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Using web-based lecture technologies – advice from students

Margot McNeill

Macquarie University, Sydney, Australia
margot.mcneill@mq.edu.au

Karen Woo

Macquarie University, Sydney, Australia
karen.woo@mq.edu.au

Maree Gosper

Macquarie University, Sydney, Australia
maree.gosper@mq.edu.au

Rob Phillips

Murdoch University, Perth, Australia
r.phillips@murdoch.edu.au

Greg Preston

University of Newcastle, Newcastle, Australia
greg.preston@newcastle.edu.au

David Green

Flinders University, Adelaide, Australia
david.green@flinders.edu.au

Web-based lecture technologies (WBLT) have been introduced in many Australian and overseas universities to offer students access to lecture recordings, twenty four hours per day, seven days per week. These technologies have been well received by many students who appreciate them as study tools offering flexibility and convenience.

The findings of a recent survey of over 800 students in four Australian universities suggest that, rather than questioning whether or not to introduce these technologies, the focus of academics should be on how to make the best use of them. This paper provides an overview of some of the findings from this survey and collates students' qualitative responses into advice on how to use WBLT effectively in terms of the structure and content of the lecture; the lecturing process and managing the technical aspects of WBLT.

Keywords: Web-based lecture technologies, Student perspective, Lecturing

Introduction

In recent years web-based lecture technologies have been used by higher education institutions to increase the availability of lectures to off-campus students. The introduction of these technologies has raised debate on whether they reinforce a teacher-centred model of higher education which is contradictory to constructivist learning approaches (Phillips, 2005; Sheely, 2006). Anecdotally, some teachers have expressed concern about the relationship

between the use of these technologies and the quality of their students' learning particularly when there is a reduction in lecture attendance.

The Carrick-funded project 'The impact of web-based lecture technologies on current and future practice in learning and teaching' set out to investigate the issues in using web-based lecturing technologies. In the first stage of the project, more than 800 students from across four Australian Universities have been surveyed to uncover students' perspectives on how these technologies affect their learning. Initial results show that students not only report positive experiences of these technologies, they also perceive they are beneficial to their learning.

Given the increasing use of these technologies and the positive endorsement of them by students it is arguable that the question should shift from whether or not to adopt these technologies, to "how can we make the best use of these technologies?" This paper reviews the findings of the research project and proposes advice for lecturers in integrating lecturing and WBLT to optimise the students' overall learning experience.

Lecturing in Universities

Lecturing is the most common teaching method in higher education (Phillips, 2005; Sheely, 2006). Brown and Atkins (1988) pointed out that lectures have three main, interrelated purposes: 'coverage, understanding, and motivation' (1988, p.7). Bligh (1972) agreed that lectures can be used 'to teach information, including a framework of a subject' (p. 223). Whilst questioning the contention that all lectures delivered by the majority of university academics are either motivational or encouraging of higher order thinking, Biggs (2003) also conceded that they 'are as effective as other methods for teaching information' (p. 100), and are particularly effective in 'exposing students to the most recent developments in the field, and to the ongoing workings of a scholarly mind' (2003, p. 100).

In the past, some universities have offered tape recordings of lectures to distance students and also to on-campus students to enable them to catch up on missed lectures or revisit the content for review purposes. More recently, web-based lecture technologies are gaining popularity amongst higher education institutions to provide a convenient means of delivering lecture recordings to students for anytime, anywhere access.

What are web-based lecture technologies?

Web-based lecture technologies (WBLT) are distributed recording systems designed to digitally capture face-to-face lectures for web delivery. These recordings are converted into streaming media formats available for access twenty four hours a day, seven days a week. The appeal for higher education institutions is that these WBLT systems enable expansion of delivery options into remote or international markets and also offer more flexibility to students (Fardon, 2003).

A popular system in Australia is Lectopia (previously known as iLecture), which was developed at the University of Western Australia. With 14 Australian universities being current licensees (Lectopia, 2007), the technology is poised to have a substantial impact on the delivery of higher education in Australia.

Other universities have adopted different approaches to delivering Web-based lectures. For example, Flinders University makes use of a combination of streaming video/audio and media files to deliver lecture materials across the University.

It is not unusual for universities to have invested substantial resources in developing the campus-wide infrastructure to support these technologies, without a full understanding of the implications of their use for teaching and learning. There is now emerging evidence that WBLT have in some cases been met with negative attitudes by academic staff. For example, Donnan, Kiley and McCormack (2004) reported that the introduction of WBLT to the University of Canberra was met with resistance by the academic staff because it was seen as an innovation led by technology rather than pedagogy. Academics surveyed in this research have attributed WBLT with contributing to decreasing attendance in lectures.

On the other hand, anecdotal evidence from some academic staff indicates that the use of WBLT does not necessarily result in low attendance (Alexander, 2006; McElroy & Blount, 2006). Where low attendance is a problem, research has shown that the availability of WBLT is only a minor factor in contributing to students' low attendance (Maag, 2006; Massingham & Herrington, 2006). Low attendance may be due to a variety of "valid" reasons, ranging from work and family commitments to time-table clashes.

How do students use WBLT?

Despite the concerns of teachers, students have reported positive feedback on the use of WBLT (Donnan et al., 2004; Goldberg & McKhann, 2000; Maag, 2006; McElroy & Blount, 2006; Shannon, 2006; Signor, 2003; Soong, Chan, Cheers, & Hu, 2006; Tynan & Colbran, 2006). Students typically report that they used WBLT to check over notes, to review difficult concepts, to revise for exams and make-up for missed lectures. In short, students often used WBLT as a study tool to supplement face-to-face lectures rather than replace them.

Given the prevalence of lectures in higher education and the growing use of WBLT by students, it is timely to refocus our attention away from whether or not to adopt these technologies to exploring how to use these technologies to deliver a quality learning experience to students.

The Carrick-funded project - researching the impact of WBLTs on teaching and learning

The Carrick-funded project 'The impact of web-based lecture technologies on current and future practice in learning and teaching' set out to investigate the issues in using web-based lecturing technologies. Additional information about the project is available at the project website: <http://www.cpd.mq.edu.au/teaching/wblt/overview.htm>.

The first stage of the project was a student survey, which gathered a wide range of student perspectives on how the use of WBLT impacted on their learning experiences and the interrelationship between lectures and WBLT. Examining what students like about lectures and how they use WBLT provided clues on how to make both more effective in the learning process.

The survey collected data on four specific areas in relation to the students and their use of WBLT. The first part of the survey asked students about their experience of WBLT in the

context of a specific subject. In the second part, students were given the Revised Two-factor Study Process Questionnaire (Biggs, 2001). The third part of the questionnaire asked students about their overall experience of WBLT in the university. In the final part, students' demographic information was collected. More details about the survey instrument and how it was developed are available at the project website.

Due to space limitations, this paper cannot deal with all the findings of the survey and focusses on presenting specific advice for lecturers based primarily on the data collected in the open-ended comments in this survey. Other results of the study will be released through a series of publications (see website for details).

Participants

Students from all four universities enrolled in subjects that made use of the technologies were invited to participate. Stratified sampling was used to select a range of subjects making use of web-based lecture technologies. The sample included representation from various:

- disciplines
- class sizes (less than 50 students, 50-200 and more than 200 students)
- enrolment mode (distance and internal students)
- level (undergraduate and postgraduate)

In total, 13278 students were invited across the four universities and 815 responded. The exact response rate of the survey cannot be determined as, although all students enrolled in those subjects were offered the technology, it is impossible to know the exact number of students in those units who actually used WBLT. Nonetheless, the sample size was large enough for statistically valid conclusions to be made.

Overview of the findings

Respondents from across all four universities liked WBLT and found it helped them to learn. Students appreciate WBLT as providing flexibility and additional study tools for exam revision and note taking, although face-to-face lectures are also seen as valuable. Seventy-six percent (76%) reported they had positive experience almost always or frequently. When asked if they thought that using WBLT makes it easier to learn, 79.9% of respondents agreed that it had in either a significant or a moderate way; 13.4% were not sure if there was any change and only 6.7% felt it didn't help or was detrimental.

When asked if they thought using WBLT helped them achieve better results, 66.7% of respondents agreed that it had, in either a significant or a moderate way; 23.3% were not sure if there was any change and 9.9% felt it didn't help or was detrimental.

In helping to understand these positive perceptions and to assist in developing guidelines for lecturers, we attempted to unpack why and how students use WBLT.

Why students used WBLT instead of face to face?

The survey asked participants who did not attend lectures regularly why they used WBLT instead of going to face-to-face lectures. The three most popular responses were:

1. I was not able to attend (mean=1.95; n=384)
2. I could learn from WBLT as well as I can from face-to-face delivery (mean=2.18; n=331)
3. The lecture was the only class I had on campus on that day (mean=2.30; n=298)

The first reason - *I was not able to attend*, can, in part, be explained by timetabling issues and a range of lifestyle issues that have been identified in other studies (Massingham and Herrington, 2006) and were reiterated in the open-ended comments.

Attending face-to-face lectures

The survey also asked students who regularly attended lectures their reasons for doing so. The three most popular reasons were:

1. I found the visual aids useful (mean=1.79; n=516)
2. I found live lectures motivating (mean=2.17; n=518)
3. The presence of the lecturer added value (mean=2.18; n=519)

We can surmise that lectures are important to many students' learning and that if useful visual aids are provided and a stimulating and motivating environment is created, students will choose to come to lectures if possible. This corresponds with McElroy and Blount's (2006) experience that attendance remained relatively high and constant throughout the semester despite the availability of WBLT.

How students use WBLT

The learning strategies adopted by students in using WBLT was another aspect investigated. Respondents were asked to indicate their agreement with seven strategies. These strategies and responses are shown in Table 1 below, ranked in decreasing order of agreement.

Table 1: I used iLecture in this unit to support my learning in the following ways (5 point likert scale: 1=strongly agree; 5=strongly disagree)

Item	Mean	n
To revise for exams	2.03	717
To pick up on things I missed in class	2.04	677
To revisit complex material, ideas and concepts	2.07	727
To work through the material at my own pace	2.08	729
To take comprehensive notes	2.33	731
To pick up on announcements and exam hints	2.38	712
To revisit the material because the lecturer did not speak clearly	3.67	557
To revisit the material because English is not my first language	3.93	557

Most students participating in this survey appreciated WBLT as a study tool. Whether attending the face-to-face sessions or not, the recordings provided opportunities to revise for exams and review materials and announcements made in the lecture.

Advice from students

An item of particular relevance to this paper was the open-ended question: *If you were to give advice to a lecturer on using WBLT effectively, what would it be?*

This question was analysed using NVivo and the coding themes which emerged from the data were:

1. Being conscious of listeners (use of visuals)
2. Dealing with unrecordable sections (films or having breaks)
3. Lecturer's style
4. Reliable access to WBLT
5. Sound quality
6. Student participation in lectures
7. Others

These are discussed in more detail below.

1. Being conscious of listeners when using visuals

Student responses reiterate the findings in the quantitative data that visual aids offered by lectures are important to students. Students urged that lecturers would provide visuals and notes whenever possible. Even when notes are provided, it is important that the lecturers indicate which visuals they are using and what they are pointing to as these listeners cannot see their gestures. A recurrent request is that lecturers indicate when they change slides, or try to synchronise PowerPoint slides and visuals with the audio recordings.

It should be noted that, at one of the universities where the synchronisation feature is enabled, students have reported technical errors where slides and audio were not synchronised with each other and made it even more difficult for students to follow. It is advisable that those trialling synchronisation provide separate MS PowerPoint files as a backup for students whilst the synchronisation technology is yet to be perfected.

Some students specifically asked that the supplementary visual materials be provided to them before the lecture or along with the recording so they can refer to them whilst listening.

When visuals are not available to the listeners, some comments highlighted the need for lecturers to describe in detail what they are showing to the class. One piece of advice was to “describe what you are drawing and pretend you are talking to someone on the phone”.

In general, students look forward to video-recorded lectures where visuals (including whiteboard, projections, and notes) used in the lectures can be captured. One student mentioned that having the lecturer recorded along with the notes is important for motivational reasons:

Try to make sure that slides etc can be seen on the video as well as the lecturer talking - but don't go back to recording the slides with no lecturer visible as it makes it really hard to stay interested.

However, it is not clear whether the technology is robust enough for widespread adoption at this stage. At one of the universities, where video recordings are available, some students expressed hesitations with using video recordings because of bandwidth and video quality:

I mainly listen to the audio recordings because I find the video recordings don't always work well even on my daughter's super fast computer. The lecturers could make the recordings downloadable so that students can either copy them to their hard drive or write them to DVD or CD.

Voice recording is best - video files are often too big. If video needs to be able to stream at a high enough quality at home so that the visual notes are readable.

2. Dealing with unrecordable sections

Mute is often used when there is a break in the lecture, and when copyright materials (e.g. a film) are being shown to the class which cannot be legally recorded. Apparently some lecturers have also muted the recordings during student discussions. On some of the systems, an automated voice message is played when the mute is turned on, which repeatedly tells the student that copyright material is being played.

In general, students do not seem to like muting, because “the annoying message is a real pain”. They also find the need to fast forward to the point when the lecturer begins speaking again inconvenient. Instead of muting, some students suggested that the recording be turned off during breaks and film playing.

However, students expressed that they would like to hear the student discussion and the recording should not be muted during those times.

3. Lecturer's Style

Many students took the opportunity to give a range of advice on lecturing in general, whether in WBLT contexts or not. In particular, a few students have indicated that WBLT users are less tolerant than face-to-face students of monotones and jokes. There were many comments relating to the use of clear speech, varied tone for delivery and structured content. Another issue raised by the students was better time control by the lecturer. Students have strong views on lecturers starting and finishing the lecture on time so the whole lecture is recorded. It is particularly frustrating if important information is given in the beginning and end of a lecture and is not always recorded.

Being more aware of the time. more than 75% of my lectures had the beginning and or end cut out because the lecturer started earlier than iltecture started recording or the lecturer continued to talk after iltecture stopped recording. VERY frustrating as an external student.

Make sure you are aware of the time lots of lectures have the last 5 /10 minutes missing which are often the most important of a lecture.

4. Reliable access to WBLT

With the exception of one university, which has a centralised automatic recording system, students seemed to be quite concerned with gaining reliable, consistent access to WBLT. Many highlighted the importance of the lecturer's proficiency with the technology, which directly affects the reliability of their access to the recordings. Some included “remember to record” in their advice and others urged consistent use week by week, or for WBLT to be introduced to more subjects. Prompt access to recordings is posed as very important for students to stay up to date with the course. Some suggested that if a lecture is cancelled or if it is not recorded properly, the lecturer can upload recordings from previous semesters as back-up for students.

5. Sound quality

The sound quality of WBLT seems to be an issue. Many students advised that lecturers should speak clearly and slowly. They also asked lecturers to be careful in putting on the microphone to ensure that they are recorded clearly. Some students reported poorer quality sound when

lecturers move around. It is notable that only one student reported background noise as a problem.

6. Student participation in lectures

Most WBLT listeners seem to be keen on listening to the discussion amongst the attending students. Many students advised lecturers to repeat students' questions or comments as the microphone does not pick up the voices from the floor. Others asked that the technology be improved to capture those discussions. Some also asked that the lecturer makes an effort to involve the external students who are listening to the recordings. Obviously, some students are not satisfied with lectures being a one-way transmission format.

7. Others

Other issues raised by students include the need for lecturers to be technically proficient enough to be able to support students technically; to keep up the communication with students; include announcements in the recordings; enable downloads (only in one university where download is not enabled); and not to discriminate against students who cannot attend lectures.

Integrating WBLT into Lecturing Practice

The findings from our survey suggest that students appreciate both the face-to-face experience of lectures and the flexibility offered by WBLT. As such, there may be opportunities to incorporate WBLT into the holistic student experience rather than treating it as an add-on. For many students who study off campus, WBLT offers the only access to lecture materials and is seen as a valuable component in distance education. Others may attend face-to-face sessions and use WBLT to revise complex materials or in preparation for exams.

We have summarised our findings into advice from students on effective use of WBLT for their learning in Figure 1. There are 3 areas of focus; *the structure and content of the lecture*; *the lecturing process* and *managing the technical aspects of WBLT*. These were developed from the students' advice to lecturers on using WBLT, their reasons for attending face-to-face lectures and the uses they make of the technologies. Nonetheless, many suggestions relate to basic requirements for good lecturing, whether in face-to-face or web-based contexts.

Advice based on what students say about using WBLT

Many students rely on WBLT for their study materials when they cannot attend face-to-face lectures. Some use the technology to revisit materials after attending face-to-face lectures. This list of suggestions is based on the advice from students to lecturers on using WBLT more effectively.

1. The structure and content of the lecture

- Provide an outline of the content to be covered and major topics to be addressed
- Summarise key points
- Plan for the time allowed to avoid important points being ‘cut-off’ when the recording finishes – start and end on time
- Capture attending students' questions and repeat their responses
- Include announcements

2. The lecturing process

- Explain references to visuals and ensure they are available for listeners
- Provide guidance through MS PowerPoint slides
- Speak clearly and vary your tone to convey your enthusiasm for the topics
- Describe what the attendees are doing
- Provide timely access to supplementary materials for students to use while listening
- Avoid long pauses, if possible
- Plan to use the microphone proficiently, such as minimising movement if it interferes with the sound quality

3. Managing the technical aspects of WBLT

- Synchronise visual and audio if possible and provide the PowerPoint file for students as backup
- Practise using the technology before the lecture and use it consistently
- Use a visualiser instead of OHP or Whiteboard in order for the image/ notes to be captured and made available to students using WBLT only
- Plan for managing changes in activity, such as discussions or playing copyrighted materials. Provide some commentary for listeners.
- Provide prompt access to lecture recordings to students
- Upload recordings from previous semesters as backups
- Plan to offer a minimum of technical support to your students (such as online FAQs) or refer them to the right channel for help

Figure 1: Advice based on what students say about using WBLT

In the next stages of the project staff survey data, vignettes and case studies will be examined. These will inform the development of a more comprehensive set of guidelines which will take into account staff perspectives and curriculum contexts.

Conclusion

It seems that while many teaching academics are still unsure about their benefits, most students responding to our survey indicated a positive experience in using WBLT. We can surmise that students like to attend lectures and use WBLT as a back up when they cannot attend or to revise for exams or revisit complex materials.

Given these positive experiences, lessons can be learned about how to make the best use of these technologies. Indeed many of the suggestions offered by students could be used to improve lecturing in general, not just those delivered using WBLT: lectures, whether online or offline, can be structured to meet time limitations and provide visual support for learning; lecturers can be conscious of the listeners and use clear speech; and technology can be used to maximum effect to enhance delivery.

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