7 steps Guide to Screencasting

Ian S. Howard, November 2014
Centre for Robotics and Neural Systems, School of Computing and
Mathematics, Plymouth University, Plymouth, United Kingdom.

Overview

This is a guide to making screencast presentations. A screencast is the recording of a computer screen with simultaneous narration. Screencasts are multimedia versions of a podcasts, which only consist of an audio track (McGarr, 2009). Multimedia presentation of material can be more effective than words alone (Mayer, 2005). Screencasts are viewed on demand and are generally accessed over the Internet. They can either be streamed live, or first downloaded onto computers and portable media devices.

Screencasts are an effective method to learn new aspects of computer science, and many are now on sites such as YouTube, which is a useful resource in educational fields (Burke, Snyder & Rager, 2009). Screencasts offers many potential advantages over conventional lecturing (Mullamphy, Higgins, Belward, & Ward, 2010). In the flipped classroom scenario, in which student study content online and do exercises in class rather than at home (Kordyban & Kinash, 2013), screencasts can provide an alternative to students attending lectures. Indeed there is evidence that online learning can work better than face-to-face learning, although a mixture of both can be even more helpful to the learning process (Means et al, 2009). Screencasts can also be used to provide effective whole class feedback (Haxton, & McGarvey 2011), be used as revision aids, and to provide supplementary material to students.

The self-paced and view-on-demand nature of screencasting has the potential to widen participation, since it enables students to learn at times which suit them. This can make studying a viable option for students who find it difficult to attend lectures (because they live far away, or have work or family commitments). Screencasts also let students select what they want to watch (Bush, 2009), so advanced students can skip over basic material, whereas students that need more support can view additional background material. Screencasts gives all students the opportunity to replay go over material until they understand it at a pace that they are comfortable with. It has been shown that such paced or distributed learning is preferred over massed learning (Hintzman, 1974, Dempster, 1989; Seabrook et al., 2005; Willingham, 2002). Thus, screencasting fits well into the framework of the UKPSF professional values of respecting individual learners.

Screencasts can have advantages for the lecturer, since the same material can be used for a number of years and across different courses. Screencasts embedded in Moodle can incorporate online monitoring, so lecturers can check that students are actually watching the material. Students could use their university-supplied iPads as feedback devices for answer such

questions. This feedback is useful as a means to evaluate screencast popularity and where to improve future screencasts (Loch, 2010).

Screencasts can integrate well with automatic online assessment (Rodrigues, Brandão, & Brandão, 2010). Embedding material in teaching sites like Moodle opens up the possibility to test the student's understanding after watching, using multiple choice tests that automatically mark themselves. These can also make appropriate recommendations to the students on the basis of their results. Apart from the time initially invested in setting up tests, this can also save the lecturer time marking test scripts.

1. Review what you want to screencast

A lecturer can base a screencast presentation on previous PowerPoint slides. The presentation of such material should follow good practice advice (Alley et al, 2006; Holzl, 1997). These should also follow the same general principles adopted for presenting lectures in class. The presentation should focus on the learning outcomes and adopt inclusive principles, such as supporting the development of learning communities, encourage participation in higher education, acknowledge diversity, promote equality of opportunity and professional development.

It is important to get basic concepts across to the students and avoid unnecessary detail (Bourne, 2007). Don't reveal all information at the same time as it is distracting and don't put any information onto the slides that you don't intent to talk about. Keep a consistent format throughout the presentation with appropriate non-distracting backgrounds. Add animations to illustrate principles when they help explain the material. This can include an embedded video. Slide effectiveness can also be enhanced if titles are full sentences rather than single words, if the slides avoid too much text and bullet points, and if the present information is graphically where possible.

It can be helpful to include on-the-fly coding examples in lectures to teach programming, whereby the lecturer writes a program in front of the class, compiles and runs it. Such demonstrations are better suited to screencasting than live presentation. The screen resolution of screencasts can be higher than the projectors that are available in classes, making it easier for everyone to see what is going on. Additionally, students can pause screencasts presentation and examine the code in detail. If the lecturer makes a coding error and can't find the problem, the screencast can be redone. If this happens in class, it can be embarrassing and gives the impression that the lecturer is incompetent.

2. Identify user needs and requirements

It is important to identify the needs/requirements of the users (Hall, 2002). To ensure a planned course is inclusive of all abilities and levels of experience, it is helpful for the screencast designer to put themselves into the student's shoes and think about it from their perspective, or even design a screencast with the students together if time is available. How would someone behave if

they had no knowledge of computing, no established work routine, or just operated on a very slow timescale? This process requires a certain amount of imagination, but can be helpful in designing screencasts that will help the widest range of students.

To make a screencasting series effective on first contact with a group of students it is helpful to start with an activity to identify the current level of student understanding (Hall, 2002). This makes it possible to tailor the level of the course appropriately, and also point individual students towards the relevant screencasts suitable for them. This process can be done automatically by an online quiz, which can make the appropriate recommendations on the basis of their results.

Having decided on the material in the screencast, as determined by the learning outcomes, it is important to choose a format for presenting information to students that is appropriate for the material (Brown and Race, 2002). For example, in my course it is necessary to cover the basics of Android programming and illustrate how to deal with real time sensors. PowerPoint slides are very widespread and known to have a positive effect on teaching (Craig & Amernic, 2006). Indeed, PowerPoint is generally preferred over conventional black board methods, and imparts the impression of good course organization (Frey & Birnbaum, 2002). Such presentations work well if they are engaging and as simple as possible, but not too simple as there would then be a danger of leaving out important messages.

3. Avoid potential drawbacks

There are some downsides of screencasting, although usually these can be overcome by taking appropriate measures (Willis, Kestell, Grainger & Missingham, 2013).

Interaction with the lecturer is not possible during a screencast. Since learning is not just the transmission of information (Biggs & Tang, 2007) and interaction plays an important role, a lack of it might disadvantage some learners. However, this can be compensated by ensuing there are interactions with the lecturer during other occasions (laboratory sessions, or other lecture sessions). The lecture sessions can then include more interaction than before and possibly additional information, since the basics are already covered in the screencasts and more time is available for questions (Race, 2006).

Students need an Internet connection and a suitable playback device to watch screencasts, as well as the ability to use them, which is potentially divisive. However in the School of Computer Science and Mathematics, all students are provided with an iPad mini, within the university have Internet access, and since they are studying and working with computers all the time anyway, are familiar with the technology.

From the lectures perspective, there may be the feeling that if all their lectures are available as screencasts, the university could increase their teaching load, or even do without lectures at all. The solution to this concern is again to ensure that screencasting only constitute a part of the overall package, and

actually frees-up valuable extra time for more in-depth interactions with the students (Garner, 2008).

4. Ensure a balance mixture of screencast versus classroom learning

It is important to maintaining interactions with the lecturer during other occasions and not simple replace face-to-face teaching and these two approaches can be made complementary (Winterbottom, 2007).

The use of screencasts could potentially result in a reduction of overall student-lecturer contact, which can weaken the relationship between the two. This could also reduce the incentive of students to come to university at all. However provided interaction is encouraged in other situations, this possible problem can be dealt with (Mullamphy, Higgins, Belward, & Ward, 2010). For example, during lectures the students can be asked to write simple programs to elucidate basic ideas, rather than learn new material by listening to lectures.

In the flipped classroom scenario, screencasts can be tailored to provide students with the basic explanation of the course material and techniques. Using the freed-up time, the lectures can then focus more on going through example problems and answering student's questions.

5. Select your screencasting technology

After preparing a suitable PowerPoint presentation with appropriate commentary, screencast recording can proceed. Various software packages are available for both PCs and also for Mac computers (Seery, 2010). Two examples of suitable computer software are Camtasia (Ruffini, 2012) and PowerPoint (but only the latter if you are using a PC). There are also web-based solutions available that operate on both, and they work very well. A good example of the latter is screencastomatic.com.

Screencast software usually let the user do many things. Recording live video with sounds, recording from the screen, recording drawings, and so on. Here we concentrate on making a screencast of an existing presentation. In this mode, screencast software behaves as screen capture devices that let you add a narration.

It is possible provide a video view of the narrator in a small window. This will enhance the experience for students and make the presentation more engaging and personal. To do so, select an appropriate video camera. This can be one built into your computer or an external webcam.

Many students will watch context on mobile devices, such as the iPad or an Android phone. It is therefore important to check screencasts operate effectively using multiple target devices, since otherwise many students will not be able to access the material.

For further support and training on screencasting, many YouTube screencasts are available; probably including the one that demonstrates the screencasting

process using your chosen software package (e.g., for Camtasia: http://youtu.be/dlUv5emdxqo).

6. Produce your screencast

To get started, find a quiet room so the sound track will be free from unwanted sounds. Distractions, such as background music, are not recommended. Choose and select a suitable microphone. Special directional podcasting microphones give the best results, although many screencasts are made with build-in computer microphones. Unless using a professional setup, recording in mono can give better results than stereo as it will prevent apparent movement of the narrator location for headphone listeners (Notess, 2012).

It is easy to record a screencast. Here we will only describe screen capture mode, so first select the screen capture region. To capture input from a single program, such as PowerPoint, the view can be set to the entire screen by maximizing the display window. However, to incorporate other programs into the view, leave a bit of screen outside the capture view to access these other programs and drag them into the view.

Before starting to record, examine the video and audio inputs are connected by viewing the display and audio level meters. Having checked the sound levels are OK and you can see yourself if desired, you are ready to go. Start your presentation and click record. It will count you down and then you should narrate your pre-prepared slide commentary. You can move the mouse to point to things on the slide too, just as you would with a laser pointer in class. This will also be recorded in the screencast. When you have finished speaking, you can then stop recording, move onto the next slide, and continue the process. After you have narrated all the slides, you may wish to edit and redo ones in which you made mistakes.

Generally its best to keep a presentation short, and to the point (5-10-minute maximum length is a good choice for technical and mathematical subjects (Jordan, Loch, Lowe, Mestel & Wilkins, 2012). This will stop viewers from loosing attention. It is also within the 10-minute time limit imposed on new users of YouTube.

7. Distribute your screencast

After you have finished your screencast, it needs to be distributed so your students can view it (Chandra, 2011).

As one means of distribution, video files can be generated from the screencast software by selecting the export file option. These can be uploaded to suitable sites (such as the Plymouth University teaching sites). This has the advantage over streaming-only sites in that the students can download the screencasts and then play them anywhere offline. However it has the disadvantage that when screencasts are updated, there will still be out-of-date versions in circulation, over which you have no control.

Another means of screencast distribution is to upload it onto YouTube. This requires setting up an account and then making a channel (See YouTube help

for assistance). Initially YouTube places a 10-minute limit on videos. Even if you use YouTube already, it is better to make a specific teaching channel for this purpose, as it is not professional to have the students browsing through your home videos. After uploading the video, it

can be embedded in other sites, ranging from your university homepage to your relevant course module page on Moodle.

Acknowledgements

References

Alley, M., Schreiber, M., Ramsdell, K., & Muffo, J. (2006). How the design of headlines in presentation slides affects audience retention. Technical communication, 53(2), 225-234.

Biggs, J. & Tang, C. (2007). Teaching for Quality Learning at University. Maidenhead: Open University Press.

Bourne, P. E. (2007). Ten simple rules for making good oral presentations. PLoS computational biology, 3(4), e77.

Brown, S. and Race, P. (2002) Lecturing, a practical guide. London: Kogan Page.

Burke, S., Snyder, S., & Rager, R. C. (2009). An assessment of faculty usage of YouTube as a teaching resource. The Internet Journal of Allied Health Sciences and Practice, 7(1), 1-8.

Bush. M. (2009), Screencasting as a Vehicle for Learning and Teaching, HEA-ICS "e" Teaching and Learning Workshop 2009, University of Greenwich

Chandra, S. (2011). Experiences in personal lecture video capture. Learning Technologies, IEEE Transactions on, 4(3), 261-274.

Craig, R. J., & Amernic, J. H. (2006). PowerPoint presentation technology and the dynamics of teaching. Innovative Higher Education, 31(3), 147-160.

Dempster, F. N. (1989). Spacing effects and their implications for theory and practice. Educational Psychology Review, 1(4), 309-330.

Frey, B. A., & Birnbaum D. J. (2002). Learners' perceptions on the value of PowerPoint in lectures. Pittsburgh: University of Pittsburg (ERIC Document Reproduction Service No. ED467192).

Garner, S. (2008). The use of screencasting and audio to support student learning.

Hall, T. (2002). Differentiated instruction. Wakefield, MA: National Center on.

Haxton, K. J., & McGarvey, D. J. (2011). Screencasting as a means of providing timely, general feedback on assessment. New Directions, (7), 18-21.

Hintzman, D. L. (1974). Theoretical implications of the spacing effect. In R. L. Solso (Ed.), Theories of cognitive psychology: The Loyola symposium. Hillsdale, NJ: Erlbaum.

Holzl, J. (1997). Twelve tips for effective PowerPoint presentations for the technologically challenged. Medical Teacher, 19(3), 175-179.

Jordan, C., Loch, B., Lowe, T., Mestel, B., & Wilkins, C. (2012). Do short screencasts improve student learning of mathematics?. MSOR Connections, 12(1), 11-14.

Kordyban, R., & Kinash, S. (2013). No more flying on autopilot: The flipped classroom. Education Technology Solutions, 56, 54.

Loch, B. (2010). What do on campus students do with mathematics lecture screencasts at a dual-mode Australian university? In Proceedings of the 4th Conference on Continuing Excellence in the Teaching and Learning of Maths, Stats and OR (CETL-MSOR 2009) (pp. 43-47). Maths, Stats & OR Network.

Mayer, R. E. (2005). Introduction to multimedia learning. In R. E. Mayer(Ed.), The Cambridge Handbook of Multimedia Learning (pp. 1–18). New York: Cambridge University Press.

McGarr, O. (2009). A review of podcasting in higher education: Its influence on the traditional lecture. Australasian Journal of Educational Technology, 25(3), 309-321.

Means, B., Toyama, Y., Murphy, R., Bakia, M. And Jones, K. (2009) Evaluation of Evidence-Based Practices in Online Learning (US Depatment of Education. Last accessed 7th Sept 2010, http://www.2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.

Mullamphy, D. A., Higgins, P., Belward, S., & Ward, L. M. (2010). To screencast or not to screencast. ANZIAM Journal, 51, C446-C460.

Notess, G. R. (2012). Screencasting for Libraries (No. 17). American Library Association.

Race, P. (2006) In at the deep end: starting to teach in higher education, Leeds Metropolitan University Press.

Rodrigues, P. A., de Oliveira Brandão, L., & Brandão, A. A. (2010, October). Interactive Assignment: a Moodle component to enrich the learning process. In Frontiers in Education Conference (FIE), 2010 IEEE (pp. T4F-1). IEEE.

Ruffini, M. (2012, October). Creating a PowerPoint Screencast Using Camtasia Studio. In World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education (Vol. 2012, No. 1, pp. 355-364).

Seabrook, R., Brown, G. D. A. and Solity, J. E. (2005), Distributed and massed practice: from laboratory to classroom. Applied Cognitive Psychology, 19, 107–122.

Seery, M. K. (2010). Podcasting and screencasting for supporting lectures.

Willingham, D. T. (2002). How We Learn. Ask the Cognitive Scientist: Allocating Student Study Time." Massed versus" Distributed" Practice. American Educator, 26(2), 37-39.

Willis, C., Kestell, C., Grainger, S., & Missingham, D. (2013). Encouraging the adoption of education technology for improved student outcomes. Australasian Journal of Engineering Education, 19(2), 109.

Winterbottom, S. (2007). Virtual lecturing: Delivering lectures using screencasting and podcasting technology. Planet, (18), 6-8.