Creating and Delivering Video Streamed Orientation and Instruction on the Internet

Karmen N. T. Crowther
Professor/Business Librarian
University of Tennessee Libraries

Alan H. Wallace
Associate Professor/Education Librarian
University of Tennessee Libraries

As educational institutions prepare to meet the challenge of delivering services to an increasingly divergent 21st century population, traditional methodologies for providing those services are also changing. The development of the Internet has greatly increased the electronic options that such institutions have available for instructional delivery. Despite the widespread use of various Web-based technologies, one such technology, streaming media, has been relatively little used on college and university campuses. Yet it holds considerable promise for instruction and orientation, especially for distance education programs and other services to remote users.

What Is Streaming Media?

Streaming media is an audiovisual presentation, delivered via the Internet, which may be viewed while simultaneously being downloaded to a user's computer. A combination of a client or player, a server, and an appropriate network protocol is needed. Streamed media differs from other network delivery systems by delivering a continuous stream of video or audio after only a few seconds for initialization. Clicking an Internet link typically activates delivery. Both live and prerecorded media may be streamed.

Streaming media is widely seen in commercial applications. Many news organizations provide streamed video and audio on their Web sites; entertainment venues present clips of music and film. Corporations provide training to employees and product demonstrations to customers. Internet radio is a popular application; even full-length Internet movies are available. Classroom lectures and demonstrations are obvious candidates for streamed presentations. Our experience with video streaming lies in its application to orientation and instruction in an academic library. Why did we choose this technology? The reasons are simple. Video is an effective communications tool, particularly with college-age students. Using the Internet for delivery means that instruction can be viewed whenever a student needs or wants it. The technology can be easily mastered by amateurs working with a shoestring budget. Finally, the end product can free staff to concentrate on other tasks.

The UT Libraries' Experiments With Video Streaming

The University of Tennessee Libraries has been experimenting with video streaming technology since 1998 and our experience illustrates how an organization, even with limited resources, can take advantage of this technology. Our first project was a "tour" of our main library's reference room with business students as the target audience. The goal was to introduce students to the location of specific materials used in class assignments, something we were unable to fit into a typical 50-minute library instruction session. Our second project was a five-minute orientation to all our campus libraries, a showcase for viewing by prospective students, their parents, or anyone new to the libraries. Our Dean of Libraries also found it useful when talking to potential library donors. Next we tackled a general library orientation for freshmen and other new students. Consisting of six modules, it has become an integral part of assignments for English 101 and other introductory classes. Our most recent effort is a series of video

Copyright 2005 The Board of Regents of the University of Wisconsin System.
Duplication or redistribution prohibited without written permission of the author(s)
and The Annual Conference on Distance Teaching and Learning
http://www.uwex.edu/disted/conference/

interviews with library staff that explain some of our library services for faculty and graduate students—purchasing of books, interlibrary loan, data services, etc. Examples of our work can be viewed at http://www.lib.utk.edu/instruction/visualtours.html

Components of Preparing a Video Streamed Presentation

Our work on these projects has given us thorough experience in amateur video production. This includes an insight into the basic steps necessary to see a project through from the initial idea to final presentation on the Web. We have learned what equipment and software are essential and what steps need to be included in a production plan. Here is our advice for those of you who are unfamiliar with video streaming but interested in trying this versatile new instructional technology.

Lay the Groundwork

Before embarking on an in-house streaming media production, make the necessary preparations. Organizational support is key to a successful project. Get buy-in from all those concerned and especially those who can help prepare or promote your video. Look for partners who can share the cost or provide assistance. For example, our first video garnered offers of help from our campus computer center and the television services unit. Both were interested in supporting a pilot project that would inspire others to try the technology. Schedule plenty of time to complete a project—we have taken advantage of quieter summer school sessions to work on our projects. Prepare a production plan. Even if it is only a simple outline or list, a plan will help you remember easily overlooked details and keep you to your schedule. Devise a plan to promote your finished product. Find a home for the video on your personal web page or your organization's page and think how you will let likely users know about it. When changes occur that affect the content of your video, updating may be necessary. Careful planning can mitigate this problem, but it is important to consider when deciding what content to deliver via streaming.

Equipment

As even basic equipment costs can mount, you will need to budget for this. Alternatively, you may find collaborators and supporters who can provide what is needed. A digital video camera, the best quality you can afford, is essential. A tripod is useful even if you intend to employ a wobbly "Blair Witch" look for your video. After experimenting with overdubbing separately tape-recorded audio to our video, we opted to purchase wireless microphones. If your budget allows, good microphones are worth the added expense. Software for creating, editing, and delivering video will be needed. Details about software options will be found below. A file server with appropriate software is needed. While video file size is getting smaller, it is still memory intensive. You need to ensure that you will have adequate storage but, as individual projects will vary, it is difficult to suggest a minimum. Your institution's network staff should be able to advise you, if necessary.

Script Writing

For those of you most familiar with a captive classroom audience, preparing a video script will be a new experience. You might simply transfer an hour's lecture to video, but would you want to watch 50 minutes of a talking head? Would an 18 year old? Select a project that will be both useful and appealing to your viewers. Think pictures, not words! The right choice of topic will be easier for you to prepare, and it will ensure that your viewers enjoy learning by watching your video. Look for opportunities to visually illustrate what you usually describe orally. Keep your language simple and to the point. Create an active and lively central "story" that contains the information you want to impart. Use a narrative style where possible. Make the content enjoyable to watch—fun, but not necessarily funny. Keep the presentation moving by imagining how your viewers might respond. Finally, keep it short. Break the

Copyright 2005 The Board of Regents of the University of Wisconsin System.
Duplication or redistribution prohibited without written permission of the author(s)
and The Annual Conference on Distance Teaching and Learning
http://www.uwex.edu/disted/conference/

presentation into modules, if necessary. We have found, for example, that 3-5 minutes is the optimum length for our productions. If you are not comfortable preparing a script of this kind, look for a partner willing to collaborate with you.

Production Planning

Before shooting any video, take time to scout locations. Your usual classroom may be fine for a lecture, but think how you might add to the learning experience by taking your presentation "into the field." An appropriate visual context can further enhance even the most lively and thought-provoking subject. Plan your camera shots and scenarios. Consider elements of your story that require close-ups or long shots for clearer understanding. Remove extraneous items from camera view—wastebaskets, homemade signs, extra chairs, etc. An hour or two of elementary storyboarding will pay off with less wasted video footage and need for reshoots. Draft "actors," if needed. We have been lucky to find ours among our student assistants and our colleagues. Most academic institutions have speech or theater departments whose students may be willing to participate for minimal wages and real-world experience. Consider whether you will use voiceover narration or allow your actors to speak. It will make a difference in the skills needed by those who participate and the way you present your story. Decide whether you will add background music to your film. If you do, inform yourself about copyright and obtain any needed permissions. Only when you have a clear idea of what you want to do and how you will proceed, should you begin shooting film.

Video Delivery Methods

Originally all streaming media utilized what is referred to as Real Time Streaming Protocol (rtsp) and required special software on the server as well as the receiving computer. Rtsp sent only enough information to a viewer's computer to deliver the video and sound needed for the precise moment being watched. The protocol could be used for both prerecorded and live broadcasts. Nothing was downloaded or saved on the receiving computer. As such video required a fair amount of band space to deliver, rtsp was best suited for high-speed Internet connections. While there were ways to compress the material being sent, they usually resulted in a loss of quality in sound, image, motion or a combination of all three. Therefore, while rtsp remains a viable streaming option, especially for long (and large) files, improvements and alternatives were sought.

An improved compression system was the key to creation of the alternative to rtsp streaming known as HyperText Transfer Protocol Streaming or http. With true streaming, only the portion of the video being delivered is seen on the receiving computer. Http actually downloads the entire file to the viewer's computer. Using what is referred to as "progressive downloading," the video begins to play as soon as there is enough information in the buffer. This gives the viewer the illusion of rtsp streaming. With compression systems such as those developed by Sorenson Media, file size was greatly reduced while quality was maintained. This type of streaming requires only a standard web server and works well on a variety of Internet bandwidth connections. A further advantage is that it may be replayed instantly, as it resides on the machine to which it was delivered. It is a viable option, especially for shorter videos.

Recently a new alternative, MPEG-4, has been introduced and it is pushing the quality of streaming video to new levels. It was designed not only for high quality delivery, but delivery on a wide range of bandwidth connections. Our initial experiments using this system indicate that we can deliver a much larger image to a variety of users while keeping file size quite small. At present both Real and QuickTime support MPEG-4. Users must have the latest viewers to be able to watch this method of delivery, as it is not compatible with earlier viewers.

Copyright 2005 The Board of Regents of the University of Wisconsin System.
Duplication or redistribution prohibited without written permission of the author(s)
and The Annual Conference on Distance Teaching and Learning
http://www.uwex.edu/disted/conference/

Streaming Video Software

Distribution

The three most widely used software programs for distributing streamed media today are QuickTime, Real, and Windows Media. All are widely available and will accommodate both rtsp and http streaming. All offer free clients for viewing with both Windows and Mac computers. While costs and features vary, all do basically the same thing—provide video on the web. Quicktime (Apple), in particular, has made all of its software available at low or no cost. Whatever choice you make, there is a sizeable body of information available on the web to support your efforts.

Creating/Editing

iMovie for Macs and Windows Movie Maker for Windows machines are the two best-known basic systems for creating and editing video. Both are designed for basic editing and offer the potential for creating simple, but professional looking videos. iMovie has been around longer and offers many sophisticated features, e.g., smooth transitions, sound editing, titling, and special effects, at an inexpensive price.

If more control over the final project is desired, professional editing software is available. The two best-known packages are Final Cut for Mac users, and Adobe Premier for Windows users. Both offer a full range of sophisticated editing and creative tools that appeal to both professional and amateur video editors. The learning curve is steeper for these products, but their flexibility and quality level is worth the investment for those who will be making more than just a few videos. While expensive to purchase, educational discounts are available.

Encoding

All the software mentioned above, both for distribution as well as editing, provide for encoding to prepare video for distribution on the web. Encoding is the process that both compresses (makes the file much smaller) and adds any coding needed for the streaming server to properly distribute the video. However, each method is usually specific to one particular distribution system. Alternatively, “Cleaner” produced by Discreet offers a flexible approach that allows video to be made available on multiple platforms. This well-designed product makes decision making about streaming type, compression choices, audio quality, video sizing easy even for the novice.

Conclusion

As educational institutions expand their distance education programs, video streaming is a new technology with great instructional potential. It can be successfully used for multi-section classes with similar assignments. We also anticipate streaming applications to upper division and graduate student instruction. By using a video presentation for general orientation to standard concepts, class time can be spent on more specialized needs. Tutorials for especially challenging topics could also be created as video streamed files. Any or all of these applications would be useful in teaching distance education students. As our campus turns increasingly to Internet-based instruction, we consider video streaming to be yet another way the University of Tennessee Libraries can be visible and accessible to our students and faculty wherever and whenever they need us.

Copyright 2005 The Board of Regents of the University of Wisconsin System.
Duplication or redistribution prohibited without written permission of the author(s)
and The Annual Conference on Distance Teaching and Learning
http://www.uwex.edu/disted/conference/

Biographical Sketches

Karmen Crowther is Business Librarian at the University of Tennessee Knoxville Libraries. Previously she was Social Sciences Librarian and Automated Reference Services Librarian. She holds an M.Ln. degree from Emory University, an M.A. from the University of Hawaii, and a B.A. from Augustana College. The author of *Researching Your Way to a Good Job*, Karmen's interests lie in business research and library instruction.

Address: Reference Department
University of Tennessee Libraries
Knoxville, TN 37996-1000
E-mail: crowther@utk.edu
Phone: 865.974.0019

Alan Wallace is Education Librarian at the University of Tennessee Knoxville Libraries. He holds an M.Ln. degree from the University of Washington and a B.A. from The University of Michigan. In 1996 he was selected to participate in UT's "Scholars in the Schools Program," which places faculty members in local schools to share their expertise. Since 1990 Alan has taught as an adjunct faculty member for UT's School of Information Sciences. His research interests are in library instruction and reference services.

Address: Reference Department
Hodges Library
University of Tennessee
Knoxville, TN 37996-1000
E-mail: alan-wallace@utk.edu
Phone: 865.974.3675

Copyright 2005 The Board of Regents of the University of Wisconsin System.
Duplication or redistribution prohibited without written permission of the author(s)
and The Annual Conference on Distance Teaching and Learning
http://www.uwex.edu/disted/conference/