty of Law</td>
<td>13.8%</td>
<td>8</td>
</tr>
<tr>
<td>Faculty of Life and Physical Sciences</td>
<td>27.6%</td>
<td>16</td>
</tr>
<tr>
<td>Faculty of Medicine, Dentistry and Health Sciences</td>
<td>10.3%</td>
<td>6</td>
</tr>
<tr>
<td>Faculty of Natural and Agricultural Sciences</td>
<td>1.7%</td>
<td>1</td>
</tr>
<tr>
<td>School of Indigenous Studies</td>
<td>0.0%</td>
<td>0</td>
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</table>

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

### Are you an undergraduate or a postgraduate student?

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<th>Response Percent</th>
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<tr>
<td>Postgraduate student</td>
<td>32.8%</td>
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**answered question** 58  
**skipped question** 0

### What do you like about IT facilities at UWA?

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<tbody>
<tr>
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**answered question** 51  
**skipped question** 7

### What problems have you experienced with IT facilities at UWA?

<table>
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**answered question** 56  
**skipped question** 2
How could UWA improve the IT facilities it provides to students?

<table>
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<tr>
<td></td>
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Comments - Common topics
Statistics reflect number of comments, not necessarily number of respondents

<table>
<thead>
<tr>
<th>Topic</th>
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<th>Problems</th>
<th>Suggestions for Improvement</th>
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<tr>
<td>SNAP/ wireless access</td>
<td>24</td>
<td>38</td>
<td>31</td>
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<td>Access to/Availability of PCs</td>
<td>12</td>
<td>10</td>
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<td>4</td>
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</tr>
<tr>
<td>Software</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Resources Lectopia/WebCt</td>
<td>4</td>
<td>3</td>
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<td>Webmail/ google apps</td>
<td>5</td>
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<td>Speed (includes log on time)</td>
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<td>4</td>
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<td>Download quota</td>
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</table>

Sample Comments

What do you like about IT facilities at UWA?

- Internet is fast. No games available on the computers.
- There may be things that I like, but I’m too pissed off by the lack of access to remember what they are.
- The Google-based webmail service is excellent. WebCT and MyUWA are also quite useful.
- Good printing setup, wireless generally works ... sometimes
- The CSSE building have adequate facilities.
- Wireless internet is super handy.
- Help has always been readily available from either the support desk or seminars put on by the librarians.
- wireless attempts to cover most of the university, free usage, MyUWA is a good concept, when it works.
- The new google student mail. It’s the best thing IT has done.
- 24 hour access to computer labs at FJ Clark lecture theatre and at Anatomy.
- Nothing much.
- The SSO is convenient, and the people at SISO are very helpful.
- The idea of SNAP and printing from SNAP
- Library computers have office 2007
- Lectopia
  I really appreciate having free wireless Internet access, and particularly that it isn't filtered. My honours dissertation and an essay that I wrote earlier in my degree are about an obscure genre of computer game, which occasionally means that I end up doing research in very odd corners of the Internet! I’m always thankful that UWA trusts me to be using the Internet for legitimate study purposes, instead of trying to restrict it and possibly locking me out of sites that I genuinely do need to read.

What problems have you experienced with IT facilities at UWA?

- 24 hr access rooms are not available for all students.
- SNAP doesn’t work! Drops out consistently, is always slow, often will not let me reconnect in the library for hours on end.
- SNAP keeps cutting out.
The time it takes to log in on library computers is also unacceptable. When printing something from an express computer, for example, it regularly takes longer to log in than it does to actually print the document in question.

IT support staff can at times be gruff. I have not experienced this personally, but have overheard interactions in the science library. It is not ok to get pissed off at a student when they don't understand what you are saying.

WebCT loading very slow, lectopia being down, supersearch not being available on the weekends. Library photocopiers don't recognise my USB drive and the email function didn't work.

Sluggishness of WebCT.

Staff at the IT desk are impersonal and incapable of addressing student inquiries, not because they lack the expertise, but because they are missing the personal and social skills necessary for problem solving.

A lot of postgraduate students are having trouble with SNAP wireless. It's inconsistent, drops out of service at busy times (often 5-6 times a day), makes connecting into their department's printing facilities difficult, is slower and generally causes a lot of problems. It is unacceptable to be a postgraduate student at a university that wants to be recognised internationally and to experience problems like these.

SNAP does not work!!!!! It drops out constantly, disrupting my work considerably. I cannot understand why IT services seem incapable of running it properly. It is a very serious problem.

It ridiculous having to complete a tutorial then take a print out to a person sitting in an office to get access to the internet at UWA. The uni is over 10 years behind other unis and organisations requiring students to do this - we expect internet access and most students are fully aware of how to use the internet responsibly. We can get easier internet access at McDonalds - that's sad. We should just be able to use our student number and pheme password to log on from the day we enrol. Other schools and unis can manage this - why can't UWA. The result is that some students don't even have internet access at uni because the process of gaining access is so complicated!

How could UWA improve the IT facilities it provides to students?

Lower printing costs.

Provide more 24 hr computers rooms for students to use.

...Ability to load school-budgeted photocopying allowance onto campus card so that it can be used in the library (instead of only on one photocopier, located in the Arts Faculty building).

I would be happy if i could get wireless in more places (oak lawn, the ref) and it was a more reliable connection.

Get some staff with better communication skills, it is their job i am guessing to help sort out IT problems, it is irritating if you are sent away.

Extend SNAP reliability and availability to all UWA sites (including houses off campus like UWA Science Communication office).

Simplify the arrangements for connecting to the university network. I understand the original intention in supporting WEP encryption, however these days most, if not all devices support WPA2 with a RADIUS authentication scheme which seems much more suited to a high-connection university environment. It is particularly counter-intuitive to have to connect to the SNAP VPN layer once connected to SNAP if you just want to access services hosted at the university. Why not abolish this completely and combine the auth and encryption into one simple layer? Easier for you to administer, easier for the end user.

10Mbps wired connections in the libraries are, er, lacking, given that a lectopia download is now approaching 150MB.

Improve the wireless system for internet on laptops is the most obvious thing to fix so there can be a stable connection in buildings throughout the university. Train the IT support staff in manners.

More labs and computers

Provide the Life Science students with a 24/7 computer lab/study area that other faculties have as well!

Put Firefox on the computers and OpenOffice.

Set computers up for power-saving.

Make network status notices more available, and improve interpersonal skills among ITS staff.

There should be no need to provide our username and password to a dialogue box when accessing non-UWA websites at UWA, if we have already logged into a UWA computer.

Also there is no logical reason why I should have to go online and report an IT incident when I need IT help, when I am at my desk and thus metres away from the IT support staff at my school.

I wasted 2 weeks at beginning of term wondering why I could not download WebCT stuff from home-turns out the UWA system doesn't like Safari. Things mostly good with Firefox except that I must use Safari to print off assignment cover pages. It took several stressed hours to work out that little anomaly! Is info for Mac users given out? I may have missed it in the 'fresher overload'.

Access to online textbooks.
Solve SNAP reliability issues. Also, provide some kind of centralised and easily accessible file storage; I end up emailing files to myself to move them between machines.

Increase download limit
As mentioned in question 4, improve/change the student email. Also, make sure the pheme single sign-on system covers ALL systems. At the moment the Get It document delivery service in the library website requires a library barcode as a password - this should be changed to pheme for convenience and streamlining the process from search to request. WebCT is also clunky and difficult to use. It is never used to full capacity (really, the only part that is used is the lectopia lecture recordings function) because it is unreliable. It crashes or freezes, it is difficult to upload documents or easily change a document if there is an error. There needs to be more staff training available on how to use the system effectively, and student help on how to navigate the system.

Some laptops require you to turn off your virus protection software in order to use the university's internet connection. I feel very unsafe doing this. It is another sign of the weak connection provided. The internet connection should be built to adapt to various types of windows and laptops being used, regardless if it's windows vista, XP, Mac etc

### ATTACHMENT 5

**Student Comments from Focus Groups**

**What do you like about IT facilities at UWA?**

*Lectopia and WebCT received the largest number of accolades from students.*

- Lectopia useful when lectures clash or for revision or for clarification of notes
- WebCT is useful
- SNAP (when it works)
- Download allocation is good although not everyone was aware of how much was available
- Science Library PCs, power points, communication ports, headphones beside each PC
- New Google email
- SISO/IT staff are helpful with internet problems and when wireless access is 'dodgy'
- PC availability screens are useful
- Lecturers who support email for sending results and use Facebook for units or group work
- Open access Internet sites
- Free scanning – especially in Library Reserve
- MyUWA because everything you need is in one place
- IT facilities at UWA are very comprehensive
- Fast internet speed
- Group study rooms with whiteboard scanners
- Laptop lockers with power points - but need to be promoted to students
- Single sign on
- Lots of PCs in Reid
- E-books – for reference and E-journals
- Endnote available from the Library
- 24/7 access to Faculty computer labs
- Computer facilities are OK in Business except when the labs are full with a class
- Sufficient PCs in Engineering
- Latest versions of Microsoft office in the Library

**What problems have you experienced with IT at UWA?**

*Wireless/SNAP availability and reliability received the largest number of complaints from students*
Wireless SNAP coverage is patchy across campus and it 'drops out' frequently 12
WebCT has lots of problems e.g. doesn’t support deep-linking and is hard to navigate 7
Faculty computer labs have outdated hardware and software 6
Faculty computer labs are poorly maintained – broken furniture and equipment 4
Online class registration is time consuming and frustrating 4
Logging into different web sites for various courses. 3
Faculties have online resources not accessible from home 3
Navigating five web pages in order to print off notes – need two clicks at most 3
Lots of websites but no linkage  Websites are black holes 3
Insufficient power points in Reid Library (ground floor mentioned) 2
Lecturers don’t always answer emails either promptly or at all 2
No single sign on. Passwords are hard to remember 2
Some lecturers are ‘technology shy’ - need to be more comfortable and proficient with Lectopia 2
Students prefer the Library to computer labs in terms of working environment – “Labs are “dark” and “unappealing” 2
Different versions of software on campus make it difficult sending material to academic staff 2
The IT people are too busy - waiting in line for half an hour for IT help 2
Faculty computer labs are not accessible to all students
SISO staff are not available after 6pm during the week in Science Library
Communication problems with IT support staff
SISO weren’t helpful - spoke quickly using terms not understood.
Searching the UWA web site is hampered by web pages that are not sufficiently descriptive
Engineering students described emails from one faculty member as Spam because there was so many
Arts student had trouble as a mature age student learning new IT
IT is not simple for International students with limited English language skills
Internet Explorer closes frequently when using Blackboard.

How could UWA improve the IT facilities it provides to students?
The most frequent suggestions for improvement related to Wireless access and availability of new PCs with up-to-date-software.

Reliable wireless access required everywhere on campus 13
Upgrade PCs and printers in the faculty computer labs 4
More Reid Library PCs needed 4
More PCs needed (in labs and in general at UWA) 4
Lectopia recordings for all lectures (videotaped – not just sound recorded) 4
Unit Web pages should be more uniform in appearance and style – same content management 3
Free or cheaper printing 3
More Internet Support needed – longer service hours 2
More PC availability screens 2
Library Apps for mobile phones incl. to check Reserve 2
Programs need Firefox not Internet Explorer
To submit assignments online (some academics prefer hard copy)
Need Google Chrome
WebCT should notify students when new notes were available
A printed fact sheet on how to connect to the Internet or someone to show students how it all works
when they start at UWA
Need more group study rooms with big screens and electronic whiteboards
Upgrade PCs and printers in the faculty computer labs
Some students thought more people would bring Laptops to UWA if SNAP worked
Need to log in once for WebCT and OCLR  7
Online listing of holdings and prices for the second hand bookshop in the Guild village – like ebay.
Find it easier to learn from YouTube – e.g. Khan Academy
First years need a step by step process with OLCR.
Important information should be sent to students in hard copy, not by email
Mac computers in Arts should be replaced with PCs for compatibility
More online books
Replace Vista in the Library with Windows7
Lecturers should use Smartboards to move easily between PowerPoint and video

On a scale 1-10 how would you rate UWA IT facilities and support?

Most people said 8 (Not everyone answered) One person said 7, two people said 7.5 and one person said 9.
Introduction:
This document provides an overview and status report on the progress of the LMS Review Project.

Project Description

Terms of reference (see Appendix A)

UWA under the management of CATL is conducting a Review of Learning Management Systems with the purpose of selecting a new system to replace WebCT. WebCT will not longer be supported by the vendor, Blackboard Pty Ltd, from 2012.

The UWA LMS Review Project is being conducted during 2010 by CATL in partnership with ITS and in collaboration with a Working Group comprised of representatives from across the university.

The review process is designed to develop a comprehensive understanding of the role and needs of an LMS at UWA, and the degree to which LMSs available in the market meet these needs. As a result of this review process, a single learning management system will be recommended to the Teaching and Learning Committee as the replacement LMS.

Project tasks
Data being collected to inform and support the recommendation comprises
• **environmental scan**
  of Learning Management System (LMS) uptake, review processes, and in the Higher Education sector in the Australasian region
  [see final report, Appendix C]

• **vendor consultation**
  o demonstrations of their Learning Management System, with feedback sought from those in attendance
  o more specific questions sent to vendors of shortlisted LMSs

• **working group explorations**
  o demonstration sites established for each shortlisted LMS for Working Group Members to explore
  o migration of selected units delivered via the current Learning Management System, into each shortlisted Learning Management System to ascertain look and feel, breakage and approximate fixing time for any migration/implementation of a new system.

• **user data**
  o a survey of all staff ascertaining current uses and future needs in an LMS
  o testing sites established within each shortlisted LMS for UWA Staff and Students to test and provide feedback on useability
  o submissions called from UWA Business Units

• **technology risk assessment**
  developed by ITS

**Communications**
A communications plan has been developed to ensure dissemination of information to a wide range of stakeholders.

A communication plan was developed to ensure that stakeholders in this project are informed of project progress, and risks can be managed in a timely manner. This aim comprises a number of objectives:

- To ensure the T&L Committee and ELS Standing Committee are aware of progress and approve key milestones
- To keep university staff aware of the Review and its progress and ensure their participation in providing data
- To ensure the Working Group and other key LMS review personnel are aware of project and risks and can help to mitigate risks
- To ensure potential business partners can respond to Review needs (such as availability of explore and test sites), and can support UWA in the review process

The key stakeholders are identified as:
- The Teaching and Learning, ELearning and Learning Spaces Committee, and the IPS Committees
- W/Prof Denise Chalmers, Director of CATL and Chair of ELS
- The LMS Review Working Group
- UWA staff and business units
- Vendors / Official Partners of LMS products
- Students at UWA

To keep stakeholders informed, the CATL LMS Review team have a range of communication strategies
- Reports to the committees at the meeting
- Monthly meetings with the working group and Denise Chalmers
- A communication wiki in Wikispaces for the Working Group
- An LMS Review information web bulletin
- Ad hoc email messages to specific stakeholders (e.g. vendors) or all in a group (e.g. all staff email), which include invitations to participate through the surveys, submissions, user testing.
Status report

Overview
CATL = Centre for the Advancement of Teaching and Learning
WG = Working Group
eLS = eLearning and Learning Spaces Committee

<table>
<thead>
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<th>Task</th>
<th>Responsibility</th>
<th>Who involved</th>
<th>Status</th>
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<td>CATL</td>
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<td>vendor consultation demonstrations</td>
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<td>Process Complete (June 2010)</td>
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<td>CATL WG</td>
<td>Vendors: Netspot (Moodle)</td>
<td>In progress: 2 x responses received by due date 4/10/10 (Bb, D2L)</td>
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<td>Process complete (27/9/10)</td>
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<tr>
<td>test unit migration</td>
<td>CATL CATL WG</td>
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<td>User data</td>
<td>CATL (WG consult)</td>
<td>All staff invited</td>
<td>Process Complete (4/10/10) Data being collated and analysed</td>
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<tr>
<td>Staff and student user tests</td>
<td>CATL (WG consult)</td>
<td>All staff and students invited</td>
<td>Testing recently complete (7/10/10) Data being collated and analysed</td>
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<tr>
<td>Submissions from BUs</td>
<td>CATL (WG consult)</td>
<td>All Business Units</td>
<td>Submissions received (4/10/10) Data being collated and analysed</td>
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<td>technology risk assessment</td>
<td>ITS</td>
<td>ITS</td>
<td>Report Complete (20/08/10) Tabled with LMS Review WG (20/10/10) To be tabled with eLS (Oct meeting)</td>
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</table>

Detail of task status

Environmental Scan:

The first task of the UWA LMS Review was to conduct an environmental scan of LMS uptake across the Higher Education sector within Australasia to identify viable LMSs for consideration.

This process involved scanning the LMS market to ascertain the LMSs which are currently in use by other Universities, and to understand the factors affecting which LMS was implemented. Five universities were selected and examined in further detail with the purpose of accessing the data gathered and examining the review processes undertaken by those Universities; so as to inform and guide the UWA LMS Review.
As a result, three Learning Management Systems (LMSs) were shortlisted for further consideration. These were:

- Blackboard Learn 9.1
- Moodle 2.0
- Desire 2 Learn 9.1

In addition the information in the reports of reviews by other universities has been used as a guide or starting point for the development of data collection tools in the UWA review process. In particular, the development of the staff survey, the staff and student user testing,

See Appendix B for the resulting report.

**Vendor Consultation:**

A series of vendor visits were organized to introduce members of the UWA community to each LMS. These visits included a public presentation, and meetings with the LMS Technical Implementation and Integration, the LMS Review Working Group, and the CATL LMS Review team. Participants who attended the vendor presentations were asked to provide feedback via an online survey.

The staff response to the surveys is presented in the table below:

<table>
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<tr>
<th>LMS</th>
<th>Staff attending</th>
<th>Feedback</th>
<th>Positive</th>
<th>Negative</th>
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<tbody>
<tr>
<td>Moodle (by partner Netspot) 27/04/10</td>
<td>46</td>
<td>10</td>
<td>Access to community development base which is responsive, passionate, progressive. (n=8)</td>
<td>Hidden cost of support and maintenance.</td>
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<tr>
<td>Blackboard Learn 9.1 18/05/10</td>
<td>22</td>
<td>7</td>
<td>Great interface</td>
<td>Vendor reputation</td>
</tr>
<tr>
<td>Desire2Learn 25/06/10</td>
<td>10</td>
<td>3</td>
<td>User friendly Well-designed interface</td>
<td>Little to no local support within Australia</td>
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</tbody>
</table>

**Vendor Questions:**

A list of 45 questions was developed and sent to each of the three LMS vendors / representatives*, for response by the 4th October 2010. (* in the case of Moodle as an open source LMS, Netspot has been the information source. Netspot is a Moodle partner that supports universities in the use of Moodle). The questions asked covered UWA-specific issues in the areas of

- Administration
- Tracking, statistics and reports
- Integration
- System functionality / features
- Accessibility
- Mobility
- Vendor/Partner Client relations

The vendor questions presented can be viewed at Appendix C.

The responses received from Blackboard and Desire2Learn are currently being collated and reviewed.

**Exploration of Demonstration sites:**
CATL negotiated with each of the three vendors/partners for access to sites which the Working Group could use to explore each LMS. In this case, delay from and difficulties with Netspot providing Moodle 2.0 sites meant that CATL approached a local Moodle Partner company, Pukunui. The working group was provided with access and asked to explore these sites and provide feedback.

Some final responses are still being sought, and collation and consideration of the responses is about to commence.

**Migration of selected units**

CATL, and specifically the EDS (Elearning Development Support) team, developed test sites to be migrated into each of the LMSs to view the outcome of a current WebCT site at UWA in the new environment with an un-tampered migration, and to note experiences and issues with the process and outcome.

Two units were migrated: the ACE tutorial which is well-known at UWA, and a ‘super unit’ which was developed as a single unit encompassing the range of tools and functionality possible by a UWA staff user. The migration process was complete on: 24th September 2010.

Recently, a member of the Working Group, has organised with the support of CATL/EDS to test the time frame and result of migrating an existing unit. This was to occur in the period 4-5th October.

The test sites were made available to the Working Group and their feedback sought. Data is currently being collated, with some late feedback still sought.

**UWA Staff Survey**

All UWA Staff were invited to complete an online survey to advise the LMS Review Working Group of their needs for a future LMS. The survey closed on 4th October 2010.

The survey questions were developed by CATL from other universities’ review reports, and further developed for the UWA context in consultation with the LMS Review Working Group. The survey was developed using the Survey Monkey online survey tool.

The survey questions addressed questions relating to:

- Staff work location
- Staff overall views of an effective LMS and their future use of technology
- Their current use of WebCT and other LMSs, or technologies
- Their desired features in a future UWA LMS

Survey questions were a mixture of click a choice and open-ended questions. This enabled staff to both respond systematically on uses and tools, but allowed for providing data about unanticipated uses, perspectives and tools. See Appendix D for the survey question instrument.

Data is automatically collated, and is currently being combined with other data and analysed. As a precursory view of some responses, the most desired future uses of an LMS are:

- Ease of content-migration with each new course *(unit administration)*
- Full integration with non-LMS assessment *(integration)*
- Integration with OLCR and student university email *(integration)*
- Ease of uploading files *(access and use)*
- Ability to drag and drop contents, links, etc *(appearance/unit design & development)*
- Ability to easily and quickly group students for activities *(student administration)*
- Ability to upload or link to a variety of audio and/or visual material *(teacher content/activity)*
Business Unit Submissions

Business units across the university were asked to provide their input into the LMS Review by addressing the following terms of reference, to be submitted by 4th October 2010:

- The extent to which the organisational unit currently interacts with an LMS
  - the degree and manner to which LMSs relate to the core business of the organisational unit
  - the nature of the interaction of the organisational unit with WebCT (UWA’s current LMS), including identified strengths and limitations
  - technologies currently used by the organisational unit for teaching and learning, and advantages and disadvantages in including them with a future LMS

- Requirements of an LMS for the work of the organisational unit
  - needs identified for a future LMS as they relate to the work of the organisational unit
  - potential impact of the functions/features of a future LMS on the work of the organisational unit or its clients
  - processes and/or activities currently engaged in by the organisational unit, that should be considered for incorporation into a future LMS
  - technologies or systems currently used by the organisational unit which are not integrated with or part of WebCT that should be taken into account when considering a future LMS
  - current processes or activities of the organisational unit that might be incorporated into a future LMS

Responses have been received from two faculties, two schools, Albany Centre and the Web Office. Data is currently being collated.

Staff and Student User Testing and Feedback

Both UWA Staff and Student User Testing sessions have been organised to trial the 3 shortlisted LMSs. The trials commenced in the week commencing 20th September and is due to conclude on 7th October 2010.

Set tasks were developed and a test site created in each LMS, and copied for each user. The tasks were developed from a combination of tasks by other universities, consultation with Working Group members, exploration and knowledge of the LMSs and UWA staff uses of WebCT, and internal trial.

Staff and student participants were given 30 minutes to trial set tasks in each LMS and provide their feedback. Against each task was a scale for indicating degree of ease of use. User testers also had the opportunity to provide additional information. At the conclusion of the 90 minute session, participants were asked to identify their preferred Learning Management System by ranking them, where 1 equals the most preferred to 3 which equals the least preferred LMS.
There has been great interest from both staff and students in volunteering to attend sessions and provide feedback on the task achievability and their preference. The degree of interest led to additional sessions being organised, and extending the user testing time frame by an extra week.

A sample of the User tasks feedback sheet is available at Appendix E.

**Technology Risk Assessment:**

Information Technology Services (ITS) was asked to investigate the implications for software and hardware specifications, including managed hosting and in-house options, of the three LMS products (Bb Learn 9.1, Moodle, and Desire2Learn).

ITS identified four acceptable options
- Blackboard local implementation
- Blackboard hosted implementation
- Moodle hosted implementation
- Desire2Learn local implementation

Two options were considered to some degree less suitable or carried a higher degree of risk to the university. These were implementing Moodle locally and implementing Desire2Learn in a managed hosted environment.

The report was tabled with the LMS Review Working Group on 20th August 2010, and discussed at the Working Group meeting on the 20th September 2010. It is to be tabled at the eLearning and Learning Spaces Standing Committee meeting in October 2010. A copy is attached here as Appendix F.
Review of UWA Learning Management System Project

TERMS OF REFERENCE

Background to project
This document outlines CATL’s approach to review the University’s Learning Management System (LMS) in response to the OPP (2009-2013)’s support for the commitment in the Policy on Selected Teaching Modes (AC Res 22/08) to reliable and efficient delivery, appropriate creativity and innovation, and well informed approaches to online learning modes at UWA, as well as the recognition that implementing these policies relies on the provision of robust, flexible, centrally supported elearning systems including a Learning Management System (LMS).

WebCT (owned by Blackboard Inc) has been used by the University since 2000, and has been the centrally supported LMS since July 2003. Since that time the online learning needs of our students have changed considerably, as have the requirements of academic staff using online learning technologies. The recent decision to implement the future framework for 2012 provides a unique opportunity for the University to integrate online learning into the design of new courses and units. In addition, our current version of WebCT will be become unsupported by the vendor in 2012. Therefore, an alternative product must be found.

Support was sought and awarded from the Central Learning and Teaching Performance Fund – 2009 to carry out the review under the OPP Strategy: EDU3.2 Develop long-term strategies for integrated approaches to learning including elearning and learning spaces. The project is to be carried out by the Centre for the Advancement of Teaching and Learning, in collaboration with Information Technology Services, and under the auspices of the eLearning and Learning Spaces Committee.

Scope of Work
The scope of this project is to complete these activities:

1. Examine recent LMS reviews by other universities
   - Select approx. 8 recent LMS reviews of Moodle and Blackboard as conducted by other universities during 2008-2010 from a range of Universities (ie at least 1 other G08 university, another West Australian University, an international University)
   - Collate findings and identify key factors for and against each LMS as identified by the selected universities
   - Develop a summary report of findings to inform final report

2. Survey WebCT and web-based applications at UWA: current and future
   - ITS investigation of Moodle and Blackboard for hardware specifications and cost implications
   - Review and adapt past surveys conducted to explore uses of technology across the university together with surveys by other universities identified above
   - Create a survey instrument tailored to identify uses and perceptions of WebCT at UWA and other web-based applications across different sectors at UWA
   - Adapt survey to different the focus and interests of different sectors
   - Collaborate with various sectors regarding design, development and implementation/data collection as appropriate
   - Sectors to include
     - learners and learning via Student Services, Student Guild, and other groups
     - teachers and teaching via Faculty Assoc Deans of T&L and CATLysts
     - ensure internal, regional and offshore groups are accessed
     - ITS and faculty IT teams
     - library
3. Conduct user-testing and feedback processes on two LMSs (Blackboard and Moodle)
   - Request user testing accounts with Moodle and Blackboard for use by project working group
   - Develop a testing feedback proforma
   - Collate feedback and identify key issues raised by testers
   - Develop a summary report outlining key issues to inform final report

4. Prepare a final report
   - Identifying criteria that an LMS must meet to serve the needs of UWA staff and students
   - identifying and proposing one particular LMS for implementation at UWA based on the criteria and supported by data collected at 1, 2, 3 above.

5. Develop a broad plan to guide preparation for a staged implementation process in 2011

**Not in Scope**
- informing and seeking feedback from the wider UWA community about the proposed new LMS
- full testing, trialling and evaluating each of the Systems reviewed.

**Broad Schedule**

<table>
<thead>
<tr>
<th>Top level task</th>
<th>Second level tasks</th>
<th>Broad timeline 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review team</td>
<td>Identify roles and responsibilities of project team members/groups</td>
<td>Early-mid March</td>
</tr>
<tr>
<td></td>
<td>Employ Project Officer</td>
<td>End March</td>
</tr>
<tr>
<td></td>
<td>Identify Reference Group</td>
<td>Early – mid March</td>
</tr>
<tr>
<td></td>
<td>Identify Working Group</td>
<td>Early – mid March</td>
</tr>
<tr>
<td>Examine recent reviews by other universities</td>
<td>Evaluate reviews</td>
<td>March – April</td>
</tr>
<tr>
<td></td>
<td>Develop summary report</td>
<td>May (early draft end April)</td>
</tr>
<tr>
<td>Internal UWA survey</td>
<td>ITS hardware specs and costings</td>
<td>March – mid April</td>
</tr>
<tr>
<td></td>
<td>Develop survey instrument(s)</td>
<td>March – April</td>
</tr>
<tr>
<td></td>
<td>Gather data (send to sectors for implementation)</td>
<td>June – July</td>
</tr>
<tr>
<td></td>
<td>Review data, develop summary report</td>
<td>July – August</td>
</tr>
<tr>
<td>Recommendations</td>
<td>Budgetary implications for</td>
<td>May</td>
</tr>
<tr>
<td></td>
<td>Recommendation report</td>
<td>August</td>
</tr>
<tr>
<td></td>
<td>Broad LMS trial plan</td>
<td>September – October</td>
</tr>
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</table>

**Responsibilities**

<table>
<thead>
<tr>
<th>Top level task</th>
<th>Second level tasks</th>
<th>Responsibilities</th>
<th>‘Sign-off’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review team</td>
<td>Identify roles and responsibilities of project team members/groups</td>
<td>CATL eL&amp;LS Committee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employ Project Officer</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify Reference Group</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify Working Group</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td>Examine recent reviews by other universities</td>
<td>Evaluate reviews</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop summary report</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td>Internal UWA survey</td>
<td>ITS hardware specs and costings</td>
<td>ITS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop survey instrument(s)</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gather data (send to sectors for implementation)</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review data, develop summary report</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td>Recommendations</td>
<td>Budgetary implications</td>
<td>ITS to CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recommendation report</td>
<td>CATL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Broad LMS trial plan</td>
<td>CATL</td>
<td></td>
</tr>
</tbody>
</table>

**Communications**

<table>
<thead>
<tr>
<th>Activity</th>
<th>To/from</th>
<th>Format</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary reports</td>
<td>eL&amp;LS Committee / CATL</td>
<td>Written report and</td>
<td>As arise, at next</td>
</tr>
</tbody>
</table>
### Status updates
<table>
<thead>
<tr>
<th>eLearning staff</th>
<th>discussion</th>
<th>eL&amp;LS meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>eL&amp;LS / CATL eLearning staff</td>
<td>Written brief</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

### Required survey activity
| Working group / CATL eLearning staff | Meeting with associated documents and/or email communication | Meetings monthly with email updates and requests, telephone communication |

### Team progress and planning
| Internal CATL | Meetings | Weekly or fortnightly |

### Progress reports
| Working Party / UWA LMS community | Email and web updates | Bimonthly and issues based |

### Other?

---

### Reference group
- CATL, Director
- eLearning and Learning Spaces Committee
- Teaching and Learning Group (via eLearning and Learning Spaces Committee)
- ITS

### Working group
- Project officer x 1
- CATL eLearning staff x 2 (Y. Button, S. Johnston)

Representatives for
- ITS x 1
- Library x 1
- eLearning and Learning Spaces Committee x 1
- Faculty representatives, e.g. from MedEd x 1, CSSE x 1
- Student Services x 1
- Guild x 1
- Facilities Management x 1
- SIMS representative x 1

### Roles and responsibilities of working group members

**CATL eLearning staff**
- Manage project
- Conduct external reviews
- Develop survey instruments
- Liaise with representatives regarding data
- Analysis and report-writing
- Report to Director, CATL; eLearning and Learning Spaces Committee, other areas as required

**Project Officer**
- Communications
- Administration
- Data collation
- Report preparation
- Dissemination
- Report to CATL eLearning staff; Director, CATL as required

**eLearning and Learning Spaces Committee**
- To be informed of project developments
- To give feedback, guidance and information as necessary
- To approve progress at key milestones
- To approve report and recommendations

Representatives (ITS, Faculties/Schools, Library, Student Services, other)
- To attend meetings and provide information and feedback as required
- To organise for collection of data within agreed timeframes
- To respond to survey and recommendation drafts within agreed timeframes and individual areas
Appendix B: Environmental Scan

[Report tabled with the eLLS Committee in August meeting]

UWA LMS Review

Summary Report on the Environmental Scan of Learning Management Systems (LMS’s) in the Higher Education Sector

Prepared by

Marilyn M Bacus
30 July 2010
Executive Summary

The first task of the UWA LMS Review is to conduct an environmental scan of LMS uptake across the Higher Education sector. This will help to identify viable LMS’s for consideration by UWA.

This process involves scanning the LMS market to ascertain the LMS’s which are currently in use by Universities, and to understand the factors affecting which LMS was implemented.

In addition, the LMS Reviews of 5 Universities were selected and examined in further detail with the purpose of accessing the data gathered and to examine the processes undertaken by those Universities; so as to inform and guide the UWA LMS Review.

This report presents a summary of the findings of these tasks and provides the following recommendations.

UWA actions

1. Shortlist three Learning Management Systems (LMS’s) for further consideration in the UWA LMS Review. These are:
   - Blackboard Learn 9.1
   - Moodle 2.0
   - Desire 2 Learn 9.1

2. The Sakai LMS (an open-source LMS) will not be included in UWA LMS Review processes. This software does not have a user community as large as the Moodle LMS and has less market share (only one Australian university currently uses this LMS at an enterprise level). It has a decreasing international community.

3. Request selected LMS Vendors and/or Official Partner provide UWA with live, hosted, production systems for the purposes of facilitating future LMS Review activities such as user testing.

4. Test the migration of content from our current LMS (WebCT CE 8.0.4) to each of the three shortlisted LMS’s to evaluate the quality, integrity and functionality of each of the shortlisted systems.

5. Conduct user-testing with both UWA Staff and Students to also assess usability and functionality.

6. Identify and evaluate the hardware specifications of each shortlisted LMS to assess technical fit and the skill required to implement each shortlisted LMS.

7. Identify the total cost of ownership and implementation of each of the shortlisted LMS’s.

8. Identify the costs and implications of external hosting
Market Scan

A common reference of market scan information was conducted by Delta Initiative in 2008. It’s a North American-centric survey of commonly used LMSs in the higher education sector. Major products are categorised into two, open-source (Moodle and Sakai) and proprietary (Blackboard, Desire2Learn and eCollege) systems.

Figure 1: LMS Market in North America

Of the five products, Blackboard dominated the market especially with their acquisition of WebCT and Angel Learning. Moodle and Desire2Learn followed with Sakai and eCollege having less market shares.

Blackboard’s status as the market leader is similar to that experienced in Australia. In 2008, Blackboard Inc gained 91% of the market share with Blackboard Academic Suite (48%) and WebCT (43%) products combined.
With the decision from Blackboard to cease development and support of WebCT from 2012, some of the 17 Australian universities affected decided to undergo a full review of the LMS options and applications. Of the 17 universities using WebCT in 2008, 2 have moved and 3 are moving to Moodle, 2 will adopt Bb Learn 9.1 in 2011, 1 is moving to Desire2Learn, 8 are undergoing review, and 1 with an unknown status. Please refer to Appendix A for the LMS status of these 17 Australian universities.

The LMS uptake of the 39 Australian universities is presented in Table 1 below reflects movements and a new entrant in the Australian higher education sector. A detailed list is presented in Appendix B.

From 2011, four different LMS systems will be adopted and implemented in Australian universities which represent a significant change in the LMS marketplace. These four systems are Blackboard, Moodle, Desire2Learn and Sakai.

Table 1: LMS Uptake in Australia

<table>
<thead>
<tr>
<th>LMS</th>
<th>Number of universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackboard</td>
<td>19</td>
</tr>
<tr>
<td>Under review</td>
<td></td>
</tr>
<tr>
<td>Moodle</td>
<td>8</td>
</tr>
<tr>
<td>Desire2Learn</td>
<td>1</td>
</tr>
<tr>
<td>Sakai</td>
<td>1</td>
</tr>
<tr>
<td>WebCT</td>
<td>10</td>
</tr>
<tr>
<td>Under review</td>
<td></td>
</tr>
<tr>
<td>Unknown status</td>
<td></td>
</tr>
</tbody>
</table>

It is evident that Blackboard Inc is losing market share while Moodle is gaining with an increase from 3% in 2008 to 21% including those that have decided to move. One university that adopted Moodle in 2008 was and will be joined by other universities that previously used or are currently using WebCT (5), Blackboard (1), their home-grown LMS (1). Sakai has maintained its market share with the same university still adopting the system. However, the Australian LMS market welcomed a new
entrant Desire2Learn with one university deciding to adopt the system. The market isn’t stable yet with 10 universities still undergoing review.

Examples of University LMS Reviews

A summary of five recent university’s LMS reviews conducted between 2008 and 2010 are described below. Of the five universities selected, three are Australian and two are overseas. These reviews were gathered from vendors and from other university contacts. While it is ideal to present a balanced reference of product recommendations, it is important to note the difficulty of getting reviews that recommend a particular LMS. Blackboard Learn in particular lacks review papers because existing Blackboard clients appear not to undertake a formal LMS review process when deciding to upgrade to the latest version. In fact, the LMS review report provided by Blackboard came from a university overseas, and is not as comprehensive as the others included in this paper. Desire2Learn, being a new entrant in the Australian higher education sector, was selected by only one Australian university (to date). Thus, proprietary LMSs are under-represented in this paper. Moodle on the other hand, has benefitted from its active community where user institutions share relevant information to guide in the review of different LMS products. The site “Move To Moodle” was established to store a wide range of information, a site highly recommended by its official partners.

Four out of the five universities included in this paper are WebCT users affected by the change of its product development and support. These universities find this change an opportunity to align the next LMS with changes in their structure, curriculum, teaching and learning goals.

Table 2: Purpose of Review

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Universities</th>
</tr>
</thead>
</table>
| Vendor has ceased further development and will discontinue support of their current LMS | La Trobe University  
University of Ballarat  
Deakin University  
La Salle University, USA |
| Align LMS implementation with change in university structure or teaching and learning goals. | La Trobe University  
Deakin University  
University of Canterbury, NZ |
| Current LMS is cumbersome by modern standards                           | La Trobe University  
University of Ballarat |
Shortlisted LMSs and Criteria Used for Selection

In the review, four universities shortlisted Blackboard Learn and Moodle while one university shortlisted Blackboard Learn, Desire2Learn and Moodle.

Table 3: Shortlisted LMSs

<table>
<thead>
<tr>
<th>Shortlisted LMSs</th>
<th>Universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackboard Learn 9.1 and Moodle</td>
<td>La Trobe University</td>
</tr>
<tr>
<td>Blackboard Learn 9.0, Moodle, Desire2Learn</td>
<td>Deakin University</td>
</tr>
<tr>
<td>Blackboard Learn 9.0 and Moodle</td>
<td>University of Ballarat</td>
</tr>
<tr>
<td>Blackboard and Moodle</td>
<td>University of Canterbury, NZ</td>
</tr>
<tr>
<td>Blackboard Learn 9.1 and Moodle</td>
<td>La Salle University, USA</td>
</tr>
</tbody>
</table>

A collation of criteria used by these universities in selecting a new LMS is provided on the table 4 below.

Table 4: Criteria Used for Selection

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td></td>
<td>University of Ballarat</td>
</tr>
<tr>
<td></td>
<td>University of Canterbury, NZ</td>
</tr>
<tr>
<td></td>
<td>La Salle University, USA</td>
</tr>
<tr>
<td>Functionality</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>University of Ballarat</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td></td>
<td>University of Canterbury, NZ</td>
</tr>
<tr>
<td>Technical fit</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>University of Ballarat</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td>Reliability and consistency of ongoing service</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td></td>
<td>University of Canterbury, NZ</td>
</tr>
<tr>
<td></td>
<td>La Salle University, USA</td>
</tr>
<tr>
<td>Cost (TCO, transition and long-term)</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td></td>
<td>University of Ballarat</td>
</tr>
<tr>
<td></td>
<td>University of Canterbury, NZ</td>
</tr>
<tr>
<td></td>
<td>La Salle University, USA</td>
</tr>
<tr>
<td>Market share</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>University of Ballarat</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td>Perceived Risk</td>
<td>La Trobe University</td>
</tr>
<tr>
<td></td>
<td>Deakin University</td>
</tr>
<tr>
<td></td>
<td>University of Canterbury, NZ</td>
</tr>
</tbody>
</table>
End-users assessment on usability and functionality is the most common determining factor. Different user groups were formed to include participation by staff and students. Participants were given set of tasks to rate the different LMSs. La Trobe University commissioned UsabilityOne to analyse the tasks performed by students. Accessibility testing was separately assessed by Vision Australia. Both Blackboard Learn 9.1 and Moodle got a high rating and both assessed as capable LMSs. The report further emphasised the importance of careful implementation and the role of staff to produce accessible content.

Cost is another common consideration. Different models were used in calculating cost. Deakin University calculated TCO based on the cost of implementation programme (from pilot to change management) and 7 years of operation. The model depicts a clearer picture of which LMS is more cost-efficient over a longer term than just migration and establishment phases. Cost consideration also includes comparison of maintaining the system in-house or hosted externally by vendors or official partners (case of Moodle).

Technical fit is another important factor, especially when the system is implemented at an enterprise-level. This includes assessing the capability of internal development team to maintain and scale the system; architecture and infrastructure (ease of integration, openness to development and third-party extensions); and software performance and maintenance (upgrades, system outages).

Perceived risk was assessed by comparing risks associated with open-source to proprietary products, considering that all 5 universities shortlisted Moodle (open source) and Blackboard (proprietary). In the case of proprietary softwares, vendor’s reliability and consistency of ongoing service was evaluated. This is important because factors such as merging and acquisition impacts development of the LMS that affects the university’s planning and implementation.

Outcomes of the University’s reviews

Three of the five universities recommended Moodle with two of them supporting the system in-house. The major consideration of this is internal capability to develop and support the system. The other university that recommended Moodle will work with an official partner, NetSpot, to combine blended hosting and services. The contract will be reviewed annually from 2012.

The university that recommended upgrading to Blackboard Learn 9.1 finds that the system is an improvement of their current LMS. It exceeds expectations on usability as assessed by staff and students.

The university that recommended adopting Desire2Learn emphasised the importance of successful vendor negotiation. This implies vendor’s openness to meet client’s needs, especially on product development. They require the vendor to develop their product to ensure seamless integration with their systems.

UWA Actions

1. Shortlist three Learning Management Systems (LMS’s) for further consideration in the UWA LMS Review. These are:
   - Blackboard Learn 9.1
   - Moodle 2.0
2. The Sakai LMS (an open-source LMS) will not be included in UWA LMS Review processes. This software does not have a user community as large as the Moodle LMS and has less market share (only one Australian university currently uses this LMS at an enterprise level). It has a decreasing international community.

3. Request selected LMS Vendors and/or Official Partner provide UWA with live, hosted, production systems for the purposes of facilitating future LMS Review activities such as user testing.

4. Test the migration of content from our current LMS (WebCT CE 8.0.4) to each of the three shortlisted LMS’s to evaluate the quality, integrity and functionality of each of the shortlisted systems.

5. Conduct user-testing with both UWA Staff and Students to also assess usability and functionality.

6. Identify and evaluate the hardware specifications of each shortlisted LMS to assess technical fit and the skill required to implement each shortlisted LMS.

7. Identify the total cost of ownership and implementation of each of the shortlisted LMS’s.

8. Identify the costs and implications of external hosting
## Appendix A
### Status of LMS Uptake of Australian Universities affected by WebCT’s life cycle

<table>
<thead>
<tr>
<th>Australian Universities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Catholic University [ACU]</td>
<td>Unknown status</td>
</tr>
<tr>
<td>Australian National University [ANU]</td>
<td>Moved to Moodle 2009 - 2010</td>
</tr>
<tr>
<td>Deakin University [Deakin]</td>
<td>Moving to Desire2Learn 2011</td>
</tr>
<tr>
<td>Flinders University [FLINDERS]</td>
<td>Under review</td>
</tr>
<tr>
<td>La Trobe University [LATROBE]</td>
<td>Moving to Moodle 2.0 2011</td>
</tr>
<tr>
<td>Macquarie University [MACQUARIE]</td>
<td>Under review</td>
</tr>
<tr>
<td>Monash University [MONASH]</td>
<td>Under review</td>
</tr>
<tr>
<td>Murdoch University [MURDOCH]</td>
<td>Under review</td>
</tr>
<tr>
<td>University of Ballarat [BALLARAT]</td>
<td>Moving to Moodle 2011</td>
</tr>
<tr>
<td>University of Canberra [CANBERRA]</td>
<td>Moved to Moodle 2008</td>
</tr>
<tr>
<td>University of New England [UNE]</td>
<td>Moving to Moodle 2.0 2011</td>
</tr>
<tr>
<td>University of Sydney [SYDNEY]</td>
<td>Moving to Bb Learn 9.1 2011</td>
</tr>
<tr>
<td>University of Tasmania [TASMANIA]</td>
<td>Under review</td>
</tr>
<tr>
<td>University of Western Australia [UWA]</td>
<td>Under review</td>
</tr>
<tr>
<td>University of Western Sydney [UWS]</td>
<td>Moving to Bb Learn 9.1 2011</td>
</tr>
<tr>
<td>University of Wollongong [UOW]</td>
<td>Under review</td>
</tr>
<tr>
<td>Victoria University [VU]</td>
<td>Under review</td>
</tr>
</tbody>
</table>
## Appendix B
### LMS Uptake of Australian Universities

<table>
<thead>
<tr>
<th>Australian Universities</th>
<th>From</th>
<th>Moving to</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Catholic University [ACU]</td>
<td>WebCT CE 8.0 + D2L e-portfolio</td>
<td>unknown status</td>
<td></td>
</tr>
<tr>
<td>Australian National University [ANU]</td>
<td>WebCT CE 4.1</td>
<td>Moodle 1.9</td>
<td>2009 - 2010</td>
</tr>
<tr>
<td>Bond University [Bond]</td>
<td>Blackboard 7.0</td>
<td>Blackboard</td>
<td></td>
</tr>
<tr>
<td>Central Queensland University [CQU]</td>
<td>Blackboard 6.3*</td>
<td>Moodle 1.9</td>
<td>2010</td>
</tr>
<tr>
<td>Charles Darwin University [CDU]</td>
<td>Blackboard 6.3</td>
<td>Bb Learn 9.0</td>
<td></td>
</tr>
<tr>
<td>Charles Sturt University [CSU]</td>
<td>Sakai 2.4</td>
<td>Sakai 3.0</td>
<td>2011</td>
</tr>
<tr>
<td>Curtin University of Technology [CURTIN]</td>
<td>Blackboard</td>
<td>Bb Learn 9.0</td>
<td></td>
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<td>Desire2Learn</td>
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<td>Flinders University [FLINDERS]</td>
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<td>University of Notre Dame Australia - The [UNDA]</td>
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Appendix C: Vendor Questions

Learning Management System Review and Selection 2010

LMS Vendor/Partner Request for Further Information

Vendor/Partner Name:

Product Name(s):

Contact details of person to whom follow-up questions should be addressed:
Briefing Notes to LMS Vendors/Partners

In preparing your response, please attend to the following:

- List the version of the LMS product and any related products you mention, referring to the system available as at 1st October, 2010.

- Complete answers to all questions directly, succinctly and fully. Include examples to demonstrate/illustrate the response.

- In your responses please refer specifically to the current version. However, should it be relevant refer to developments in future iterations of the product, upgrades or extensions to the currently available system; please clearly specify this dependency and describe the necessary developments and the timelines to general availability.

- If your response refers to a particular function/tool or integration with another system which is owned and/or developed by yourself or another vendor, please include the name and version of the product, its cost, and any other pertinent information such as references to current users of the product/tool.

- If the software and version you have named cannot meet a particular function, explain if the function is part of your development plan, and if so what the schedule to general availability is.

- If the software and version you have named cannot meet a particular function, and the function is not part of your development plan, explain our options for getting this functionality developed. For instance, if we pay you to develop this functionality, how long will it take and how much will it cost.

Thank you again, we appreciate your assistance.

Please complete your responses by 4th October 2010, and send responses to:

Marilyn Bacus, Project Officer LMS Review, M401, Centre for the Advancement of Teaching and Learning, The University of Western Australia, 35 Stirling Street, Crawley, WA, 6009 OR marilyn.bacus@uwa.edu.au.
Administration

1. How does your product support devolved administration? Can specific administrative tasks be assigned to defined roles or groups across an institution?

2. How does the product support the automated or batch creation and archiving of units?

3. Does the GUI (Graphical User Interface) administrator have end-user access to a unit without having to add their account to the unit and log out and back in?

4. Describe the standard roles within the product. In your experience, what types of customised roles (sets of permissions) have been created within your product by other organisations?

5. Describe the file/unit size quota/limit functionality within the product. Is this customisable? How are users made aware of these quotas/limits?

6. Describe the ways in which students can enrol and/or be enrolled into units within this product?

7. Describe the unit start/end date functionality within the product. How are users made aware of these dates and how can a Unit Coordinator receive notification or extend the availability to students of their unit?

8. Does each unit within the LMS product have a specific URL address that staff can give to students or can be published to a central web site/location? How are staff and students made aware of this URL address?

Tracking, Statistics and Reports

9. Can both standard and customised reports on individual, group and class performance be created? Please provide an example of the details provided in each type of report. Can these reports be exported/extracted from the system? If so, what is the process?

10. Can students monitor their own progress and track which activities they have/have not spent time on? Please provide details of the information that students can see about their own access/activities. Is this available to students at a unit and/or system level?

11. Can your product track the access and activities of all individuals regardless of standard and/or customised role? Provide example of the information that is provided. Is this available on a unit and/or at system-wide basis? Can these reports be exported/extracted from the system? If so, what is the process?

12. What types of standard and customised system-wide reports can be generated? Can these reports be exported/extracted from the system? If so, what is the process?

13. Does the product support the persistence of student tracking data after the relevant unit has been archived in order to accommodate student appeals?

Integration

14. Which standard content and data specifications are supported - SCORM, IMS, OKI?
15. Does the product allow for integration with other university mailing / calendaring / announcement / notification systems? Please describe how these synchronisations would work from the users’ perspective.

16. How does the product allow for ready integration with the following systems, if at all:
   a. LDAP/Pheme (UWA’s Access Management System)
   b. Callista (UWA’s Student Management System)
   c. OLCR – OnLine Class Registration System (UWA’s Tutorial/Class Management System)
   d. Echo System (UWA’s Lecture Capture and Delivery System)
   e. Site Minder (UWA’s Single Sign On System)
   f. UWA Student Google Apps
   g. Hive by Harvest Road (UWA’s Learning Repository System)
   h. Turn It In
   i. An ePortfolio System
   j. QuestionMark Perception
   k. An online conference system
   l. MyUWA (UWA’s Staff/Student Portal System)

17. Describe how each of these integrations would work from the users’ perspective and what the integration enables staff/students to do.

**System Functionality/Features**

18. What is the core tool/feature/function set of your product? What is the purpose of each? What functionality did they add along the way and how did this effect the implementation?

19. Does the testing tool/feature within your product allow staff to record student test results whilst also providing them with immediate feedback per question?

20. What types of assessment question-related reports can be generated? Can these reports be exported/extracted from the system?

21. Does your product automatically send students a successful assignment submission receipt via email when they have completed the submission of an assignment?

22. Describe the process and technologies that the system relies on when a user uploads a file.

23. What facilities does the system provide for the management of student collaborative group work?

24. What file storage and/or sharing facilities does the system provide, both within a unit or independent of unit?
25. What facilities does the system provide for the management of assessment questions across units and within faculties?

26. Describe how the system allows students to sign up for and/or change their group allocation within a unit. Is this able to be undertaken after a related assessment/assignment task has been released?

27. In your experience, what are the main issues staff face when managing very large cohorts (1000+) of students online? What features/functionalities have been included with the system to address these issues?

28. How complete is the documentation, how-to guides, training and online help for this system? In what formats is it provided? Please detail resources which are free of charge and which need to be purchased.

29. What instructional design related resources or wizards are available to staff to assist them with the development of their unit?

30. What self-help supports are available to an end-user who is unable to login to help them diagnose why their computer is unable to load/display the LMS?

31. How effectively can the system present students with a 'portal' to their enrolled subjects, study-related information and other assistance to their education, including student support services? How might this be done?

**Accessibility:**

32. To what level does the system generate pages that are compliant with W3C Web accessibility guidelines?

33. How are users reliant on assistive technologies such as screen reading and/or screen magnification software, refreshable Braille displays and Braille embossers supported?

34. Does the system have supports for structuring and preparing content for accessibility and assistive technology compatibility?

35. Does the system support browser zoom functionality or provide individuals with preference settings for the way pages, text or images are displayed? Please provide an example.

36. Do system generated elements such as images and links have unique, contextual names for use by assistive technologies? Please provide an example.

**Mobility**

37. With which computers/browsers and mobile technologies is this product compatible? Does the system provide a suitable, navigable interface for mobile devices?

38. How well is access from a variety of devices supported and what, if any, specific technologies are required to enable this support?

**Vendor/Partner – Client Relations**

39. What product developments/enhancements have you committed to undertaking in the next 3 to 5 years?
40. What avenues does UWA have to influence how your product is developed/enhanced?

41. In terms of vendor support for UWA as a client, how responsive will support be and how should support calls be managed? (local, hours of operation, online support, guaranteed response times?)
Appendix D: Staff Survey questions

Staff Survey of WebCT and future LMS needs

UWA is currently conducting a review to determine a replacement learning management system (LMS) for WebCT. WebCT will no longer be supported by the vendor from 2012; therefore, it is timely, along with our New Courses framework to consider an LMS that better fits our teaching and learning needs into the future.

We invite you to complete this survey of teaching staff to help the LMS Review Working Group understand your needs in relation to the future LMS.

General

In which Faculty / School do you work?

How do you see yourself using technology in teaching in the next five years?

Please give us a 3-5 word phrase that best encapsulates a good learning management system to you.

Current use - LMS and other technologies

For how long have you used WebCT?

To what purpose have you used WebCT?

For what functions and in which environments do you CURRENTLY use technology? Select the WebCT environment and/or “Other”. If you select other, please type its name in the relevant cell.

<table>
<thead>
<tr>
<th>Functions</th>
<th>Environment</th>
<th>Other System</th>
<th>Other system name (type name)</th>
</tr>
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<tr>
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<td>Other (click in cell)</td>
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<tr>
<td>Site management</td>
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<td>□</td>
<td></td>
</tr>
<tr>
<td>Site design (e.g. menu items, tool availability, content organisation)</td>
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<td>□</td>
<td></td>
</tr>
<tr>
<td>Tracking and monitoring site usage</td>
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<td>□</td>
<td></td>
</tr>
<tr>
<td>Teaching administration (not assessment – see below)</td>
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<td>□</td>
<td></td>
</tr>
<tr>
<td>Creating student groups</td>
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<td>□</td>
<td></td>
</tr>
<tr>
<td>Managing enrolments</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Communicating with other teaching staff</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Providing learning content, e.g.</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
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<td>□</td>
<td></td>
</tr>
<tr>
<td>Linking to CMO</td>
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<td>□</td>
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<tr>
<td>Providing elf-developed content</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Linking to lectopia recordings</td>
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<td>□</td>
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</tr>
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</table>
Communication/Collaboration/Community Building
- Announcements/News Items to Students
- Email
- Online Discussions – Threaded or Blogs
- Group Activities – Sign Up Sheets
- Synchronous chat
- Online conferencing (e.g. Adobe Connect, Elluminatelive, Skype)
- Learner Activities, e.g.
  - Reflective Journals
  - Blogs
  - Wikis
  - Group collaboration tools

Assessments
- Individual or Group Assignments
- Self Tests
- Quizzes
- Surveys
- Giving marks and/or feedback to students using the Grade Book
- Peer assessment / peer review

Please add any other functions and associated tools you currently use here.

Desired features of a future LMS
Indicate how desirable these features are to you: not desirable or desirable
First, for your information, all three LMSs under investigation include these tools. If there is any further function, tool or special aspect to your use of any of these, there is space at the end of this question to elaborate.

Administration
- Automated reminders/notifications to staff regarding completion of administration procedures
- Synchronisation of LMS gradebook with SIMS
- Ease of content-migration with each new course iteration
- Ability to have cross-course and other community and atypical sites
- Ability to obtain student tracking data and overall use of the system data.
- Ability to have a variety of customisable user-roles.

Integration
- Full integration with non-LMS assessment processes e.g.?
- Integration with other university software / tools, e.g.
  - google apps
  - student university / google email
  - student portal
  - OLCR

Access and use
- Ease of navigation
- Fast access over low bandwidth connections
- Ease of uploading files
- Independence from java requirements
- Ability to link directly to a specific resource in a course
- Ability to use the web browser’s “back” button reliably
- Absence of pop-up screens in web browsers

Appearance / unit design and development

- Ability to change icons and page colours
- Ability to drag and drop content, links, etc

Student administration

- Ability to easily and quickly group students for activities
- Ability to have students self-assign to groups
- Full integration with the Online Class Registration System (OLCR)

Teacher content / activity

- Shared whiteboard
- Ability to create podcasts
- Online conferencing software
- Synchronous chat tool
- Ability to upload or link to a variety of audio and/or visual material

Tools for student activity / engagement / collaboration

- Ability for students to peer review work
- Built-in wiki
- Built-in blog
- Voice capability in discussion forums
- Group tools (e.g. communication and file-sharing within a discrete group)
- Discussion forum
- Individual student journals
- ePortfolio

Communication

- Internal messaging to other users
- Ability to email to students from the system
- RSS feeds from the system
- Subscription to discussion forums

Assessment

- Sophisticated quiz tools (e.g., a variety of question types, the ability to incorporate multi-media, to use published question banks)
- Sophisticated grade book options (ability to reveal or hide grades or marks, …)
- Plagiarism detection software
• Group and/or peer assessment facilities

Course evaluation

• Student tracking and reporting
• Context-sensitive help documentation

Types of sites

• Ability to create sites for non-standard teaching purposes or for purposes other than teaching
• Ability to create sites where members can self-enrol.

Please add any further elaboration on functions or tools specific to your needs.

Anything else?

Please add any further comments, suggestions, ideas or needs that you may have

Thank you for your feedback and information. The information you provide helps us to know what it is that staff do, want or need from a learning management system.
Appendix E: User-testing tasks feedback sheet

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<tr>
<td>Email:</td>
<td>LMS Being Evaluated: Bb Learn 9.1 (<a href="https://uwa2.blackboard.com/">https://uwa2.blackboard.com/</a>)</td>
</tr>
</tbody>
</table>

Navigational Tips:

1) **Edit Mode**
   To carry out system editing, switch *Edit Mode* to **ON** (situated at the top right of screen).
   *Note.* Switch *Edit Mode* to **OFF** to see the unit as a student.

2) **Course Menu / Course Management:**
   The following sections will be referred to throughout this document (situated on the left of the screen):

   ![Course Menu Diagram]
   ![COURSE MANAGEMENT Diagram]

3) **Submit**
   Use the **Submit** button to save your work.

4) **Log In / Access Your Unit**
   Once you have logged into the BBLearn Learning Management System, please go the unit which corresponds to the name of the User Account you have been allocated.
<table>
<thead>
<tr>
<th>Task</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **1) Build Course Menu**  
Go to the Course Menu (top left of screen)  
a. Use the button:  
b. Create Content Area  
   Enter name: “Learning Resources”  
c. Create Tool Link  
   Enter name: “Announcements”  
d. Create External Link  
   Enter name: “UWA Home Page”  
   Enter URL: [http://www.uwa.edu.au](http://www.uwa.edu.au)  
e. [optional] Use or to change the order of Course Menu items. | Ease of Use | Very Easy | Easy | Neutral | Difficult | Very Difficult |
| **2) Upload a file**  
Go to COURSE MANAGEMENT (bottom left of screen)  
 a. Click in Files > your test unit code  
[File:](#)  
   b. Use the button to upload a document from your computer using or drag and drop. | | | | | | |
| **3) Display a file**  
Go to the Course Menu > “Learning Resources”  
 a. Use the button.  
 b. Go to Create > File  
 c. Find File >  
   d. Go to Test Documents folder > Outline and Lectures folder  
 e. Select a file and click Submit button. | | | | | | |
| **4) Create an Announcement**  
Go to the Course Menu > “Announcements”  
 a. Use the button  
 b. Enter a subject and a message using the Visual Editor.  
 c. Click Submit button. | | | | | | |
| **5) Create a Discussion Board**  
Go to the Course Menu > “Discussions”  
 a. Use the button.  
 b. At item 1 enter a name: “Test Discussion”. | | | | | | |
c. Click Submit button.

6) **Create a Test**
   Go to COURSE MANAGEMENT > Course Tools > Tests, Surveys and Pools
   a. Go to Tests.
   b. Use the Build Test button.
   c. At item 1 enter Name: "Coffee Quiz" and click Submit.
   d. Select to add questions to the test.
   e. Click on the left of screen and select the Coffee checkbox.
   f. Click 4 items from the question list and click the Submit button.
   g. Select ALL, enter 1 in the Points textbox and click the Update button.
   h. Click the OK button.

7) **Create an Assignment**
   Go to the Course Menu > "Learning Resources".
   a. Select Create Assessment.
   b. At item 1, enter a name: "Individual Assignment".
   c. At item 3 enter a grade: Possible Points = 10.
   i. At item 5 enter a Due Date.
   j. At item 6 select All Students Individually and click Submit.

8) **Manage User Access**
   Go to COURSE MANAGEMENT > Users and Groups > Users
   a. Select Enroll User.
   b. At item 1
      • enter a username in the textbox
      • Select Role: Teaching Assistant
   c. Click Submit.

9) **Create a Group**
   Go to COURSE MANAGEMENT > Users and Groups > Groups
Create Single Group

a. Select
b. At item 1 enter a name: **Group 1**
c. At item 4 select some names from the list of users on the left and move them to the right using the button.
d. Click **Submit**.

10) **Mark Student Work**
Go to **COURSE MANAGEMENT > Grade Center > Tests**
   a. Click on a student’s grade for Chocolate Quiz.
   b. Enter a new grade, click **Enter** to save.
Appendix F: ITS Report

[Report tabled with the eLLS Committee in August meeting]

Please refer to report on separate file in PDF.
Infrastructure implications of the LMS Review

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<td>Brian Poleykett; Damian Bramanis</td>
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<td>5 August 2010</td>
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<td>0.3</td>
<td>Brian Poleykett</td>
<td>Updated with feedback from B.Coad, A.Shaykevich, J.Wang.</td>
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<tr>
<td>0.5</td>
<td>Brian Poleykett</td>
<td>Feedback from S.Trefry.</td>
<td>19 August 2010</td>
</tr>
<tr>
<td>0.6</td>
<td>Brian Poleykett</td>
<td>Final version, following feedback from S.Trefry.</td>
<td>20 August 2010</td>
</tr>
<tr>
<td>1.0</td>
<td>Brian Poleykett</td>
<td>Final version circulated to the LMS Working Party.</td>
<td>20 August 2010</td>
</tr>
</tbody>
</table>

Related documents:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Date completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Section</td>
<td>Page</td>
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<td>Considerations</td>
<td>4</td>
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<td>Local implementation</td>
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<tr>
<td>Remote Hosting – Risk Profile - Blackboard</td>
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<tr>
<td>Remote Hosting – Risk Profile – Moodle via NetSpot</td>
<td>17</td>
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<tr>
<td>Remote Hosting – Risk Profile – Desire2Learn</td>
<td>24</td>
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</tr>
</tbody>
</table>
Background

As part of the LMS Review, ITS was asked to investigate the implications for software and hardware specifications, including managed hosting and in-house options, of the three LMS products (Bb Learn 9.1, Moodle, and Desire2Learn).

Summary

Based on the information provided, each of the six options reviewed were evaluated for its technical suitability and risk. Four options appear to be acceptable (Blackboard local implementation, Blackboard hosted implementation, Moodle hosted implementation, Desire2Learn local implementation). Two options are to some degree less suitable or carry a degree of risk to the university (Moodle local implementation, Desire2Learn hosted implementation).

<table>
<thead>
<tr>
<th></th>
<th>Local Implementation</th>
<th>Hosted Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blackboard</strong></td>
<td>• Closely aligned to ITS-preferred technologies.</td>
<td>• Low risk – a Blackboard hosted implementation doesn’t expose the University to significant risk</td>
</tr>
<tr>
<td></td>
<td>• Solution is supportable and scalable.</td>
<td>• Recommend a more detailed review of integration requirements prior to deciding on this option</td>
</tr>
<tr>
<td></td>
<td>• Further investigation will be required to determine the complexity of integration.</td>
<td>• There is not enough information to evaluate whether this option is more cost-effective than a local implementation</td>
</tr>
<tr>
<td><strong>Moodle (Netspot)</strong></td>
<td>• Technology used is supportable, but not preferred.</td>
<td>• Low risk – a Moodle (NetSpot) hosted implementation doesn’t expose the University to significant risk</td>
</tr>
<tr>
<td></td>
<td>• Support by ITS would be more reliant on a Service Level Agreement with the external support agency.</td>
<td>• Recommend a more detailed review of integration requirements prior to deciding on this option</td>
</tr>
<tr>
<td></td>
<td>• Solution is supportable and scalable.</td>
<td>• Recommend the use of NetSpot Disaster Recovery service</td>
</tr>
<tr>
<td></td>
<td>• Further investigation will be required to determine the complexity of integration.</td>
<td>• There is not enough information to evaluate whether this option is more cost-effective than a local implementation</td>
</tr>
<tr>
<td></td>
<td>• Has the greatest infrastructure cost of the 3 local options.</td>
<td></td>
</tr>
<tr>
<td><strong>Desire2Learn</strong></td>
<td>• Closely aligned to ITS-preferred technologies</td>
<td>• Moderate risk – a Desire2Learn hosted implementation may expose the University to some risks, as information provided by the vendor is incomplete or unclear.</td>
</tr>
<tr>
<td></td>
<td>• Solution is supportable and scalable.</td>
<td>• It is unclear how the University may influence the future feature list</td>
</tr>
<tr>
<td></td>
<td>• Further investigation will be required to determine the complexity of integration.</td>
<td>• While the application appears to be customisable, there is more technical uncertainty compared to Blackboard or Moodle. Recommend that further technical investigation is undertaken if this option is considered.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No information was provided describing the process for day-to-day communication and issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• There is not enough information to evaluate</td>
</tr>
<tr>
<td>Local Implementation</td>
<td>Hosted Implementation</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>whether this option meets the University needs for Disaster Recovery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• There is not enough information to evaluate whether this option is more cost-effective than a local implementation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• As the solution will be hosted in Canada, there is greater risk that performance will not meet the university’s expectations.</td>
<td></td>
</tr>
</tbody>
</table>

**Considerations**

1. **Hosted Implementations**
   A hosted implementation may expose the University to risks surrounding data confidentiality, loss of control, customisation, vendor management and vendor issues. However, these risks appear to be adequately managed in two of the three options reviewed – Blackboard and Moodle (NetSpot). There is not enough information to adequately evaluate the third (Desire2Learn). In addition, a hosted implementation may provide some benefits over local implementation regarding availability, disaster recovery, cost, or capacity (or time) to implement.

2. **Open Source**
   For the options reviewed, open source software with support provided by a commercial support agency does not provide a significant benefit or disadvantage compared to the proprietary solutions, and the options should be reviewed on their merit. The complexity and cost of support, customisation, and addition of new features appears comparable between open source and proprietary solutions.

   Open Source solutions can lead to greater support costs if changes to code are not supported by the support agency or adopted into the mainstream system code. Changes can also increase the complexity and costs for system upgrades.

3. **Hosting Location**
   Services hosted in international data centres will have some slight performance degradation compared to those in Australian data centres. If data of a highly confidential nature is hosted internationally, the legal implications should be reviewed (for example, there has been some concern regarding the USA PATRIOT Act). The Moodle (NetSpot) hosting is located in Australia, Desire2Learn is located in Canada, and Blackboard has data centres in Australia, USA and The Netherlands.
## Local implementation

<table>
<thead>
<tr>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the technology stack supported by ITS?</td>
<td>Yes. For Linux servers: • Apache Web Server. • Tomcat Application Server. • Oracle database (Oracle RAC supported). For Windows servers: • IIS Web Server. • Tomcat Application Server. • Oracle database (Oracle RAC supported) or MS SQL Server. Technology stack is similar to that used for WebCT CE 8, which is well-understood and supported by ITS.</td>
<td>Not preferred. • Linux or Windows servers. • Apache Web Server. • PHP-based, and requires a PHP optimizer to enhance performance (Zend Server). • MySQL or PostgreSQL open source databases are preferred. Oracle databases can be supported, but NetSpot strongly advise against it. ITS has few staff skilled to support these infrastructure components. ITS are unlikely to develop skills in these areas, as they are not on ITS’ preferred technology matrix.</td>
</tr>
</tbody>
</table>

2. Does the vendor support an architecture which is proven to scale to meet demand? | Yes. Up to 80,000 concurrent users or 250,000 enrolments. | Yes. University 30,000, or TAFE 80,000. | Yes. Up to 40,000 FTE or 200,000 Enrolments. |

3. Does the vendor support an architecture which is proven to deliver high availability? | Yes. Multiple application servers can be clustered, and sit behind a server load balancer. Files are stored in the file system. A clustered file system technology such as GFS (Linux) will be required. Data is stored in the database, which can be clustered using Oracle RAC. | Yes. Multiple application servers can be clustered, and sit behind a server load balancer. Files are stored in the file system. A clustered file system technology such as GFS (Linux) will be required. Data is stored in the database. MySQL 5 and above supports clustering, but this technology is not “mature”. A large primary server will be required, with a slave replica for failover. | Yes. Microsoft Clustering technology with Internet Information Server (IIS) can be used to cluster the application servers. The efficacy of this solution has yet to be demonstrated within ITS. Microsoft SQL Server databases can be clustered, although ITS has little expertise or experience in this area. |
<table>
<thead>
<tr>
<th>4. Does the product and vendor support customisation of the product?</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes. The application itself is proprietary code, although APIs are available to customise and extend. Customisation outside the scope of the API is performed at UWA’s own risk. BlackBoard Building Blocks are available from many vendors, or could be built in-house by ITS.</td>
<td>Yes. Moodle is Open Source, which in theory allows developers to customise the source code for specific purposes. This is something that ITS would not support. Any change to Moodle Source Code would increase the maintenance overhead and therefore cost of ITS support. Moodle has a large number of Extensions developed by a global developer community. NetSpot has a review process for vetting and supporting Extensions to ensure quality is maintained.</td>
<td>Yes. The application itself is proprietary code, although APIs are available to customise and extend.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Does the product offer programmatic interfaces to facilitate extensions or customisations?</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes. Building Blocks API and framework available, and development with this API is supported. The BlackBoard Learn 9 API is different to the CE 8 API.</td>
<td>Yes. APIs available. Code is Open Source. Developer community is robust and active. Moodle APIs are likely to progress rapidly.</td>
<td>Yes. API is available, and development within this API is supported. Desire2Learn is written in Microsoft’s ASP.NET Framework, which is also ITS’ preferred development platform.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.1. Data ingestion from Callista.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes.</td>
<td>Yes. NetSpot-supported integration module by University of Canberra.</td>
<td>Extensive experience integrating with SIS via “Holding Tank”. Callista integration being developed in partnership with Deakin University.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2. Score export to Callista.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>5.3. Lectopia.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>5.4. echo360.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure. More investigation required.</td>
<td>Yes.</td>
<td>Not at present, considering echo 360 as a development partner.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.5. HarvestRoad Hive.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>5.6. Course Materials Online.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom development required.</td>
<td>Custom development required.</td>
<td>Custom development required.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.7. Question Mark Perception.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, Questionmark-Blackboard Connector.</td>
<td>Yes, Questionmark Moodle Connector.</td>
<td>Unsure. More investigation required.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.8. LDAP authentication.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.9. Shibboleth authentication.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>5.10. CA SiteMinder SSO.</th>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
</table>
### 6. What is the initial infrastructure and its cost?

<table>
<thead>
<tr>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
<td><strong>Production</strong></td>
<td><strong>Production</strong></td>
</tr>
<tr>
<td>6x application server nodes (physical server).</td>
<td>10x application server nodes (physical server).</td>
<td>(Based on 50,000 enrolments and 10,000 FTE)</td>
</tr>
<tr>
<td>Administration node (virtual server).</td>
<td>MySQL database (2x physical servers).</td>
<td>2x Windows application servers.</td>
</tr>
<tr>
<td>Shared file system.</td>
<td>Shared file system.</td>
<td>2x Windows file servers.</td>
</tr>
<tr>
<td>Oracle RAC database.</td>
<td>PHP accelerator (Zend).</td>
<td>2x MS SQL Server database servers.</td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td><strong>Test</strong></td>
<td><strong>Test</strong></td>
</tr>
<tr>
<td>2x application server nodes (physical server).</td>
<td>2x application server nodes (physical server).</td>
<td>1x Windows application servers.</td>
</tr>
<tr>
<td>Administration node (virtual server).</td>
<td>MySQL database on existing ITS hardware.</td>
<td>1x Windows file servers.</td>
</tr>
<tr>
<td>Shared file system.</td>
<td>Shared file system.</td>
<td>1x MS SQL Server database servers.</td>
</tr>
<tr>
<td>Oracle RAC database.</td>
<td>PHP accelerator (Zend).</td>
<td>Shared file system.</td>
</tr>
<tr>
<td><strong>Development</strong></td>
<td><strong>Development</strong></td>
<td><strong>Development</strong></td>
</tr>
<tr>
<td>Virtual servers.</td>
<td>Virtual servers.</td>
<td>Virtual servers.</td>
</tr>
<tr>
<td></td>
<td>PHP accelerator (Zend).</td>
<td></td>
</tr>
<tr>
<td>Estimated cost: $289,000 over five years.</td>
<td>Estimated cost: $562,500 over 5 years.</td>
<td>Estimated costs: $223,500 over 5 years.</td>
</tr>
</tbody>
</table>

### 7. Summary

<table>
<thead>
<tr>
<th>Blackboard</th>
<th>Moodle</th>
<th>Desire2Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closely aligned to ITS-preferred technologies. Solution is supportable and scalable. Further investigation will be required to determine the complexity of integration.</td>
<td>Technology used is supportable, but not preferred. Solution is supportable and scalable. Further investigation will be required to determine the complexity of integration. Has the greatest infrastructure cost of the 3 options.</td>
<td>Closely aligned to ITS-preferred technologies. Solution is supportable and scalable. Further investigation will be required to determine the complexity of integration.</td>
</tr>
</tbody>
</table>
### Remote Hosting – Risk Profile - Blackboard

<table>
<thead>
<tr>
<th>Risk</th>
<th>Considerations</th>
<th>BlackBoard’s response</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data confidentiality</td>
<td>Components in a SAAS solution may be shared or managed outside the University, which can increase the risk to data confidentiality</td>
<td>Blackboard’s managed hosting service provides all the benefits of a fully supported external SAAS solution but with the significant advantage of a separate, dedicated and customised instance of the application that is UWA’s environment. Blackboard Managed Hosting allows for 24-hour operations 365 days a year and monitoring without the expense of acquiring and maintaining your own infrastructure or hiring new staff to cover the 24 x 7 shifts. The Managed Hosting service offers a secure hosting environment, redundant connectivity, redundant network, all software upgrades, and routine maintenance at a much lower cost than a client doing the same on its own. Blackboard addresses all security, network, database, and application issues, allowing institutions to allocate resources and budget to other priorities. Each client’s installation is dedicated to the respective client and is not shared by multiple clients. This allows a separate application tier and database tier per client, including physical storage separation. Managed Hosting does operate with a shared network stack (routers, switches, firewalls, Load Balancers, IPS, etc) and shared filer head units for storage, however, client data is still separated per client within the storage environment itself. The network connectivity to Managed Hosting is comprised of multiple Tier-1 ISPs, including AARNET, with multiple levels of security deployed. As for data redundancy and storage, Managed Hosting uses three levels of data redundancy and backup strategy: 1st level: Data is kept on highly available clustered storage devices to protect against device failure. 2nd level: Using “Snapshot” technology, database and content information is snapped daily and kept on disk. 3rd level: Using “Snapmirror” technology, data is copied to a remote datacenter to protect against site outages. For clients with servers located in the Australia datacenter, the 3rd level backups can be mirrored to one of the Amsterdam datacenter sites. However, as a long-term solution, Blackboard is currently reviewing options for a 2nd datacenter in Australia for off-site storage capability.</td>
<td>Low</td>
</tr>
</tbody>
</table>

- Physical and logical separation of data from one customer to the next
- Shared infrastructure compared to self-hosted infrastructure
- Network connectivity and security
- Storage of offsite data
- Data confidentiality requirements; Are there any policies that prevent offsite data storage?

Attachment F 8
## Risk Considerations

BlackBoard’s response

<table>
<thead>
<tr>
<th>Risk</th>
<th>Considerations</th>
<th>BlackBoard’s response</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of control</td>
<td>Some components of a SAAS solution may be outside of the University’s control. This may be a problem with forced upgrades, downtime and improvements.</td>
<td>Scheduled maintenance is occasionally required to perform routine work on the network architecture, such as applying latest vendor recommended updates, security patches, etc. The Managed Hosting team will notify clients affected via email at least ten (10) calendar days in advance of any scheduled downtime. Typical maintenance windows are scheduled, if required, for early Friday morning local Sydney datacenter time (2 to 6 a.m. timeframe). When at all possible, the Managed Hosting team will work with institutions to schedule an alternative time if the original time is inconvenient. Blackboard Managed Hosting also has network moratorium periods (typically one month of beginning of semesters or ending month of semesters) where Blackboard is aware that the time period is the busiest usage time for the majority of clients and will not conduct any network changes or maintenance work in our datacenters. As the infrastructure includes a fully redundant A side, B side structure, most upgrades involve performing the upgrade on one side of the network, then switching to the alternate and vice versa hence giving no, or only minutes of downtime to end users. Specific to client environment upgrades e.g. installing a patch or service pack, Managed Hosting clients will be given options when any Blackboard application upgrade occurs. We maintain an “opt in” policy: no application updates/upgrades will occur without receiving explicit permission from the client (we try to get the approval in writing). We’ll schedule an upgrade any time that the client wants provided that a window is available. Before upgrading a client site that has been customized by Blackboard Consulting, we will have to get approval from either the Project Manager or Technical Developer in Blackboard Consulting first. If a certain patch will overwrite any customizations, we’ll need to coordinate the effort with Blackboard Consulting so that they can re-apply them immediately after the update.</td>
<td>Low</td>
</tr>
<tr>
<td>Risk Considerations</td>
<td>BlackBoard’s response</td>
<td>Risk Rating</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>Customisation and Integration</td>
<td>In a SAAS solution, customisation may be more difficult, as the application is controlled by an external party. Where heavy integration is required, a SAAS solution may not be a good fit.</td>
<td>Low – recommend a more detailed review of integration requirements prior to deciding on this option.</td>
<td></td>
</tr>
<tr>
<td>• Ability to customise the application without vendor involvement</td>
<td>Any customizations should be reviewed by Managed Hosting and/or Blackboard Consulting to determine what involvement outside of the client the customization might require. Some integrations and customizations, such as custom written Building Blocks, Snapshot and Authentication, may require assistance from Managed Hosting and/or Consulting. Specific details around APIs, SSO or alternative integration/customization options needs to be reviewed with Blackboard to determine feasibility and whether they will be any associated costs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Coordination required between the University and the SAAS provider for any integration effort and testing</td>
<td>Managed Hosting encourages clients to take advantage of one or both of the two Non-Production environments that it offers: Test &amp; Development and Staging:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| • University applications or components that the SAAS solution must integrate with | **Test & Development Environment**
This environment is more of a small-scale sandbox environment meant for activities like:
- Developing Building Blocks
- Creating and testing integrations
- Testing Authentication
- Proof of Concept testing for new feature/ functionality

**Standard features of the T&D Environment:**
- Designed for fewer than 5 concurrent users on the system at any given time
- Limited storage capacity: 10GB
- Full Root access available
- Does NOT qualify for any Service Level Guarantees for uptime | |
| • Availability of test environments | **Staging Environment**
This is a Pre-Production environment designed for testing out software upgrades or modifications in software configuration before implementing these changes in a production environment. The Staging Environment allows for more “real-life” testing since it is set up to be more like the Production Environment. This includes:
- Testing upgrades: By performing a Staging/Pre-production upgrade, Managed Hosting can find potential issues and document needed corrective action before upgrading the Production Environment. Staging upgrades reduces the possibility of downtime due to unforeseen compatibility or accessibility issues post upgrade.
- Data Verification after Pre-Production upgrade: Data on the Staging Environment is a clone of the Production data, which allows for verification and understanding of how the Production data-set will change from version to version.
- Faculty Training: Again, because the Staging Environment is a clone of Production data, training courses on new versions can be developed and delivered to select faculty using the Staging Environment.

**Standard features of the Staging Environment:**
- Includes a data clone of Production Environment: BbMH will provide up to four (4) full clones of product data in one calendar year
- Up to 500GB of storage can be used for a period of up to six months of the year
- Hardware may not be a clone of Production hardware
- 512 Kbps bandwidth as “soft quota” – but bandwidth is never capped
- 99.7 to 99.9% Uptime Guarantee Service Level Agreement | |
**Vendor Management**

A SAAS solution will require some ongoing effort for vendor management.

- Vendor expectations of the University
- Process for day-to-day communication and issues
- Issue escalation and management

**BlackBoard’s response**

For Managed Hosting clients, Blackboard is responsible for making sure that the client has reliable and consistent Internet access (as far as it is within Blackboard Managed Hosting team’s control) and the hosted servers are always up and running. On the other hand, the client is responsible for actually using and managing the Blackboard software and content.

The client has full access to the Administrator Menu and is responsible for the following:

- Creating/removing users including Students, Teachers, System Administrators, etc.
- Modifying all User Information
- Creating/removing all Course Web Sites
- Building and managing all Course Web Sites
- Customization to the Site (some customizations can be setup through the GUI of the application, others must be setup using Blackboard Consulting Services)
- System Usage Tracking Reports
- Deciding which product features will be available or unavailable, how much functionality instructors will be allowed, etc.
- Choosing any customizable features available through the system administration panel that can be turned on or off
- Two (2) system administrators will have access to the Managed Hosting Support team. These Blackboard administrators are responsible for all Blackboard software related questions originating from students and/or faculty unless other arrangements are made (i.e. instructor/student technical support is purchased). System administrators may contact Managed Hosting Support for answers to instructor/student questions. Instructors/students may not contact Blackboard directly.

Blackboard is responsible for making sure that the client has reliable and consistent access to the Blackboard software (back-end), and the client is responsible for actually using and managing the Blackboard software (front-end).

In addition, when moving from a locally hosted environment to Blackboard’s hosting service, an institution will still need to have at least one System Administrator employed that can dedicate their time to the Blackboard application. While Blackboard’s Managed Hosting team will maintain and manage the datacenter and the systems/servers running the Blackboard applications, it is not responsible for anything local to the client site.

Some of the tasks that the Sys Admin will be in charge of include:

- Maintaining third party applications that may need to integrate or work with the Blackboard software
- Setting requirements for and then testing integrations
- Installing Building Blocks
- Determining the need and timeframe for upgrades
- Opening trouble tickets with Blackboard’s Managed Hosting Support

Also, since Blackboard is not responsible for setting up the client’s local infrastructure or ensuring clients’ Internet access, the Sys Admin will need to be able to handle typical IT activities such as configuring DNS and maintaining network connectivity.

**Risk Rating**

Low
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<th>Risk</th>
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<tr>
<td>Vendor Management cont...</td>
<td></td>
<td>In addition to the System Administrator role, it is also important to have someone at the client site that knows the Blackboard applications and can assist end users in learning about the different functions of the software. This will include things like how to add a course or how to use a discussion board. Depending on the size of the deployment and the number of users, the client may want to create two separate roles to handle these tasks. In some cases, however, the same person could probably handle both sets of responsibilities. Note that there is no need for the client to maintain a Database Administrator (DBA) since Blackboard has a team of DBAs dedicated to Managed Hosting and the hosted servers. Specific to communication and escalation, Managed Hosting follows the local support model in that there are two levels of support: Level I and Level II. Each client will be assigned to a small team of three to four TSMs who will handle all first-level calls. Should the Level I TSM be unable to resolve the client issue, they will escalate to the Level II support team, which is made up of groups of Customer Support Engineers (CSEs). The Managed Hosting CSEs work in close cooperation with the MH Operations and Infrastructure teams. Managed Hosting also has an optional and strategic level of support available via a Complex Hosting Manager. A CHM’s responsibilities fall under the following three objectives: 1) Management – Plan and project manage Customer’s ASP infrastructure implementation, growth, and planned/unplanned incidents and changes 2) Communication – Build and execute business processes for communication and customer support (with a special focus on providing transparency and visibility into the purchased ASP services and change management) 3) Documentation – Document and report on Customer’s ASP infrastructure, projects status, escalation issues, and other Customer ASP environment-relevant knowledge. 1. Management To meet this objective, the CHM’s tasks will include, but not be limited to, the following: • Central Point of Contact and Escalation: The CHM will be the central point-of-contact within Blackboard ASP Services and maintain day-to-day knowledge of all plans, activities, and status of projects and issues involving Customer’s hosted environment • Infrastructure Management: Plan and manage projects involving Customer’s infrastructure for scalability, optimal performance, and growth in coordination with Customer and all elements within Blackboard • Internal Blackboard Delivery Coordination: Coordinate with Blackboard Global Services Project Management, Developers, and Customer’s Technical Support Manager in ASP Services, and ASP Operations and Engineering and other elements of Blackboard to deliver and manage Customer’s requirements • ASP Support Activities: Support directly the hosted Blackboard application and infrastructure through: o Direct ASP ticket escalation management and documentation o Development support activities focused on impact analysis and evaluation based on updates and upgrades</td>
<td></td>
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</table>
### Vendor Management cont...

- **Infrastructure Expansion**: Modify and replace hardware when necessary in coordination with Customer to ensure proper capacity planning
- **Infrastructure and Software Upgrade Management**: Design and implement ASP testing and/or staging in coordination with Customer as necessary for testing and evaluation purposes (examples: upgrading from one Blackboard version to another, upgrading application servers)
- **Auditing**: Regularly conduct systems audit and analysis on Customer’s ASP environments’ performance and utilization for proactive monitoring, infrastructure management, forecasting and reporting purposes
- **Customer Business Planning Integration**: Keep master schedule of Customer’s academic activities and key events/milestones. Communicate to entire Blackboard Team on critical events on the calendar.

#### 2. Communication

To meet this objective, the CHM’s tasks will include, but not be limited to, the following:

- **Contact**: Be dedicated to Customer’s Systems Administrators and Operations staff through a dedicated phone number/contact information for day-to-day ASP support requests and status reporting
- **Project Communication**: Build proactive two-way communication processes in coordination with Customer for project management, support issue escalation, and other communication procedures as necessary
- **Regular Reporting**: Coordinate and facilitate regularly scheduled (weekly or monthly or quarterly) and ad-hoc project and status update meetings
- **Channel Management**: Modify and update communication processes and channels as deemed necessary

#### 3. Documentation

Complete and thorough documentation is a key aspect of meeting the management and communications objectives of the CHM. As such, the CHM will provide the following documents during the life of the relationship between the CHM and Customer:

- **Operations and Plans**: Develop detailed documents including Escalation process, Operations Handbook, Infrastructure (including Oracle RAC) test and implementation plans
- **Regular Status Reporting**: Document and provide weekly reports to Customer on all project plans and updates
- **Infrastructure Reporting**: Document and provide monthly updated reports to Customer on Infrastructure design, hardware inventory, monitoring and management infrastructure, change management logs and other relevant materials
- **Change Management/Status (I)**: Provide timely and detailed reports of planned infrastructure changes; planned or unplanned service outages, or degradation of services; and issue resolution reports
- **Change Management/Status (II)**: Document and communicate any procedural changes that regulate the flow of code fixes, patches to the production environment

**SLA Performance Reporting/Analysis**: Provide monthly reports (and as often as necessary to manage system stability) on system utilization and performance, including MRTG graphs, user activities summaries, and systems performance analysis. Goal will be to develop, mutually with Customer, a standard set of reporting for overall systems management.
### Vendor Issues

The University may incur significant cost or effort if the vendor is unable to provide the expected level of service.

- **Vendor viability** – including financial health, sustainability, past success, operations, and ability to provide the service.
- **The likelihood and impact of vendor dependence**
- **Ability and cost involved to exit the SAAS solution, and choose a different solution**

Blackboard is a NASDAQ-listed company (BBBK) with a market capitalisation of circa US$1.35 billion. Blackboard has approximately 1500 employees across the globe, and 185+ of those are dedicated to solely providing managed hosting services across 5 datacentres in the US, Amsterdam and Sydney.

Over 900 clients ranging from over a million users to small K-12 schools have entrusted Blackboard to host their LMS presence.

As both the software vendor and managed hosting provider, UWA will benefit from a single point of contact that then in turn has many direct escalation channels.

Clients can select from contracts of 12 months to 5 years duration. At the conclusion of the contract, should UWA wish to self-host or migrate to an alternative solution, then managed hosting will work with you to transfer data in a format for restoration onsite.

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</table>
| Availability | - Historical uptime  
- Planned downtime  
- Support arrangements | Blackboard guarantees that on a 24 x 7 clock, a client’s production environment hosted by Blackboard Managed Hosting will be “available” to the client’s end users based on your selected Service Level Agreement. This can range from 99.7% to 99.9% uptime. Availability generally means that the hosted software is available to end users via web access and that the Managed Hosting team monitors the availability through regular HTTP ping checks and login checks. A site that is not available to an end user due to connectivity issues on the end user’s side or due to an authentication system (e.g., LDAP server) failure issue on the client’s side will not constitute as unavailability. Managed Hosting has maintained an 99.9% uptime across its facilities for the past several years. Specific to planned downtime, please see the “Loss of Control” section and response. Specific to support arrangements, please see the “Vendor Management” section of and response. | Low |
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</table>
| Disaster Recovery | - Likely impact in the case of a University disaster – how might the SAAS solution be affected  
- The vendor’s DR plans and readiness | The University will need to respond to their first inquiry regarding a local impact. Typically, the Hosting environment is not affected by a local disaster except that the University will need to consider authentication and integration methods if a local disruption of service will impact Blackboard when hosted by Blackboard Managed Hosting. Managed Hosting also maintains DR/BC plans as part of the business strategy to ensure that client data is recoverable in the event of a disaster. A disaster can encompass both failures at the hardware and software levels as well as site failures that are unplanned and cause data damage or loss. If an outage occurs on an individual client system at a particular datacenter, Managed Hosting monitoring will display the disruption and appropriate engineers will own the issue until resolution. Monitoring of this nature occurs 24x7x365 so that there is always a set of eyes monitoring alerts for all clients. Upon assignment of the outage, engineers will assess the situation and determine the resolution path needed, which will include one of the following:  
1. Server failover  
2. Application or Database restore  
3. Operating System reload or clone  
4. Site failover (if applicable)  
The overall DR/BC plan includes detailing the backup architecture, file level recovery, database recovery and application server recovery. The plan is owned by the Business Continuity Coordinator (BCC). The BCC is responsible for the overall creation, maintenance, training, administration and awareness of the DR/BC plan. The BCC is a member of the Managed Hosting Management Team and can approve changes to the plan and has immediate access to senior Blackboard management. The BCC also leads the team in the event of a disaster. In addition, Managed hosting also offers an optional service for hosted clients who wish to have a dedicated environment with a specified/contractual RTO (Recovery Time Objective) and RPO (Recovery Point Objective). Please see the attached Business Continuity Product Brief for further details on the levels of services offered. | Low        |
| Cost              | - Cost structure – both upfront and ongoing  
- Likelihood that additional services, such as customisation, will be required | Blackboard’s model for compensation is based on an annual fee. Even if an extended contract term is selected then an annual payment schedule is included. In some instances a small setup fee is charged in year 1. It would be unlikely that this exceeds $20,000 and is often waived. The annual fee is based on the client’s student population, storage and bandwidth requirements. An included benefit to this model is never capping the deliverables. Should UWA regularly exceed the stated metrics then a discussion will take place to budget for additional capacity as part of the next renewal cycle. Blackboard Managed Hosting provides a solution based on your needs. As stated in this response there are many options that can be included in the solution if required. Components include, but are not limited to; Production environment, Testing environment, Staging environment, Business Continuity solution, Complex Hosting Manager. Blackboard’s open API and Building Block framework gives client’s the ability to self develop, source from the community or work in partnership with Blackboard Consulting to create and install customised functionality to how Blackboard Learn’s software functions. As a managed hosting solution allows for these customisations, assuming following development guidelines, and UWA can self install, there may be no cost associated with this activity. | Not enough information to rate |
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<tr>
<td><strong>Capacity to Implement</strong></td>
<td>The availability of resources, time-to-implement, and capability to support the service may differ significantly with a SaaS solution.</td>
<td>Managed Hosting is a 24x7 operation with over 900+ clients around the world. Managed Hosting can have an environment up and running within 7-10 business days of a contract being signed, however, this time does not take into account any migration of data from a local installation. The process of moving data into Hosting from a local environment will be project managed by a dedicated member from Managed Hosting’s PMO team and the timeline will be tailored to fit the University’s schedule and needs. The PMO team will be the single point of contact for support and coordinating all Blackboard resources for the move into Managed Hosting.</td>
<td>Low</td>
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## Remote Hosting – Risk Profile – Moodle via NetSpot

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<tr>
<td><strong>Data confidentiality</strong>&lt;br&gt;Components in a SAAS solution may be shared or managed outside the University, which can increase the risk to data confidentiality</td>
<td>Physical and logical separation of data from one customer to the next&lt;br&gt;Shared infrastructure compared to self-hosted infrastructure&lt;br&gt;Network connectivity and security&lt;br&gt;Storage of offsite data&lt;br&gt;Data confidentiality requirements; Are there any policies that prevent offsite data storage?</td>
<td>NetSpot’s hosting architecture is designed with a security focus and incorporates virtualisation at the server, storage and network layers to enable logical separation of customer data. Dedicated customer virtual servers are allocated to avoid server resource conflicts and to prevent one customers’ servers from accessing another customers’ data. Storage allocated for customers is provided from virtual disks carved out of shared physical storage and inter-client data accessibility is restricted where applicable by industry standard security techniques such as host LUN masking and fibre channel zoning. NetSpot’s backups of customer data storage are retained offsite in a secure facility with restricted access for only authorised personnel.&lt;br&gt;NetSpot allocates virtual network segments for customers’ servers and is able to restrict network communication between customer virtual networks to protect against malicious or accidental access of other customers’ data. For network communication outside of the private customer virtual network segments, including end-user transmission via the internet, NetSpot endeavours to apply encryption (e.g. HTTP via SSL) to all sensitive communication where available.&lt;br&gt;With regard to confidentiality, our hosting contracts typically contain the following clause:&lt;br&gt;NetSpot must comply with the Privacy Act 1988 (Cth) (including both the National Privacy Principles and the Information Privacy Principles to the extent that they apply to NetSpot or The Client in connection with The Client Data.)</td>
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<tr>
<td><strong>Loss of control</strong>&lt;br&gt;Some components of a SAAS solution may be outside of the University’s control. This may be a problem with forced upgrades, downtime and improvements.</td>
<td>How often and how long is any planned downtime?&lt;br&gt;What is the upgrade schedule – are upgrades mandatory? Is there an opportunity to delay or negotiate?&lt;br&gt;Can additional features and small changes be added by the University? Is there an opportunity to influence the future feature list?</td>
<td>NetSpot offers a Managed Hosting service for Moodle, which involves NetSpot hosting instances of the application dedicated to a client, and as such provides the client with a lot more control than typical SAAS solutions where there is multi client occupancy of a single instance of an application. Therefore, upgrades are not mandatory and may be negotiated.&lt;br&gt;Downtime for upgrades to Moodle varies according to the complexity of the changes. Some minor updates can be performed ‘live’ without any down time, while more significant upgrades may require several hours of downtime - typically 1-3 hours. Ordinarily, these are scheduled during pre-agreed maintenance windows and are negotiated on a case by case basis.&lt;br&gt;Moodle has a weekly stable release, however NetSpot typically upgrades customers to new releases of Moodle twice per year to minor releases (e.g. 2.0.1) in consultation with the client and only after the client approves the upgrade. Additionally we often create client specific monthly ‘releases’ containing customer requested patches, third party modules and configuration. In this case, the University might request additional features or small changes which would be made by NetSpot as service provider.&lt;br&gt;First and foremost, Moodle is a system driven by educators, for educators, with the community driven open source development model meaning that the evolution of the product is led by the educational community, rather than to meet the needs of shareholders. In this way clients can influence the future direction and features within Moodle, and there is also a vibrant group of more than 10 Australian Universities now using Moodle and sharing their enhancements with one another.</td>
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<tr>
<td>Customisation and Integration</td>
<td>Ability to customise the application without vendor involvement</td>
<td>Low-Moderate Customisation of source code can lead to increase support costs and complexity of upgrades.</td>
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<td>In a SAAS solution, customisation may be more difficult, as the application is controlled by an external party. Where heavy integration is required, a SAAS solution may not be a good fit.</td>
<td>Coordination required between the University and the SAAS provider for any integration effort and testing</td>
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<td>University applications or components that the SAAS solution must integrate with</td>
<td>Availability of test environments</td>
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<td>Complexity and openness of vendor-provided APIs</td>
<td>Integration with CA SiteMinder Single Sign-On</td>
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<tr>
<td>Availability of alternative integration or customisation options</td>
<td>Because Moodle is open source, additional features or patches can be applied to Moodle to address a client’s specific needs. NetSpot can also work with the client’s developers to enable client developed code to be deployed into the hosted environment following a formal review and change process. One of Moodle’s core strengths is its openness to customisation and its ability to reflect local preferences such as terminology, branding, and customised security roles. All of Moodle’s terminology can be customised through the modification of language packs, which allow for changing of terminology without the need for any code modifications. Moodle’s branding can be heavily customised through the use of stylesheet-driven ‘themes’ to reflect the branding of the University. As part of our enterprise managed hosting services, in addition to the production environment, we provide separate development, user acceptance testing and staging environments. This enables our clients to conduct development in a NetSpot supported environment, followed by formal user acceptance and staging processes before being deployed on a production environment. NetSpot’s formal plugin review process also assesses any third-party plugins or client developed code for security, performance and maintainability issues before being deployed on production to ensure the availability and performance of the production environment. Please see the attached appendix. Typically Moodle is integrated with University Student Information Systems and Identity Management system along with other third-party tools such as Virtual Classrooms. NetSpot has extensive experience integrating Moodle and the Callista SIS used by UWA through our support for both the University of Canberra and Monash University’s Moodle systems which are both hosted by NetSpot. We are also now commencing work with UNE (also a Callista site) to implement Moodle at an enterprise level to replace Blackboard CE 6.</td>
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| Low-Moderate | Customisation of source code can lead to increase support costs and complexity of upgrades. |
NetSpot is an affiliate member of the Australian Access Federation project (www.aaf.edu.au), which means that students and staff from UWA (which is also a member of the AAF) can login securely to NetSpot’s hosted services (such as Moodle) using their UWA username and password. This is all achieved without the need to open firewalls between NetSpot and the University resulting in greater security. Additionally it provides a way for UWA to enable students and staff at other partner institutions to securely access UWA’s Moodle using their local institution’s username and password rather than issuing separate accounts in Moodle or adding these users to the UWA identity or student information systems.

NetSpot is not aware of an integration between Moodle and the CA SiteMinder Single Sign-On solution, however Moodle has an open and extensible authentication mechanism and there are plugins for other SSO solutions such as Shibboleth and CAS, and an integration with CA SiteMinder could be developed if required. Moodle also integrates with directory systems such as Active Directory via LDAP(S).

Moodle has over 20 API’s or plugins which enable anything from developing custom question types for Quizzes, through to admin reports and content filters. Moodle 2.0 has seen the introduction of several new APIs which will make integration development even easier. These APIs include:

- a Repository API, which can easily connect Moodle users to any file repository such as Flickr, Google Docs or YouTube and support searching within these repositories for content which can be added to Moodle;
- a Portfolio API, which enables students to push content such as assignments from Moodle to their ePortfolio (such as Mahara), making the creation of an electronic portfolio of work a simple task.
- a Web Services API, which allows developers to build integrations with Moodle which call core functionality from outside of the system. In practice this will mean that Moodle functionality will be easily deliverable through existing web portals if required.

## Vendor Management

A SAAS solution will require some ongoing effort for vendor management.

| Vendor expectations of the University Process for day-to-day communication and issues Issue escalation and management | NetSpot seeks to play a proactive role in supporting the effective project management of the implementation of Moodle across the institution. Following implementation NetSpot assigns a service delivery manager that servers as the day to day contact for overseeing issue resolution and coordinating upgrades. Typically we have fortnightly teleconference or virtual classroom meetings with clients to discuss issues, but we are flexible and some customers prefer to communicate via email as required.

In terms of our expectations of the University, our engagement model is very much one of a partnership model, and for implementing and supporting a mission critical enterprise system such as Moodle it is important that there is good collaboration and engagement between the University and NetSpot. One particularly critical relationship is between the University’s IT department and NetSpot technical staff. This is necessary in order to integrate with various systems. NetSpot provides 24x7 fault reporting lines to our clients to raise critical issues with systems we manage, and we also monitor our systems and dependent systems operated by the University (such as identity management systems) 24x7, and to provide the most effective support for Moodle it is desirable for NetSPot to have a 24x7 IT contact/escalation process we can follow when we detect issues related to dependent systems.

NetSpot utilises a formal issue management and escalation process to ensure that all clients are aware of the appropriate channels for raising issues, and what recourse is available in the unlikely event that an escalation is required. | Low |

| Attachment F 19 |
Typically the most common model for issue management within NetSpot can be illustrated using the diagram below, with several common points of entry for client issues within an engagement depending on the type of issue.
The University may incur significant cost or effort if the vendor is unable to provide the expected level of service. Vendor viability – including financial health, sustainability, past success, operations, and ability to provide the service. The likelihood and impact of vendor dependence. Ability and cost involved to exit the SAAS solution, and choose a different solution.

NetSpot is Australia’s largest official Moodle partner and is among the top three of 50 official Moodle partners world-wide. NetSpot has vast experience in supporting enterprise-level learning management systems in Australasia for universities and TAFE’s and provides managed hosting (on AARNet) for over 500,000 students and related services including integration, development, content migration, customisation, training, technical support and end-user (academic and student) help-desk. Through our success in this area, NetSpot has grown to approximately 30 staff with an annual turnover approaching $5M. NetSpot was recognised as a BRW Magazine Fast 100 growing company in 2009 for the period 2006-2009.

Clients that NetSpot hosts, include, but are not limited to:
- Monash University (Moodle Pilot)
- The University of New South Wales (Moodle)
- Australian National University (Moodle)
- University of Canberra (Moodle)
- University of South Australia (Moodle)
- Macquarie University (Bb CE 6)
- Australian Catholic University (Bb CE 6)
- TAFE VC (Bb Vista, Moodle)

NetSpot has also recently signed an agreement with The University of New England to provide hosting and support of Moodle, as well as implementation services including migration from CE 6/8.

Because Moodle is open-source, there is no risk of vendor lock-in. Clients have a choice to use the services of any of the 50 official Moodle Partners globally, or any other company with the required skills, or can bring hosting and support of Moodle in-house. NetSpot has experience supporting some clients during a pilot phase before the client transitions the service internally, and the process is neither costly nor time consuming.

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### Other issues to consider, that may differentiate in-house and SAAS solutions:

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Attachment F 21
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<tr>
<th>Issue</th>
<th>Considerations</th>
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<th>Risk Rating</th>
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</table>
| Availability              | Historical uptime  
                          Planned downtime  
                          Support arrangements                                                                 | NetSpot manages downtime and availability for specific clients and applications based on the required service levels for that system.  
                          For our hosting facility itself we have the following historical results (scheduled/unscheduled) which we record and report on a quarterly basis:  
                          2010 q1: 100.00% / 100.00%  
                          2009 q4: 100.00% / 100.00%  
                          2009 q3: 100.00% / 100.00%  
                          2009 q2: 100.00% / 100.00%  
                          2009 q1: 99.915% / 99.919%  
                          2008 q4: 99.992% / 100.00%  
                          2008 q3: 100.00% / 100.00%  
                          2008 q2: 99.822% / 99.834%  
                          2008 q1: 99.976% / 99.987%  
                          Our hosting agreements typically provide for an application level availability of 99.7%.  
                          The majority of scheduled works is around maintaining and updating the application, and in the case of Moodle we generally perform monthly or bi-monthly updates which often require no application outage. Larger scheduled works that do require an outage (such as network and power maintenance) for the hosting facilities are scheduled during non-teaching periods of the year to reduce impact on clients. | Low         |
| Disaster Recovery          | Likely impact in the case of a University disaster – how might the SAAS solution be affected  
                          The vendor’s DR plans and readiness                                                                 | In addition to the above backups, NetSpot highly recommends (and provides as an optional service for our Managed Hosting customers) a Disaster Recovery environment located at a secondary data centre, synchronised by way of SAN mirroring to provide continuity of services (with a typical Recovery Time Objective of 6 hours) in the event of a catastrophic event affecting the primary data centre.  
                          As an added measure of risk mitigation, NetSpot can provide an offsite synchronisation mechanism to provide a local client hosted copy of data on a regular basis.  
                          In the event of a University disaster there are several dependent systems that may affect Moodle hosted by NetSpot. Firstly login to Moodle may be dependent on the ability to communicate with an Identity Management (IDM) server hosted by the University. If this system is unavailable users may not be able to login. NetSpot has mitigated this risk with clients in the past by hosting a replicated IDM server within our hosting facility, and which could be managed by the University.  
                          A critical part of our disaster recovery planning is to ensure integration with University disaster recovery plans, so that NetSpot can, for example, undertake any necessary configuration changes to Moodle required to point to Disaster Recovery instances of dependent systems. | Low – Recommend the use of NetSpot Disaster Recovery service. |
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<tr>
<td><strong>Cost</strong>&lt;br&gt;A SAAS solution may have different upfront and ongoing cost implications.</td>
<td>Cost structure – both upfront and ongoing&lt;br&gt;Likelihood that additional services, such as customisation, will be required</td>
<td>NetSpot’s Managed Hosting services are based on an annual fee, and include provision for a number of key quotas related to usage – in particular storage consumption and number of ‘active users’, as well as support and upgrades. The underlying approach to the hosting fee is for it to be inclusive of all services and baring unexpected increases in usage there should not be a requirement to budget for additional costs. Further supporting the management of cost associated risk is the fact that enhancement is by no means mandatory as Moodle is a mature and robust Learning Management System and NetSpot deploys Moodle to Universities with the addition of a range of tested and maintained plugins used by other Universities in its standard deployments. This deployment should be considered comparable to other industry standard Learning Management Systems and sufficient for use without additional services beyond those included in the hosting fee. Moodle itself is open-source and there is no associated license fee – one of the significant differentiators of Moodle compared with proprietary systems. Savings in license fee can be redirected to staff development and enhancement of the platform to better meet the teaching and learning needs and to more closely support the strategic objectives of the University.</td>
<td>Not enough information to rate</td>
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<tr>
<td><strong>Capacity to Implement</strong>&lt;br&gt;The availability of resources, time-to- implement, and capability to support the service may differ significantly with a SAAS solution.</td>
<td>Expected time to deliver&lt;br&gt;Support arrangements&lt;br&gt;Availability of key resources&lt;br&gt;Priority with respect to other work</td>
<td>One of the key features of NetSpot’s Managed Hosting service is how quickly an enterprise scale deployment of Moodle can be deployed. Clients such as ANU and University of Canberra have been able to reduce the implementation time for Moodle to between 6-8 months. Institutions that have chosen to implement Moodle in-house have typically taken between 12-18 months. The reason NetSpot is able to deploy an enterprise environment so quickly include: Use of shared infrastructure&lt;br&gt;Provision of spare capacity to enable rapid growth&lt;br&gt;Well established systems architecture for an enterprise Moodle&lt;br&gt;An established procedure for deploying and supporting Moodle&lt;br&gt;Availability of staff resources as a priority for Higher Education contracts&lt;br&gt;NetSpot’s core business is to support Universities’ eLearning technology, with provision and support of hosted environments being one of our more significant offering. As such our hosting operation is adequately resourced to ensure we are able to meet tight timelines and to exceed our service level obligations.</td>
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## Remote Hosting – Risk Profile – Desire2Learn

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<th>Desire2Learn’s response</th>
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<tr>
<td><strong>Data confidentiality</strong>&lt;br&gt;Components in a SAAS solution may be shared or managed outside the University, which can increase the risk to data confidentiality</td>
<td>• Physical and logical separation of data from one customer to the next&lt;br&gt;• Shared infrastructure compared to self-hosted infrastructure&lt;br&gt;• Network connectivity and security&lt;br&gt;• Storage of offsite data&lt;br&gt;• Data confidentiality requirements; Are there any policies that prevent offsite data storage?</td>
<td><strong>Separation</strong>&lt;br&gt;Client data is separated within a single instance. Common Internet File System (CIFS) file shares are accessible only through Desire2Learn's Network Access Server systems. Clients do not have direct access to the file shares but can access storage and course data through the D2L application. Each Client CIFS file share has individual Permissions per instance. Databases are also individual to the clients with an administrator account to the database being provided.&lt;br&gt;&lt;br&gt;<strong>Shared Infrastructure</strong>&lt;br&gt;Depending on the size and needs of the Client, the D2L application servers and Database servers may be shared or may be in a stand-alone stack. Shared configurations are generally in a Virtual Server Environment. These environments share physical resources such as CPU and memory. The actual servers that host the D2L application are separately running Operating Systems (MS Windows Server) and have no interaction between them other than directed by the application using its inherent security. Some Hosted Clients prefer to have their own physical environment for either their exclusive use of the Server resources, privacy or in some cases, time zone constraints.&lt;br&gt;&lt;br&gt;<strong>Network connectivity and security</strong>&lt;br&gt;All client data is kept behind state of the art Firewall technology. All traffic to the outside is 100% encrypted during transport.&lt;br&gt;&lt;br&gt;<strong>Offsite data storage and confidentiality</strong>&lt;br&gt;All Client data is replicated between our Hosting facilities to ensure continuous access. If requested clients may have an extra copy of their data stored offsite by industry leading professional data retention companies, this would be at an incremental cost to the standard hosting fees.</td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Loss of control</strong>&lt;br&gt;Some components of a SAAS solution may be outside of the University’s control. This may be a problem with forced upgrades, downtime and improvements.</td>
<td>• How often and how long is any planned downtime?&lt;br&gt;• What is the upgrade schedule – are upgrades mandatory? Is there an opportunity to delay or negotiate?&lt;br&gt;• Can additional features and small changes be added by the University? Is there an opportunity to influence the future</td>
<td><strong>Desire2Learn Hosting Services reserves the rights to perform maintenance monthly. This is currently scheduled for the fourth Sunday of each month from 01:00-07:00 EST. During this maintenance window, activities such as, but not limited to Infrastructure firmware updates, Microsoft patches, and equipment moves, add and changes, are performed.</strong>&lt;br&gt;We endeavour to balance an upgrade schedule providing new features and enhancements with a stable and reliable learning platform for our customers. Our software release schedule generally follows the guidelines below:&lt;br&gt;• Major software platform release occur in general once a year;&lt;br&gt;• Minor software maintenance releases generally occur 2-3 times per year&lt;br&gt;• A scheduled monthly maintenance window is designed to allow Desire2Learn the opportunity to upgrade or repair IT infrastructure and hardware and general systems and</td>
<td><strong>Low</strong> — although it is unclear how the University may influence the future feature list.</td>
</tr>
<tr>
<td>Risk</td>
<td>Considerations</td>
<td>Desire2Learn’s response</td>
<td>Risk Rating</td>
</tr>
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<td>----------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Risk Considerations        | feature list?                                                                 | storage maintenance  
All major and minor upgrades are scheduled to meet your needs. We do not enforce upgrades on our customers.  
Additional features can be added by the University (see extensibility options described below).                                                                                           |             |
| Customisation and Integration | In a SAAS solution, customisation may be more difficult, as the application is controlled by an external party. Where heavy integration is required, a SAAS solution may not be a good fit.                                                                 | Application development within the Desire2Learn application context is intentionally limited to ensure the integrity of the core application, and maintain our history of security. In order to ensure we’re continuing to maintain our commitment to extensibility, there are numerous approaches to application extensibility of the Desire2Learn Platform.  
Extensions can be built using Custom Widgets, Web Services, and external applications connected using Single Sign-On such as IMS Basic LTI.  
- Custom Widgets can be implemented using HTML, Java script, and Desire2Learn Replace Strings. They can also be iFrames to outside pages, which could be implemented in whatever web development language the institution is comfortable with. Occasionally dynamic custom widgets and pages are required to be hosted on the same servers as the Desire2Learn Platform. These can be written in ASP vbScript or .NET, and are typically created, security reviewed, and deployed by our Professional Services Organisation.  
- Web Services can be used to read/write/update course, user, enrolment and grade properties within the Learning Platform. The Web Services are exposed via standard SOAP interfaces and are described in appropriate WSDL’s. Institutions can interact with these web services using whatever development language they are comfortable with. The web services are Open in that there is no licence fee for them and the Client is encouraged to publish integration or extensibility work back into the D2L User community.  
- External tools can be built outside of the Desire2Learn context and linked in using SSO. One of the favoured approaches is the new IMS Basic LTI implementation. A Basic LTI tool can be implemented in whatever development language an institution is comfortable with.  
- Client can set up as many test instances both physical and virtual as required and for a nominal fee to setup and host these test and other non production systems.  
- Single Sign on (SSO) integration to other university sytems such as CA SiteMinder can be achieved with a setup fee and annual maintenance fee to manage that SSO.  
<p>| Medium – While the application appears to be customisable, there is more technical uncertainty compared to Blackboard or Moodle. Recommend that further technical investigation is undertaken. |             |</p>
<table>
<thead>
<tr>
<th>Risk</th>
<th>Considerations</th>
<th>Desire2Learn’s response</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor Management</td>
<td>A SAAS solution will require some ongoing effort for vendor management.</td>
<td>Desire2Learn and Callista have formed a new partnership for the Australian market based upon our mutual collaboration on the implementation and integration at Deakin University. Aside from a rich level of integration this will bring attractive pricing to Australian Universities that choose Desire2Learn as a hosted (SAAS) solution. A more detailed description of Integration options is provided below.</td>
<td>No information provided for managing day-to-day communication and issues.</td>
</tr>
<tr>
<td></td>
<td>• Vendor expectations of the University</td>
<td>A typical project implementation and communication plan begins with Desire2Learn allocating a project manager who will work with you to understand and establish a detailed and shared understanding of your requirements and to develop a full project plan and a project team including all relevant stakeholders from Desire2Learn and your institution.</td>
<td></td>
</tr>
</tbody>
</table>
|                         | • Process for day-to-day communication and issues                                | **Conception**
Deliverables and major milestones of this phase include:
- Execution of Letter of Intent (LOI)
- Discovery Workshop and High Level Requirements Gathering
- Roles and Responsibilities
- Risks and Mitigations Planning
- Draft Statement of Work (SOW)
In the conception phase the following activities would take place:
- Account Manager (AM, your strategic planning partner) and Project Manager (PM, your project delivery partner) work to understand the business needs
- Evaluate your needs against existing Desire2Learn solutions
- Outcome of this phase is agreement on a solution that meets your needs |
|                         | • Issue escalation and management                                                | **Initiation**
Deliverables and major milestones of this phase include:
- Requirements Definition Document
- Discuss integration and customisation needs at a business level
- Detailed Project planning (WBS – Work Breakdown Structure)
- Base systems installation
- Administrator Training (Train-the-Trainer)
- Instructor training
In the initiation phase the following activities would take place:
- PM engages Subject Matter Experts (SME’s) to transform requirements into a technical solution |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Considerations</th>
<th>Desire2Learn’s response</th>
<th>Risk Rating</th>
</tr>
</thead>
</table>
|     |                | • PM works with you to position your project for success (communication plan, project plan, resource plan – both external and internal)  
      |                | • Outcome of this phase is a detailed plan that simply requires execution |             |
|     |                | **Construction**  
      |                | Deliverables and major milestones of this phase include:  
      |                | • Advanced Org Structure / Roles & Security  
      |                | • Integrations & Customisations  
      |                | • Content Migration  
      |                | • Pre-delivery testing  
      |                | In the construction phase the following activities would take place:  
      |                | • PM manages Desire2Learn Delivery team who develops / configures the solution  
      |                | • PM (and Desire2Learn Delivery team) provide consulting support to guide your delivery team and provides support for external (i.e. your) deliverables  
      |                | • Outcome of this phase is a fully tested production-ready solution |             |
|     |                | **Transition**  
      |                | Deliverables and major milestones of this phase include:  
      |                | • Training  
      |                | • Transition to ongoing support  
      |                | • Acceptance testing  
      |                | • Project closure  
      |                | In the transition phase the following activities would take place:  
      |                | • Document and hand-off to support  
      |                | • Outcome of this phase is happiness attributed to the high quality solution that has been deployed  
      |                | At any stage in the implementation issues can be raised through support mechanisms (email, fax, intranet, 1800 phone number) or escalated with the account or project managers. Regular (eg Weekly) calls are scheduled with the Account and Project Managers throughout the implementation. |             |
| Vendor Issues | Vendor viability – including financial health, sustainability, past success, operations, and ability to provide the | Desire2Learn Incorporated (Desire2Learn) was founded on April, 20, 1999, and officially incorporated on February 25, 2000. Desire2Learn is a private Canadian corporation in good standing and employs approximately 220 employees. We have won a Deloitte Fast 50 award for fastest growing technology companies for the last 4 years in a row, with the last 5-years of revenue growth exceeding 920%, and this growth is attributed to our client satisfaction and their growth. Our business activities are solely in | Low |
|     | expectations |             |             |
Other issues to consider, that may differentiate in-house and SAAS solutions:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Considerations</th>
<th>Desire2Learn’s response</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>the delivery, support and maintenance of the leading-edge teaching and learning technology which allows us to be an ideal partner for our clients in helping them achieve their strategic vision. To minimise vendor dependence, Desire2Learn has designed a truly extensible platform as described above. In addition it believes in a best of breed approach whereby we partner and integrate with other key university systems such as Callista, Turnitin, Respondus etc, rather than trying to build all functionality ourselves or buying and owning companies. Regarding exiting the SAAS solution, since inception Desire2Learn has comprehensive standards based import and export tools so that customers are not locked into our platform. It is easy to export course structure and content into SCORM packages for uploading into a different system. Having said that, once a customer gets beyond 1,000 users and no longer a pilot, we have never lost a customer to a 3rd party system. But this is because of the high levels of support and customer satisfaction achieved by our customers and not by technical barriers in them switching systems.</td>
<td></td>
</tr>
</tbody>
</table>
**Availability**

- Historical uptime
- Planned downtime
- Support arrangements

Desire2Learn has introduced several service level objectives (SLO) to provide additional peace of mind to our customers who have chosen to host Learning Suite with Desire2Learn. Uptime values reset at the end of each period and do not carry forward to subsequent periods. Desire2Learn target SLO for our hosting customers is 99.8% uptime meaning that the target is to achieve availability or uptime for a total of 99.8% of the minutes within each measurement period or month or better.

Desire2Learn internal measures are accurate to four decimal places (e.g. 99.99%) to allow for greater granularity of measures on our internal targets. Desire2Learn’s Hosting team measures against a higher target level than the SLO we commit to and as such our teams are incented to achieve a better than committed/expected availability target for our customers. All work completed within our facilities and systems are measured against these targets and as such only highly qualified work and change occurs with multiple tests, change reviews, and contingency plans in place. We take our commitments seriously to ensure your business is running smoothly.

The table below demonstrates how Desire2Learn achieves its uptime service level objective targets; we calculate each measurement period to align with a calendar month and as not all months have the same number of days; the measurements in the table below vary slightly per month.

<table>
<thead>
<tr>
<th>Measurement Periods (Days)</th>
<th>Minutes Within Period</th>
<th>Allowable Outage Minutes Within Period</th>
<th>Minutes of Uptime Within Measurement Period</th>
<th>SLO Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>44,640</td>
<td>89.28</td>
<td>44,550.72</td>
<td>99.80%</td>
</tr>
<tr>
<td>30</td>
<td>43,200</td>
<td>86.40</td>
<td>43,113.60</td>
<td>99.80%</td>
</tr>
<tr>
<td>29</td>
<td>40,320</td>
<td>80.64</td>
<td>40,239.36</td>
<td>99.80%</td>
</tr>
<tr>
<td>28</td>
<td>41,760</td>
<td>83.52</td>
<td>41,676.48</td>
<td>99.80%</td>
</tr>
</tbody>
</table>

Planned downtime for hosting services infrastructure maintenance occurs monthly, on the fourth Sunday of each month during the hours of 01:00-07:00 EST.

**Risk Rating**

<table>
<thead>
<tr>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Issue</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Disaster Recovery</td>
</tr>
<tr>
<td>Cost</td>
</tr>
<tr>
<td>Capacity to Implement</td>
</tr>
</tbody>
</table>
Field of Study: The Built Learning Environment (awarded 2009)

A. Brief Description of Fellowship:

Teaching & learning environments extend well beyond the built environment, however for the purpose of this project, outcomes will be directed at built facilities including wet & dry labs, lecture theatres, seminar & group meeting rooms and associated ante spaces.

The proposed project addresses the current shortfalls in the design, refurbishment & investment in teaching & learning environments including:

- Design and delivery of refurbished or replacement teaching facilities which consider the needs of the immediate users and not the greater university. Design briefs are generally taken from those directly involved in teaching in the venue, representatives of the users, and an external consultant team with little consideration to other potential users or current trends in teaching and learning methods.

- Focusing capital development investment in teaching & learning environments in areas of the highest demand, but without a longer term plan (say 20 years) of how the facility may be used. The efficient utilization of the University’s space, and understanding of where the demand for space is, is critical to informing the Capital Development Plan and prioritizing where in the University capital investment is most critical. The Accommodation Efficiency Audit is currently being finalized in Facilities Management and the outcomes can be used to inform this project.

- Engagement of the cross campus community in the design outcomes, not just the immediate users.

B. The research and development plan is to:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STATUS</th>
<th>REPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Investigate, analyse and review current design practice and ongoing research in Australian G08 Universities for teaching spaces.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>2</td>
<td>Review documentation prepared by internationally based architects &amp; education providers on vision of teaching &amp; learning spaces of the future.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>3</td>
<td>Analyse how Australian G08 Universities communicate the availability of their diverse learning facilities to the University Community and External users and obtain feedback on satisfaction of environment &amp; amenity, ie. review web based availability of information and support.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>4</td>
<td>Consult with staff and students across the university campus, together with university associated community and business groups, on their vision for future teaching &amp; learning environments and how we may shape them.</td>
<td>Yet to be commenced</td>
</tr>
<tr>
<td>5</td>
<td>Review current space efficiency audit (2009 completion) prepared by an external consultant for the purpose of the University assessing space utilization hotspots and under utilized space, including teaching &amp; learning environments.</td>
<td>In progress</td>
</tr>
</tbody>
</table>
**C. Description of expected outcomes:**

Develop a physical asset based program to provide an improved teaching & learning environment at UWA which supports the University’s Strategic Directions to achieving international excellence. Expected outcomes to be delivered in support of this program include:

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>STATUS</th>
<th>REPORT October 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Draft</td>
<td>Provide Summary to eLearning Committee</td>
</tr>
<tr>
<td>2</td>
<td>Yet to be commenced</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>Ongoing</td>
<td>Nil</td>
</tr>
</tbody>
</table>

**D. Fellowship Program:**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>PROPOSED DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Campus Collaboration &amp; Peer Review (ongoing for life of project &amp; beyond)</td>
<td>November 2010 +</td>
</tr>
<tr>
<td>Research &amp; Development including Literature Review</td>
<td>July 2009 – November 2010+</td>
</tr>
<tr>
<td>Develop <em>draft</em> Future Teaching &amp; Learning Building Environment Based Directions</td>
<td>October 2010</td>
</tr>
<tr>
<td>Review existing teaching &amp; learning facilities and space utilization audit, and prepare <em>draft</em> 10 Year Program of Teaching and Learning Spaces to be refurbished/replaced</td>
<td>February – November 2010</td>
</tr>
<tr>
<td>Complete Future Teaching &amp; Learning Building Environment Based Directions and 10 Year Program of Teaching and Learning Spaces to be refurbished/replaced</td>
<td>December 2010</td>
</tr>
<tr>
<td>Project Dissemination</td>
<td>January – June 2011</td>
</tr>
<tr>
<td>Preparation of article for publication</td>
<td>No later than June 2011</td>
</tr>
</tbody>
</table>