

DELIVERY OF E-LECTURES

Derek Lavelle

School of the Built Environment

Northumbria University

Newcastle upon Tyne, NE1 8ST.

Email: derek.lavelle@unn.ac.uk

Abstract

The paper reports on the latest progress of an ongoing project entitled “E-Lectures”, specifically on the delivery of recorded lectures via streaming video. A case study is described, covering the recording and publishing of two lectures for use by a cohort of 90 undergraduates. Student feedback allowed for an evaluation of the work with regard to access, preferences and benefits of using the resources.

Keywords: electronic lectures, evaluation, mp3, video streaming.

1. Background

This paper reports on the progress of an ongoing project entitled “E-Lectures”. Lavelle (2004) described how the lectures from a whole MSc programme and a selection of undergraduate modules had been recorded and published to the student body as multimedia presentations, incorporating video. The evaluation of this work Lavelle (2005) was very positive, with a mitigation of the isolation experienced by distance learning students and opportunities for paced revision for campus based students.

The method of distribution for these materials was via CD, which was the most efficient and certain method of ensuring that the students could access the materials. This necessitated a time lag between recording, production and distribution, as well as a considerable amount of time and effort in the actual production of the CD’s. Therefore the method of delivery was identified as one of the areas in which the service could be improved for both staff and student.

2. Video Streaming

A potential method for improving the delivery of the e-lectures is web-based streaming video. The technology has extended the use of the web as an educational medium in recent times, enabling easier and more responsive on-demand access to multimedia resources (Thornhill et al, 2002). The Joint Information Systems Committee (JISC) has defined video streaming as:

“The transmission of moving images over the internet in compressed form as a continuous stream. A recipient equipped with suitable ‘player’ software can decompress and view the images in real time - as distinct from the alternative of waiting while a video file is downloaded and viewing subsequently. (JISC, 2006)

Therefore, with streaming, the video file is not available for download but remains on the server. The initial part of the video file is copied to the buffer of the users’ computer and starts to play while the server regulates the delivery of the streaming

file, thus smoothing out the presentation of the video on the users' computer. This still requires the user to have an adequate (broadband) internet connection to allow the interaction between the server and the client to take place satisfactorily. The advantages of streaming include a smooth delivery and viewing of the video, the removal of long download times and the retention of ownership of the source file on the server.

The author's employers, Northumbria University, have made a streaming server available in academic year 2005/06, providing a platform for testing the viability for using the technology in conjunction with the ongoing e-lectures project.

3. Recording and Production of Lectures

Two lectures given by visiting speakers to an undergraduate cohort of students were chosen for recording and publishing as streamed videos. The lectures were both in support of an assessed piece of project work; therefore there was a high likelihood of use by the students. The lectures were given in normal timetabled classes, so the students were not dependent in the first instance on the recordings, which would be available for revision as well as for those unable to attend the classes.

The lectures were recorded, with the full permission of those involved, with a single digital video camera. A radio microphone was unavailable on these occasions, but by positioning the camera near to the front of the room, the in-built camera microphone was sufficient to pick up a satisfactory level of audio. The lectures were captured to computer in compressed WMV format, which is the required format for the available streaming server. The files were uploaded to the streaming server and access was limited to the particular student cohort via Blackboard, the university's e-learning portal. From the student's point of view, they are very familiar with Blackboard and a link to the video files from there provided easy and secure access.

The lecturer carried out all of the recording and production without further technical assistance. With the necessary technology in place, the procedures were quite easy for an amateur video technician to carry out and the end product is quite satisfactory for the intended purpose. However this was quite a small scale project. For a larger

scale project, the time and resource requirement means that a team effort between academic and technical staff is much more efficient, as proved to be the case in the earlier stages of the overall e-lectures project, which was much wider in scope.

4. Student Access

At present there is very little availability on campus of sound-enabled PC's for students. The expectation was that the students would access the videos off campus, thus creating a test of how easily the students could access online multimedia resources via their own Internet connections. A fallback option was for the tutor to provide the files on CD, but in the event only two out of ninety students requested this. (As an aside, there is a debate as to the viability of providing students with technology that could access online multimedia resources as part of the standard course provision.) A 1mb broadband connection was required to be able to successfully view the streamed videos without interruption (tests on a 512kb connection showed this to be the case). Knowing that some students would not have this facility immediately available, mp3 audio files of the lectures were created (ripped from the video) and made available for download. The expectation was that all students with a reasonable Internet connection would be able to download the mp3 files and play them locally on a computer, mp3 player or similar. Ability to access the online resources in a satisfactory manner is just as important as their content, as discovered by Bracher et al (2005).

The tutor did not consider it a particular disadvantage in this case if the streamed videos could not be accessed, partly because the recordings were for revision, the lectures having been given on campus already, and partly because one of the lectures was given without any visual aids or slides in support. The lectures consisted of industry contacts providing students with their insights and experiences of working on a live construction project and for one lecture the presenters did not consider there was a need for visual aids. The slides for the other lecture were available as a file for download if required.

5. Student Feedback

Students were set a piece of coursework based on the content of the lectures. The streamed video and mp3 audio files were available for revision or for first access to the lectures if a student had not attended. Once the coursework was complete, the tutor requested anonymous feedback from the students with regard to their use of the multimedia resources, using the questions indicated below. 56 students responded out of a possible 90 (although it was unlikely that all 90 would have used the recordings).

Q1. Which of the files did you use?

Streamed video MP3 audio download Both

Q2..Were you able to access and use the files from Blackboard easily or not?

Easily With some difficulty Not at all

An equal number (21) used either the streaming video or the mp3 files and 14 students used both resources. 47 of the students reported that they accessed the resources easily, with little or no difficulty with the technology. 9 reported some difficulty with accessing the resources, mostly with regard to their ability to access the streamed video. A small number of these gave up trying to access the video and reverted to using the mp3 files instead.

Q3. What technology did you use to watch the video / listen to the MP3's?

Home PC Other PC MP3 player Other
(please specify)

The vast majority of the students used their home PC or laptop to access the resources. These responses show that students are increasingly able to access online multimedia resources that require a high bandwidth, such as video streaming, with home based broadband access. This compares to the experiences of only a few years ago (e.g. Zenios, 2002) where ease of access for students could only be guaranteed via a dedicated specialist computer lab.

Only 3 of the students used a portable mp3 player, which may be a reflection on the use of such devices primarily as a means of entertainment at present. The growth of podcasting, which entails the use of such technology, into areas beyond pure entertainment, may have an impact on how such technology is used in the future. An experiment in the next academic year, as part of the overall e-lectures project, will test the feasibility of this idea. There are a growing number of reports of lecturers using an online electronic format to deliver and support their teaching. A recent report outlines one lecturer's use of podcasting to replace traditional lectures (BBC, 2006). However there is a need to take students views into account when considering such changes in delivery method (see below) and not assume that changes are desirable just because the technology is available.

Q4. Would you prefer video or is MP3 audio sufficient?

MP3 audio sufficient

Would prefer video

There was a marked preference for the video version of the resources (35 students against 21 stating that the mp3 files were sufficient). Of the 21 students who used only the streamed video, only 1 of them considered that the mp3 audio would have been sufficient, with 20 preferring the video. Of the 21 students who used only the mp3 audio, 14 considered that the mp3 was sufficient, with 7 students that would have preferred the video (4 of these were amongst those who had initial difficulties with accessing the video). Of the 14 students who used both resources, 8 stated a preference for the video, while 7 stated that the mp3 files were sufficient. The questions were stated in this way, bearing in mind the extra effort and cost required to capture, publish and distribute video over and above audio files. Whilst there is a preference amongst the students for the video, which informs the university in considering whether to invest in supporting the resource, there is clearly a demand for both types of resource at present, based on choice and technological capability.

Q5. Generally, I would like more use of similar recordings of classes

Yes No Don't know

Q6. Would you like more recorded classes and less face-to-face classes?

Less face-to-face classes, Same face-to-face classes Don't know
and more recordings with recordings as back up

The response of the students to the overall use of the recorded lectures was unequivocal. 47 out of 56 students stated that they would like to see more use of similar recordings, yet 51 out of 56 stated that this should not be at the expense of face-to-face classes. Therefore only a very few students preferred the idea of e-lectures replacing traditional lectures. Most wished to see traditional classes retained, with recordings used as a back-up. Once again this kind of evidence is important if the possibility of changing the delivery of modules in favour of less face-to-face classes is being considered.

Q7. Students were also asked to identify the benefits they found (if any) in using the online multimedia resources. The value of interaction has previously been highlighted by those working in this field (Thornhill et al, 2002), particularly with regard to:

- Access: availability of the material asynchronously and independent of location;
- Choice: a library of materials to view on-demand; and
- Control: ability to start, stop, pause, skip and review material.

These aspects of study were identified by several of the students as being beneficial. Some typical comments are listed below:

“Able to listen at my own pace and listen again to anything which I didn't understand or that I missed previously.”

“Listening again was useful as during the lecture you can both miss things and write down incorrect information.”

“It was easier to make notes by listening to short extracts of lectures and being able to study the lecture in ‘bit’ parts.”

“Able to go back over bits that I was unsure of.”

“Controlling the pace of it – found it useful to be able to pause it whenever you wanted to make notes.”

“Can listen again to what someone has actually said rather than notes on a slide.”

6. Summary

The paper has reported on the latest progress of an ongoing project entitled “E-Lectures”, specifically on the delivery of recorded lectures via streaming video, with a back-up provision of mp3 audio files. Compared with the earlier method of delivery by CD, the streaming service provides efficiencies for staff and the benefit of more immediate access for students. Student feedback allowed for an evaluation of the work with regard to access and preferences. Access was successful, indicating how students are increasingly able to access online multimedia resources that require a high bandwidth. Given a choice between video and mp3 audio versions of the lectures, the majority of students preferred the video resource, although a significant number considered that the mp3 audio files would be sufficient for the purpose. The students voted overwhelmingly for further use of similar recordings but, interestingly, not at the expense of face-to-face classes. Benefits cited by the students in using the resources included the ability to access lectures asynchronously and in particular the ability to control aspects of pacing, pausing and reviewing material.

The earlier CD-based products of the e-lectures project incorporated the integration of the video and PowerPoint slides, which also provided a navigation menu for a lecture. This feature could not be reproduced with the streaming technology available and will be the subject of further investigation and trialling as the technology develops. Also, the next stage of development will include trials of podcasting, incorporating the use of ipods or similar devices and subscription services to e-lectures.

7. References

- BBC (2006) "Podcast lectures for uni students". Available at: http://news.bbc.co.uk/1/hi/england/west_yorkshire/5013194.stm (accessed 25 May 2006)
- Bracher M., Collier R., Ottewill R. and Shephard K. (2005) Accessing and engaging with video streams for educational purposes: experiences, issues and concerns, *ALT-J, Research in Learning Technology* Vol. 13, No. 2, June 2005, pp. 139–150
- JISC (2006) Technologies V, available at: http://www.jisc.ac.uk/index.cfm?name=techwatch_resources_specific_v (accessed 25 May 2006)
- Lavelle D. (2004) "E-Lectures", RICS National Tutor conference, Brighton June 2004.
- Lavelle D. (2005) "E-Lectures", BEECON conference, London September 2005.
- Thornhill S., Asensio M., Young C., (2002), Video Streaming: a guide for educational development, The JISC Click and Go Video Project. Available at: <http://www.clickandgvideo.ac.uk> (accessed 25 May 2006)
- Zenios, M.K. (March 2002), The Use of Video Streaming in Higher Education: a report on the evaluation of the Click and Go Video case studies and the educational benefits for learners. Available at: <http://www.clickandgvideo.ac.uk> (accessed 25 May 2006)