Critical Design and Effective Tools for E–Learning in Higher Education:

Theory into Practice

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Chapter 13

Developing Educational Screencasts:
A Practitioner's Perspective

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ABSTRACT

YouTube to iTunes, company to college websites, there is a seemingly exponential explosion in creating screencasts. A screencast is a digital recording of computer screen activity, often with an audio commentary. Short and engaging, screencasts have the potential to enable learning in new and exciting ways. They are becoming easier to create and, as a teacher in higher education, I have gradually increased my use of screencasts, learning with experience and from the generally positive feedback from students. Drawing on existing research and personal experience, this chapter will introduce screencasts and discuss their potential. The importance of integrating screencasts thoughtfully and carefully into the teaching and learning process will be examined, including pedagogical and instructional design issues. Next a four-step process for creating a screencast will be presented: prepare, capture, produce and publish. Prior to conclusions and final reflections, future research directions will be examined.

INTRODUCTION

The other day I wanted to embed a YouTube video into a PowerPoint presentation: to link and view directly a video on YouTube, rather than hyperlink out to an internet browser or embed the downloaded video file. I didn't know how to do this, so I searched YouTube and *hey presto*

a series of videos appeared. Selecting the first video, I watched a screencast showing how to do the task I wanted to do myself. I was able to watch it, pausing at places and switching to my presentation to embed the video I wanted. As well as the basic process, the screencast gave a number of tips. Less than ten minutes later I had completed my task.

A screencast is often used to capture *how-to-do-something*, for example how to use particular

software. In the vignette above, I learnt and practiced a new skill: I had an immediate need, I found help in a form that was immediate, understandable and engaging, and I used that help to complete my task.

Increasingly educators are blending more online elements with traditional face-to-face teaching, often by simply using a virtual learning environment (VLE) to provide notes and other documentation as well as to communicate with students. As part of a multimedia approach (combinations of video, animations, images, text and sound) to blended learning, screencasts offer a multimedia-rich option to support student learning in particular contexts (such as learning a new skill as above). Thus a screencast can be a standalone multimedia learning object or can be part of a series that together comprise a fuller learning resource, or indeed be part of a learning object that integrates a screencast(s) with other hypermedia elements. Screencasts are becoming easier to create: a computer, some software and a microphone is enough. At the simplest, it could be adding a voiceover to a presentation, perhaps by using the narration feature within Microsoft PowerPoint. A little more complicated is recording on-screen activity with explanatory labels or a voiceover. With more effort, a screencast can integrate some interactivity, including clickable zones and quizzes. The time, resources and expertise required increases with the complexity of the screencast.

So what exactly is a screencast? How does one go about creating a screencast? What are the pedagogical and instructional design, technical and practical issues involved? And, of course, why do it? What are the benefits for learners? The rest of the chapter will explore these questions, starting with examining in more detail what a screencast is and sharing some personal experiences of using screencasts with students.

EDUCATIONAL SCREENCASTS

A screencast is a digital recording of computer screen activity, often containing audio narration. It is sometimes referred to as a video podcast or simply a video, and also as a *scrast* (verbally shortening the word screencast to one syllable).[1] A screencast gives a *look over my shoulder effect* similar to one-on-one instruction and can be accessed whenever and wherever it is convenient (Educause, 2006). Students particularly value this, flexibly using screencasts to support their learning and thereby allowing for greater learner independence. A screencast usually has control buttons, enabling it to be paused and particular sections to be replayed: this level of learner control over pace is important (Oud, 2009, p. 169). The combination of video and audio appeals to different learning styles (as an alternative to predominantly text-based learning materials) and, as it is produced locally, it may be more approachable than glitzy packaged instructional videos (Kanter, 2008).

Short, sharply focused screencasts can be very useful in supporting students, working at their own pace, to achieve learning outcomes. Screencasts are particularly useful for teaching software applications and showing how to use online tools such as websites and library catalogues, having the following benefits over reading step-by-step instructions, as identified by Mount and Chambers (2008): 'improving student cognition through improved information integration, reduced information redundancy and an improved representation of the dynamics of software operation' (p. 49). They can provide engaging revision materials and, like other learning materials, are particularly valued by students if focused on preparing for assessments. Screencasts can be used to give short presentations (mini-lectures of voiceovers over images or PowerPoint slides). These short teaching episodes are best used for topic overviews, difficult concepts and guidelines for the module, projects and assessments as well as for just-in-time support for project- or problem-based approaches.

Other potential uses include explaining model solutions, correcting and giving feedback, answering frequently asked questions (FAQs) and website testing. Using a tablet and wireless pen together with software for writing on the screen, *mathcasts* (screencasts where the solution to a maths problem is hand-written to an accompanying voiceover explanation (see Budgett, Cumming, & Miller, 2007; Bonnington, Oates, Parnell, Paterson, & Stratton, 2007; Fahlberg, Fahlberg-Stojanovska, & MacNeil, 2007) and other screencasts incorporating writing, drawings and highlighting can be created.

Personal Experiences

A number of years ago, as part of a quantitative techniques module, I introduced first-year students to spreadsheets and then looked at their applications to financial mathematics and statistics. In a computer lab, students first worked through some generic introductory exercises focused on basic skills and then progressed to applying these skills and learning new ones by tackling subject-specific exercises. I would often explain new spreadsheet features using a digital projector, requiring the entire class to stop and watch, irrespective of their progress. The disadvantage of these *helpful* interruptions was that the timing did not suit all the students and thus some would fail to get the full benefit of these explanations.

Changing to an alternative approach, I created a series of short screencasts (using the four-step process explained later in this chapter) that introduced the basic features of spreadsheets as needed by the introductory exercises (each exercise listed the relevant screencasts). Students were now free to work through the exercises, watching the relevant screencast(s) as required. This allowed a student to watch the screencast exactly when needed, as often as they wanted with full control to pause and replay particular sections. Thus students could spend more time on task, as well as freeing more time for me to assist individual

students. Together with a number of screencasts showing how to do a sample assessment, this series of screencasts formed a reference bank that students could draw upon as and when needed, including when revising.

Screencasts showing a suggested approach to completing the tasks of a sample assessment are, like everything explicitly linked to assessment, very popular with students. Useful also are screencasts of solutions to assessments, especially if released prior to results: they provide valuable feedback (and also can be used in future iterations of the module as further sample assessments). Moreover, a reference bank of screencasts introducing a topic, such as the 'introduction to spreadsheets' screencasts as described in the vignette above, can subsequently be used in more advanced courses as a quick revision for students to go through prior to classes; this has the benefit of encouraging students to engage prior to the first class as well as establishing a minimum starting level. Groups of screencasts can also be used as a first point of reference for former students who make contact asking for help on using software applications, which usually enables them to resolve their difficulties by themselves.

Initial feedback from students has been very positive (similar to Bush, 2008; Peterson, 2007; Winterbottom, 2007). Consistently for the past five years, in end-of-module evaluations for computer lab-based subjects, most students indicate that the available screencasts have been very useful and, that for future iterations of the module, more should be produced. Accessed through the college's virtual learning environment, the screencasts provide students with rich, multimedia online content to complement face-to-face classes. The VLE also provides a platform for the integration of screencasts into the module, so that they naturally support other activities and materials.

Recently, one week prior to a test, I uploaded to the VLE a series of four mathcasts (two to three minutes each) showing the handwritten development of the solution to a number of mathematics

problems. The screencasts were presented with the questions, so that prior to viewing the screencast the student could read and indeed was encouraged to attempt the question. In the week prior to the test, over half the students in the class accessed the resource and nearly a quarter on two or three different days. A small number of students watched the screencasts over the weekend, with the heaviest use in the day before and the morning of the exam. The screencasts were viewed both during the day and into the late evening. Feedback from students a week after the exam (via a short anonymous in-class survey) showed a positive and enthusiastic attitude, indicating that almost all students would like to see more of this type of support and that using it helps to get a higher grade, with about three quarters of students thinking that this type of online solution is very useful for them personally. Students used the online solutions in a variety of ways, from just quickly watching them, through thinking carefully about the question before watching, to trying the question and then watching the solution (or fast-forwarding to the end to check their answer). Some students study together in groups, only resorting to the mathcasts if the group cannot solve the problem. A reservation that surfaced among a substantial minority, particularly from those who did not use the mathcasts, was the inability to print the solutions.

This vignette illustrates the potential of screencasts: students engaging with revision materials prior to an assessment. They did not all use the online solution, and those that did used the mathcasts in a variety of ways, a way that suited them. It raises the importance of being aware of individual differences and preferences for different ways of engaging with the materials. How screencasts are presented to students is important. Screencasts need to be integrated into the teaching and learning process, with attention to their design and use so as to avoid passivity and encourage engagement: students doing tasks, thinking and solving problems.

The profusion of screencasts on the internet, on YouTube and on specific websites such as www.teachertrainingvideos.com (a collection of screencasts for teachers to help them to incorporate technology into their teaching) and www.demogirl.com (a blog with short screencasts explaining new internet applications and services), links to a dilemma that faces a teacher considering using screencasts: should you just link to useful screencasts you find on the internet, or create your own? Creating screencasts involves time, pedagogy and technology, with an important trade-off between final screencast quality and sophistication, and the time taken to develop it. Getting the balance right can be difficult, but may be answered by keeping the benefits to students clearly in mind: sometimes it's better to link to a screencast produced elsewhere, other times preferable to create your own. Prior to presenting a four-step process for creating a screencast, the next section will consider some pedagogical and instructional design issues.

Integrating Screencasts into the Teaching and Learning Process

All teaching starts with a learner's need. Screencasts are created by teachers to assist the learning process of students, to help students achieve learning outcomes. As the goal is to support student learning, it should always first be asked whether a screencast approach is the most appropriate and effective way to accomplish this. Only after reflecting on this should screencasts be created. Thus screencasts should be *pedagogically led* rather than *technology led*: in short, when creating a screencast, think about the learner. It is advisable, like with other teaching innovations, to start small and build on initial successes, learning what works best for your students.

Create bite-sized screencasts: it is better for students to choose from a series of short, clearly focused screencasts than to have to navigate

a smaller number of longer ones: two to four minutes, definitely less than ten minutes (see Cann, 2007). Shorter screencasts are more flexible for reusing with other learners and can be updated more easily. Each screencast should have a specific, clear purpose (ideally focused on one learning outcome), such as

- introducing a module
- providing guidelines or giving an overview
- reviewing a difficult concept
- previewing a forthcoming lecture, reviewing or summarising a previous lecture
- illustrating the steps to solve a problem
- explaining a technical diagram or picture
- demonstrating a software or website feature (particularly useful for software that students have limited access to)
- supporting an activity or project
- revising for a test
- answering frequently asked questions
- correcting or giving feedback

Combined together, a series of screencasts can form a reference bank (as discussed earlier) that can be used as a comprehensive resource for independent study and revision, a support for project work and a starting point for more advanced modules. Note that for students viewing on campus, particularly in computer labs, consideration of whether to use audio is required: Will all students have headsets or should an alternative no-audio screencast with captions also be produced? Veronikas and Maushak (2005) concluded, from a small research study, that students learning software applications prefer audio and text, rather than text only despite no statistically significant evidence that audio improves test scores (p. 204).

Careful preparation is crucial to the creation of high quality educational screencasts of high value to students. When creating a screencast, balance the time and effort involved against the potential benefits for learners. Also consider whether the screencast is to be of limited use, by

a small number of students for a short period of time? Or should you expend more time and effort to create a screencast of higher quality that can be productively used by a variety of learners over a longer time-span across different modules and contexts? This extra effort may be rewarded if screencasts can be shared, either internally within a college or externally via YouTube or a national repository of learning objects.

A potential and real criticism of screencasts is that they can have a teacher focus rather than student focus and can lack interactivity (Educause, 2006), and thus may encourage passivity in learners, an attitude of *just sit back and watch*. To counteract this, think carefully how students can be encouraged to be active when using screencasts (a criticism and response that was also considered by Franciszkowicz (2008) when using screencasts to teach problem-solving skills and conceptual understanding in a general chemistry module). If possible, add some interactions. These could be some quiz elements, such as answering multiple-choice questions or dragging and dropping. It could be the addition of clickable zones, for example where a student must click on the correct button to get a software demonstration to continue. At the most basic, it could simply be a requirement to click a button to continue, paired with an instruction or exhortation to think or do something before continuing. For example, if illustrating how to solve a question, such as an accounting or engineering problem, the screencast could display the question and then pause, instructing the student to read it carefully and consider how to proceed. The student could then click to view how to approach the question, with an audio explanation linked to underlining or highlighting on screen the key terms and numbers. Then the student might be requested to attempt the question, only viewing when having completed their solution as best they can. As the learner can forward and rewind, they can focus on specific areas of difficulty, watching these sections a number of

times. The solution could be partitioned into stages, with pauses at each transition.

There is an element of 'watch what I do' in a screencast: this can be useful, enabling the student to watch an expert at work, thereby offering a scaffold for undertaking the activity herself/himself. Some interactivity giving feedback may be incorporated into the screencast itself, as discussed above. This increases the complexity of the screencast, requiring greater time and expertise to create it; indeed many screen capture softwares may not support this, or it may be easier to create a simple screencast and build the other elements separately. This latter approach is where screencasts may bring audio-visually rich media to an online learning activity, a form of reusable learning object (RLO). Alternatively, it may be better to create simple screencasts and then carefully consider how these can support learning in conjunction with activities designed for students to undertake.

Oud (2009) presents a useful summary of the implications stemming from the limited capacity of short-term or working memory and how this limits learners' capacities for information processing. When too much information is presented, learners' 'working memory is overloaded and they cannot process anything well, which leads to poor understanding, retention and learning' (p. 166). Thus when creating a screencast, it is important to minimise the cognitive load. This leads to practical recommendations (see below in the Capture section). Of particular importance is chunking, the splitting of longer or more complex content into small sections (p. 167).

Instructional design approaches are valuable for informing the screencast development process. An instructional design approach to the development of educational multimedia, specifically screencasts, is based upon the application of appropriate research, such as the psychology research on cognitive load theory summarised above. Instructional design is the use of systematic design procedures, thereby making, according to
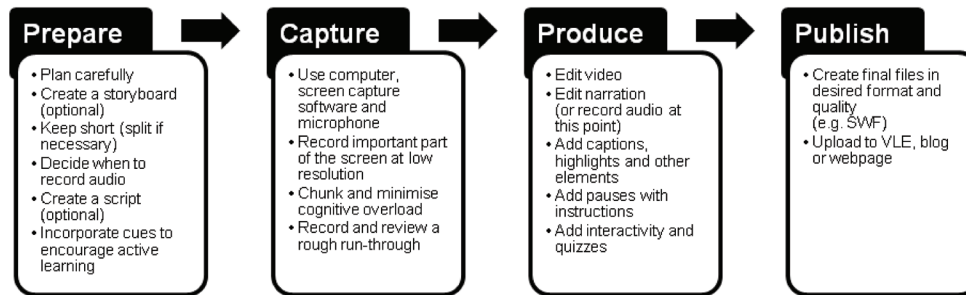
Gustafson and Branch (2002), 'instruction more effective, efficient and relevant than less rigorous approaches to planning instruction' (p. 18). Fundamental to all systematic design approaches are the following elements: analysis, design, development, implementation and evaluation (often referred to by their acronym ADDIE). (Readers interested in instructional design are directed to the References and Additional Reading sections.) In the next section, the four-step model proposed for creating a screencast broadly corresponds to the middle three elements of the ADDIE model.

Creating a Screencast

The motivation for creating a screencast is to support learning. The process builds naturally on existing teaching expertise, often using low threshold applications (i.e. technology with a relatively short learning curve, Gilbert 2002). As shown in Figure 1 the process to create a screencast can be envisioned in four steps:

The process starts with preparation, careful consideration of a teaching activity and learning opportunity. With a computer, screen capture software and a microphone, educational screencasts can quickly be created that are of immediate use and value. Voiceovers can be captured when recording the screencast or added later during the production process. The production process can be elaborate, including the addition of captions and other visual cues, additional voiceovers and interactive elements such as quiz questions. Alternatively, given usual time pressures, this pre-deployment step can be minimised to simply publishing the screencast in the required technical format (Costello, 2008). Then the screencast can be deployed via a virtual learning environment, a blog, an intranet or the Internet. Although Figure 1 presents the four steps as a linear process, the boundaries are fuzzy and, similar to the ADDIE model, there may be jumps back and forth and reiterations.

Figure 1. Four-step Screen Capture Process (with a summary of each step)

Prepare
- Plan carefully
- Create a storyboard (optional)
- Keep short (split if necessary)
- Decide when to record audio
- Create a script (optional)
- Incorporate cues to encourage active learning

Capture
- Use computer, screen capture software and microphone
- Record important part of the screen at low resolution
- Chunk and minimise cognitive overload
- Record and review a rough run-through

Produce
- Edit video
- Edit narration (or record audio at this point)
- Add captions, highlights and other elements
- Add pauses with instructions
- Add interactivity and quizzes

Publish
- Create final files in desired format and quality (e.g. SWF)
- Upload to VLE, blog or webpage

For capturing a screencast, there are both hardware and software requirements. The computer needs to be sufficiently powerful to run the capture software plus any target applications that you are recording. The same general issues apply to sound quality as when producing a podcast and an inexpensive microphone headset usually suffices. For capturing handwriting on the screen, such as for mathcasts, a tablet laptop is likely to result in much clearer handwriting than an external USB tablet and it is easier to use for annotations as you are writing on the actual screen. Software that is useful here includes Microsoft OneNote, PDF Annotator and Microsoft PowerPoint, as well as drawing tools such as Microsoft Paint.

There are many capture software options available, from sophisticated packages with powerful capture and editing features such as Adobe Captivate and Camtasia to simple, free options that simply publish what you capture without any editing such as Jing and Screenr.com.[2] These four software options all include screencasts showing how to use the particular software to create screencasts (see links in Additional Reading). Your choice of software should be dictated by the extent to which you wish to edit your screencasts, as well as the importance of particular features, such as being able to add quiz elements, modify menu options, accessibility features and publishing format options.

In the following four sections, each of the four steps will be discussed in terms of instructions and tips for creating educational screencasts.

Prepare

Plan your recording carefully. Know what you want to show, to do and what you want to say. Be aware of what your students already know. It may be useful to create a storyboard, a 'visual representation which illustrates the content, navigation and structure of the learning materials' (Clarke, 2001, p. 173). Use the storyboard to help the chunking of complex sections into simpler pieces. For short, simple screencasts, the storyboard can be an overview of the major elements. For longer screencasts, the storyboard may be more elaborate, detailing each major element or screen display. If the storyboard indicates a long screencast, consider whether it is possible to break it into a series of two or more shorter screencasts. Remember at this stage to think carefully how students are likely to use the screencast and what cues you can incorporate to encourage them to be active when using the screencast.

Decide when to record the audio. For short simple screencasts you may decide to record narration as you capture the screen activity. For longer screencasts, it may be easier to record the audio separately after capturing the screen activity. For example, if demonstrating how to use a website, it may be better to first edit out any time

waiting for pages to load and any glitches before adding the voiceover. Also recording the audio afterwards allows you when screen capturing to focus on doing clear screen actions. Consider using a script: the trade-off is between spontaneity and naturalness versus a professional, confident narration mostly free of ums and ahs. An added benefit of a script is that it can be used as a transcript or for closed captions.

To summarise, a teacher creates screencasts to help learning happen. Creating good screencasts depends on 'planning a session with an eye toward its being recorded and on thoughtful editing afterwards' (Educause, 2006). Careful planning and thoughtful reflection can assist in translating teaching activities into useful screencasts: indeed this preparation is key to the *capture* stage in the creation of educational screencasts.

Capture

After your planning, you should know exactly what you are going to record. If recording audio, use a quiet room with telephones turned off. Ensure that any other applications will not interfere with the recording, for example an email application beeping or otherwise alerting that a new email has arrived. Indeed you should close any unneeded applications. A tip when recording is to record only the application window or a defined area, and to consider recording at low screen resolution (such as 800x600). It is important to be aware of any quirks of your screen capture software that may result in glitches in your recording. For software demonstrations, make clear mouse movements at a pace that is suitable for learners to follow.

Be conscious of instructional design principles. In particular use strategies to minimise cognitive load such as the following guidelines suggested by Oud (2009, pp. 176–177): start with an outline and end with a summary; split content into small segments/chunks; sequence content logically; use words (text or audio, not both) with graphics; pro-

vide clear interface, navigation and instructions; remove unnecessary graphics, text and audio; and, focus attention on important areas with visual or verbal cues.

A pragmatic approach is to record a rough run-through, review it and then record the main version. For a short screencast, if you make a mistake you could just restart recording rather than having to edit. For longer screencasts, errors can be edited out during the *produce* stage.

Produce

The *produce* stage may be extensive, short or omitted entirely (especially in the case of screencasts that are not to be used extensively). Start with editing the video, removing glitches and unneeded elements such as video showing the loading of webpages. Edit the audio, removing ums and ahs (or record the narration at this point). Make the modifications decided upon in the *prepare* stage: add captions as appropriate (or edit captions that have been automatically created by your screen capture software), whilst remembering not to overburden the viewer with too many simultaneous elements; use text animation, highlighting and zoom effects to focus attention and reinforce important points; and, add interactivity such as clickable zones and buttons, quiz elements or simply pauses with exhortations to think.

If your screen software capture allows, modify the default menu (player) options to your desired configuration, ensuring to allow learners substantial control. Now the screencast should be ready to *publish*.

Publish

The *publish* stage of the screencast creation process involves creating the final screencast file(s) in a technical format suitable for use by learners. Depending on the software used to capture and process the screencast, there may be a variety of op-

tions, such as Macromedia Flash (swf), Windows Media Video (wmv), Audio Video Interleave (AVI) or executable (exe). Screencasts can be delivered on a variety of platforms, primarily streamed via the internet for watching via a browser with suitable media player, but also downloadable for later viewing on a computer or portable device capable of playing video (although note that the small display size of some portable devices may be insufficient to display certain screencasts in sufficient detail). For example, Adobe Captivate creates Flash files to be viewed via a browser, also creating the HTML code for launching the screencast.[3] It can also create Windows executable files (not requiring any other software) and AVI (which can be further processed for uploading to YouTube).

It is straightforward to upload these files to a VLE, a blog, an intranet or the Internet. Decide whether to only allow the screencasts to be viewed online, or to permit downloading for offline viewing. Some issues may arise regarding file size and server space if uploading a large number of screencasts (particularly within a VLE where each file must be uploaded separately to different courses). A solution is to host separately and to post links to the VLE. For students viewing screencasts from home, large file sizes necessitate having broadband. A separate issue is how students should be notified of new screencasts. Within a VLE, they may be uploaded to the relevant section, possibly accompanied by an announcement or email notification.

FUTURE RESEARCH DIRECTIONS

Screencasts are very popular with students and many teachers in higher education are exploring their use. Although most practitioner-reported experience views screencasts positively, there may be questions as to the effectiveness of screencasts in improving learning for students; for example Lee, Pradhan, and Dalgarno, (2008) report on a research project in which screencasts were used to support the teaching of programming, finding 'no significant effect of the provision of screencasts during learning' (p. 75). The level of complexity of the task or subject matter for the screencast is important, with Bhowmick, Khasawnehb, Bowling, Gramopadhyea, and Melloya (2007) finding that for complex procedural tasks 'a combination of audio, video and synchronized text yields the best results both in terms of learning performance and process efficiency' (p. 615). Given the development of national repositories for reusable learning objects (RLOs) such as the National Digital Learning Repository Project (NDLR) in Ireland, Jorum in the United Kingdom and MERLOT in the USA, it is appropriate to consider the development of quality screencasts that are reusable by students on a variety of programmes, in different ways and contexts.

A potential criticism of the four-step screen capture process presented above is that, unlike the ADDIE model, it does not explicitly include an evaluation stage. There is a need for the evaluation of the use and effectiveness of screencasts in a variety of intents and contexts. These evaluations and related research should inform the development of evidence-based recommendations for good practice in the creation and use of educational screencasts.

It is incumbent on teachers who develop screencasts to become proficient with the technology. However those who create screencasts also need to become familiar and draw upon research in areas such as instructional design, pedagogy, educational psychology and accessibility. This should be viewed within the context of major change in higher education underpinned by technology and the attending change in the role of the academic (see Davidson-Shivers, 2002).

CONCLUSION AND REFLECTIONS

Simple, short screencasts are quick and easy to produce, popular with students and can help learning happen. The combination of text, audio and video is engaging. Screencasts can be used for many purposes, for instance to introduce a module, give an overview or review a difficult concept, illustrate how to solve a problem, explain a technical diagram or picture, show how to use software or a website, and give feedback. Students can flexibly use short, sharply focused screencasts how, when and where they want.

To create a screencast, you need a computer, some software and a microphone. There are many software choices, with more powerful options having a steeper learning curve. Time is often the major issue, whether to capture a simple screencast and publish with little editing or to expend greater effort in creating a screencast together with inter-active elements that is of use by a greater number of students in a wider context.

When introducing screencasts into a module, there are some personal considerations. Screen-casts, like full digital recordings of lectures, are a more public form of teaching. This combined with the possibility of the digital recording of mistakes (Do *you* want to appear on YouTube? See Young, 2009) may enable possible misuse by students and criticism of presentation style by colleagues (see Budgett et al., 2007). This open-ness is broadly positive, but requires a certain level of confidence. Another issue may arise: if recording mini-lectures, software demonstrations and explanations for model solutions of questions, will students stop coming to class? No, I would tentatively suggest; it is likely that screencast use and class attendance are positively corre-lated, consistent with the findings of Grabe and Christopherson (2007) who found that the use of online lecture resources, lecture attendance and examination performance were positively related. Screencasts do need to be thoughtfully integrated and their introduction may provide an opportunity to rethink the use of classroom time, to create space for implementing more active learning strategies.

Screencasts indeed have the *potential* to enable learning in new and exciting ways. Screencasts can be used to support greater learner indepen-dence and may allow for a change in how lectures, tutorials and lab sessions are used, with less time spent presenting and more time spent on students doing things. It is important to reflect on the strengths and weaknesses of screencasts to be able to harness their potential, as well as to draw upon pedagogical and instructional design principles in their development. In particular, it is essential to carefully integrate screencasts into the teaching and learning process to support students' active engagement with their learning.

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ADDITIONAL READING

a website of a professional screencast creation company, including examples, a blog and a short screencast overview of the company approach to creating screencasts (http://scraster.com/82/scraster-professional-screencasting-a-3-minute-introduction-2)http://scraster.com

http://screenr.com: a website that allows you to create screencasts directly from your browser with no software to install. For free, you can create your screencast, preview it (no editing) and then upload for hosting on screenr.com, download as MP4 or upload to YouTube. It integrates with

http://www.screencast.com: a website that allows you to upload and share screencasts, presentations, documents and images. Integrates with Jing and Camtasia.

Branch, R. M. (2009). Instructional design: The ADDIE approach. London: Springer. A general instructional design primer focused on fundamental ADDIE principles.

Oud, J. (2009). Guidelines for effective online instruction using multimedia screencasts. *Reference Services Review, 37*(2). Written from an academic library instruction perspective, this journal article presents a summary of research in cognitive psychology, education and librarianship from which useful guidelines for designing educational screencasts are derived.

http://www.teachertrainingvideos.com: Russell Stannard's website is a collection of screencasts to help teachers incorporate technology into their teaching. It demonstrates the usefulness of screencasts, and has a series of screencasts on using Camtasia.

Salmon, G., & Edirisingha, P. (Eds.). (2008). Podcasting for Learning in Universities. Berkshire: Open University Press. Comprehensive book on podcasting, including a useful chapter by Mount and Chambers on their research on screencasting for software practicals.

http://www.mathcasts.org: Tim Fahlberg's website is a useful starting point for those interested in creating mathcasts (or simply recording writing and drawing on a screen). He also showcases *pencasts*, created using the Pulse SmartPen which digitally records writing and your voice as you write on paper.

Twitter. http://demogirl.com: a blog with short screencasts explaining new internet applications and services, useful to see some good screencasts and Molly McDonald explains how she makes a screencast (http://demogirl.com/2008/01/14/want-to-see-how-i-make-a-screencast)

http://www.adobe.com: website for Adobe Captivate, where you can download a fully functioning trial, get help and tips from the Developer Center, watch example screencasts and visit the blog.

http://www.techsmith.com: website for Camtasia, where you can download a fully functioning trial, go on a product tour, watch tutorials and visit a section on using Camtasia in education.

http://www.jingproject.com: website for Jing, where you can download Jing or upgrade to Jing Pro, read about Jing's features, watch screencasts demonstrating how to use Jing and visit the Help Center.

http://www.lynda.com: website of provider of educational materials on using technology. Many of their courses comprise of a series of screencasts and the site provides an opportunity to review some high quality screencasts.

http://www.rlo-cetl.ac.uk: website of the Centre for Excellence in the design, development and use of learning objects. They define an RLO as 'a web-based interactive chunk of e-learning designed to explain a stand-alone learning objective'. RLOs can contain screencasts and this website has many good examples.

ENDNOTES

[1]   Note Educause's (2006) definition of a screencast as 'a screen capture of the actions on a user's computer screen, typically with accompanying audio, distributed through RSS' (p.1); thus a student will have subscribed to the teacher's RSS feed which will automatically highlight any new screencasts that have been added since the student last logged in (Educause, 2007).

[2]   I have used a variety of software, starting with Viewletbuilder (www.qarbon.com*),* then switching to Adobe Captivate (www.adobe.com) and most recently testing Jing (www.jingproject.com). Another very popular screen capture software, particularly in higher education, is Camtasia (www.techsmith.com). Note that there are many software options to choose from. The choice of software is a balance between sophistication of features, ease of use and financial cost. If you want to create a professional screencast, usable over time by many students and reusable by others, using a professional tool such as Captivate or Camtasia is advisable. Captivate, which I am more familiar with, has many features enabling full editing of your screencast (editing of recording and sound, adding captions, clickable zones and buttons, highlighting and much more) as well as the development of e-learning objects with quizzes and branching scenarios. It is part of a suite of e-learning tools. Captivate incorporates a good text-to-speech converter and supports accessibility features like closed captioning. Like Camtasia, it has a presentation feature seamlessly enabling the narration of a PowerPoint presentation. The power of Captivate does come with a learning curve, especially for those less technically literate. Both Captivate and Camtasia have fully functioning trial versions that can be used for 30 days, with integrated screencasts demonstrating how to use the main features. A simpler option that can be used to quickly produce screencasts, especially throwaway (one-use) or limited-use ones, is Jing. Jing makes the capture very straightforward. The free version allows screen captures of up to five minutes to be recorded, with audio if desired. Jing, in conjunction with Screencast.com (www.screencast.com), makes it easy to upload your screencast to the internet, in the process generating a unique URL to link to and the HTML code to embed it within your VLE, blog or other webpages (similar to the options for linking to a YouTube video). Disadvantages however include, as well as the five minute limit, not being able to add captions, indeed not to edit the screencast at all nor to add audio after screen capture, as well as the commercial branding of Jing at the end of screencasts produced. These can be partly overcome by moving to the professional version (which allows removal of commercial branding as well as an easy upload to YouTube) or by bringing the SWF file generated by Jing into Camtasia for editing. At this early stage of my experience of working with Jing, it seems a promising option for colleagues who wish to produce the occasional screencast for use by their

own students and I can see myself increasingly using it for limited-use screencasts (or alternatively Screenr.com, a new web-based option offering similar features). However the editing power of Captivate means it likely that I will continue to use it or similarly powerful screen-capture software for producing screencasts that will be used more widely.

[3] It is sometimes useful to create a simple webpage with links to a series of screencasts that students can open as full screen in a separate browser window. These files can be put into one zipped file and uploaded as a package file (for example, when uploading content in Blackboard choose 'Unpackage this file' to allow the online display of the zipped material, pointing to the index page from which the screencasts will be launched).