

CHEAP AND EASY WAYS TO BE EVERYONE'S PERSONAL TRAINER : TRIED AND TESTED OPTIONS FOR PRODUCING LIBRARY TUTORIALS USING AUDIO AND VIDEO

Susan Porter*
Jason Schimming
Reference & Information Services, Library
La Trobe University
Victoria 3086
Ph +61 3 9479 3824, Fax +61 3 9471 0993,
Email: s.porter@latrobe.edu.au

BIOGRAPHIES

Susan Porter has been a reference librarian with the Health Sciences Team at La Trobe University since 1996. Along with her subject specialty comes an associated focus on distance education. She is experienced in designing web pages, has tested a chat reference service, and has co-ordinated a response to the need for online tutorials at the Library through its strategic plan.

Jason Schimming has been employed as a technical officer in the La Trobe University Library for 11 years. In recent times Jason has been responsible for the implementation and management of the Library's media streaming services, which incorporate both on and off campus access.

ABSTRACT

Staff from the Reference and Audiovisual Sections of the La Trobe University (LTU) Library developed tutorials for remote users after experimenting with various ways of recording and publishing simulated classes. We sought to identify those technical solutions which would provide exceptional screen resolution and high quality sound. However, the equipment and software used to capture and publish the tutorials had to cost less than \$1,000, be easy to use in-house, or be cheap enough to out-source. Methods to record real and simulated classes were a tripod video camera with digital videotapes, VHS tape in a LTU lecture theatre, a studio recording by a Media Production Unit, scan converter, image editing software, desktop recording software, and Microsoft Powerpoint. Macromedia Flash is at testing stage. Tutorials were successfully produced on VHS and DVD, although professional assistance was required. Computer files that were successful in certain situations were avi, MPEG, RealNetworks and Flash. Desktop recording software allows for easy recording and editing of computer files, but the only format which most faithfully reproduced the screen movements and sound through this software was Flash. Flash files are also the smallest to store, and download quickly on a PC, either on a CD-ROM or over the Internet.

INTRODUCTION

More than ever, the librarian needs to consider options for remote delivery of information literacy, due to a growing patron demographic and a corresponding reduction in library staff numbers. She cannot reach all her clients in person due to distance, time constraints, or poor class attendance. She may want to create a tutorial that users can borrow, or complete online, but she does not know where to start, or what equipment or software would be needed, and it is likely she does not have a lot of funds or time.

Staff from the Reference and Audiovisual Sections at La Trobe University (LTU) Library recorded a series of live and simulated classes using different hardware and software, the aims of which were to reduce class contact time for reference staff, and increase access to classes for distance students. It was difficult to identify media that would capture and output a tutorial that was clearly visible and audible on videotape, CD-ROM or over a 56 Kbps modem, but there are a few options that do so.

Personal, Easy and Cheap

The audio/video format allows students or staff to hear you, and sometimes see you, in person. Two information literacy classes which are offered at LTU were chosen as the test tutorials: an advanced level workshop in searching health databases, and an introductory level orientation to the library which includes CINAHL searching.

To be part of this study, the tutorials produced could not cost more than \$1,000, and had to be easy for the librarian to create. They needed to be capable of capturing a video presentation of the library web site with associated audio, which could be viewed by patrons outside the library.

Most of the tutorials were created in two stages. A method for recording or capturing each tutorial is used. The tutorial may then require conversion to a suitable format if it is to be viewed on a PC using the Internet or a CD-ROM.

While it is technically possible to produce tutorials using any input or output pairing, the quality of the final product varies widely between the combinations. Online library instruction is different to other lectures and tutorials, as it involves typing relatively small text on a computer screen, so it is essential that an above average screen resolution is maintained.

COMBINATIONS THAT WORKED

With some provisos, the following methods of recording/production resulted in tutorials with good screen resolution and high sound quality. In the case of RealNetworks and Flash tutorials, client workstations would need to meet the minimum system requirements for the player software used. Further explanation is provided on each option followed by a table of costs.

Recording/Capture	Published Format
VHS tape recording in La Trobe University lecture theatre	VHS tape
Image capture software (Snagit)	(a) Raw avi files on CD-ROM CD-ROM or streamed versions of: (b) MPEG files (made with VideoWave v.4) (c) RealNetworks files (made with Camtasia Producer v.1.1.1 or RealPresenter)
Desktop recording software (Camtasia Recorder v.1.1.1)	CD-ROM or streamed versions of Flash files [†]
Microsoft Powerpoint	CD-ROM or streamed versions of: RealNetworks files

Recording/Capture	Published Format
Studio recording by Media Production Unit	Shockwave files on CD-ROM or DVD

¹Use of Macromedia Flash Producer to create Flash files is still at test stage

1. VHS Tape of a Recording in a La Trobe University Lecture Theatre

A number of LTU lecture theatres are equipped with AMX control systems (i.e. distributed by the company, AMX) which enable the automatic video recording of lectures. The AMX control system enables a variety of inputs (eg: video camera, PC/Laptop, document camera) to be recorded onto tape via user (lecturer) input. The lecturer is provided with a videotape copy at the end of the lecture.

2. Avi Files Created With Image Capture Software (SnagIt).

Different image editing programs are available which can capture all or part of a computer screen as an image, and some can capture movements across the screen and save them as a digital video file. By utilising a personal microphone and a receiver, the voice lecture can be recorded simultaneously over the video, and the result is saved as an avi file. These can be used in a raw form stored on CD-ROM, or converted to MPEG, RealNetworks or Flash format (for streaming or CD).

At this point it should be mentioned that the appropriate settings in the audio/video capture software need to be made to achieve the desired results. As part of our testing, we determined that for audio capture, setting the parameters to capture at a rate of 22KHz @ 16 bit mono was sufficient. There will always be some sort of trade off between quality, and what will actually work!! It must always be remembered that if the tutorials are to be streamed over the Internet, the lowest connection speed (i.e. modem type connections) must always be in the forefront of the creator's mind.

(a) Avi files on CD

Avi files can be very large. It is recommended to store files that are not in current use on CD-ROMs. A CD-ROM will hold 650~700MB of avi files or about 50 minutes of tutorial time (depending on capture settings).

The avi format is not designed for streaming. To successfully stream these files to remote users, it is necessary to use some other file formats – namely MPEG, RealNetworks or Macromedia Flash. All of these formats can be used to make a tutorial on CD as an alternative to an online tutorial.

The Library, as part of its current streaming services to users, has a selection of software packages to edit/convert video files:

(b) MPEG files

Videowave software is used to do the initial conversion of avi files to the MPEG format. MPEG files are large and will not stream over a telephone line. So they can only be used for Internet tutorials which are viewed on campus/via cable. Approximately 60 minutes of MPEG tutorial will fit on a CD.

(c) RealNetworks files

The creation of RealNetworks files is achieved by the use of RealNetworks RealProducer software. A media streaming server which incorporates the RealServer streaming software resides in the LTU Library and is used to house Realnetworks files. RealServer streaming software is a significant investment. A 100-concurrent-user license costs about A\$10,000. LTU Library purchased this license some time ago when it began to stream audio-lectures for the University.

RealNetworks files were attempted in both sure- and single- streams. An example of a tutorial made from SnagIt files using the surestream option is "*Making the Most of Databases in the Health Sciences*" (<http://www.lib.latrobe.edu.au/information/sp-advancedtutorial.html>).

About 45 minutes of RealNetworks tutorials will fit on a CD.

Flash files can be made from SnagIt files through Camtasia, and the use of Macromedia Flash to create these files is at test stage.

3. Desktop Recording Software (Camtasia) to Produce Flash files for CD-ROM

Screen Recording (or Desktop Recording) involves the use of a software application to record the on screen (either the entire screen, or a selected portion) activity of a user, and then output the resultant file to an appropriate digital video format (i.e. avi, mpeg, etc.) There are a number of applications available at the time of writing. The Library chose to use the Techsmith product 'Camtasia', which is a 'sister' product to SnagIt but designed specifically for the capture of video.

The recording process is simple to start, stop and pause and the editing function is intuitive to use. The tutor chooses a final format for the tutorial 'project' from a list of options. Of all the computer tutorials we attempted only the Flash format maintained the original video and sound integrity. It was also the quickest for the viewer to load. A CD-ROM was produced using this method called "*Introduction to the La Trobe University Library for Postgraduate Nursing Students.*" Minimum system requirements were, for PC: Windows 98, Pentium 200-300 MHz, 32 MB RAM, using 800x600 colour monitor; for MacIntosh: OS 8.6, 64 MB RAM, using a 600x600 colour monitor.

Five hours of Flash tutorials will fit on a CD. The Flash Player is required to view Flash files and can be downloaded from the Macromedia web site. If the player is to be included on a CD along with the Flash tutorial, agreement needs to be obtained from Macromedia to distribute it.

Using Flash files over the Internet was not attempted. However, they are highly compressed and, based on past experience with them, we can assume that streaming should be easily achieved over telephone lines. Special server software does not appear to be necessary at the library end.

4. Microsoft Powerpoint

Real Presenter software will create a RealNetworks version of any PowerPoint presentation.

The powerpoint presentation is created as normal and any video/audio material inserted as required. RealPresenter works as a module from within Powerpoint. When RealPresenter is installed on the same PC, it actually appears as a menu item in Powerpoint, so the creation

of the RealNetwork files is as simple as selecting the appropriate RealPresenter menu item. As part of the conversion to the RealNetworks format, the user can specify the bitrate for the resultant file by making a selection between modem and ADSL/cable speeds. The advantage of this is that multiple versions of the files are created (transparently to the user), and the RealServer will stream out using the surestream option, i.e. at multiple bitrates.

5. Studio Recording by Media Production Unit

The Media Production Unit (MPU) of the University is equipped with broadcast quality recording facilities. The tutor delivers the presentation in a studio, while three MPU staff control the recording of the tutor's face and computer screen via a scan converter, as well as the speed of the teleprompt if this is used.

The MPU can generate the resultant recordings in a number of different formats, including CD-ROM and DVD. The tutorial typically takes the form of a 'talking head' of the author interspersed with the online Powerpoint and Internet content.

A Macromedia "Shockwave" version of the product was created onto ISO-9660 CD-ROM media. Major drawbacks of this method were a loss of resolution during the scan conversion capture, along with a reduced screen size of the Shockwave file, rendering the small text of the LTU Library web site illegible. Web sites with larger text may convert quite well.

The DVD version will display the recorded computer screen at full size on a standard television. However, it will not reproduce small web site text better than the original file from which it is derived. Obviously it can only be used by patrons with the appropriate technology. Academic staff in the Faculty of Health have performed their own surveys with students which reveal that most LTU nursing students do not own a DVD player. Therefore, we did not choose this format to deliver a tutorial.

The main advantage of having productions made by such a unit, whether they are internal or external to your organisation, is that production values will be of a very high standard, due to the involvement of professionals and the use of a dedicated recording studio. There is some loss of control for the tutor over the finished product, which in some cases may be seen as a disadvantage in terms of the intended learning objectives. Cost may be another issue; however at LTU, we are charged per copy of the final product, i.e. \$9 per DVD, or \$4 per CD-ROM.

COSTS

Free demonstration copies are available for some of the software mentioned.

CD-ROM reproduction can be done in-house with your own burner, or out-sourced. Companies providing this service will require a master CD which has the tutorial copied onto it. At about \$3 per CD they will also label your CDs with the graphic you have designed, and supply you with the jewel cases. At LTU Library we designed and printed our own CD covers.

Item	Cost (AUS)	Combination(s) That Worked
Video	\$10	1
SnagIt	~\$70 single user license. This or a similar	2

Item	Cost (AUS)	Combination(s) That Worked
	program may be freely available through your IT department as part of your normal systems upgrades	
Camtasia	\$250 http://www.techsmith.com/	3
RealPresenter	\$800	2,4
RealPlayer	FREE http://www.real.com/	2,3,4
Flash Player	Free http://www.macromedia.com/	2,3
Microsoft Powerpoint	Part of Microsoft Office suite	4
CD Burner	\$100	2,3,4,5
CD-ROMs	\$1 per CD	2,3,4,5
CD labels	70c per label	2,3,4,5
Cases for CDs	80c per case	2,3,4,5
CD label and cover design software	Bundled with CD burner	2,3,4,5
Out-sourcing CD reproduction and labelling/casing	\$3 per CD Microcare Pty Ltd.	2,3,4,5
MPU CD-ROM, with case and graphic design service for label and cover	\$4 per CD	5
MPU DVD, as above	\$10 per DVD	5
Macromedia Flash for educational use	\$120 http://www.compnow.com.au	Not tested

COMBINATIONS THAT DID NOT WORK

The following methods of recording/production resulted in tutorials with low screen resolution and/or poor sound quality. The lower quality can be attributed to a number of factors, such as poor recording environments, and resolution losses due to compression techniques.

Recording/Capture	Published Format
1. Tripod video camera using digital video tapes	VHS tape RealNetworks file MPEG

Recording/Capture	Published Format
2. Scan converter, using digital video tapes	VHS tape RealNetworks file MPEG
3. VHS tape recording in a LTU lecture theatre	MPEG RealNetworks file using RealPlayer software RealNetworks file from MPEG file
4. Desktop recording software (Camtasia)	RealNetworks file file using Camtasia Producer RealNetworks file using 'Realnetworks for Camtasia' Windows Media file

1. Tripod Video Camera

During a live class, the camera was positioned near the back of the room to capture the computer screen as it was projected onto the Library training room wall. The librarian could go in and out of view as she wished. As the class was one and a half hours long a second digital tape was inserted after 45 minutes.

Some problems were encountered during this process. These included obtaining a camera, inability to zoom in on any screen details, and change of camera or lens position when inserting tapes. The audio was poor, as was the video in its original form and after conversion.

Two versions of the tutorial were produced using the digital camera method, one using the camera's internal microphone, and the other using a lapel microphone. The first attempt recorded all unwanted room noise (i.e. air conditioning, etc.), and the presenter is a considerable distance from the microphone. The use of a lapel microphone greatly enhances the quality of the audio, but it means any input from the floor must be repeated by the presenter.

Several conversion methods were attempted. The first was a simple transfer to analog, VHS videotape. While this is a very simple process requiring a minimal amount of equipment (i.e. the camera and a VHS machine), the results were less than satisfactory. Conversion to common video file formats was also attempted (using MPEG-1 and RealNetworks formats). As both file formats use 'lossy' compression techniques, the poor quality of the original video was even more evident once converted.

2. Scan Converter

By using a portable device known as a scan converter, it is possible to view the graphical output of your PC on a normal television.

Recording of the tutorials for this method was done by passing the output of the presenter's computer to a scan converter, and then into a Digital Video cassette deck (Sony DSR-80). The resultant DV tape could then be converted into any format required.

Results from the scan converter were disappointing, in that the scan-converted screens completely blurred out textual information, rendering it mostly useless (even before converting to MPEG/RealNetworks). The resolution of the converted image was quite poor with blurred text, and a 'flickering' effect.

It must be said however, that the scan converter used was of domestic quality, and was not designed for 'production' type use. Broadcast quality scan converters can cost several thousands of dollars, and would be well out of the price range of most library organisations, (and we want to do this cheaply!!).

3. VHS Tape Recording in a LTU Lecture Theatre and Conversion for Streaming

As previously mentioned, there are several teaching locations on the La Trobe University campus that have been equipped with recording capabilities. The results of these recordings were transferred to a number of different formats, including VHS, MPEG-1 and RealNetworks files. VHS is discussed under the *Combinations That Worked*, part 1.

The conversion to these additional file types did, unfortunately prove unsuccessful. Again the main reason affecting the successful conversion to these file types was the loss of visual detail introduced by the conversion (as previously stated both use lossy compression techniques).

4. Camtasia Recorder for RealNetworks files

While Camtasia initially seemed promising, it was not as successful as we anticipated. The Library had already had success providing streamed RealNetworks video files (see *Combinations That Worked*, part 2); and it was initially thought that we could simply create our RealNetworks files by selecting that output format in Camtasia, and then access them through our RealServer. When tested however, we encountered several problems.

Firstly, if a Camtasia-produced RealNetworks file had a duration of longer than one minute, problems with the video component at the client end were encountered, not only via a modem connection, but also via the La Trobe University campus network.

Camtasia can create RealNetworks in two distinct ways. Camtasia can create RealNetworks files in two distinct ways. Firstly, using lossy compression techniques, it can create 'standard' RealNetworks files that will successfully play using RealPlayer software.

Secondly, it can create "RealNetworks for Camtasia" files. These files use a special lossless encoding scheme that will faithfully reproduce the original digital video. Unfortunately, the latter option (which produced the better result) was not compatible with the Library's version of the RealServer software. A newer version of the RealServer was required to enable this option. As an upgrade to the RealServer would cost approximately \$4,000 the idea to use Camtasia to produce RealNetworks tutorials was no longer pursued.

CONCLUSION

In conclusion, there are several technical options available for the librarian to successfully record and publish simulated or live classes on her own, or out-source cheaply, for under \$1,000. Good screen resolution and sound quality can be achieved with tutorials in a variety of mediums, such as VHS, DVD, CD-ROM and the Internet (via appropriate file formats).

It is difficult to capture the audio and visual detail of information literacy training on domestic video recorders, and professional equipment and expertise should be used for the production of VHS or digital video. The tutor may need to sacrifice some control over when and how content is displayed in the finished product.

Tutorials which are captured on in-house computers are the easiest for the librarian to modify herself. Tutorials which are computer files typically have had the audio recorded over the movements and changes on the tutor's computer screen. The raw avi file obtained is usually converted into one or more formats for streaming over the Internet, or for storage on CD-ROM. Avi files captured with the image capture/editor SnagIt, the desktop recorder/editor Camtasia, and Microsoft Powerpoint, could all be converted to high quality alternative formats: MPEG, RealNetworks, or Flash.

MPEG files however can only be offered on cable networks, as they are too large to stream over a telephone line. Due to local infrastructure issues, success was limited with RealNetworks files when they were over five minutes in duration.

Flash files load quickly at the client end, either on CD or online, and are easily stored at the server end. Many hours of Flash files will fit onto a CD and the tutorial video and audio of the tutorial are faithfully reproduced. Simple Flash tutorials can be created using Camtasia, however the full potential of this file format for slick presentations and interactivity can be realised through the use of the proprietary software Macromedia Flash, which is currently under testing at the LTU Library.

GLOSSARY OF TERMS

AVI

An AVI (Audio Video Interleaved) file is a sound and motion picture file that conforms to the Microsoft Windows Resource Interchange File Format (RIFF) specification.

Bps

The speed in bps is equal to the number of bits transmitted or received each second.

DV

Digital Video. High resolution, broadcast quality video format. A variety of DV formats are available (DV, mini DV, DVCam to name a few)

DVD

Digital Versatile Disc. Optical disc technology that will hold 4.7 GB of data

Flash

Flash, a popular authoring software developed by Macromedia, is used to create vector graphics-based animation programs with full-screen navigation interfaces, graphic illustrations, and simple interactivity in a resizable file format that is small enough to stream across a normal modem connection.

Kbps

The speed in Kbps is equal to the number of thousands of bits transmitted or received each second.

Lossy Compression

Reduces file size by permanently eliminating certain information, especially redundant information.

Lossless Compression

Every single bit of data that was originally in the file remains after the file is uncompressed. All of the information is completely restored.

Mbps

The speed in Mbps is equal to the number of millions of bits transmitted or received each second.

MPEG

The Moving Picture Experts Group, develops standards for digital video and digital audio compression.

RealNetworks

RealNetworks are a company responsible for the development of the “RealPlayer”, a popular web based client for streaming media. Several ‘Real’ file formats are available (RealAudio, RealVideo, RealPix to name a few)

Scan Converter

Scan converters give you the ability to put a computer's screen on a standard (NTSC, or PAL) television monitor, or conversely, watch television on your PC's screen.

Singlestream

Surestream

Stream/Streaming

Streaming media is streaming video with sound. With streaming video or streaming media, a Web user does not have to wait to download a large file before seeing the video or hearing the sound. Instead, the media is sent in a continuous stream and is played as it arrives.