INNOVATIVE LECTURE CAPTURE

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Abstract

In an era of MOOCs and flipped classrooms, lecture capture (though a popular choice with an increasing number of institutions) can often be a dull and passive experience for students who are required to watch lengthy films, often showing a static view of a lecturer speaking at a lectern, in their own time. There is no opportunity for interaction, and the length of the lecture is often detrimental to the student experience as the human brain cannot retain more than a small percentage of information relayed over such a long time span.

Cardiff University's School of Healthcare Sciences (HCARE) has developed a number of online lecture capture resources for students, but using an interactive approach. Footage is broken into a series of fifteen to twenty minute chunks, with interactive elements such as quizzes, drag and drop activities and text input areas (where students can record thoughts and feedback) placed between each 'chunk'. Once students have worked through a film clip and its associated activities (thereby self-assessing what they have learnt) they can move on to the next clip, and so on.

At the start of the activity students can download any presentation slides used in the lecture and at the end students are given links to relevant websites and to a lecture-based discussion forum where students can comment, ask and even answer peers' questions. Fora such as this also assist in eradicating any sense of isolation an online student may feel, as it becomes the digital backbone of an asynchronous community.

Keywords: lecture capture, online learning, interaction, innovation, case study.

1 INTRODUCTION

The early stages of the twenty first century have seen increasing pressure on higher education institutions to trim budgets in order to save costs and, in tandem with this, to increase student numbers, often by way of extending catchment areas for prospective students from a national to international level. As a direct result there has been a need to think creatively for solutions that save (or, conversely, make) money whilst increasing cohort sizes. One of these solutions, and the focus of this paper, is lecture capture.

The term *lecture capture* relates to the recording of classroom-based activities in a digital format that students can then watch over the web, on a computer or via their mobile device. Lecture capture technology records the presenter's audio and video, as well as any visual aids: laptop, tablet, whiteboard, document camera and visualizer, for example, and then synchronizes them, and webcasts the stream live or archives for on-demand playback. Although web-based lecture capture technology has been available for over a decade, institutions of higher education are just recently beginning to employ it, particularly in large undergraduate classes [1, 2, 3, 4, 5] (Deal, 2007; Evans, 2008; McGarr, 2009; Scutter, Stupans, Sawyer, & King, 2010; Traphagan, 2005). This timing, it could be implied, links to an extent to the aforementioned requirements to save money and increase class sizes.

2 STRENGTHS AND WEAKNESSES OF LECTURE CAPTURE

Students are unable to attend live lectures and classes for a number of reasons: they may not be able to physically reach the institution through illness, disability, family or work commitments. They may be enrolled on a course at an institution thousands of miles away from where they live as distance or international students. These issues have led to the rise of recording live sessions as a way for students to be able to 'attend' virtually, though there are other advantages to this process: for example, a lecture, once filmed, does not need to be delivered again for some time, so fiscal savings can be made year on year. There is no need for the institution to make payments for guest speakers or visiting lecturers, for transport, overheads and subsistence, and if the lecture is usually repeated across a semester or academic year, the speaker in question needs only to 'perform' once, thereby

freeing their time. Added to this, students appear to want access to recorded lectures to make up for missed lectures, to improve content retention, to review lectures before class, and for general convenience [6] (Nagel, 2008).

As with many other digital processes, lectures captured on film have limitations too: when viewed asynchronously, students can feel a sense of helplessness and disconnection and are unable to interact: there is no facility, for example, to ask the speaker questions or to comment with peers in a synchronous setting. The issue of student retention and completion rates in distance education have been investigated and vigorously argued over for many years, with the issue only intensifying since the introduction of eLearning and its progression from the periphery of mainstream and earlier modes of distance education and training to a more central role [7] (Berge & Huang, 2004). Providing students with lengthy, didactic and, ultimately, passive online resources that ask little more of the user than to sit and watch a screen for several hours could be seen as just one of a myriad of reasons student attrition from eLearning has traditionally been so high.

Indeed, academic staff have reported attrition from eLearning as high as 70 - 80% [8, 9, 10] (Flood 2002, Forrester 2000, in Dagger & Wade, 2004). Parker [11] (1999) argues that "…with the growth of distance education has come the problem of exceedingly high attrition rates". Parker goes on to suggest that eLearning student attrition in some institutions is exceeds 40%, while others [12, 13] (Frankola, 2001, Diaz 2002), put it at between 20 - 50%, and [14] Carr (2000) estimate it to be 10% - 20% higher than for traditional on-campus education.

The length of a recorded session can also be an issue. A three hour film consisting of a speaker standing at a lectern 'grinding' through PowerPoint slide after PowerPoint slide can, with the best will in the world, become something of a chore to watch, and though films can be paused, rewound and revisited as much as the student wishes, this can make a long journey even more arduous for many students.

Not only this, but the quality of a captured lecture can vary greatly and this can also make for a negative student experience. As one student confirms:

> "The camera was placed statically…like, it didn't move for the whole 2 hours. It was in front of the lectern throughout the whole lecture, which would of (sic) been okay if the lecturer hadn't moved away from the lectern after introducing herself and walked around the stage during the whole session. All I saw on screen for 2 hours was an empty lectern with a bunch of roses in a vase on top. And because the microphone was on the lectern too, I could only hear clearly what she (the lecturer) was saying when she walked close to the lectern. It was a pretty grim experience, and I came away from it feeling frustrated and pissed off, and like I knew nothing after trying to watch it."

Examining the creation of lecture capture resources from a staff perspective highlights low skills levels along with time and workload issues. Staff need to have the skills and the time to be able to record, edit and make filmed activities available to students. Often, teaching staff, by their own admission, have neither of these. As one member of academic staff says:

> "I was a nurse, and now a lecturer, and my skills are all tied to nursing. I can use a computer to do what I need to do, can find my way around a spreadsheet and the Internet like anyone…but I don't feel competent or confident enough to look at video editing and I really, really don't have the time to learn or make these things."

However, research has shown that students tend to believe that lecture capture helps their performance by alleviating academic anxiety and improving the quality of their learning experiences [15] (Bongey et al., 2006; Deal, 2007; Traphagan, 2005). Indeed, students highly value lecture capture. On a large-scale survey carried out at the University of Wisconsin—Madison [16] (Veeramani & Bradley, 2008), some 82% of undergraduate students indicated their strong preference for the provision of recorded lectures over the Internet to compliment in-class lecturing. It is worth noting then, that the role of a learning technologist (or similar) is an important one should institutions wish to capture lectures *and* add elements of interactivity as highlighted in this paper.

3   DEVELOPMENT OF INTERACTIVE LECTURE CAPTURE SESSIONS

As a direct result of student feedback, Cardiff University's School of Healthcare Sciences (HCARE) has developed a method of capturing lectures that offers students two-way interaction and provides them with opportunities to assess their own understanding of core concepts, reflect upon their own

attitudes and behaviours and provide starting points for further research and reading. Asynchronous, digital discussion with peers and academics is encouraged as part of a plenary activity and, importantly, the recorded lecture is broken into manageable, 'bite-sized' clips. Each of these clips last no longer than twenty minutes (and are often considerably shorter), and each clip is followed by a selection of multiple choice, drag and drop or short answer questions that cover the content of the clip that has just been viewed, giving the student an opportunity to self-assess their understanding. Other breaks between filmed sections provide students with an opportunity to think and write reflectively. Questions such as 'how do you feel your own response to this situation may have been improved in light of what you have just seen?' are asked, giving students time to reflect on their own practices. At the end of the lecture, links to noteworthy readings and websites are offered so students can take their learning further if they wish, enabling self-directed study. As a plenary activity, an asynchronous discussion forum or digital notice board such as *Padlet* is set up so students can ask questions, share ideas and thoughts and compare experiences anecdotally. As a result, the two way flow of interactivity between the student and the resource increases. Furthermore, the inclusion of links to further resources and the inclusion of a forum provides an opportunity for elements of self-directed learning, a concept whereby [17] 'individual learners can become empowered to take increasingly more responsibility for various decisions associated with the learning endeavour.' (Hiemstra, 1994)

The completed lecture capture objects are published as SCORM packages and then uploaded to the university's Learning Management System (LMS). Student tracking is switched on so lecturers can see how many people have viewed the film. Additionally, students' responses can also be collated and results captured. Not only can staff see who has accessed the resource and when, but they can look for patterns in responses to see if there are any areas for concern.

4 COMPARISON OF FILMED LECTURE RESOURCES

A lecture that had been filmed but had *not* been edited in any way was uploaded as an MP4 file to the LMS and a group of 45 students invited to watch in their own time. It was made clear that viewing the filmed lecture was an optional rather than mandatory task. After two weeks a student tracking report was run and showed that only 2 students had accessed the film.

The same film was split into short sequences interspersed with interactive content as outlined. Again, the completed resource was uploaded to the university's LMS, students were notified and invited to watch and the ability to track students' access was switched on. After two weeks another report was run, and this showed that 27 students had accessed the film. Further to that, as students' responses to the questions interspersed throughout the resource were recorded, there was auditable evidence that they had worked through the lecture until the end; evidence that could not be gathered for the unedited film, uploaded as it was as a 'non-responsive' MP4 file.

This large increase in the number of students who had accessed the resource was encouraging to both academics and HCARE's in-house learning technologist, who had been responsible for the design, authoring and publication of the completed resource. It was then agreed that the academic responsible for the delivery of the original lecture would informally ask students about their experiences and attitudes towards working through the resource. Below is a selection of responses.

> "I felt that I had to concentrate on the lecture because I knew that I would be asked questions every now and then. I got all of the multiple choice questions right, so I finished feeling that I had learnt *(sic)* something when sometimes I'm not sure."

> "If I have to sit through hours of talking I will admit that I will let my mind wander and go onto Facebook or something. When you know you only have to sit through ten minutes or so, it's not so…scary? Daunting, I guess?"

> "I don't usually bother with filmed lectures even if I couldn't go to the 'proper' lecture in the first place. They're…erm…a bit…boring? I tried this one though, because there is a forum on Learning Central (the university's LMS) afterwards so I can ask the lecturer a question that they (the audience) didn't ask in the lecture itself."

5 SUMMARY AND CONCLUSIONS

Most lecture capture research to date has focused on comparisons of student attendance and achievement between classes with lecture capture and those without. However, the purpose of this study was not to record levels of physical attendance, but simply to examine one group of students'

levels of access and engagement to a specific digital resource presented in two different forms. It would appear that student tracking and comments from users themselves back up the idea that a richer learning experience is to be had when working through a version containing opportunities for interaction and reflection.

6 LIMITATIONS AND FUTURE RESEARCH

There are several limitations to this study that need to be kept in mind when interpreting the results. It must be remembered that this study was carried out using just one group of students. It also relied on student self-reports which may not be accurate despite the best intentions of students. Further research is needed to understand what kinds of learners will benefit most and under what conditions and in what contexts will they benefit. Outcomes from research of this nature will help guide the pedagogical design of lectures that are to be recorded and assist higher education decision-makers on where to locate lecture capture resources.

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