



## Project Document Cover Sheet

Project Information			
<b>Project Acronym</b>	ELTAC		
<b>Project Title</b>	Enhancing Lectures Through Automated Capture		
<b>Start Date</b>	1 October 2008	<b>End Date</b>	31 March 2010
<b>Lead Institution</b>	Coventry University, Coventry, CV1 5FB		
<b>Project Director</b>	David Morris, Coventry University, Coventry CV1 5FB  <a href="mailto:d.morris@coventry.ac.uk">d.morris@coventry.ac.uk</a>		
<b>Project Manager &amp; contact details</b>	Gita Devi, Coventry University, Coventry CV1 5FB  <a href="mailto:g.devi@coventry.ac.uk">g.devi@coventry.ac.uk</a>		
<b>Partner Institutions</b>	None		
<b>Project Web URL</b>	<a href="http://cuba.coventry.ac.uk/eltac">http://cuba.coventry.ac.uk/eltac</a>		
<b>Programme Name (and number)</b>	Institutional Innovation Programme: Large-Scale Institutional Exemplars		
<b>Programme Manager</b>	Lawrie Phipps		

Document Name			
<b>Document Title</b>	ELTAC Final Report		
<b>Reporting Period</b>			
<b>Author(s) &amp; project role</b>	David Morris: Project Director		
<b>Date</b>	19 May 2010	<b>Filename</b>	
<b>URL</b>			
<b>Access</b>			General dissemination

Document History		
Version	Date	Comments
1.0	March 2010	Initial draft to Project Team for comment
2.0	14 April 2010	Draft submission to Programme Manager
Final	19 May 2010	Final

## Table of Contents

<b>Acknowledgements</b>	<b>3</b>
<b>Executive Summary</b>	<b>4</b>
<b>Background</b>	<b>5</b>
<b>Aims and Objectives</b>	<b>5</b>
<b>Methodology</b>	<b>7</b>
<b>Implementation</b>	<b>8</b>
Issues	8
What is a lecture?	12
Emerging models of lecture capture	12
Business Models	14
Physical infrastructure and room layout	14
University-wide Implementation	17
<b>Outputs and Results</b>	<b>17</b>
<b>Outcomes</b>	<b>17</b>
<b>Conclusions</b>	<b>18</b>
<b>Implications</b>	<b>19</b>
<b>Appendixes</b>	<b>19</b>

## **Acknowledgements**

We are grateful to JISC for funding and support under the Institutional Exemplars Programme.

We would also like to record our thanks to the other projects in the programme and the support and synthesis project teams for their critical and constructive comments on our work. We have also greatly benefitted from learning about their projects.

We have particularly benefitted from collaboration with the Steeple Project and thank Bjorn Hassler and the project team for their incisive and supportive inputs.

We are indebted to Echo360 for their support and technical assistance.

We are grateful to the academic staff of Coventry University who have willingly given their support to the project by trying lecture capture out. We hope that the occasional pain of things not quite working has been compensated by the gratitude of their students.

## Executive Summary

ELTAC (Enhancing Lectures Through Automated Capture) aimed to provide an exemplar of institutional implementation of automated lecture capture. The project built on a successful small scale pilot of Echo360 (the leading commercial system) at Coventry during 2006. ELTAC added two further stages. Firstly, larger scale trials were carried out in two faculties (out of a total of four), covering a longer period of time, a wider range of subjects and greater diversity of delivery methods. Secondly, building on the experience and data gathered from these trials, an indicative plan for institution-wide implementation was developed. In the event an emerging institutional imperative for greater core business resilience resulted in a faster roll-out than we expected.

ELTAC was a partnership between the university's e-Learning Unit, which has responsibility for designing, developing, delivering and supporting the online learning platform, faculties as developers and deliverers of learning and teaching, and external technology suppliers. Other critical partners, such as IT Services were involved through bilateral contact with eLU. The eLU also has a small team of Instructional Designers who were closely involved in the pedagogic development aspects of the project.

The project highlighted a number of areas of general interest. We underestimated the extent of technical issues. These were mainly a product of our policy of integrating our e-learning systems with each other to provide an easily understood and usable platform for both students and staff. The issue here is "keeping the technology ducks in a row", not just getting them there. Put another way, the road maps of technology developers rarely run in parallel. However, the major practical issues turned out to be organisational. Implementing lecture capture systems on an institutional basis inevitably involves a significant number of departments and individuals who may have competing interests and for whom lecture capture may be a minor part of their concerns. Estates are one example, IT Services potentially another.

ELTAC also laid stress on the *automated* capture of *lectures*. The automated element was, in practice, misleading. Teaching staff were unhappy at giving up complete control to an automated system. They wanted to be able to start recordings when they were ready and have visual feedback that recording was in progress. The use of fixed cameras and podium microphones limited lecturers' freedom to move about. The term "lecture" also covers a wide range of different teaching and learning events. This became very apparent when working closely with teaching colleagues from across a wide range of subjects and pedagogic traditions. Not all lectures proved to be easy to capture using standard room layouts and capture infrastructure.

ELTAC also challenged the view that lecture capture was neutral and automatic in the sense that the act of capture did not require any adjustments to the lecture itself. It is clear that captured lectures are not used as simple substitutes for the original presentation. The context and ways in which students use captured lectures is different and lecturers need to be aware of this when developing teaching material. Staff development in simple instructional design considerations became an important part of the project and the associated materials are a significant project output.

The project also considered lecture capture in the context of institutional business models. Long term sustainability for institutional lecture capture depends on there being a clear link between the pedagogic affordances of the service and institutional business plans. This could be through differentiating the offering, raising retention, reducing the need for lecture repetition, helping students who find learning from lectures difficult, providing a shop window or extending international partnerships and provision. The potential for cost savings is unlikely to be the sole driver for introducing lecture capture.

## Background

Recording and replaying videos of lectures has long been a part of FE and HE teaching practice. In some cases, such as earlier periods of the Open University's operations, lecture material distributed on video cassettes was a natural extension of the practice of broadcasting educational content. Elsewhere university and college libraries have developed collections of video materials which may include recordings of lectures. However there have always been shortcomings to the effective use of recorded lectures as learning materials. One is the lack of flexibility inherent in the technology. If large numbers of students wished to access video material then either it would have to be broadcast or shown cinema-style. Both means would restrict availability by time or place or both. Alternatively multiple copies of the material would need to be produced (legitimately or otherwise) and distributed. This includes, of course, domestic production via home video recording. A second restriction is the lack of interactivity inherent in replayed lectures.

Recent advances in technology have renewed interest in exploring the pedagogic and other affordances of recorded lectures. In particular distributing recorded lectures via the internet is now a viable proposition given advances in web streaming technologies. This overcomes the time and place restrictions inherent in older technologies. The falling cost of digital storage has also been a factor. However, recording lectures and making them available has still been a labour intensive process and few institutions have been able to progress beyond recording a small number of lectures, usually for special reasons such as delivery by a distinguished guest.

Latterly, automated lecture capture systems have begun to emerge. These, it is claimed, overcome the labour cost issue by automating the key processes of scheduling, recording, digitising, storing, publicising and distributing lectures. In recent years a number of proprietary systems have been developed with education in mind, the market leaders being Echo360 and Sonic Foundry. There are also systems with a more commercial sector market focus, for example ePresence from Microsoft. It is also possible to build a system from existing applications and tools. The Echo360 system was implemented in Australia early in its market life and some preliminary evaluation of experience gained has recently been published. This suggests that students find access to captured versions of lectures a valuable resource and that they use them in a variety of ways, for example to catch up on missing lectures, for revision and to revisit parts of lectures which they find difficult.

The ELTAC project built on an existing pilot implementation of automated lecture capture at Coventry University by conducting a large scale trial in two faculties during 2008/9 with the full expectation of an institution-wide roll-out from summer 2009. An important element of the project was, therefore, to look at alternative scenarios for institution-wide deployment.

## Aims and Objectives

The overall aim of the project was to develop and implement a university-wide automated lecture capture system which informs the university's new build programme, enhances the current estate, increases active participation in lectures by linking them to CUOnline<sup>1</sup> and social software environments and makes lectures available for replay via a variety of mobile devices.

At the project outset the specific objectives were to:

- Assess the affordances of automated lecture capture for our students, particularly those with English as their second language, work-based learners, studying at partner institutions and/or with disabilities.
- Assess the usability of captured lectures for students, particularly via mobile devices and in settings other than the university or home.
- Identify potential challenges and advantages for teaching staff when using a capture system that will influence academic staff development and support services.
- Gather and analyze evidence on how, when and where students access and use captured lectures and where it works best.

---

<sup>1</sup> CUOnline is the name given to the university's e-learning environment.

- Identify strategies for overcoming staff resistance to having their lectures captured.
- Develop policies on IPR which promote lecture capture and align individual, group and institutional incentives.
- Develop staff briefing and training materials and approaches which help staff adapt their lecture styles and material to exploit the pedagogic benefits of automated lecture capture.
- Evaluate the benefits and costs of implementing automated lecture capture from a range of perspectives including student and staff satisfaction, learning outcomes and economic.
- Develop a robust plan for, and change management approach to, institution wide implementation of automated lecture capture.
- Identify and evaluate the implications of automated lecture capture for new building design.
- Integrate captured lectures with other learning and teaching tools, for example social software (developing an “architecture of participation” in lectures which extends beyond the time space occupied by the lecture itself and permits students who do not attend the lecture or who are only willing to engage in or capable of limited participation in live lectures).

These objectives have been extended in the light of project experience. In particular much greater emphasis has been placed on pedagogic issues. It rapidly became clear that, despite the prevailing and largely unchallenged view that a (live) lecture and its captured (recorded) counterpart were essentially the same, we would need to recognise that the contexts and ways in which captured lectures might be used by students required some ex ante consideration of lecture pedagogy and teaching style. In particular a lecture and its captured version are not near-perfect substitutes but may be very valuable complements in an overall course offering. Where they are being used as enforced or elective substitutes then the value of the captured version can best be enhanced by improving the original delivery and style. The capture technology is unable to add anything of its own; however the act of capture may be a catalyst towards improving lectures. The first paragraph of this section (the overall aim) uses the phrase “makes lectures available for replay”. This provides a further window into the changes in the way in which we are now looking at a lecture capture. Students do not simply “replay” captured lectures. They either use them ab initio (that is are experiencing the lecture for the first time) or are re-using the lecture resource to enhance their studies.

We were hoping to use Echo360 to further enhance the student learning experience, by providing them with a second chance to view their lectures and re-visit material they may not have fully understood the first time. It also provides an opportunity for students to pay attention to the live lecture rather than needing to take comprehensive notes, and to ask questions. Overall this should boost retention, achievement and progression, and improve student satisfaction.

HLS Project Staff Lead

Our involvement in the OER (via our OCEP project) and ReProduce programmes helped us to understand that issues of IPR in learning and teaching content were wider and more general than lecture capture ones. On the other hand captured lectures may embody image and even performance rights which are not relevant to other forms of open education resources. Our position has moved towards one of operating on an informed consent basis rather than debating who actually owns the resources. Whilst this position might change in the future, our current view (borne out by ELTAC experience) is that desired culture change is much more likely to occur within the positive environment which informed consent generates.

An unforeseen, but useful and challenging, development has been the interest shown by the university in lecture capture systems as a means of helping ensure business continuity in the event of a pandemic (in this case swine flu). We therefore looked at ways in which we could deploy easy to use smaller scale capture systems which would enable us to continue to deliver lectures and other face-to-face teaching via CUOnline (our web-based technology assisted learning systems). This meant rolling out smaller-scale systems (Wimba Live Classroom) in a variety of locations to allow staff to record and deliver lectures on-line. It also presents challenges to us in supporting staff, including those who are not enthusiastic and/or experienced users of educational technologies, in using the systems. In a period where senior managers are likely to be highly focused on the business benefits

of investing in learning and teaching technologies, the contribution to helping ensure business continuity is useful.

This also allowed us to move the project away from the (mistaken) perception of some that ELTAC was the “Echo360” project. It was never meant to be such but the inevitable early activities of infrastructure development and testing tended to lead to the label being applied. The deployment of Wimba as part of a mixed economy of lecture capture re-focused attention on the rightful core of the work, that is the affordances and issues associated with the capture and re-use of “lecture” resources.

The major shifts in the project’s perception of lecture capture can be summarised by deconstructing the project acronym – **Enhancing Lectures Through Automated Capture**. The notion of enhancement has become much more important and our concept of what is meant by a “lecture” has become much wider. On the other hand the much promoted benefit of automation in the system has come under challenge.

## Methodology

During the first year of the project we conducted faculty-level trials of the Echo360 automated lecture capture system in two faculties; Business, Environment and Society (BES) and Health and Life Sciences (HLS). These two faculties account for over 50% of the university’s students. Within BES the trial was mainly conducted by capturing lectures on the MBA programme. The MBA is studied by approximately 300 students (in 2007/08) of whom over 70% are non-white and 50% have a first language other than English.

In the HLS-based trial we concentrated on courses which have a high proportion of work-based learners, for example the Foundation Degrees in Health and Social Care Management and Paramedic Sciences, degree programmes in occupational therapy, physiotherapy and social work and the core Inter-professional Learning Pathway taken by all students on health professions courses.

In total the trials:

- Covered 20 different modules ranging from Level 1 undergraduate to Masters Level
- Involved modules with single figure populations up to over 1000 students
- Embraced totally online, blended and supported face-to-face delivery modes
- Involved over 25 staff

The scope of the ELTAC project limited to two faculties and up to 20 capture installations. The project team was approached by other areas of the university to see if they could become involved. Somewhat reluctantly we took the decision to keep the work as intended (ie restrict it to the two existing faculties) to avoid spreading resources too thinly and jeopardising the success of the project.

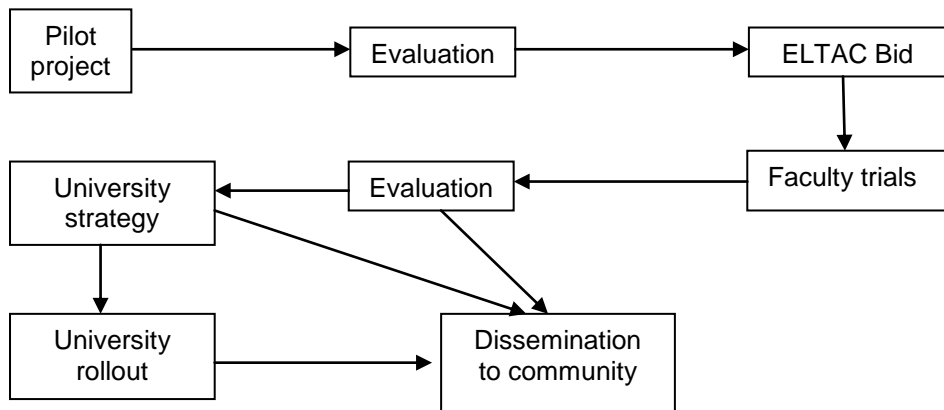
The project was coordinated by the e-Learning Unit (eLU) who provided technical, project management and administration and pedagogic support. The eLU took responsibility for all integrations with CUOnline, working with IT Services on network, storage, streaming and other IT infrastructure requirements and providing briefing and training for faculty-based technical staff. The eLU also worked closely with the main technology suppliers, Echo360 and Wimba. The model is one of a partnership coordinated by a central university unit (eLU), but with funding and responsibility for trials being located with faculties. Evaluation was carried out by a university colleague from outside the participating faculties and the eLU. This provided an element of arms’ length evaluation on a continuing basis.

In the second year the project aimed to implement automated lecture capture across the campus, including integrating provision for the technology in the university’s new build programme. In practice we extended the faculty trials into the second year and extended provision across the campus in parallel. In part this was to compensate for a later than hoped for start to faculty trials as a result of a decision by our major technology supplier to make major changes to the platform which resulted in a later than expected release of hardware.

The major new build currently being undertaken is a new faculty building for Engineering and Computing (EC). Whilst EC were not part of ELTAC they have been close watchers of the project and are significant users of the Wimba Live Classroom service which became part of the project in the later stages.

We can express our methodology as a simple diagram.

**Figure 1: ELTAC Methodology**



The top row of the diagram summarises the work done before the ELTAC project. The middle row represents the core work of the project. The bottom row summarises outcomes, both from the project itself and the post-project. In research terms we could describe this approach as “action research”, however a more pragmatic label might be iterative development.

## Implementation

The bulk of the project work was carried out under the heading of “faculty trials”. The methodology used was the familiar one of experimentation and learning-by-doing. As always this revealed a mix of issues which in overall terms can be encapsulated as:

- Issues which we thought we would encounter as set out in the project bid and which we actually encountered (Anticipated issues)
- Issues which we thought we would encounter but turned out to be minor (Non-issues)
- Generic issues (those which arise in many projects) which we perhaps should have anticipated and encountered (Generic issues)
- Specific issues which were unexpected and unforeseen, but were always there (Unanticipated issues)
- Issues which are still unresolved or have emerged since the project began (Emerging issues)

Table 1 provides a classification of issues.

**Table 1: Project Issues**

Type of issue	Organisational and policy	Technical	Resource	Pedagogic
<i>Anticipated</i>	Ownership issues Locus of policy			"A poor lecture is a poor lecture."
<i>Non-issue</i>	How long should captured lectures be retained? What do we capture? Is there a need for post-capture edit? What can captured lectures be used for? Can we ensure students sign up to fair use?		How should technology be incorporated into new build programmes?	
<i>Generic</i>	Multiple and conflicting interests	Ongoing support	What is the relationship of lecture capture to the university's business model?	Building lecture capture into overall course design
<i>Unanticipated</i>	Who is responsible for the capture system? Student IPR and other rights.	Costs of adapting existing facilities. Integrations Software system changes Hardware changes System bugs Standards	Do we switch to open source?	How does the context in which a captured lecture is used influence the design and delivery of the original?
<i>Emerging</i>	Fractured media support arrangements. Where should policy be made?	Open source alternatives	Who pays long term? Cost of licenses Under resourcing of media support.	What is a lecture? New pedagogic models Captured lectures as OERs

### *Organisational and policy issues*

Given that ELTAC operated via faculty trials many of the organisational issues were faculty ones, at least at the outset. The project initially took a fairly centralist view, one consequence of this is that it probably jumped ahead of itself. The reality of the project is that we worked with willing volunteers on an informed consent basis whilst we tested systems out and developed briefing and training materials. At the outset, we also hoped to avoid some contentious areas, such as attempting to capture lectures where we expected there might be legal or other issues, although this turned out to be not the case. In a sense the project covered up some of the long-term organisational issues by providing the resources to undertake lecture capture. Neither the university nor the faculties were forced into a position where a decision needed to be taken. This is not to say that the project ignored these issues and they are currently being debated at the highest level, triggered by resource questions. The positive side of this is that the project has provided a rich source of background information against which the university can make the decision.

The ELTAC Team has always argued that its role has been to undertake development work on behalf of the sector, of which the university is an important part. It is not the project team's role to make policy on behalf of the university; we do however advise the university, present options and make

recommendations. In this sense our interactions with Coventry University as a corporate body and policy making entity serve as a means of testing out issues that other universities will face in making choices over lecture capture services. However we would not presume to make recommendations to universities other than Coventry; apart from anything else we would not know enough about the context in which decisions are taken to do so.

This approach has identified a number of points of pressure. Implementing lecture capture technology effectively requires the cooperation of a number of units, and at times specific individuals, within the university. These include estates, IT services, faculty technical staff, teaching staff, the eLU, AV technical staff, room management and timetabling services, PVC's for learning and teaching and maybe more. It is not uncommon to have to coordinate and obtain agreement from seven or eight different university groupings to install a single capture system in an existing room. On occasions this has taken us months rather than weeks or days to sort out. In addition the groupings involved may be different depending on which teaching space is involved. Typical issues which arise are getting additional power and data ports fitted, finding space in existing lecture theatre podiums, adapting podiums, fitting additional cameras, compatibility with existing AV equipment such as microphones, securing access to spaces to do the work and so on. Whilst we thought there could be some difficulties in this area, we nevertheless greatly underestimated them. Discussions with other universities suggest that this is far from a localised problem. In the Coventry case these experiences have pointed out a wider issue. As learning and teaching technologies develop and staff begin to use a wider and richer range of digital resources in their teaching, the demands placed on AV and media services rise. In Coventry's case such services are not coordinated across the university and there is no clear strategy for developing them. In the past there may have been little need for clear central direction in the media provision field; technologies such as lecture capture are stretching that assumption.

"Tajinder" attempted to record four sessions, however only two came out well. The issues that spoil the two recordings were resolved, but some guidance might have been helpful, in particular it was not clear where to stand and the inability of the capture to cope with lecturer movement was not helpful. Later a taped square was put on the floor to show lecturers where to stand in order to be captured and the camera position was adjusted to help with the awkward position of the computer console in the room used.

### *Technical issues*

The ELTAC bid document contains the bold assertion that "In technical terms there are few outstanding issues." With the benefit of hindsight a great deal more caution would have been appropriate.

The section above notes the organisational difficulties associated with installing lecture capture technology to serve existing teaching spaces. We can also add the need to provide ongoing technical support. The term "automated" may give the impression that once capture stations are installed and the system is working (including, for example, integrating with timetabling software so that systems can automatically be started and stopped) then they can just be left to run with a minimum of ongoing support. As with nearly all systems, this has not turned out to be the case. Major software upgrades need to be installed and tested. Some staff need help with switching microphones and other equipment on. Camera angles are mysteriously changed. Informal timetable changes occur. All software has bugs. These, and other examples, demonstrate the need for ongoing support. Whilst it is difficult to be precise about how much might be required long term, there is some consensus around a figure 1.0 FTE staff. At the very minimum someone needs to be identified who can take responsibility for ongoing troubleshooting.

Echo360 software and hardware has undergone rapid development. However, this delayed the project in its early stages since we had to hold back our capture device installation programme whilst we waited for the new hardware. These developments were unanticipated at the outset of the project, both by us and, in many ways, by the system suppliers.

System interoperability has also proved to be a challenge. The issue is becoming fairly familiar to us from a number of projects. We integrate our lecture capture system with our repository. Over the project life there were new versions of both the lecture capture and repository software which meant that we have had to rewrite part of the integrations. This seems to be an inevitable consequence of deploying several software systems each affording different benefits within a coherent platform (a loose-coupled approach). Our ideal would be to try and persuade the relevant software suppliers to talk to each other about their development and release paths. As a first stage we are pointing out to them that we need to get our own upgrade plans into line and, as a consequence, we may not implement new product releases immediately.

The ELTAC team has built an ongoing collaboration with the Steeple project. Indeed the worlds of podcasting and lecture capture systems are moving towards each other and many of the issues (for example ownership, distribution, how resources are used etc.) are common. A very fruitful emerging area of collaboration is via the OpenCast Foundation's Project Matterhorn which is developing an integrated open source lecture capture and podcasting system. The ELTAC team are currently formulating some trial comparisons of the Matterhorn system benchmarked against our current Echo360 service.

ELTAC has also informed the work of a number of other institutions. An important dissemination route has been via the conferences and workshops of a number of organisations, for example SCHOMS (Standing Conference of Heads of Media Services), LTMSG (Learning and Teaching Spaces Management Group) and UCISA as well as events organised by software providers such as the UK and international conferences of Echo360 and Wimba. In a number of cases members of the ELTAC team gave keynote presentations and this was followed up by individual contacts with institutional colleagues.

#### *Resource issues*

One surprise for us was that we thought that questions of how to build lecture capture services into new build projects could be an issue; the reality is that existing spaces are the problem. The experience of working with existing spaces has shown the importance of designing in lecture capture services rather than relying on retrofitting. The ELTAC project has heightened awareness of the pedagogic and business benefits of lecture capture within the university to the point at which it becomes very obviously short-sighted not to design-in provision wherever possible.

The emergence of Project Matterhorn will give a major boost to interest in lecture capture. In particular it will add a new dimension of choice and competition to the market. This will have both short run effects on pricing of commercial products and longer term dynamic effects in being a spur to increased innovation. ELTAC project outputs will be a valuable resource for those looking a lecture capture in general and for potential Matterhorn adopters in particular.

On the other hand, in the short term and current economic climate commercial license fees may present a barrier to implementation.

#### *Pedagogic issues*

The focus of our pedagogic work has shifted from a concern that capturing a poor lecture does little to improve matters. We initially thought that lecture capture would provide a lever and tool for helping staff improve their lecturing skills. Whilst this is still an important element of our staff development activities the focus has shifted towards helping staff think about the purpose of lectures and what they are trying to achieve through them and then asking what capture can offer to help achieve those ends. The objective of improving lectures per se has become more covert.

These concerns have been explored in detail via the ELTAC Benefits Realisation (BR) project (see the references at the end of the report).

“John’s” motivation was to provide an extra resource, in addition to face-to-face contact, for his postgraduate students, many of whom are international students and he says “have used it to recap on things they did not fully understand”. He found use easy, but it did make him “more aware of body language and the need to use as simple a vocabulary as possible”. Lecture capture will allow him to reuse content captured for the first cohort in the year with the second cohort.

### ***What is a lecture?***

The notion of lecture capture is fairly simple to understand and work with if the lecture in question is in the conventional form which most people would associate with the term. In such a case static camera focusing on the lecturer (rather than parts of the audience) and capture of presentation and other materials which are displayed on a screen will normally work well. However, it rapidly became apparent that what goes on inside teaching spaces under the portmanteau heading “lecture” can be very different. For example, in occupational therapy a lecture can include a demonstration by students on other students. In such cases a static camera will not work. It might also be necessary to gain the consent of all the students who are recorded in order to be able to use the captured material. In other cases lectures might include live performance elements which go beyond simply talking. Demonstrations might also be involved. Lectures might involve audience response activities which might be difficult to capture automatically. In other cases lectures might not have a live audience at all and simply recording them in an empty lecture theatre might be a lost opportunity to develop a more interesting presentation.

The term lecture is often used to embrace seminars and workshops, conversations between experts and panel discussions. All of these may require different capture approaches. At the other end of the scale are more intimate and contained teaching activities such as giving oral feedback on work, answering questions, giving help on specific points of difficulty or simply reflecting on current issues of interest. It is here that the boundaries between lecture capture and podcasting begin to blur.

Hopefully lecture capture technologies will open up the range of teaching possibilities rather than restrict them to activities which can easily be automatically captured. However, recognising that lectures are diverse in nature also leads to a conclusion that a single system is unlikely to be appropriate in all cases. For the lecturer wanting to record sessions at off-campus locations a simple desktop tool will be appropriate. Such tools (for example the Echo360 Personal Capture System) are now becoming widely available. In other cases systems such as Wimba Live Classroom may offer all the features required. At Coventry we have moved from a position where a single system was sought to cover the bulk of our needs to one where a mixed economy is appropriate. Whilst this has some risks in terms of supporting multiple platforms both technically and via staff development, the tailoring of systems to needs does have substantial cost-saving benefits.

### ***Emerging Models of Lecture Capture***

The ELTAC project suggests that there are two main models underpinning approaches to lecture capture; these are summarised in the table.

<b>Utility Model</b>	<b>Resource Model</b>
Warts and all recording	Higher production values
Throwaway	Legal/IPR/QA concerns
Private	Re-usable
Supplementary	Re-purposable
Support material	Sharable
	Pedagogic insertion
Examples: revision; emergency planning	Examples: Learning Objects; cohort management; distance learning, active learning (wrappers)

The utility model holds that captured lectures are used for short-term purposes, for example to help students revise or fill in lectures they have missed. Such lectures are only intended to be seen by the students on the course in which they feature and will only be kept until those needs have been satisfied and will then be removed from the system. Access to the lectures will be controlled via the VLE or other means of authentication. The captured lecture is closed in the same way as the original. Such lectures are captured just as they happen and are a supplementary service. Capture does not

raise any new IPR or quality issues. This is not the same as saying that there are no IPR issues, capturing lectures often brings such issues out into the open – but they were there anyway.

If, however, we seek to add significant and enduring value to lectures through capturing them then we need a different model. It may be that we need higher production values than can be achieved in a simple automated capture situation. Such production values might not be confined to recording and editing but could also embrace the performance aspects of the lecture. Legal and quality issues come to the fore if the lecture is to be reused outside the original context of the particular instance of the course on which it originally featured. Anticipating re-use, sharing and different contexts may require the “insertion” of explicit consideration of pedagogic issues. In essence captured lectures become “Learning Objects” and need designing as such. The resource model sees captured lectures being used in active learning situations rather than the more passive mode inherent in the utility model. Active learning can be promoted through “wrapping” the lecture in a set of related activities, perhaps managed in a blog or other suitable online environment.

The two models (utility and resource) imply different pedagogic approaches; the resource model requires active consideration of lecturing pedagogy whereas the utility model assumes the status quo. Implementation of the resource model can only be achieved in the context of proactive staff development. Comparison of the two models also throws the trade-off between the value of captured lectures (as assets in the resource model and throwaway consumption in the utility model) and the effort which needs to be put into the capture process by the lecturer and others (none in the utility model, potentially considerable in the resource model) into sharper relief.

Captured lectures may also become Open Educational Resources (OERs). In this case all the concerns which have been explored via the HEFCE/HEA/JISC OER programme (and our own OCEP Project within it) come into play, plus some potential additional ones if any student contributions are captured. The ELTAC project has not specifically investigated this aspect of lecture capture. On the other hand a number of lectures have been made open through CUTV (the university’s YouTube channel) and our iTunesU channel. This is particularly the case with special event lectures such as Professorial Lectures, the Global Leaders lectures and Coventry Conversations (a prestigious series of guest lectures by media experts). This work has brought the question of standards to the fore since the formats used by automated lecture capture systems may not be compatible with those required by publishing systems such as iTunesU.

“Sally” is an enthusiastic user of lecture capture who employs it to capture all the guest speakers (currently 10) which she invites in to talk to her students. The guest lectures are posted on the course site so students can review and revisit them and they are accessed by late enrollers to the course, who find it useful to be able to catch up. Sally also uses “quotes and clips for other teaching”, to evidence points she makes in other contexts. This is the fourth lecture series that B3 has captured, but prior to the availability of Echo360 she had to arrange video camera capture which was fiddly and cumbersome in comparison to Echo360. She has also recorded herself for the internships preparation workshops, so students can review tips before producing a CV for example and plans to capture some professorial lectures which will take place every Monday in March. B3 reports that guest speakers are quite happy to be recorded, “it’s a way of life now”, and they are provided with a consent form and assured that the lectures are for internal Coventry University use only. She attended an eLU training session to familiarise herself with the technicality of the system and this made her very aware of how she looks to students, mannerisms and words and phrases that get repeated. Her tips would be: remember to turn on the mike, think about where you stand, that is, work out where the camera is, and give it a go; it’s easy and “very, very useful”. While she plans to record new lectures every year she would like to keep the library of previous recordings and still makes use of last year’s.

## **Business models**

Universities are, and increasingly obviously so, businesses and university senior management teams also tend to want to know what the business benefits will be of investment in new learning and teaching technologies. Such questions will be asked even more pointedly in the current economic climate. It may also be that the denizens of the university C-floor may have caught up with the “no significant difference” debate and be somewhat sceptical of educational developers’ claims for the undoubted benefits of the latest hot development in learning and teaching technology.

Coventry University is in the midst of a new build programme. An important part such plans naturally concerns the design and technical specification of teaching spaces. We are also seeking ways of further expanding our overseas student business, both by bringing more students to Coventry and by developing greater presence in other locations (including London, a popular destination for international students) either in partnership with existing colleges or via direct provision. As a business-facing university we also need to develop presence in workplaces and provide a more flexible academic programme. Lecture capture has an important role to play in all these areas of business development through expanding the reach of a core part of our delivery and enhancing our marketing presence through exposing captured lectures CURVE and the university’s YouTube and iTunesU channels.

The relationship between lecture capture and the business model has been highlighted by the development of the university’s London Campus which will offer a variety of “premium” programmes within the highly competitive market of postgraduate business courses for overseas students. Echo360 capture stations are being deployed throughout the facility and the availability of captured lectures is part of the market-differentiated service package being offered to students.

## **Physical infrastructure and room layouts**

As part of the project implementation plan a number of rooms were equipped with Echo360 within the Faculty of Business, Environment and Society (BES) and the Faculty and Health and Life Sciences (HLS). In addition a number of “university” (ie centrally managed) rooms have been equipped along with a training/practice/familiarisation space.

All the rooms have a notice outside them to inform those who entered that recording may take place inside. In the lecture theatres in BES these notices are also placed on the back wall.

The rooms kitted out with Echo 360 are either large tiered lecture theatres or classrooms that are capable of taking 50 plus students and are laid out with rows of either chairs and tables or fixed surfaces and benches. Some of the rooms, particularly in William Morris building have additional break out / group work areas that are not captured by the camera.

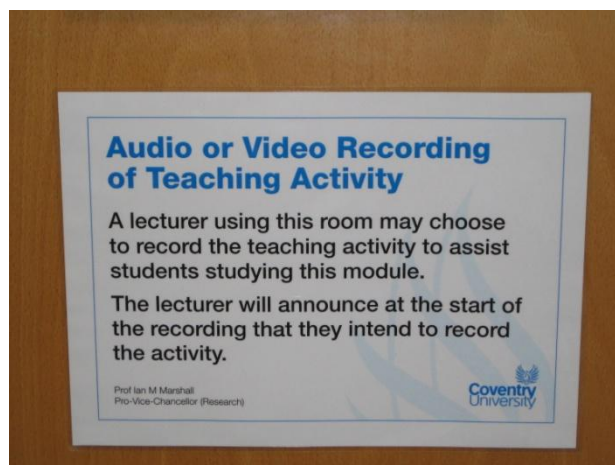


Figure 1: standard notice outside Echo360 rooms

Rooms have two distinct layouts. The first are traditional tiered lecture theatres. The lecture capture camera has been placed to capture a lecturer standing at the console that controls the projected materials. Whilst the capture is fixed on one point, which can inhibit lecturer movement, it can be set to capture a wider picture, including the projection screen, so that the lecturer can move more freely, or alternatively the participants of a seminar. In this latter case it was generally decided not to do this because of concerns around the capture and possible dissemination of student contributions and protection of their rights.

Figure 2: Lecture room layout and camera position



Figure 3: Camera position in lecture theatre



Figure 4: WMG layout showing fixed desk space



Figure 5: WMG layout showing fixed desk space

The second type is a large, flat classroom with rows of fixed desks and seats typically seating 50 - 100 students, together with a breakout / group space to the side comprising seven sets of desks around which chairs are placed (as shown in Figure 6). The camera captures a lecturer speaking at the front of the fixed desks. It is possible to project audio visual material on screens to the front of the fixed desks and to the side of the breakout / group space. The lecture capture camera can be seen on the top right hand side of the picture in Figure 6.



Figure 6: WMG layout showing breakout / group work space

Some lecturers found that the necessity to stay in one position, by the lecture console, was unnatural (many lecturers tend to like moving around during class and one lecturer in particular felt this was necessary due to the subject matter, anatomy). This had the added disadvantage in one lecture theatre in particular where the lights turned off, due to lack of movement, mid-lecture! Knowing where to position themselves and ensuring the angle of the camera was correct was problematic in the beginning, solved by marks being placed on the floor and adjustments being made. While the Echo360 boxes are visible in some cases in others they may be placed in cupboards or out of sight, maybe to avoid tampering, however lecturers found that seeing the red light on gave them the reassurance that the recording was taking place.

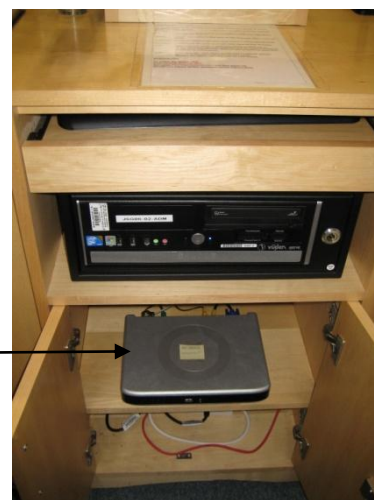


Figure 7: Echo360 capture box in console cupboard

As we discussed, it is quite off putting not knowing whether the lecture is being recorded. Having a system with a 'user guide' taped near to the console, and the ability to see the lights that indicate recording is taking place would really enhance my confidence. As I stood there alone, talking to myself, I was really conscious that if it wasn't being recorded, I would in effect be wasting four hours of my time - two to do it the first time, and two to redo it. We really do trust you - honest! but.....

Ideas for improvement include:

- providing a user guide in the rooms that have Echo 360
- providing visible lights to indicate the recording is taking place
- maybe a notice to put up on the doors( or red light system like in recording studios) to indicate recording is taking place (I ended up having two interruptions of students wandering in to the lecture theatre whilst I was in mid flow, expecting to be able to talk to me)
- a reminder to tell staff that lights may go off during recording and how to deal with this
- a 'top tips' guide from people who have done recordings of what to do and not do in order to adapt to the new way of working (I would be happy to contribute to this - am collecting feedback from students to see what works and what doesn't)

Hope this helps - I really did appreciate all of your support which was fantastic, and I also think that the system is a great step forward, but I guess that it will take us some to get used to the new technology'.

HLS Lecturer

### ***University-wide implementation***

A project objective was to develop a university-wide implementation plan by September 2009. In the event this proved unnecessary in the very formal sense we had envisaged it. Essentially the plans for implementing lecture capture can be seen in three phases.

In the here and now we have implemented 15 Echo 360 capture stations in major teaching spaces. We have also deployed Wimba Live Classroom systems in a further 45 teaching spaces as a result of a request by the university to help ensure business continuity in the event that we could no longer teach conventionally due to widespread illness amongst staff and students. The eLU was very happy to take this on board and incorporate it into the ELTAC project (via, for example, developing the system integrations, briefing and training staff and providing a staff support system) as a means of promoting lecture capture. The 60 systems cover approximately 70% of the university's classroom seats.

We are also implementing a number of Personal Capture systems for staff who have a need and who request it. Finally we are implementing a number of "podium systems" which have a more limited capture capability but do not need any additional wiring or equipment at the capture end.

In the medium term we will evaluate the potential of Matterhorn for institutional implementation.

All new build programmes will have the capacity for automated capture designed in. New build will partially replace older teaching spaces which have been low on the priority list for Echo360 and Wimba installations.

## **Outputs and Results**

The ELTAC project has provided an exemplar of the implementation of lecture capture technology at the institutional level. The project has analysed the issues from a wide range of perspectives including the:

- Organisational
- Technical
- Pedagogic
- Business enhancement

The major tangible external outputs have been a series of presentations to national and international audiences on the project's findings, a web-based resource to help those considering implementing automated lecture capture and a collection of staff development resources<sup>2</sup>. These are listed in the Appendix.

Internally the project has resulted in a the implementation of an institution-wide lecture capture capability based on a mixed economy of systems and the generation of a collection of captured lectures available for re-use. Some of these are OERs available via iTunesU and YouTube.

## **Outcomes**

The anticipated outcomes ELTAC were to:

- Assess the use of classroom capture systems to increase student learning.
- Provide students with instant anytime, anywhere access to recorded face-to-face lectures.
- Provide students with a multimedia archive of course lectures for immediate and assessment review.
- Develop good practice guidelines for teaching staff.

---

<sup>2</sup> <http://cuba.coventry.ac.uk/lecturecapture>

- Develop and test a change management framework for implementing automated lecture capture.
- Improve student satisfaction.

In retrospect this list seems a modest one and, in the event, ELTAC has gone far beyond these outcomes. We confirmed our expectations, based on the pre-ELTAC pilot, that students are very positive about having captured lectures available to them. This extends to the students who use them proactively in conjunction with attendance at the face-to-face event.

The project methodology was highly reliant on the quality of faculty participation. This was markedly better in one faculty than the other. Had we chosen to work with just one faculty we would have run a major risk of not having the quality of feedback from the trials that we needed.

An alternative approach would have been to work with a greater number of smaller units (ie departments or subject teams), but this was rejected because it was unlikely that such units would have had the authority to mandate some of the physical changes to spaces that the project required.

The difference between levels of faculty involvement was a product of varying levels of commitment to the project by senior faculty staff. Middle leaders (for example departmental heads) took their cues from senior staff.

Tajinder was satisfied with the quality of the successful recordings and would have liked to continue using the system he did not feel that there was sufficient buy in or leadership from the course leader. He stated that there seemed to be "no clear ownership" of lecture capture by the department or faculty, there was "no continuity of promotion" and that it is not clear who facilitates or supports usage.

On the other hand comparisons between the two faculties did allow us to draw some useful conclusions about change management scenarios. The most important of these is to keep on engaging senior managers rather than assuming that initial enthusiasm will persist throughout the life of the project. It is also noteworthy that the drive which succeeds is pedagogic rather than economic. Staff are more motivated by student satisfaction and improving their professional skills that they are by potentially saving the institution money. This is also demonstrated by the plans to design-in automated lecture capture into the new EC building; the clear motivation is to improve services to students within an overall pedagogic strategy of activity-based learning.

An important outcome of ELTAC has been to help shift the debate around lecture capture away from the technological considerations and the "automated" features towards considering the pedagogic implications. In addition it has helped shift the research focus away from surveys of student opinion towards the integration of lecture capture into professional teaching practice. In essence the debate has shifted towards what works and improves learning and away from how it is used by students. This shift is evidenced by, for example, the changing focus of bids to the Echo360 Research Grants programme.

## Conclusions

The major conclusions of ELTAC are:

- Lecture capture provides significant benefits to students, not only the vulnerable ones, but to all.
- Lecture capture can benefit staff by allowing them to re-use their material and give them greater control over their time
- The "automated" aspect of lecture capture should not be overplayed and may be an inhibitor to some members of staff.

- Lecture capture is not a pedagogically neutral technology.
- Staff development is a very important element of successful deployment of lecture capture
- It is vital to ensure senior staff buy-in at the right level (this may vary according to institutional contexts and organisational structures)
- Equipping existing spaces for lecture capture is not as easy as many people think

## Implications

The major implications of the ELTAC project are:

- Lecture capture is useful for activities which go beyond conventional lectures.
- Think about what you mean by “lecture” before you try and capture them.
- For many institutions mixed economy solutions may be the most appropriate
- Lecture capture needs to be considered within the overall context of institutional business models as well as learning and teaching plans
- IPR and ownership issues are best thought out within an institution’s overall policy on such matters; this is probably better dealt with in the wider context of OER’s rather than the specific one of captured lectures.
- Implementing lecture capture will place significant additional workloads on AV and media technical support staff.
- Getting the pedagogy and course design right is a prerequisite to leveraging the economic benefits of lecture capture.

New avenues which could be profitably explored include:

- The use of captured lectures as OERs
- The potential development of a user community around Project Matterhorn

## Appendixes

The main project website is:

<http://cuba.coventry.ac.uk/eltac>

This includes all project documents and access to presentations given to national and international conferences.

The lecture capture support site

<http://cuba.coventry.ac.uk/lecturecapture>

gives examples of captured lectures, guidance on how to prepare for captured lectures and help for academic staff.

Staff using Wimba to capture lectures for later delivery in a situation where the university **is closed** or for any other purpose can get help at

<http://cuba.coventry.ac.uk/swineflu>

A paper giving an overview of the ELTAC project targeted at the international lecture capture community can be accessed at:

[http://curve.coventry.ac.uk/cu/items/b47b10fa-bc06-d146-f172-4316a81555e6/1/?tempwn.b=access%2Fsearch.do%3Fpg.e%3Dtrue%26pg\\_pp%3D10%26pg\\_pg%3](http://curve.coventry.ac.uk/cu/items/b47b10fa-bc06-d146-f172-4316a81555e6/1/?tempwn.b=access%2Fsearch.do%3Fpg.e%3Dtrue%26pg_pp%3D10%26pg_pg%3)

Project Acronym: ELTAC  
Version: 2.0  
Contact: David Morris  
Date: March 2010

[D1%26qs.tq%3Deltac%26qs.td%3Deltac%26qs.q%3Deltac%26b.e%3Dtrue%26sort\\_s%3DRANK%26she\\_canDisplay%3Dchecked](#)



## JISC Project Final Financial Statement Oct 08 - Mar 10

Directly Incurred Staff	Total Budget	Oct 08 - Mar 09	Apr 09 - Sep 09	Oct 09 - Mar 10	Balance
<b>Total Directly Incurred Staff (A)</b>	<b>£0.00</b>	<b>£0.00</b>			<b>£0.00</b>
<b>Non-Staff</b>		<b>Oct 08 - Mar 09</b>	<b>Apr 09 - Sep 09</b>	<b>Oct 09 - Mar 10</b>	<b>Total</b>
Travel and expenses	£3,000.00	£241.15	£67.00	£2,691.85	£0.00
Dissemination	£5,000.00	£0.00	£0.00	£5,000.00	£0.00
<b>Total Directly incurred Non Staff</b>	<b>£8,000.00</b>	<b>£241.15</b>	<b>£67.00</b>	<b>£7,691.85</b>	<b>£0.00</b>
<b>Directly Incurred Total (C) (A+B=C)</b>	<b>£8,000.00</b>	<b>£241.15</b>	<b>£67.00</b>	<b>£7,691.85</b>	<b>£0.00</b>
<b>Directly Allocated</b>		<b>Oct 08 - Mar 09</b>	<b>Apr 09 - Sep 09</b>	<b>Oct 09 - Mar 10</b>	<b>Balance</b>
Ass. Dean 90 days Work Package Leader (D Skinner)	£29,215.00	£9,164.94	£10,311.73	£9,738.33	£0.00
PM 120 days Grade 7 (G Devi)	£17,827.00	£5,592.45	£6,292.22	£5,942.33	£0.00
Ass. Dean 20 days (D Finlay)	£6,766.00	£2,122.54	£2,388.13	£2,255.33	£0.00
Ass. Dean 20 Days (Harrower)	£6,967.00	£2,185.59	£2,459.08	£2,322.33	£0.00
Work package leader Grade 7 65 days (Tutchings)	£12,946.00	£3,973.94	£4,656.73	£4,315.33	£0.00
Project Officer 240 days (Ali/Taylor)	£44,580.00	£13,985.05	£15,734.95	£14,860.00	£0.00
Sen Lect 30 days (Hardy)	£6,220.00	£1,986.97	£2,159.70	£2,073.33	£0.00
Work package leader Grade 7, 30 days (Hinrichsen)	£5,572.00	£1,766.19	£1,948.48	£1,857.33	£0.00
Sen Lect 30 days (Courtney)	£6,220.00	£1,986.97	£2,159.70	£2,073.33	£0.00
Director e-learning, work package leader 50 days (A Syson)	£16,050.00	£5,077.81	£5,622.19	£5,350.00	£0.00
Sen Lect 20 days (previously McTavish) now Dickinson	£4,412.00	£1,324.65	£1,616.68	£1,470.67	£0.00
Sen Lect, work package leader 112 days (Moron Garcia)	£18,776.00	£5,960.90	£6,556.43	£6,258.67	£0.00
Estates	£22,329.00	£7,166.64	£8,047.78	£7,114.58	£0.00
<b>Directly Allocated Total (D)</b>	<b>£197,880.00</b>	<b>£62,294.64</b>	<b>£69,953.78</b>	<b>£65,631.58</b>	<b>£0.00</b>
<b>Indirect Costs (E)</b>	<b>£180,286.00</b>	<b>£56,781.84</b>	<b>£63,763.18</b>	<b>£59,740.98</b>	<b>£0.00</b>
<b>Total Project Costs (C+D+E)</b>	<b>£386,166.00</b>	<b>£119,317.63</b>	<b>£133,783.96</b>	<b>£133,064.41</b>	<b>£0.00</b>
<b>Amount requested from Jisc</b>	<b>£299,956.00</b>	<b>£99,985.00</b>	<b>£99,986.02</b>	<b>£99,984.98</b>	<b>£0.00</b>
<b>Institutional Contributions</b>	<b>£86,810.00</b>	<b>£27,255.28</b>	<b>£30,606.33</b>	<b>£28,948.39</b>	<b>£0.00</b>