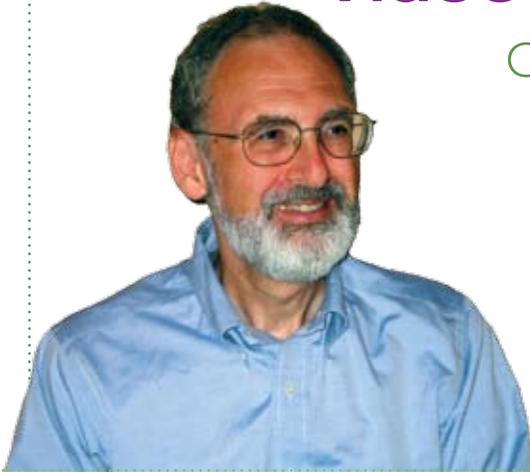


Video in the Age of Participation



Screen capture of streaming video from National Geographic's "Pete's Pond" Web site.

More than 65,000 video clips per day are being uploaded to YouTube's streaming site. Couple that with Google's recent acquisition of YouTube for more than \$1 billion, and it becomes clear that digital video is the next frontier in the technology world.

Teachers have long used movies and videos as effective classroom tools, but isolating the appropriate portion of a video can be a cumbersome process. Technological advances have made digital video feasible in the connected classroom. Increased bandwidth and improved compression standards have made it possible to stream video-on-demand over the Internet.

Digital Video in the Wild

Astonishing amounts of video—with tremendous instructional potential—are available on the Web: PBS makes its NOVA science programs available online and the National Geographic Society features a webcam monitoring a watering hole in Botswana. A search on the terms "National Geographic" combined with "Pete's Pond" will lead to the NGS WildCam Africa site.

This African video, streamed live to the United States via satellite, is remarkably clear. One viewer commented that it is a bit like sitting in a tree above the watering hole. By disseminating these videos on sites such as del.icio.us and digg, National Geographic encourages tagging and linking via social bookmarking and sharing sites.

One of the lessons that Pete's Pond illustrates in a tangible way is how time and season create change. Botswana is a third of the way around the globe from North America, and consequently, the time is six to nine hours ahead (de-

pending on time zone). African wildlife is most likely to visit the watering hole during the dry season, when they cannot readily find water in other spots. Fortunately for viewers, National Geographic makes a number of other wildlife webcams available during the wet season.

Searching on the phrase "Pete's Pond" as you browse through YouTube reveals numerous wildlife video clips posted by members of the devoted audiences watching these sites. There is a thriving community that also participates in a discussion of each week's events both through an official blog on the National Geographic site and through a variety of other discussion forums at other sites.

Digital Video Connected to Standards

Although countless video resources of this kind are currently emerging on the Web, there is no direct connection between this content and teachers' instructional objectives. It is up to individual teachers to determine ways to link these resources to learning outcomes.

The Discovery Education unitedstreaming Web site provides digital video resources in a format that provides connections to explicit curricular objectives. These resources are keyed to content area and grade level with links to state standards. The Discovery Education site provides a preview of some of the features we can expect to find in schools of the future.

These resources primarily consist of copyrighted content from the Discovery Channel and

By Glen Bull

Glen Bull is a co-director of the Center for Technology and Teacher Education in the Curry School of Education at the University of Virginia.

Glen serves as a volunteer columnist for L&L.



Digital video on the Discovery Education unitedstreaming site is organized by content area.

similar sources. The site has approximately 4,000 video programs, but these programs have been separated into 40,000 shorter segments that facilitate integration into lessons. These shorter segments allow teachers to quickly locate the exact clips that fit their specific teaching objectives without wasting time cuing and re-cuing cassettes.

Discovery provides a variety of mechanisms to ensure that its video is available in a way that fits within a school framework. For example, it is possible for teachers to download video clips ahead of time so that they will be available even if the school network is limited or unreliable.

There are a number of other sources of free classroom-oriented video clips available on the Internet. Annenberg Media (<http://www.learner.org>) and PBS (<http://www.pbs.org/teachersource>) both provide a large number of professionally produced programs online. Such sites often include excellent teacher guides, lesson plans, and additional materials.

The Age of Participation

The abilities to work with shorter segments of video and to incorporate digital clips into other media are significant advancements over the classroom film projector or analog VCR. However, the hallmark of the current age of participation is the two-way flow of information. Outside the classroom, thousands of individuals are creating and uploading their own digital video clips every day.

The Discovery Educator's Network (DEN) is an interesting experiment

that provides teachers and students with the capability to edit and remix licensed unitedstreaming content. Educators can upload and repost the revised materials to the DEN site. The site was launched at NECC 2005 in Philadelphia and quickly grew to approximately 15,000 educators.

Approximately 70% of the schools in the U.S. currently subscribe to unitedstreaming services. Any teacher from a school system that licenses unitedstreaming content can join DEN. About one-tenth of the current DEN members are actively developing remixed content and contributing instructional materials. Discovery recognizes these teachers with the designation of "DEN Star" and provides support for their efforts.

The remixed instructional videos contributed by DEN Stars are currently available only to other DEN Stars as the mechanisms for supporting this effort on a larger scale are worked out. The director of the project, Coni Rechner, plans to make this user-contributed content available to all unitedstreaming schools in the future.

The DEN initiative provides access to content and mechanisms for connecting that content to instructional objectives—with professional staff to support these efforts. More than 9,000 workshops have been offered to more than 200,000 teachers since DEN was launched. Chances are that *L&L* readers have been involved in these pilot efforts. I would be interested in hearing your impressions if you have been a participant (letters@iste.org).

Emergent Web Services

At present, work in schools is primarily based on text materials, even as students are exploring every conceivable form of digital media in the world outside schools. The Web is making it possible to develop and disseminate digital video among communities of educators. DEN's remixed videos, along with the blogs and wikis that

have spontaneously emerged around the National Geographic site in Africa, illustrate the potential for communities of participation. The examples represent just a few of the efforts that tap into new capabilities. More will certainly emerge in the future.

For example, Next Vista is a non-profit organization founded earlier this year with the goal of distributing open educational digital media. Next Vista works to make learning more engaging, with a focus on helping students start strong with any topic they study. Its core is a free, online library of teacher- and student-made short videos for learners everywhere (<http://www.NextVista.org>).

New technologies are also beginning to facilitate video sharing efforts. A number of Web 2.0 video tagging services are appearing, with names such as MotionBox, Click.TV, and VeoTag. These services allow users to create tags linked to individual sections of a video (also termed "deep tagging"), so interested users can skip directly to relevant sections.

A new generation of Web 2.0 sites also provide online digital video editing, enabling teachers and students to create montages of video clips on the Web. MotionBox, JumpCut, and VideoEgg offer free sites that let people upload, store, and edit videos.

These services are bringing us closer to constructing an index of attributes relevant to specific instructional objectives. If this capability is combined with a video rating system, digital video may quickly become significantly more useful in schools. In the meantime, the features being incorporated into the Discovery Educator Network may encourage similar capabilities for licensed unitedstreaming materials. This will offer a significant laboratory for exploration of these ideas. With combined efforts, we may shrink the gap between the explosion in use of video on the Internet at large and effective use in schools. ■