USING PODCASTS AND VIDEOCASTS TO COMPLEMENT TRADITIONAL TEACHING METHODS

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ABSTRACT

Podcasts and videocasts (recordings of lectures with audio and video content) are valuable teaching resources which provide a flexible and engaging learning environment and help to accommodate a wider variety of learning styles. Getting students to generate videocasts of their work can give teachers a valuable insight into how students approach problems and the depth and breadth of their knowledge in the relevant subject area. A database of student videocasts can encourage a community approach in learning, where students can learn from the knowledge, tips, dead ends, tricks and approaches of their peers.   Practical issues associated with the use of online teaching material and assessment methods are included. Key issues to consider include the carrying-over of course content and logistical issues such as file sizes, recording times and techniques of recording..

1   INTRODUCTION

Kolb (1984) provides a cyclic model for experiential learning which highlights that the learning process can begin with any of the key stages in this cycle. These key stages in the cycle are: concrete experience, reflective observation, abstract conceptualisation, active experimentation (Figure 1). The cyclic model suggests that a variety of learning stages must be followed in sequence for the learning to be successful. For example, students attend a lecture and are encouraged to reflect on its contents. An assignment will allow the student to form their own interpretation of the content, leading to the students trying different activities themselves to relate further to subject material.
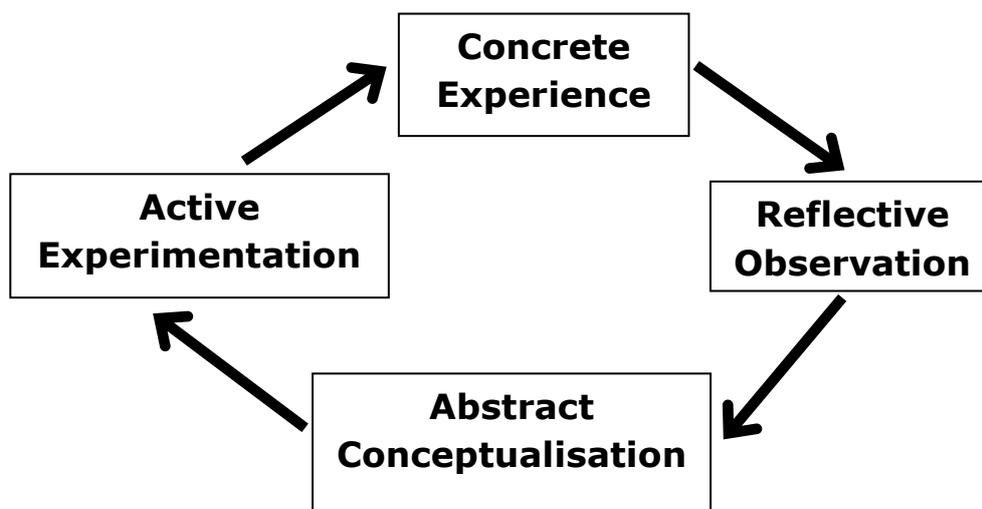

Figure 1 Kolb's Experiential Learning Cycle (Kolb, 1984).

These learning stages allow students to incorporate their own learning styles, which may range from using

different resources, interacting with staff and peers, listening to podcasts of the lectures, or engaging in more reflective learning by writing their own notes, to name a few.

As educators we have a responsibility to accommodate as many such student learning styles in our delivery and assessment as possible. . In some cases not all styles are being accommodated. As a result students' miss out on key stages in their learning according to the Kolb cycle. This may be the case for a variety of reasons, such as existing traditions in teaching specific subjects, large class sizes, a lack of awareness of teaching staff, and perceived time constraints restricting change.

This paper looks at issues surrounding the implementation of such a cycle in our programmes of teaching engineering and design at the University of Brighton in the School of Environment and Technology. It can be broken into three main parts. The first looks at the effect of introducing online learning methodology into the learning cycle. The second looks at the effects of multiple iterations of the cycle on the learning process, with an emphasis on new assessment strategies and techniques. The third looks at the practical issues associated with the use of online teaching material and assessment methods.

2   ONLINE LEARNING

Traditional lectures have their place in giving information to a large number of students. For smaller classes, lectures can become more interactive. One way to support the learning for the student is to record live lectures and the interaction that follows. This can be done using "podcasts" (audio only) and "videocasts", a term we have used to describe a recording of a lecture with audio and video content. Once in electronic form, the podcasts and videocasts are easily publishable in standard Virtual Learning Environments (VLE) such as Blackboard.

In our School some students have little time at their disposal. Spare time is often spent working to provide financial support for their studies. Consequently, students have less time to interact with tutors after lectures to seek clarification. Some students find that they cannot attend some lectures because of personal difficulties. Making a recording of the lectures can help to alleviate such problems. It is our belief that teaching material that is recorded live in a lesson and uploaded to an online resource gives flexibility and freedom. Students can access taught material in their own time and they can do this remotely from their home or while travelling. Anecdotally, these strategies support students, and they feel this complements traditional delivery methods. Students feel the opportunity to ask questions in a live lecture is vital part of their learning process, while the videos help to support this, and help to reinforce the material(Covill *et al, 2008)*.

This approach, despite initial investments of time, can also save educators time in the long term. Covill *et al (2008)* demonstrates the value of publishing "how to" guides to using software. This approach can be adapted for standard lectures, software demonstrations and can be used in creative assessment methods

to support the learning Kolb Learning Cycle.

Podcasts

Several methods were used to make an audio recording. These included using a specialist audio recorder (Dictaphone), a palm top computer, an onboard microphone in a laptop and using a lapel microphone with the audio recorder. The most appropriate method was found to be the audio recording device (Dictaphone). This device was very easy to use, had an indicator when recording was on, and saved the files in a standard MP3 format, which made it very convenient and easy to upload to the VLE. Students could then download the audio files and play them from the PC speakers or portable mp3 player. Although this was a helpful resource for reviewing lectures, several limitations were highlighted with the audio-only format:

- Timing the transition between slides with the audio was difficult (unless prompted verbally)

- Co-ordinating the slideshow with use of the whiteboard during the lecture was difficult.

Camtasia and Videocasts

Students appreciated the use of audio podcasts, but with their knowledge and awareness of online video technology they began to request videocasts. A software package called Camtasia Studio by Techsmith to record lectures with slideshows has provided a convenient and robust facility to enable us to respond to this request. Camtasia allowed us to record keystrokes and slides projected onto the big screen so students could have a permanent audio and visual record the lecture. This was adapted to include a webcam video stream for activity on the whiteboard. Although easily implemented in Camtasia, this required considerable editing later.

Figure 2 is a screenshot of the generic options in Camtasia, including screen or window recording, audio only, a PowerPoint slideshow, or importing media (audio, video, images etc) from elsewhere. This figure also provides an option to open recent Camtasia projects and gives links to tutorials for getting started with Camtasia, how to record material, how to edit material, how to produce as a usable video file, and how to share with others.

Figure 2 Camtasia studio options.

The layout of Camtasia is shown in Figure 3, showing the options for adding material, editing the video, and producing on the left, the clip bin with all the material ready to use in the centre, a preview of the video on the right, and the timeline with audio, video, and other tracks (extra audio, video, transitions, images etc) on the bottom.
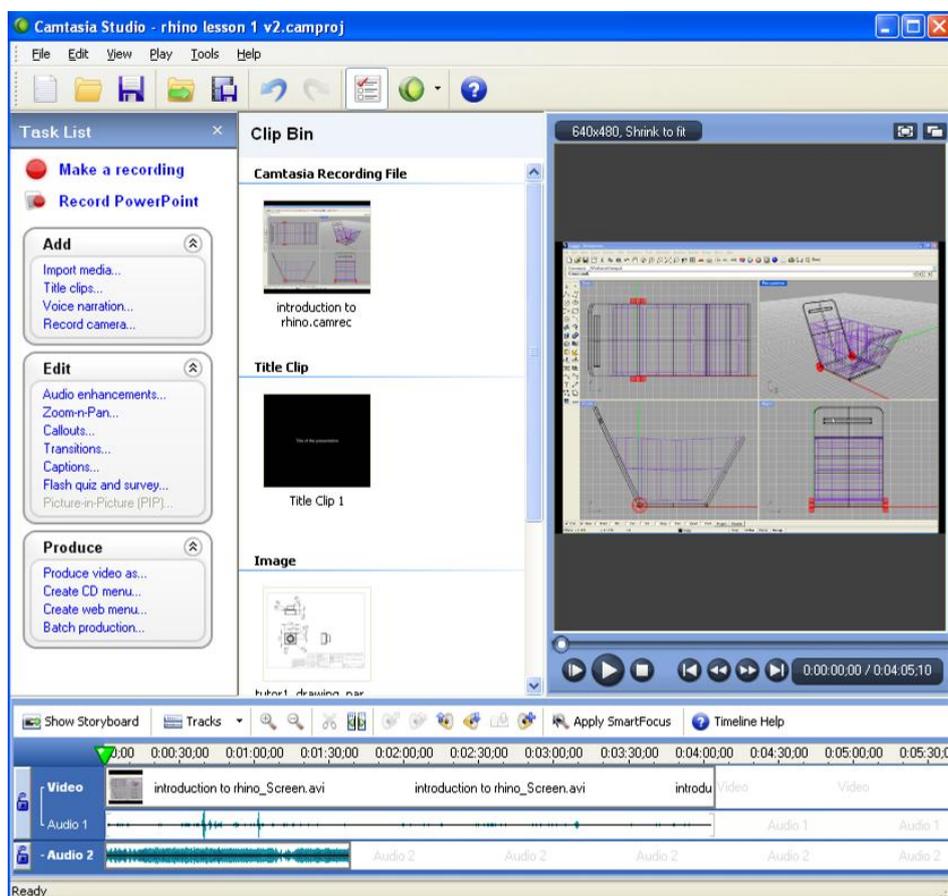
**Figure 3 The Camtasia studio interface.**

In Figure 4 below (a) shows a screenshot of the video taken from the web cam attached to the laptop, (b) illustrates the facility for the lecturer to highlight a section of a word document projected on the screen, and (c) illustrates that one can combine both the video of the whiteboard as well as the projected screen. All of these were part of the same lecture.
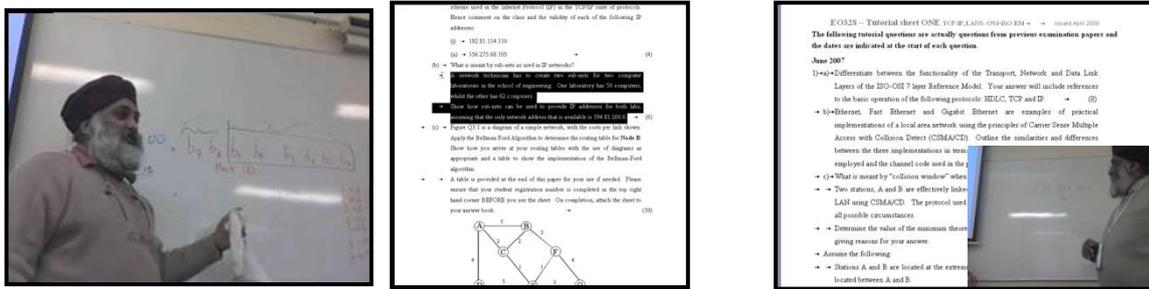
(a) video of the lecture   (b) records what students see   (c) combination of both

Figure 4 Camtasia Screen shots (a) Full screen video only, (b) Project screen only, (c) Both simultaneously.

Figure 5 shows the presentation of content on student**central** for this electrical engineering module. It is advisable to describe the contents of the multimedia file in the title where possible, e.g. describing the content as being topic in Digital Television (DTV).
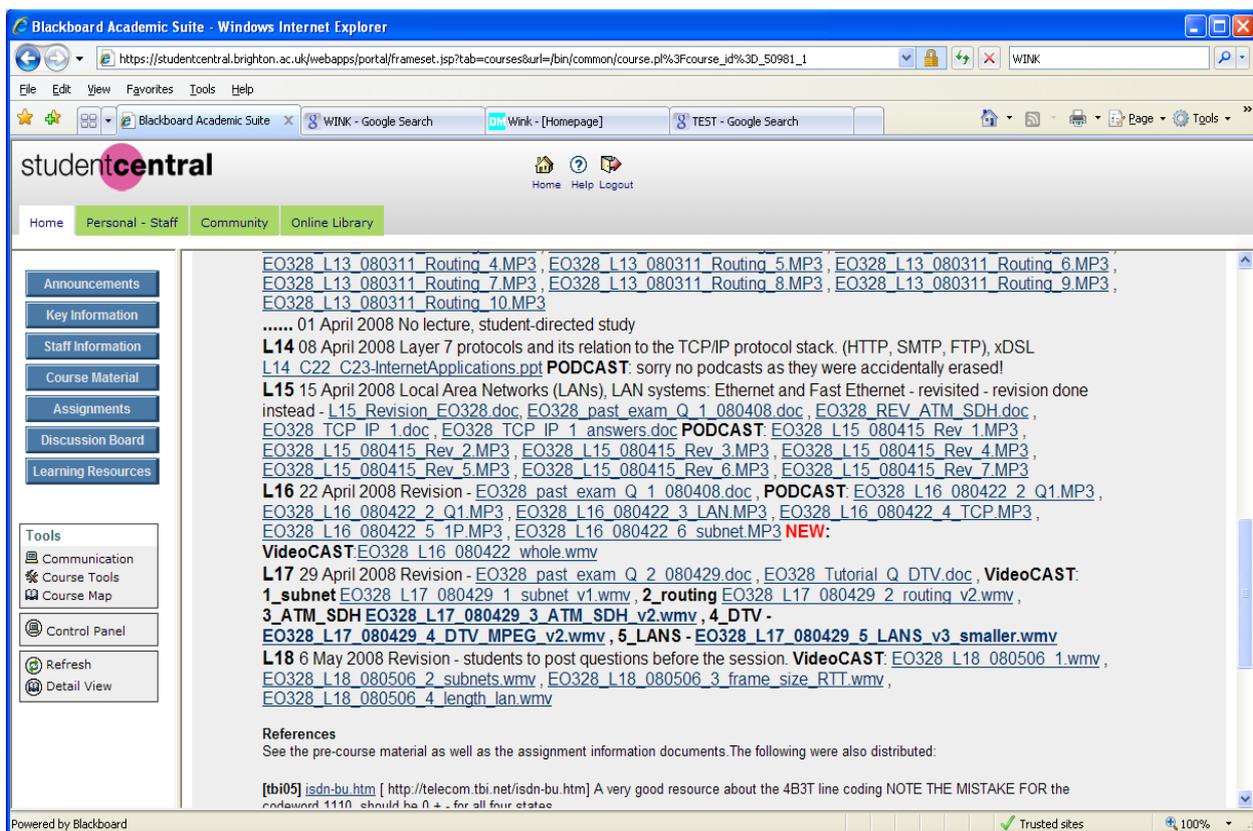
Figure 5 Publication of the podcasts and videocasts on studentcentral.

Using podcasts and videocasts with blogs in teaching this module has enabled students to adopt a more interactive and flexible approach to their learning. Students can effectively enter the cycle at any stage, rather than having the entry point prescribed by the lecture content. Feedback can be sought from staff via the blog and students can access the teaching material at any time. Students are encouraged to

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reflect on the learning that takes place in the lecture and during the subsequent activities. A proposed revision of Kolb's cycle for this electrical engineering module illustrates how blogs are used to complement the videocasts and podcasts to promote further learning. This is shown in Figure 6. At Stage 1 of the revised model, students are encouraged to find out more about the lecture content before the lecture. This is re-enforced in stage 2 at the lecture and followed by activities revolving around the use of BLOGS for reflection. An on-line activity allows for students to share their ideas with their peers. Students are set a directed activity in stage 4 to apply what they have learnt. This can be problem based, which is appropriate for engineering students. The cycle is completed with the students reflecting on their learning and further exploring the subject area..
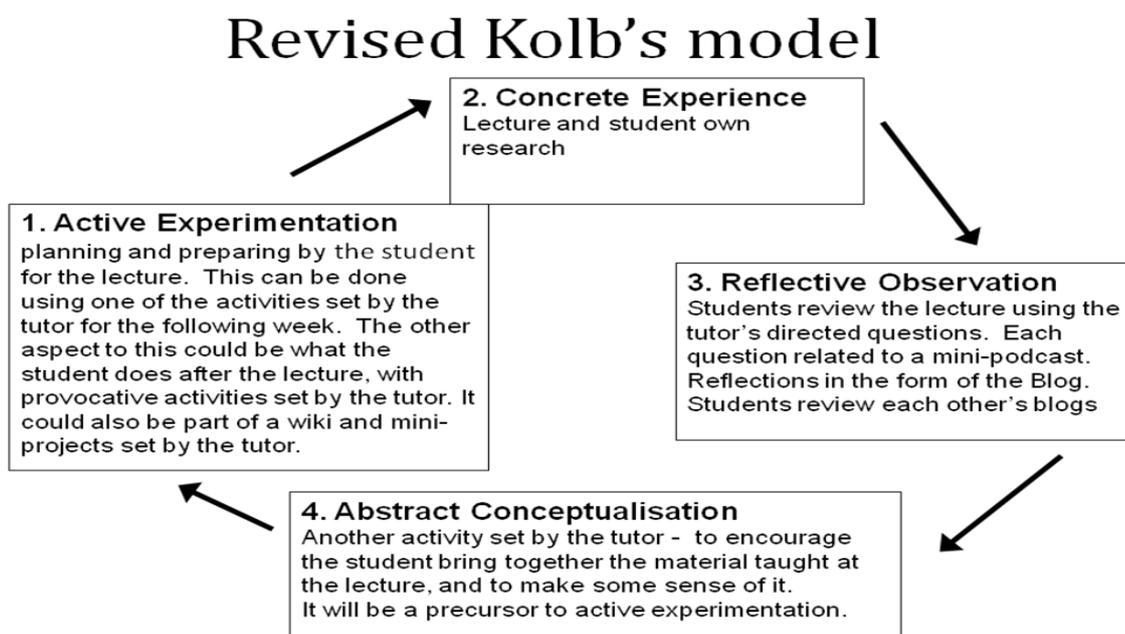
Figure 6 The revised Kolb's model for the electrical engineering module.

3   ASSESSED STUDENT ACIVITY

Whilst podcasts and videocasts can be used to assist and even promote learning, they can also be used to assess student learning. In another module called Communication for first year Product Design students, videocasts as well as being used by teaching staff to record lectures, were also introduced to assess student work in Computer Aided Design (CAD).

In previous years, this module only involved two types of assessment: the group presentation/report and the individual portfolio of CAD work. This year however, students were also required to produce an online demonstration of a CAD model. The rationale for this was based on the limited information that could be gathered from a CAD portfolio: how was it created? was this approach correct? could it be created more efficiently? was it even the work of that student? Although most of these issues could be addressed by students reflecting on their approach and by working closely with the students on their CAD work, much more detailed information could be gathered by students producing their own online demonstrations.

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Furthermore, it was reasoned that if students were able to share and discuss their videocasts, then they would be able to learn from each other as well as the teacher. Students were shown how to use the software and were introduced to the online tutorials provided by the software developers. Students were required to submit their videocasts to the online discussion board on Studentcentral (Blackboard). Guidelines were given (similar to the ones used by the teacher above) for preparing (planning, rehearsing), editing (mistakes are acceptable, but no swearing) and producing (file type, size, resolution, frame rate) the videos. This facility allowed students to comment on each others' work, and staff were able to provide feedback and grade the work.

After a slow response students engaged with the assessment well and produced some informative videocasts. In fact, the videocasts gave such an insight into the approaches, tools used, and shortcomings with the student's work that it was a valuable opportunity to provide feedback. It was often the case that students were able to demonstrate a new feature that proved useful to them which had not been covered in class. They were pleased to be promoting the use of these to their peers, and this provided an obvious sense of satisfaction. The assessment was particularly timely for students as they were in the process of developing their portfolios and this feedback could be directly implemented in their own modelling. Students could also gauge the progress of other students and their understanding of the package, introducing a healthy element of competition. The competitive element was thought to be appropriate, since students were studying for a professional degree where industry mirrors this competitive approach. As a result, students were exposed to a variety of new techniques, tools and approaches and information on these could be accessed at any time. A rich variety of student work included a glossy finish to a fully packaged frisbee with labels, a set of lit traffic lights, a toy robot and the application of lights.

The criteria for this assessment included the following:

1) clarity and coherence of voiceover,

2) clarity of presentation structure, and

3) level of detail in discussion.

These were chosen to ensure that students paid attention to how they presented themselves and how they structured and prepared their presentation. It also placed an emphasis on their critical awareness of the package in terms of options available, alternative approaches, and the limitations of various tools.

By asking students to produce a small portfolio and develop their own videocasts of their work we are effectively giving them the opportunity to go around the Kolb cycle twice. Firstly, when they are learning to use the CAD software they are exposed to various techniques and are required to reflect as they learn and to produce a portfolio of work. They are then required to go around again, as they communicate their work in a different manner as a video for others to learn from. An added advantage of this is that they are also required to peer assess each other, and this gives them an opportunity to learn from others in the group.

They gain a variety of perspectives, learn a variety of tips and techniques and also learn form the mistakes of others. This is potentially a very powerful and empowering approach to learning CAD (and of course other skill and knowledge based areas). However, there are potential traps to note, including the danger of excluding slower learners or those whose communication skills are not adequate.

4   DISCUSSION OF PRACTICAL ISSUES

The fundamental premise for this paper was to introduce and evaluate the use of online material in teaching and assessing, with the aim of improving the student learning experience. It is believed that overall students responded well to the podcasts and videocasts and that this enabled them to develop skills more efficiently and more interactively with other students and with the teacher. A positive outcome was that none of these students felt that online demonstrations should replace the live equivalent, since students feel the ability to ask questions is vital (Covill *et al*, 2008). Having easily accessible and hence easily sharable material available to students can potentially leave teachers vulnerable to intense scrutiny and may be shared outside the context of the institution leading to intellectual property issues. However, with careful planning of material (and since students themselves can develop online demonstrations) it is thought that they may take more responsibility and ownership with how they respond to this activity.

For those students generating videocasts who for reasons of illness, disability or a difficultly in learning progress more slowly than others in the group may become isolated as a result of such an activity. This was highlighted by a number of comments which may have been flippant or intentional but they did highlight that students may feel more despondent as a result of this activity. Regardless, it is an issue worth addressing by teaching in a responsive and supporting manner, working closely with students.

5   CONCLUSION

The authors have demonstrated the use of podcasts and videocasts using two different approaches; lecture-led and student-led. Both were found to engage students by accommodating a wide variety of learning approaches and by enabling a flexible, reflective approach to learning according to the Kolb cycle.

By using videocasts in assessing students, teachers receive a valuable insight into how students approach problems and the depth and breadth of their knowledge in the relevant subject area. Furthermore, a database of student videocasts encourages a community approach in learning, where students can learn from the knowledge, tips, dead ends, tricks and approaches of their peers. This method in conjunction with traditional assessment methods can allow students an extra iteration of the Kolb cycle, giving them access to a richer learning experience.

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Acknowledgements

Biographies

Derek Covill is a senior lecturer in the Division of Engineering and Product Design in the School of Environment and Technology (SET).   His areas of expertise lie in computer aided design/engineering, finite element analysis, heat transfer and mechanics of solids. He is a keen sportsman and an urban shepherd.

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