

Digital Video



A Biology class are studying animal locomotion. One group used the school digital video camera to record a horse galloping across a beach. Now, they are editing clips on the computer to demonstrate different aspects of the animal's motion.

What is Digital Video?

Digital video (DV) refers to the storage, manipulation and capture of video in digital formats. A digital video camera is a video camera that captures and stores images in digital format. These formats can be displayed on a television, computer or digital projector. Historically, analog video has been the primary format used. Digital video cameras are available in three various formats a) DV tape, b) Hard drive and c) DVD.

DV tape is the most common format for Digital video cameras. The recorded images are stored onto a small digital video tape. Hard drive digital video cameras have the ability to store the recorded footage internally on the camera and do not require the purchase of additional media formats to store the video. DVD cameras have the ability to record the video footage onto a miniature DVD disk which upon completion of filming can be instantly watched on a DVD machine.

Digital video cameras enable users to capture, produce and edit broadcast-quality video. High quality images and digital video clips can be stored and reproduced on a computer, CD or writeable DVD or on the internet without any loss of quality. Analog video, on the other hand, has the quality of a videotape and this degrades each time it is reproduced.

Possible Educational Uses

Digital video cameras have enormous potential for impacting on pupil creativity, team building and higher-order thinking skills. They can be used to:

- Record school excursions, field trips, school events or visiting dignitaries
- Produce video clips for use in multimedia creations and for inclusion on the school Web site
- Prepare educational clips on subjects such as safety (road safety, safety in the playground, etc.)
- Record student role-playing exercises, e.g., in difficult social situations for subjects such as SPHE (Social Personal and Health Education)
- Assist in language learning
- Record interviews with visiting speakers, such as local historians, dignitaries, etc.,
- Compile still images over a long period in order to produce time-lapse movies for analysis
- Increase student awareness of the manipulative techniques used in advertising
- Prepare mini-documentaries or news reports

Technical Considerations

PC Specifications

A high specification PC or Mac is needed to edit video. It should have:

- At least 500 MB of RAM (1 GB of RAM is recommended)
- A relatively recently purchased PC or Mac with a fast processor
- A minimum of 80GB of hard drive space, or 100GB or more if possible
- A DVD Burner

Hard Drive

Recording digital video to the hard drive typically consumes 3.6MB per second. In other words, 9 minutes of video will fill about 2 gigabytes of disk space. The fastest spin speed available (usually 7,200 rpm) is recommended, as data needs to be moved from the hard disk to memory very quickly during editing. It is possible to install two hard drives and this could be a viable option for some schools. A smaller drive (20GB) can be used to hold the operating system and program files, and a larger, high-speed drive (100GB or higher) installed for the video files.

Software

Video-capturing software is required to edit video on the computer. This is often supplied with the digital video camera. Presently there is basic digital video editing software on both contemporary Apple and Microsoft operation systems.

Quality

Video quality can generally be considered in terms of its horizontal resolution. This denotes the amount of discernable detail across the screen's width. Measured in lines, higher the number of lines, the better the picture quality. The quality of the different video formats varies quite considerably, as the list below illustrates:

- Super VHS (SVHS) or Hi8 — approx. 400 lines
- Digital Video (MiniDV) or Digital 8 — approx. 500 lines

Video-editing Card

To edit video on a computer a video-editing card, such as the IEEE 1394 Card (FireWire or iLink) or equivalent, is needed. However, most recent laptops and desktop computers come with the IEEE 1394 Card installed as standard. A portable TV can be connected to this card in order to view the video as it is being edited on computer, before it is outputted to digital video or VHS.

Analog Input Connection

Some digital video cameras have an analog input connection and this provides a means for analog video to be transferred across to a digital environment. If footage from TV or older VHS videos is likely to be used in video-editing exercises, it may be necessary to capture analog video first. In such instances, an analog input connection would be required.

Purchasing Considerations

Just a few years ago digital video was an exclusive technology, not generally affordable by most schools. Now, digital video cameras of all shapes and sizes are available at highly competitive prices. The following is a list of DV camera features and add-ons that should, ideally, be included at the time of purchase to avoid costly extras being required separately later on:

- Support for digital video IN as well as digital video OUT
- Good optical zoom rating (for example, 10X or 12X minimum)
- Special features that allow for children who may have motor difficulties
- A sturdy tripod with a fluid head
- Video-editing software
- Directional microphone

The following list of questions will also help determine if there is a need to purchase additional features:

- Does the camera take still images on memory cards?
- Are new tapes inserted at the base of the camera? This can be a nightmare if filming a school concert where the video recorder is mounted on a tripod.
- Does it have an analog video input connection?

Digital video cameras can enrich learning experiences for both students and teachers. The processes involved in capturing information on digital video as well as the exposure to information presented in video format can have a lasting benefit to all in this information age. More recently the capability of still digital cameras has extended to include basic video capture, higher end models may come with an inbuilt microphone for audio capture.

Relevant Web Sites

FÍS

www.fis.ie

FÍS (literally translated as 'vision') is an initiative from NCTE and the Department of Education and Science. It began as a pilot project and was designed to introduce the medium of film as a support to the Revised Primary School Curriculum (Curaclam na Bunscoile). FÍS a Dó concentrates on introducing the medium of film into the Primary and Post Primary School curriculum. The project places an emphasis on the exploration of creativity as a means of learning and self-expression through the visual arts, drama, music dance and literature.

Students Make Audiovisuals Themselves

<http://utopia.knoware.nl/users/schoutdi/eng/introduc.htm>

Essay on DV in Schools outlining the educational benefits and learning experiences in student-created audiovisuals.

Video in Language Education

<http://lookingahead.heinle.com/cnn/mejia.htm>

A site that focuses on developing a range of language skills using video. It offers guidelines for ensuring successful video lessons.

RealVideo

<http://service.real.com/help/videoccg/overview.html>

Before you create and manage video content, you should understand how the system works. This link describes the primary components of RealVideo System and explains how they work together.

Note: While the advice sheets aim to act as a guide, the inclusion of any products and company names does not imply approval by the NCTE, nor does the exclusion imply the reverse. The NCTE does not accept responsibility for any opinions, advice or recommendations on external web sites linked to the NCTE site.

This Advice Sheet and other relevant information are available at:

www.ncte.ie/ICTAdviceSupport/AdviceSheets