

Guerrilla video: helping teachers to reflect and learners to rewind

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Learners report preference ratings of up to 82%² for viewing the results of lecture capture systems. Obstacles to the uptake of such systems have included cost, return on investment, lecturer time commitments, IT network bandwidth constraints, demands placed on student time outside of the classroom, and concerns about equality of access and decreased attendance.

The National Academy for the Integration of Research and Teaching and Learning (NAIRTL) noticed the disparity between well-equipped facilities available in the private sector and in third level institutions abroad, compared with the scattering of lecture capture systems installed in Ireland, despite severe student pressure on lecture room space³.

In the context of the downturn and budgetary battlefields, a decision was made to pursue a “guerrilla war” approach: an inexpensive, portable system of lecture capture technology with a low in-class footprint. This system can be moved from room to room, and operated by one person with basic ICT skills. It is intended to temporarily provide a facility for experimentation and discovery of best practice.

Conflicting arguments about lecture capture were taken into account such as:

- It can provide opportunities for learners to try an “erase and rewind” approach to complex or confusing material^{4,5,6,7}
- Learners may be enabled to access educational opportunities they are unable to attend in person^{8,9,10}
- It can provide an effective tool for revision of material¹¹.
- It can supply teachers with opportunities to reflect on their practice^{12,13}
- Some capture systems are unsuited to interactive and mobile styles of teaching¹⁴
- There are fears that the use of lecture capture will reduce learner attendance in person^{15,16,17,18}

The equipment selected provides rapid production for same-day web distribution, while retaining good quality video content, for five different scenarios:

- Desk-based recording of lectures or other information using a webcam
- Non-intrusive hand-held filming of workshops and forums using the camera and laptop
- Portable system capable of 10-minute setup in standard classrooms where background noise may be a problem, using the camera tripod and a lapel microphone
- Recording of formal lecture-room presentations by visiting lecturers, including use of radio mics and lighting.

- Full conference and event recording, including light and sound equipment for a discussion panel as well as the speaker, PA, and backdrop, which can be installed in any venue, while fitting into a small car van for transportation.

Equipment specification¹⁹

- Sony handheld video camera with DVD tape and USB output; also webcam
- Sony cabled lapel microphone
- Tripod
- Laptop with Camtasia 5 software (Dell D630, 3 Gb RAM, Windows XP)
- 2 x USB slide advancers
- 4 x 500w fresnel (not profile) theatre lamps with limited focusing capabilities allowing sidelighting positions for better facial modelling
- 6-way lighting control board
- 4-way lighting dimmer rack
- Flightcase on wheels
- 2 x lighting stands
- Cable trips and control cables for lighting equipment
- Sound rack with power supply, mixer and amp built into travelling case
- Sound earth noise cancellation box
- 4 x wireless mics (2 handheld with table stands, 2 lapel)
- 2 x portable speakers with stands
- Sound control cables and power cables plus long network cable for Internet-enabled presentations.
- Pull-up stand and portable 3m-wide display stand/backdrop in wheeled case
- Transport box for sound equipment and wheeled “dolly” for sound rack
- Consumables: AA mic batteries, DVD tapes, PVC tape and Gaffer tape, 2m length of theatrical black tat for masking items unwanted in shot. Ladder.

The total cost, excluding the display stand, was just under €7000. It would have been preferable to purchase a high definition (HD) format system but at the time of purchase the Camtasia software could not utilize HD recordings. The equipment is easily upgradable to HD by purchase of a new camera.

Time and organizational aspects

In order to maintain “popular mass support”, there is little extra burden on the lecturer apart from the need to sign a video release form, allowing distribution of the recording²⁰. Because it is necessary to copy the PowerPoint slides onto two laptops, (one controlling the lecture room projector, and one recording the video), extra preparation time takes two to five minutes.

When the lights and radio microphones are used for conferences or formal lectures, light focus, radio microphones and sound levels must be checked, which requires that speakers and those introducing the session allow 10-15 minutes of their time, particularly if they plan to use an Internet connection or link to content held on disk which may need to be copied to the recording laptop.

For data protection purposes, a notice is placed on the room door to warn the audience that the lecture is being filmed, and this information is also included on the header of the sign-in sheet for the lecture. Audience members are not required to sign individual video release forms.

Tricks and tips

Camtasia works as an add-in to PowerPoint. Once the PowerPoint presentation is loaded, the slide show setup needs to be set to 22 kHz, 16 bit mono sound and 640 x 480 resolution at 15 frames per second. The laptop screen display settings may need tweaking, as the final appearance of the slides when recorded may be at a different aspect ratio.

It can be difficult to guess when a lecture is actually going to start, so begin recording early and edit out unnecessary preamble later. As the lecturer goes through their slides, advance the slides on the recording laptop and follow any Internet or DVD links. The operator also monitors sound levels, alters the camera focus if the speaker is moving around the room, and changes the backup tape as needed (90 min intervals). A novice with ECDL-level IT skills and aptitude can learn the system in about two hours. Teaching full lights and sound requires about two days. For simple webcam narration of PowerPoint slides, no operator is needed.

The file produced is about 100 Mb in size per hour of recording. Camtasia can perform basic edits and produce formats ranging from screencasts to iPod mp3 for iTunes-U to SCORM VLE resources. Additional purchases were made of a 500 Gb disk and DVDs for backup, and a \$130 subscription allowing 25Gb of hosting on the Techsmith screencast.com server for one year.

Recordings are edited into segments of less than 15 minutes. Postproduction takes about the same time as the original lecture, including uploading. Segments are zipped and uploaded to the Screencast.com site which provides code to create an HTML link to the recorded segment. Files can be uploaded to YouTube or Screencast directly if website branding is not an issue.

For web broadcast, hyperlinks allow users to skip to the slide they are interested in. A 15-minute segment of recording in this format occupies around 50Mb of hosting space. Viewers take less than five seconds to download a segment using a typical HEANET T1 link available within most Irish third level institutions.

Evaluation and development

To evaluate and encourage critical review²¹ and popular support, NAIRTL is comparing the views of in-person attendees with those viewing the screencasts remotely. Early indications from this “drive-by” research are that users find the experience positive, but not as positive as physical attendance. Work will continue to increase the response rate to the survey and derive a larger dataset, and to include a third group of people who will view the screencast together, to assess how best to reproduce positive aspects of physical attendance (such as group discussion).

The system was showcased at the inaugural HEA Erasmus Lecture given by Peter Sutherland in October 2008, and used to record the HEA's Bologna conference in November 2008. Some videos have proved highly popular, with over 300 downloads, while others achieved only a handful. The issue of motivation must be addressed to win the hearts and minds of users, along with consideration of how to use video material in a more engaging way, through shorter segments arranged to encourage an active learning experience²², incorporating quizzes, discussions and online feedback. NAIRTL operates an irregular forum inviting suggestions for improvements.

Recent "propaganda distribution" includes using Facebook and Twitter to announce new recordings and receive feedback. Other improvements planned include:

- producing more audio-only podcasts
- including two minute trailers to encourage viewing of longer sections
- including a slide linking to the feedback forum at the beginning and end of the screencasts
- introducing content tagging and tag clouds
- investigating other offerings such as blogs incorporating "Proclaim" v-mails.

In conclusion, re-education is vital! On the complex issue of whether lecture capture affects in-person attendance, UCL's Learning Technology Centre concludes²³: "research in this area has shown that students are pragmatic and sensible: if a lecture is really so bad that it can be replaced by an online handout, they will take the easy option... Lecturers who ensure their classes are varied, stimulating and richer than the handouts have reported no problems with declining attendance".

¹ Contributions: Jennifer Murphy, project manager of NAIRTL, conceived the original requirement and accessed relevant funding. Imogen Bertin, publications officer of NAIRTL, co-ordinated the technical and software aspects, and trialled, operated and trained others on the equipment. Robert Cosgrave, learning technologist with Ionad Baire, the UCC teaching and learning centre, designed the comparison quasi-experiment. Paul Denby, lighting designer, specified the equipment and installed the lighting. Lawrence White, sound designer, designed and built the racked "plug and go" radio mic sound system. Uwe Schiller, AV technician, optimised the camera and sound recording, assisted with the initial sessions and made things run smoothly. NAIRTL would like to acknowledge Rocket Media for their assistance with customising their CMS to allow our website to include the screencasts.

² Veeramani R and Bradley S (2008). Insights Regarding Undergraduate Preference for Lecture Capture [online]. University Wisconsin, Madison. Available from: <http://www.uwebi.org/news/uw-online-learning.pdf> [accessed 27 April 2009]. A survey was sent to 29,078 undergraduate and graduate students at the University of Wisconsin-Madison in April 2008 and about 7,500 replied (The research, it should be noted, was sponsored by Sonic Foundry, a developer of streaming media technologies.).

- Making up for a missed class (93%)
- Watching lectures on demand for convenience (79%)
- Improving retention of class materials (78%)
- Improving test scores (76%)
- Reviewing material before class (52%)

³ In UCC, audio podcasting has been trialled for a course of 500 English undergraduates where, as the largest lecture room holds 390, the only other practical alternative is to repeat the lecture or run it in parallel with a different lecturer. "Podcasting in Action: practical experiences of teaching using podcasting", presentation by Professor Patricia Coughlan and Dr James Knowles, Ionad Baire, 23 March 2009.

⁴ Eisenberg A. (2007). What Did the Professor Say? Check Your iPod [online]. The New York Times, December 9, 2007. Available from:

<http://www.nytimes.com/2007/12/09/business/09novel.html?scp=1&sq=lecture+capture&st=cse> [accessed 27 April 2009]. "Students don't have to review the whole lecture," he said. "They can type in key words on their computer, do a Google-like search, and open the lecture at that point."

⁵ Brotherton J, Abowd G (2004). Lessons Learned From eClass: Assessing Automated Capture and Access in the Classroom [online]. ACM Transactions on Computer-Human Interaction, 11(2), 122. Available from:

<http://portal.acm.org/citation.cfm?id=1005362> [accessed 27 April 2009]. Sixty per cent of students prefer to use slide title navigation to move around within a recording.

⁶ Traphagan T (2005). Class Lecture Webcasting, Fall 2004 and Spring 2005: A Case Study [online]. Report from the Division of Instructional Innovation and Assessment at the University of Texas at Austin. Available from: <http://www.utexas.edu/academic/diia/research/reports/> [accessed 27 April 2009].

Female students and students who cared about their course grades perceived webcasts as more beneficial than did male students or those who did not care about their grades respectively. Also, those with certain difficulties (non-native speakers of English, students with a learning disability, and students with difficulty in understanding the professor's speech) did not report benefits from webcasts, contrary to our expectations... Students rated most current and future webcast interface features as important, in particular stop/rewind, scan, manipulating the slides or video window (current feature)... A majority of students watched webcasts at least once, but the number of times they watched webcasts was typically small (1-7 times). Most students watched webcasts only before exams or 1-3 times a month, typically at night from home through high-speed connections such as Ethernet, wireless, cable, or DSL... Sophomores agreed that webcasts were important to their course satisfaction more than did freshmen and juniors. (fall 2004)"

⁷ Veeramani R and Bradley S (2008). Op. cit.

⁸ Windham, C (2007). Confessions of a Podcast Junkie: A Student Perspective [online]. EDUCAUSE Review, vol. 42, no. 3 (May/June 2007): 50-65. Available at: <http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume42/ConfessionsofaPodcastJunkieASt/156831> [accessed 27 April 2009].

⁹ Briggs, Linda L (14 February 2007). Classroom Capture: Lecture Recording System Draws Devotees at Temple [online]. Classroom Technology. Available from: <http://campustechnology.com/articles/45216/> [accessed 27 April 2009].

¹⁰ Stephenson J E, Brown C and Griffin DK (2008). Electronic delivery of lectures in the university environment: An empirical comparison of three delivery styles [online]. Computers & Education 50, pp. 640-651. Available from: http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VCJ-4MFJJ3D-1&_user=77869&_coverDate=04%2F30%2F2008&_fmt=full&_orig=search&_cdi=5956&view=c&_acct=C000006258&_version=1&_urlVersion=0&_userid=77869&md5=933c040afb4402d7a3fa40a12a8ad966&ref=full [accessed 30 April 2009].

¹¹ Evans C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education [online]. Computers & Education pp. 491-498. Available at: http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VCJ-4R2Y44V-1&_user=77869&_coverDate=02%2F29%2F2008&_fmt=full&_orig=search&_cdi=5956&view=c&_acct=C000006258&_version=1&_urlVersion=0&_userid=77869&md5=bac276aac656076f9d8a0369575f32f7&ref=full [accessed 30 April 2009].

¹² Young J (2008). The Lectures Are Recorded, So Why Go to Class? [online]. Chronicle of Higher Education, May 16 2008. Available from: <http://chronicle.com/weekly/v54/i36/36a00103.htm> [accessed 27 April 2009].

¹³ San CY (2000). NUSCast Survey: Instructor Perspective [online]. Report from the The Centre for Development of Teaching and Learning at the National University of Singapore. Available from: https://team.nus.edu.sg/cdtl/staff/Research/CDTLMSNo_1.pdf [accessed 27 April 2009].

¹⁴ injenuity (2008). Seeking opinion on lecture capture. [Online] Available from: <http://injenuity.com/archives/390> [accessed 28 April 2009].

¹⁵ May, V. (2008). 2008. Lecture Capture Pilot Project Results [online]. Dartmouth Center for the Advancement of Learning. Available from: http://docs.google.com/Doc?id=df8pbk4g_420gcq8pzhj [accessed 27 April 2009]

¹⁶ Williams J and Fardon MJocasta (2007). Recording lectures and the impact on student attendance [online]. University of Western Australia Alt-C Short Paper Presentation. Available from: www.alt.ac.uk/altc2007/timetable/files/1064/2007_AltC_Williams_Attendance.pdf [accessed 27 April 2009].

¹⁷ Harrity, M and Ricci, A. (2008). How Course Lecture Capture Can Enhance Student Learning [online]. Worcester Polytechnic Institute. Available from: <http://www.wpi.edu/Academics/ATC/Collaboratory/News/NERCOMPHandout.pdf> [accessed 27 April 2009].

¹⁸ University College London Learning Technology Centre (2005) Will students stop coming to my lectures? [online]. Available from: <http://www.ucl.ac.uk/learningtechnology/concerns/personal.html> [accessed 27 April 2009].

¹⁹ A complete specification and costs is available at <http://www.nairtl.ie/videquip>.

²⁰ A copy of the video release form that we use is available at <http://www.nairtl.ie/videquip>.

²¹ Lee Shulman, in P. Hutchings The Course Portfolio 1998.

²² Smith, James A. (2005). Maximizing Student Learning through Effective Note-Giving [online]. Teaching Concerns, University of Virginia Teaching Resource Center. Available from: http://trc.virginia.edu/Publications/Teaching_Concerns/Spring_2005/TC_Spring_2005_Smith.htm [accessed 27 April 2009].

²³ University College London Learning Technology Centre (2005) Will students stop coming to my lectures? Op. cit.