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), W/Professor Bill Taylor
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)

ITEMS FOR INFORMATION AND CONSIDERATION BY CIRCULAR

As advised by email on 28th April the meeting of the eLearning and Learning Spaces Standing Committee scheduled for Wednesday, 5th May 2010 has been cancelled.

The following items are for Members’ information and consideration by circular.

In particular Members are asked to consider item 5 for decision by circular. If you do not agree with the recommendations from the Chair or would prefer that the item be referred to the next meeting for discussion please contact the Executive Officer (jan.cardy@uwa.edu.au) no later than Friday 14th May 2010.

If there are no objections by that date the item will be processed in the normal way and the recommendation recorded as a resolution in the next set of minutes.

Jan Cardy
Executive Officer
ITEMS FOR INFORMATION BY CIRCULAR

1. WEBCT AND LECTOPIA – PROGRESS UPDATE FROM CATL – REF: F5397, F22828

The attached report (Attachment A) provides a progress update on the current status and performance of the WebCT and Lectopia systems at UWA.

For information

2. REVIEW OF THE UNIVERSITY’S LEARNING MANAGEMENT SYSTEM (LMS) – REF: F28027

At the March 2010 committee meeting, members had before them a ‘draft’ plan, prepared by Assistant Professor Shannon Johnston, Higher Education Development (eLearning) with Yvonne Button from the eLearning Development and Support team, for the review of the University’s Learning management System. Members’ were invited to comment on the proposed membership of the working group and reference group, and the proposed strategy.

A copy of the ‘revised’ plan is attached (Attachment B) for members’ information and an update on the progress of the review is also attached (Attachment C).

For information

3. ITEMS IN PROGRESS – UPDATES

Student IT Needs Study

‘Following minimal feedback, the Student IT Needs Study draft proposal has been modified with a small change to the proposed timetable. The date for completion of the interim report has been moved from June to early August, though the date for the final report remains the same. The new proposed dates, yet to be confirmed, are:

1. 23 July 2010 – Interim Report to the Teaching and Learning Committee meeting 5 Aug 2010
2. 20 August 2010 – Final Report to the Teaching and Learning Committee meeting 2 Sept 2010
3. September 2010 – Final Report to the UWA Executive

A small working group of staff from the Information Services Division has been assembled to move the study forward.’

For information

4. NEXT MEETING

The next meeting of the eLearning and Learning Spaces Standing Committee will be held on Wednesday 4th August 2010 from 9.30am – 11am in Winthrop Tower, meeting room W1.

For noting
ITEMS FOR CONSIDERATION BY CIRCULAR

5. LECTOPIA LECTURE RECORDING AT UWA – REF: F22828, F29611

By way of background, the Lectopia lecture capture system was developed by a team in the Arts Multimedia Centre. In 2007 it was commercialised with UWA as a licensee of the product. Recently the Centre for the Advancement of Teaching and Learning (CATL) became the ‘business owner’ of Lectopia supported by Information Technology Systems (ITS) who took on all technical responsibilities.

The use of Lectopia, which is already considerable, is expected to increase as it becomes a fundamental tool in the University’s eLearning strategy.

At its meeting held on 8th December 2009, the eLearning and Learning Spaces Standing Committee, members noted that the following recommendations had been endorsed by both the Teaching and Learning Committee and the Academic Council:

- Lectopia recordings should be of good quality.
- When Lectopia recordings are the primary method of teaching they should be specifically prepared for the purpose, appropriately supported with relevant learning resources and the LMS (WebCT) should be used to ensure active engagement.

Members also noted that the following recommendation had been referred to the Faculties for further consideration and feedback to both the Teaching and Learning Committee and the Academic Council:

- That all lectures in all venues which have recording facilities be recorded and made available to students. Exceptions should normally only be made when approved in advance by the Head of School and when at least one repeat lecture is provided.

A discussion paper has been prepared by Dr Shannon Johnston, Asst Prof eLearning, CATL to provide background information on the latest research relating to the use and benefits of lecture recordings for the Teaching and Learning committee and to facilitate informed decisions related to the Lectopia and it’s use at UWA.

A discussion paper ‘The Use and Benefits of Lecture Recordings – the Student’s Perceptive’ is attached (Attachment D).

The Chair recommends that members approve this document and it be forwarded to the Teaching and Learning Committee for their information and circulation.

If you do not agree with the recommendations from the Chair or would prefer that the item be referred to the next meeting for discussion please contact the Executive Officer (jan.cardy@uwa.edu.au) no later than Friday 14th May 2010.
April Update to eLearning and Learning Spaces Committee

Learning Management System (WebCT): 

To date, the following Learning Management System (WebCT) units have been created for Semester 1, 2010.

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHSS</td>
<td>144</td>
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<tr>
<td>ALVA</td>
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<td>BUS</td>
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<td>CATL</td>
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<td>ECM</td>
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<td>LPS</td>
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<td>MDHS</td>
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<tr>
<td>NAS</td>
<td>62</td>
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<tr>
<td>SIS</td>
<td>10</td>
</tr>
<tr>
<td>Grand Total</td>
<td>570</td>
</tr>
</tbody>
</table>

These figures do not include:
- non-standard teaching period units, or university wide units such as the Academic Conduct Essentials (ACE) or Introductory Research and Information Skills (IRIS) units.
- specialist units for purposes other than teaching and learning (e.g. community of practice or research collaboration units).
- Semester 2, 2010 units.

In addition, in the Semester 1, 2010 study break, the introductory workshop “Quickstart Guide to Developing your Learning Management System (WebCT) Unit” was offered with 9 people in attendance.

In preparation for Semester 2, 2010, the eLearning Development and Support (eDS) team is currently working on improving the LMS Unit Request online form and updating training materials and web resources for staff.

Lecture Capture System (Lectopia):

To date, the following Lecture Capture System (Lectopia) units have been created and scheduled for Semester 1, 2010.
Number of Units per faculty for Semester 1, 2010:

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHSS</td>
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<tr>
<td>ALVA</td>
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<td>BUS</td>
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<td>ECM</td>
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<td>EDU</td>
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<tr>
<td>LAW</td>
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<td>LPS</td>
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<tr>
<td>MDHS</td>
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<tr>
<td>NAS</td>
<td>36</td>
</tr>
<tr>
<td>SIS</td>
<td>4</td>
</tr>
<tr>
<td>Grand Total</td>
<td>305</td>
</tr>
</tbody>
</table>

These figures do not include
- one-off “special” recordings for events around campus (Sports Medicine Australia – WA Branch Briefing Night).
- Semester 2, 2010 units.

Several Lectopia-enabled lecture venues were affected by the March 23 2010 hailstorm. Initially, this resulted in several lectures not being recorded or recordings being blank and then ad hoc changes to some units’ lecture recording venues and schedules.

Students were notified via the Lecture Capture system of cancelled and/or rescheduled lectures.

In preparation for Semester 2, 2010, the eLearning Development and Support (eDS) team is currently working on
- redeveloping the current ‘paper-based’ Lectopia Booking Form into an online request form. This should make the process of requesting and scheduling the recordings for a unit much easier and quicker.
- developing online forms for the changing of lecture schedules, editing of lectures once recorded and the restoration of previous years’ lecture recordings.
- redeveloping the ‘prior to semester’ staff development opportunities and support materials to minimise recording failures during the semester.
- incorporating the Lectopia web site into the eDS section of the Centre for the Advancement of Teaching and Learning (CATL) web site and redeveloping its contents.
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
     o learners and learning via Student Services, Student Guild, and other groups
     o teachers and teaching via Faculty Assoc Deans of T&L and CATLysts
     ** ensure internal, regional and offshore groups are accessed
     o ITS and faculty IT teams
     o 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 pro forma
   - 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>
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</table>

**Responsibilities**

<table>
<thead>
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<th>Second level tasks</th>
<th>Responsibilities</th>
<th>‘Sign-off’</th>
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<td>Review team</td>
<td>Identify roles and responsibilities of project team members/groups</td>
<td>CATL</td>
<td>eL&amp;LS Committee</td>
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<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>
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</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>
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<tr>
<td>Internal UWA survey</td>
<td>ITS hardware specs and costings</td>
<td>ITS</td>
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</tr>
<tr>
<td></td>
<td>Develop survey instrument(s)</td>
<td>CATL</td>
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<td>Gather data (send to sectors for implementation)</td>
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<td></td>
<td>Review data, develop summary report</td>
<td>CATL</td>
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<tr>
<td>Recommendations</td>
<td>Budgetary implications</td>
<td>ITS to CATL</td>
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<td>Recommendation report</td>
<td>CATL</td>
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</tr>
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<td></td>
<td>Broad LMS trial plan</td>
<td>CATL</td>
<td></td>
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</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 eLearning staff</td>
<td>Written report and discussion</td>
<td>As arise, at next eL&amp;LS meeting</td>
</tr>
<tr>
<td>Status updates</td>
<td>eL&amp;LS / CATL eLearning staff</td>
<td>Written brief</td>
<td>Monthly</td>
</tr>
<tr>
<td>Required survey activity</td>
<td>Working group / CATL eLearning staff</td>
<td>Meeting with associated documents and/or email communication</td>
<td>Meetings monthly with email updates and requests, telephone communication</td>
</tr>
<tr>
<td>Team progress and planning</td>
<td>Internal CATL</td>
<td>Meetings</td>
<td>Weekly or fortnightly</td>
</tr>
</tbody>
</table>
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
LMS Review

In 2010, the university is reviewing its Learning Management System (LMS) with a view to upgrading.

As part of this process, Marilyn Bacus has been appointed as the LMS Review Project Officer. Since beginning in this role Marilyn has been involved in documenting the characteristics and advantages and disadvantages of commonly-used Learning Management Systems and reviewing other university’s LMS reviews, for comparison.

A call for nominations to participate in the UWA LMS Review Working Group has also been undertaken. Below is the list of membership to the LMS Review Working Group:

- Mr Brian Poleykett, ITS
- Dr Lisa Cluett, Student Services
- Miss Emma Greeney, Guild
- Dr Alexandra Ludewig, eLearning & Learning Spaces Committee
- Mr Romesh Goonewardene, ALVA
- W/Prof Steve McShane, BUS
- Assoc Prof Diana Jonas-Dwyer, MDHS
- Dr Shannon Johnston, CATL
- Mrs Mary Carroll, SIMS
- Ms Yvonne Button, CATL – eDS
- Mrs Marilyn Bacus, CATL – LMS Review Project Officer

One of the activities which has already taken place was a visit to UWA by NetSpot, an official Moodle Partner – on Tuesday April 27th and Wednesday April 28th 2010. On the first of these two days, a public seminar titled: “Adopting Moodle as an Enterprise Level Learning Management System” was held. This presentation, in two parts, discussed how Moodle has been adopted as an Enterprise Level Learning Management System by Australian learning institutions and provided a guided demonstration of Moodle's features. This seminar was attended by 56 participants, 77% UWA staff and 23% from other institutions.

On April 28th 2010 two further sessions were held by invitation. The first was a technical session in which NetSpot presented how they have, in conjunction with other universities implemented and integrated the Moodle Learning Management System as a university-wide system. Representatives from ITS and business-owners of other UWA applications (e.g. Student Management System, Course Materials Online) were present.

A meeting with the LMS Review Working Group followed, where NetSpot discussed what information they could provide to assist UWA in its LMS review and a potential university-wide implementation and integration of Moodle at UWA.
Teaching and Learning in higher education this century holds at its core the student experience. A range of tools and activities are drawn on to enhance student learning as relevant to meeting the University’s core principles, acknowledging the kinds of learners we have; their contexts, needs and motivations; and the tools available to address these. Lecture recordings result from one particular kind of technological tool that plays a role in meeting the needs of learners in studying successfully at university. This paper focuses on messages from the literature on web-based lecture technology (WBTL) that inform the student experience by meeting learning needs, learner needs, learning outcomes, and flexible learning opportunities.

**Introduction**

Literature investigating web-based lecture technology (WBLT) seeks to explore key issues around the use of lecture recordings and remains somewhat controversial, with at times disparate views between students and lecturers on its value and necessity. This paper explores the literature which examines the student experience with WBLT. In the main, the literature available examines the use of Lectopia (or iLecture) in Australia initially developed by UWA and now a world-leader in lecture recordings, and the technology used by UWA. UWA focuses strongly on what is termed a ‘high touch and high tech’ approach to meeting students needs with long-term strategies on flexible learning in myriad ways and in order to meet the varied needs of learners – the “diverse range of learners, learning styles, needs and interests” (Fardon & Ludewig, 2000, p.1). The key characteristics of UWA’s Operational Priorities Plan (2009-2013) and related objectives in the Education Strategy 2009 – 2013) reflect this focus. For instance, UWA identifies its characteristics as including being

- **Technologically innovative**, to maximise our flexibility
- **Responsive**, to meet the needs of the community, our students and our graduates (p.8).

In accordance with the OPP education objective “to improve the quality of the student learning experience,” the Education Strategy further clarifies that “The University therefore seeks to enhance further the quality of its student body with a deep commitment to equity access and diversity, and to improve further the quality of the student learning experience.” (UWA, 2008, p.1) Thus at UWA, there is a commitment to meeting the needs of diverse learners and developing access to education, and improving the quality of the student learning experience – both are key factors in literature on WBLT. The purpose of this paper is to determine through a literature study, the nature of the student experience with lecture recordings.

**Discussion**

**Meeting student learning needs**

Much research explores students’ motivations for using lecture recordings, impact on attendance, and impact on learning. Considering the framework of podcasting types discussed by McGarr (2009) in his literature review, there are three ways that podcasts are used in higher education from most to least common – substitutional, supplementary and creative use. The first two are also characteristic of the use of lecture recordings by students.

The study by Williams and Fardon (2007) of an online survey with 1074 responses identifies that students have both substitutional and supplementary uses for lecture recordings, depending on their attendance rates. They found that the more students attend, the more their use of recordings is for revision and reviewing; the less they attend, the more recordings are used for work commitments,
preference for recorded lectures, or location (e.g. in a regional location). The benefits of using lecture recordings for supplementary use were identified as the opportunity to revise and review lectures, control learning, overcome language barriers, and overcome distractions in lecture theatres. Those who use lectures for substitutional means did so due to clashes between schedules of different units, work commitments and disabilities or medical conditions.

Albon’s questionnaire and interview study of 44 first year Bachelor of Education students similarly found that students used lecture recordings because of the flexibility it afforded them to their learning – they identified that lecture recordings could be used in their own time and place and their own pace, being able to stop, start, and repeat as often as possible. This allowed students the opportunity to clarify points in the lecture for improved understanding.

The most significant research study, funded by the ALTC, and conducted across a number of universities in Australia, in a paper by researchers Gosper, McNeill, Woo, Philips, Preston and Green (2007, 2008) identified that of the students they surveyed, there was a strong agreement that WBLT supported their learning. Through accessing lecture recordings, they were able to review lectures and supplement notes and improve understanding, and revise for assessment. In addition, 66.7% found that lecture recordings assisted to some degree in achieving better results (although 23.3% were unsure), and almost 80% found it easier to learn. In greater depth of data than other studies, they found, amongst a range of usage strategies, that the younger students were more likely to browse and stop and particular places in the recording and so consciously select segments for listening, while older students were more likely to listen to recordings or parts of them more than once. Most significantly, they identify that the focus on lecture recordings should not be on whether to have them, but how to adapt technologies so that students with different learning styles and strategies can use them most effectively as study tools.

Meeting the needs of all learners

Lecture recordings have been found to meet the needs of many learner groups. Chang’s (2007) small interview and focus-group study of 11 academics and 4 students supports the literature in finding that lecture recordings are beneficial for equity reasons for a wide range of student groups, including remote, working, non-English speaking background, those with medical conditions, and disabilities. McElroy and Blount (2006) found in their student questionnaire and staff learning journal study of a second year accounting unit, that most students using the lecture recordings were those from a non-English speaking background or lived far from campus, followed in frequency by those with illness or work commitments.

In particular, lecture recordings have a place in helping to meet federal government mandated equity and diversity requirements for Australian universities. A study by Williams (2006) explored the benefits of lecture recordings for students with disabilities. She outlines literature which holds that recorded lectures allows learners with disabilities to listen in live lectures and not have the pressure of note-taking, and then to review, revise, and note take from the materials in their own time. Her study of undergraduate and Masters students who acknowledged a disability on their enrolment forms, found that most students found the recordings to be either essential (65%) or useful (32%), that they always or regularly also attended live lectures (43%, 45%), and that they used the recordings always (16%), regularly (40%) or occasionally (33%). The reasons for lectopia recordings were a desire to revise or review missed concepts (73%), inability to take notes in lectures (36%), or unable to attend live lectures due to disability (22%). Sixty percent of students’ advice in written comments was that the recording system should be compulsory or widespread for all lectures and they were frustrated at lecturers who would not record.

Learning outcomes with lecture recordings?

Generally, the aim of using technologies in teaching is to enhance learning outcomes. Much of the research identified in this paper is concerned with student and lecture perceptions of the value and
usage of lecture recordings for their learning, and to date has referred to student views of preferences and uses. A study of third year computer science students by von Konsky, Ivins, and Gribble (2009) sought student views of the value of lecture recordings, data of their actual usage patterns and final marks, compared with lecture attendance data. In this more comprehensive study drawing on a range of data sources, they found that there is no significant impact of access to lecture recordings on lecture attendance in this cohort, and no direct link between lecture attendance and final mark. In an earlier examination of their own supply of recorded lectures for online flexible learning, Smeaton and Keogh (1999) also found that there was no change in student summative assessment results when virtual lectures replaced traditional live lectures. However, the study by McCredden and Baldock (2009) which explored links between live and recorded lectures with exam performance on a multi-level analysis found slightly different results. Their survey study of approximately 213 third year engineering students found that on a uni-dimensional analysis, neither recorded nor live lectures have strong evidence to support a claim for predicting student achievement; however on a multi-dimensional analysis, there was a statistically significant result for attending lectures and using lectopia as a study resource for missed lectures. They found that there was no improved comprehension when students used recorded lectures to try and understand a live lecture in which there was significant initial difficulty with understanding key lecture concepts. They suggest that lecture recordings suit independent learners who are able to fill in gaps in their learning, but that students with major difficulties in understanding the lecture for whatever reason do not benefit from listening again.

**Flexible learning – choice and range**

Flexible learning principles hold that learning is about choice – choice about when and where to learn (and can ostensibly include how and what to learn, and how to demonstrate that learning, although this is beyond the focus of this paper). Fardon and Ludewig (2000) found of their 1300 survey responses (both online and paper questionnaires) that the convenience of accessing the lectures any time, anywhere and using them at their own pace was a benefit identified by students. McElroy and Blount (2006) similarly found that students appreciated the control over where and how they do learning, an affordance of the lecture recordings. The notion of flexibility in learning to meet diverse learner needs and learning preferences also refers to the choice to attend or not attend, to supplement or substitute live lectures with lecture recordings, and the choice not to use lecture recordings. Most of this discussion concerns how learners choose to use lecture recordings, however, there is also evidence of learners who choose not to use recordings. For instance Albon (2004) found that such students valued face-to-face lectures due to the live interactions, the poor quality of recordings, or frustrations with technology and minimal knowledge about addressing problems that arose. Fardon and Ludewig (2000) early on noted that approximately half of the responses to their survey felt they did not need to access them, or that they would access them if they identified a need, such as for revision or missing a live lecture. The other half of responses found there were technical issues which prevented their access (for which they identified a need for developing technical literacy, and these issues do not arise in more recent literature) – a finding supported in McElroy and Blount (2006).

Gosper, et al. (2008) further add that as well as students appreciating the flexibility afforded to them by the availability of lecture recordings which is a form of learning support. They conclude that students do not also necessarily exclude attendance because of the existence of lecture recordings, but they make strategic choices, based on personally perceived educational value, convenience, and social opportunities. In support, VonKonsky et al (2009) found that students who passed the unit were more likely to combined lecture attendance with accessing lecture recordings, and the biggest influence on their decision to access recordings was due to their own personal views of the value of recordings for learning. Thus “if students perceive that something is of value to their learning, they will tend to use it” (p.594) and the decision is thus individually determined. Students should be able
to choose the most appropriate method of learning for them – whether face-to-face or lecture recordings or other (McElroy & Blount, 2006).

Concluding remarks

Lecture recordings assist in responding to and thus enhancing the learner experience, beyond improving grades. Through lecture recordings, students have the opportunity to make use of lectures as a learning resource in ways that meet myriad student needs, and the flexibility to decide where and when and how they might choose to learn from lectures. Furthermore, having lecture recordings available as a matter of course, allows us to meet universal design concepts: universal design means that the products which designers design are universally accommodating, that they cater conveniently for all their users. On the route towards this goal a product that was initially designed primarily for the mass market of normal able-bodied people could have been subsequently been refined and modified – the effect, with accommodation parameters being extended, being that it would suit all its other potential users as well, including people with disabilities” (Selwyn, 2006, p.1)

In education, this suggests that in the past accommodating students with diverse needs was post curriculum and pedagogical design, where preparing and providing for learning needs of all learners – abled, disabled, in different environments, from different backgrounds from the start is both efficient for university procedures and lecturer administration, it is being prepared for all learners from the outset.

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Lecture Capture: A Guide for Effective Use

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Lecture capture is an exciting technology that is drawing the attention of instructors and students on college campuses across the country. A number of faculty members at the University of Michigan (U-M) are already capturing lectures and creating podcasts and screencasts as additional learning resources for students. Other institutions, including Duke (1) Stanford (2) UC Berkeley (3) and University of Wisconsin-Madison (4) are also experimenting with offering podcasts to students to provide supplementary learning material, to free up class time for active learning experiences, or to make learning material accessible to the general public.

1 http://itunes.duke.edu
2 http://itunes.stanford.edu
3 http://itunes.berkeley.edu

What Is Lecture Capture and Why Is It Used?

Lecture capture involves the recording of classroom activities or special events using specific software and making that recording available electronically. The audio or video recording is normally stored digitally on the Internet or in iTunes U for downloading and playing back on computers and portable media players, such as MP3 players and iPods. The recording is sometimes referred to as a podcast or a screencast, and may be audio-only or include video of the lecture. Some software synchronizes lecture slides for viewing alongside the relevant sections of audio and/or video recordings of the instructor. Depending on the software used for recording, students may be able to speed up or slow down lectures, pause the playback, and move forward or backward in the presentation.

Survey results indicate that the majority of college students prefer courses that offer podcasts over those that do not. Students cite convenience, flexibility, and positive impact on learning as the main reasons to have recorded lectures (Nagel, 2008; Fernandez, Simo, & Sallan, 2009). As is the case with any new technology, lecture capture has the potential to benefit students and faculty, but it also presents producers and consumers with a set of challenges for getting the most from this technology.

Lecture capture
- provides additional resources for students:
  - archived lectures,
  - tutorials for lab work,
  - demonstrations of difficult concepts and complex procedures like printmaking or CPR, and
  - presentations by guest speakers;
- allows students to review material at their own pace and convenience (Coghlan et al., 2007);
- offers students more flexibility in note-taking;
- makes time for active learning during class by having the lecture available for viewing before the class meetings (Lund, 2008);
- allows students to catch up with a missed lecture;
- offers another tool for student learning projects (e.g., student-generated podcasts for interviewing locals and sharing with peers in a study-abroad program).

This paper reviews research on the use and impact of lecture capture technology, discusses challenges and implications of using this technology in classrooms, and provides guidance for using this tool to enhance teaching and student learning.

What Have We Learned About Lecture Capture?

Although many anecdotal reports about lecture capture circulate in higher education, only a few notable evaluation studies have investigated its impact on student learning. Below is a summary of key points from
such evaluations, many of which rely on students’ self-reports about their lecture capture usage and perceptions.

**Impact on student behaviour and learning**

No noticeable impact on students’ class attendance. Despite a common fear among instructors that students will stop coming to class if they have access to a lecture recording, surveys at various institutions in the US and the UK have indicated that access to lecture podcasts generally does not impact students’ decision to attend class (Bongey, Cizadlo, & Kainbach, 2006; Brotherton & Abowd, 2004; Dale, 2007; Harrity & Ricci, n.d.). In one study, students explained that they continue to attend lecture because it offers opportunities for interaction in a structured learning environment (Copley, 2007).

Potential benefits for student learning and grades. Offering podcasts of lectures has the potential to improve students’ mastery of course material. In surveys, students report gaining a better understanding of class material in courses that used the technology (Brotherton & Abowd, 2004). At U-M, undergraduates in Engineering and graduate students in Dentistry who listened to or viewed recorded lectures overwhelmingly believed that their use of the media had a positive effect on their exam grades (Pinder-Grover, Millunchick, & Bierwert, 2008; Brittain, Glowacki, Van Ittersum, & Johnson, 2006). In particular, U-M students in one study indicated that screencasts are helpful in clarifying misunderstandings, supplementing lecture material, and reviewing for exams (Pinder-Grover, et al., 2008).

Deeper engagement with course material

Undergraduate students have reported in focus groups and surveys that podcasts helped them stay focused on the course, made learning more fun and informal, supported independent learning, and enabled deep engagement with course material (Edirisingha & Salmon, 2007; Duke University, 2005). Improved learning may also be a result of changes in students’ note-taking practices. Some students have reported that, because they had access to this learning tool outside of class, they took fewer notes during class and were able to pay closer attention to the lecture (Brotherton & Abowd, 2004).

Other research supports students’ perceptions of their increased ability to focus on lecture when they have access to lecture capture. In an experimental study of 195 students enrolled in a U-M physics class, researchers found that students who watched a video presentation of a lecture with slides were better able to apply what they had learned than students who attended the same lecture in person. One explanation for this finding is that students in the live lecture looked at the professor significantly more often and paid more attention to what the professor was saying than to the material being conveyed through the accompanying slides (Dey, Burn, & Gerdes, 2009). For this reason, audio podcasts with slides "might be particularly useful for disciplines that are 'equation heavy'' (p. 391).

**When students use podcasts and why**

A survey of over 29,000 undergraduate students at the University of Wisconsin-Madison reported several perceived benefits of lecture capture technology, including the opportunity to make up a missed class, the convenience of watching lectures on demand, and the potential for increased retention of class materials (Veeramani & Bradley, 2008). Additional evaluation reports and case studies indicate that when students do use podcasts, they use them for specific reasons and at specific times in a course of study.

A number of studies examine why podcasts appeal to students, sometimes more than traditional course materials. Students report that they appreciate the flexibility of accessing podcasts anywhere and anytime (Fernandez, Simo, & Sallan, 2009; Winterbottom, 2007), and they like resources that are presented in a video or audio format, since this allows for self-paced learning and multitasking.

Researchers at U-M found that students who viewed video presentations of lectures with slides tended to back up and repeat slides containing information that they had difficulty understanding (Dey, Burn, & Gerdes, 2009). In addition, students at a university in the UK who reported using podcasts more than their textbooks for reviewing indicated that podcasts are more efficient than their own notes in helping them learn (Evans, 2007). Although students may appreciate podcasts, this technology tool should not replace traditional learning resources but, instead, should serve as a complement to them (Fernandez, Simo, & Sallan, 2009).

In terms of when students use podcasts, studies show that lecture recordings (audio or video) are used mainly to prepare for exams and review course material in order to gain a better understanding of complex topics (Soong, Chan, Cheers, & Hu, 2006; Lane, 2006). Research on when students tend to access podcasts during a course of study supports this finding, showing that students usually view podcasts shortly
after a lecture has occurred and in the few days before an exam (Copley, 2007). In one study, lecture recordings were accessed within one week of when the lecture occurred almost one-third of the times they were accessed (Brotherton & Abowd, 2004). It should be noted, however, that student use of podcasts may vary across disciplines or social backgrounds. A study at U-M, for example, found that underrepresented minority students were more likely to view screencasts, and students in one engineering department accessed screencasts more than all of the other engineering majors combined (Pinder-Grover, Millunchick, Bierwert, & Shuller, 2009).

Issues to Consider Before Getting Started

Lecture capture technology offers students a new way to access organized course content. However, the potential benefits of podcasts are accompanied by unique logistical, technical, and pedagogical challenges for faculty.

Technology and support

Most lecture capture systems at U-M are managed by school/college technology support services and are automated in ways that allow faculty to use a touch screen interface to start and stop the recording of a lecture. (For information about lecture capture support and services in individual schools and colleges, see http://www.crlt.umich.edu/inst/lecturecapture.php). The recording is then processed and uploaded to a location that can be accessed by students. Editing is usually possible, but not absolutely necessary.

When an automated system is available, the skill level required to capture lectures and make them available to students is fairly minimal. However, if a faculty member teaches in a location where an automated recording system or a portable recording system is not available, she or he will need to use commercially available software applications to capture the computer screen, PowerPoint, and audio. Software applications include Camtasia, Elluminate, and Echo360. An instructor who records lectures using such software will need to gain familiarity with the selected application before starting to record classes or events.

When considering the use of lecture capture technology, faculty should also understand students' technological competencies. It is important not to assume that all students possess the same technology skills and have had equal exposure and access to technology (e.g., computers and MP3 players). Some segments of the U.S. population, such as rural or lower-income Americans, are less likely to have Internet connections in their homes or to be familiar with commonly used technologies (Zhu & Kaplan, 2011). Other researchers note that instructors should recognize that students without experience and comfort using technology may be disadvantaged when class materials must be retrieved from the Web (Lewis, Coursol, & Khan, 2001). Given the potential differences in levels of access and technological skills, instructors may want to consider administering a short survey at the beginning of the term to determine students' comfort with and access to technology required for using lecture capture (Zhu & Kaplan, 2011).

Copyright and privacy

The use of lecture capture technology raises issues of privacy and copyright (Brittain, Glowacki, Van Ittersum, & Johnson, 2006; Flanagan & Calandra, 2005; Vogele, Garlick, & The Berkman Center Clinical Program in Cyberlaw, 2006). When a lecture is recorded, synchronized with PowerPoint slides, and uploaded to the Internet, the resulting podcast has the potential to reach anyone who has a mobile device or computer. Faculty who choose to podcast lectures should be aware of this and take precautions to protect their intellectual property. Equally important is the responsibility to obtain copyright clearance for material (e.g., graphics, images, and audio/video clips) referenced or used during lectures. If the podcast will include students' questions or responses, you should ask students to sign a consent form when the podcast audience is broader than the class itself. A sample consent form is available from the CRLT website (http://www.crlt.umich.edu/inst/lecturecapture.php). If, however, the podcast is put on a secured website (e.g., CTools) for only that class to view, no release is required. In general, the technology to capture and share lectures may run ahead of many institutions' policies and faculty understanding of the legal issues involved (Kim, 2009). It is always a good idea to consult with U-M's Office of the Vice President and General Counsel if you have questions concerning copyright.

Changing expectations and practices

The availability of lectures in podcast form may change students' learning behaviours as well as their expectations about the use of class time. Since students take fewer or summary style notes in courses using lecture capture (Brotherton & Abowd, 2004), they have more time to process course material on the spot, which may lead them to ask more questions and want more interactivity during lecture. Students may, therefore, expect the format of lectures to shift from a process of information transfer to a more student-
centred and interactive format. As a result, instructors may need to devote more time to in-class activities that enable students to practice skills, think critically about material, and apply what they’ve heard in lecture to grappling with real-world problems (McKenzie, 2008).

Lecture capture technology also expands the range of possible presentation options. For example, instructors could record presentations made by guest lecturers so that students in future years can benefit from experts who may not be available each time the course is offered. Podcasts can also make a significant contribution to online courses, so that students have access to lectures even though they are not on campus. Moreover, when lectures are posted in open platforms, such as iTunes U or YouTube EDU, their viewership may include many more students than those enrolled for the class (Young, 2008). In hybrid courses that meet only occasionally in person, instructors could ask students to watch lectures in advance, and the limited resource of class time could be used for questions and applied learning, such as case studies, problem-based learning, or group projects. The integration of lecture capture technology into teaching may thus create opportunities for developing a range of teaching innovations and for investigating the impact of these approaches on student learning (i.e., the scholarship of teaching and learning).

Recommendations for Using Lecture Capture Effectively

Getting started with lecture capture can be quite simple, especially when faculty have access to the automated systems described earlier. Despite this potential ease of use, it is important for instructors to think carefully about the content and style of their lectures and any possible implications the technology may have for student learning. Below is a list of recommendations worth considering before adopting lecture capture technology for your classes.

1. Before you start, make sure that:
   - you have clear goals for podcasting lectures and the time to prepare them consistently throughout the entire semester;
   - you have adequate and continuing technology support and podcast hosting if you don't teach in a room with an automated lecture capture system/service;
   - you attend to the relevant copyright policies regarding podcasts (e.g., acquiring copyright clearance for materials and release forms from students if their questions and answers will be recorded and the podcasts will be shared beyond the current semester's classroom).

2. Once you decide to podcast, make time to experiment with recording quality. Poor sound quality may prevent students from using the resource.

3. Make podcasts available as soon as possible after a lecture, since most students download podcasts within a few days of a given lecture, as well as right before an exam.

4. If you require students to listen to podcasts before lecture, provide them with content-related questions or other learning activities.

5. When podcasts are assigned in advance of a class meeting, use class time for interactive discussion, student-centered learning activities, or demonstrations to complement and build on podcast content.

6. Before making podcasts available, be sure that all of your students have access to and are comfortable using devices to download and play podcasts.

7. When appropriate, make reference to podcasts during lectures or when responding to students' questions so that students will be more likely to use them.

8. Make accessing and using podcasts easy and fast by providing detailed instructions for downloading and ensuring that the file format is compatible with common media-playing devices (e.g., MP3 players and iPods).

9. Provide students with a clear explanation of instructional goals and technical requirements if podcasts are used for student projects or assignments.

10. Draft an evaluation plan for your lecture capture project to investigate what did and didn't work for you and your students.
Additional Resources

Visit the CRLT website (http://www.crlt.umich.edu/inst/lecturecapture.php) for resources to support the use of lecture capture for teaching. Information is available on the following topics:
- lecture capture technology available in U-M schools and colleges
- examples of U-M faculty using lecture capture technology
- checklist of technical practices before, during, and after recording lectures
- articles on podcasting as an instructional tool for the college classroom

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