

Lights, Camera, Learning!

By Glen Bull and Lynn Bell

Media underwent a transformation from analog to digital formats during the transition from the 20th to the 21st century. In fact, this year the analog broadcasting network in the United States is being replaced by a digital system. This tipping point is a cultural shift as well as a technological transition.

Older analog technologies were relatively fixed and unchangeable. Celluloid film was revised by cutting and physically resplicing the pieces in a different order. The process for editing an analog videotape was almost as cumbersome. Once revised, it was necessary to make physical copies to disseminate the revisions.

In contrast, digital video is easy to revise and disseminate. From 1948 to 2008, NBC, ABC, and CBS broadcast more than a million hours of programming. In the past six months, individuals posted more than a million hours of original video on YouTube alone—more than the networks broadcast in the previous 60 years combined.

Michael Wensch, a digital ethnographer, reports that youth contribute the majority of posts on YouTube. The 10,000 hours per day posted on YouTube are the equivalent of 400 continually broadcasting channels. They are posted in the form of 200,000 three-minute videos intended for an audience of 100 or fewer viewers in most instances. The shift from analog to digital video transformed the system from a unidirectional analog broadcast to a two-way conversation, resulting in the birth of participatory media.

Digital video offers new opportunities for teaching science, social studies, mathematics, and English language arts. The professional education associations for each content area are devoting extensive thought to ways digital video might be used to strengthen student learning.

The affordances of digital video that appeal to these educators differ substantially based on the nature of their content area.

Social studies. Today, digital video is taking its place alongside other forms of historical artifacts such as photographs, maps, newspapers, and texts. Many social studies teachers already take advantage of documentaries and Hollywood films to investigate the big ideas of history, geography, economics, and civics. Video can add motion, sound, and a sense of real life to social studies instruction. Further, teachers can guide students through documentary projects in which they engage in critical thinking as they work with digitized primary sources—the raw materials of social studies.

Science. In contrast to the social studies, which focus on history and human endeavors, science is primarily concerned with natural phenomena explored empirically, often through visual observation. In the science classroom, digital video—especially when enhanced by special effects such as time-lapse, slow-motion, and extreme close-up photography or when paired with data collected via probeware—provides a wide range of opportunities for engaging in scientific inquiry. Video not only allows students to see the detail of a phenomenon they might not otherwise

Teaching with Digital Video across the Curriculum

Discipline	Instructional Methods
Social Studies	Interpreting the record of human endeavors through media
Science	Exploring and analyzing natural phenomena
Mathematics	Interpreting multiple representations of visual patterns
English Language Arts	Communicating through multiple modes of new literacies

be able to see, but also invites repeated watching. It also allows the application of science process skills such as observing, inferring, classifying, predicting, measuring, communicating, and generating hypotheses.

Mathematics. Advanced digital technologies have changed the way mathematicians think about and do mathematics. Digital video can be used to present challenging mathematical questions, improve students' visualization of mathematics concepts, and offer opportunities to analyze situations and models leading to mathematical descriptions of relationships. Digital video can engage students in thinking about mathematics in ways previously difficult to achieve, especially when it is layered with other interactive media.

English language arts. In science, social studies, and mathematics, digital video is used as a mechanism for learning about a subject area. In language arts, digital media has become a new mode of communication to be analyzed as well as used in learning. Students outside the classroom are increasingly consuming and creating multimodal compositions that include images, sound, and digital video.

Classroom projects using digital video offer an authentic framework for exploring the concept of nonprint text and new literacies.

Digital video offers important new teaching opportunities across the curriculum. Today's teachers and students can access and view millions of digital resources through the Internet. Analyses of digital video are made easier than ever by software that can overlay and combine representations allowing visualization of underlying patterns. Using simple free digital video tools, teachers and students also can create video by combining photographs, documents, maps, audio clips, and even snippets of other videos. These capabilities allow students to explore concepts that would not be as accessible otherwise.

Every day, people carry one or more devices for capturing, watching, and editing digital video. Adults might not realize that their cell phones can record video or that they can watch YouTube on their tiny screens, but K–12 students are actively engaged in using these features to document their lives and explore the world.

When digital cameras became ubiquitous, ISTE published *Teaching with*

Digital Images. This book was a collaboration among four teacher educator content associations representing science, mathematics, language arts, and social studies. It summed up important trends in the tools and possibilities for applying this increasingly ubiquitous technology to K–12 classrooms.

A companion volume scheduled for publication, *Teaching with Digital Video*, follows the same logic: Digital video is permeating our culture and the ease with which it can now be acquired, edited, remixed, and disseminated creates new pedagogical affordances. The four articles that follow provide illustrations in each content area.



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. He can be reached at gbull@virginia.edu.



Lynn Bell works with the University of Virginia Center for Technology and Teacher Education. She co-edits the online journal *Contemporary Issues in Technology and Teacher Education* (www.citejournal.org) and co-edited the book *Teaching With Digital Images*.