

Digital Video Tips and Techniques for the Classroom

By Ann Bell

I. Introduction

- A. Library Media Specialist at Camanche High School, Camanche, Iowa.
- B. Author and Instructor of the Online Professional Development Course "Creating Video for the Curriculum" a.k.a. "Creating Computer Video in Your School" through the University of Wisconsin-Stout.
<<http://www.uwstout.edu/soe/profdev/video/>>
- C. Author of *Creating Digital Video for Your School* published by Linworth Publishing.

II. Impact of Visual Literacy

- A. Students Learn to Use 21st Century Skills.
- B. Students Learn to Use Higher Order Thinking Skills.
- C. Improves Decision Making.
- D. Improves Creative Thinking.
- E. Improves Collaboration Skills.
- F. Builds and Reinforces Content Knowledge.
- G. Appeals to Multiple Intelligence.
- H. Increases Media Literacy.
- I. Helps to Meet National and State Technology Standards.

III. Advantages & Disadvantages of Various Distribution Formats

- A. DVD Format
 - 1. High Video Resolution and Sound Fidelity.
 - 2. Ability to author the DVD in a Menu Format.
 - 3. Supports Dolby AC-3 audio and multiple audio tracks.
 - 4. Downside – Requires At a 350-450 MHz CPU for decoding and Playback.
- B. Transferring onto a VHS Tape
 - 1. Converts Digital Signal to NTSC Television Signal.
 - 2. Can Use an External Scan Converter.
 - 3. Can Use Video Card that Supports TV Out Along with Video In.
- C. Transferring Video to CD-ROM
 - 1. Video CD, or VCD, is a Primitive Version of DVD.
 - 2. Uses MPEG-1 Video Compression.
 - 3. Most, but not all, DVD Players Will Play Back VCD, if CDs are written to CD-R format.
- D. Conversion from VHS to DVD
 - 1. USB or Firewire Capture Device
 - 2. Best Way to Convert Analog Video to Digital Video is to Purchase Internal Computer Cards that Have S-Video or A/V Jacks.

E. Inserting Video into PowerPoint

- 1. Insert → Movies and Sounds → Movie from File.
- 2. A QuickTime movie (.mov) can only be imported into Macintosh PowerPoint.
- 3. Create a hyperlink to a movie on your hard drive. Windows Media files (.wmv) and MPEG files (.mpeg, .mpg) can be used in Windows PowerPoint.

IV. Video Via WWW

- A. Needs to be short and to the point. Cut scenes.
- B. Use mainly close-ups of main subject.
- C. Limit panoramic and big spaces.

V. Approaches to Video E-Mail

- A. My Video Talk – <http://www.myvideotalk.net/>
- B. WebCam Mail – <http://www.webcamsoft.com/en/wmail.html>
- C. Audio Video Interactive E-Mail <http://www.avimail.com/>
- D. Vmdirect <http://www.vmdirect2.com>
- E. ClipStream <http://live.clipstream.com/>

VI. Video on Pocket PCs

- A. PocketTV <http://www.pockettv.com/> can play any standard MPEG-1 video file.
- B. Capable of streaming MPEG video files using standard Internet protocols with a wireless network connection.

VII. Digital Compression

- A. Digital Compression utilizes Video Codecs (Compression/DECompression.)
- B. Uncompressed, a single minute of video total about 1 GB.
- C. Uncompressed, a three minute song uses 27 MB.
- D. Final step in preparing a digital video clip is called rendering.

VIII. Lossy versus Lossless Compression

- A. Lossless compression is used to reduce the size of computer files for electronic transmission.
- B. Lossless is necessary to make perfect copies. .SIT and .ZIP are common formats.
- C. Lossy compression discards some data contained in the original file.
- D. Lossy compression used on audio and video files.

IX. Lossy Compression Background

- A. Cinepak, Sorenson, and Sorenson3 compression formats are used for Mac Quicktime files.
- B. Indeo video compression was created by Intel and has been shipped with Windows since 1994 and Apple's QuickTime since 1998.

X. Types of Digital Compression

- A. Interframe – compares consecutive frames of video, looking for frames where most of the pixels are not moving.
- B. Intraframe – works on the premise that when the user knows that a pixel is going to be one color. Assumes that the pixels surrounding the pixel with known color are likely to be the same color.

XI. MPEG Compression

- A. MPEG-1 is best compression for web.
- B. NTSC VCD and PAL VCD are variations on MPEG-1 used to create video compact disks.
- C. MPEG-2 yields highly compressed files. Used on DVDs, satellite television, digital cable television, and HDTV.
- D. MPEG-3 is the International Standard for Digital Music.
- E. MPEG-4 files can transmit video and images over a narrower bandwidth and can mix video with text, graphics and 2-D and 3-D animation.

XII. DivX Compression

- A. Facilitates large video transfer on high-speed modems.
- B. Uses a model similar to MPEG-4.
- C. Used for DVD full-length videos and theatre-screen dimension movies.

XIII. H.263 Compression

- A. Targeted toward smaller file size rather than superior quality.
- B. Supports video compression (coding) used for video-conferencing and video-telephony applications.
- C. Published by the International Telecommunications Union (ITU).
- D. Used in exporting e-mail and Web prefab settings.

IX. DV-NTSC and DV-PAL Compression

- A. Used for very high-quality movies.
- B. Primarily for transferring video clips from camcorder to computer in the 16:9 widescreen format.
- C. Standard video display monitor is 4:3 ratio.

X. Setting Compression Options

- A. Data Rate – Amount of information processed during each second of playback.
- B. Pixel Rate – How many pixels are drawn to the screen in a given second.
- C. Data Type – Specifies video color bit depth, which determines the number of colors used. Normal video is 24-bit or 16 million colors.
- D. Quality Slider – Most compression formats provide a slider controlling general video quality, measured in percentage.

XI. Shooting Capture-Ready Video

- A. When capturing video, choose a compression setting that produces a better quality clip than needed.
- B. Users can always choose a lower quality compression setting when exporting the movie, but they cannot select a higher one.
- C. Avoid detail and motion.
- D. Avoid jump cut.
- E. Be aware of what is happening in the background.
- F. If text is used, sharp edges and details of small text are difficult to compress.
- G. Use cross-fades with care.

XII. Audio Compression

- A. Determines the relationship between input and output.
- B. Reduces the difference between the quietest and loudest parts of a song or other audio.
- C. Best to maintain audio quality at 44 MGz, 12-or 16 bit stereo.
- D. Dolby Surround Sound 5.1 Called Dolby AC-3 or AC-3.
- E. Used in many commercial DVD titles.
- F. Contains 6 discreet channels.

XIII. Locations and Settings

- A. Check both visual and audio surroundings before selecting a location.
- B. Obtain a signed release from any business whose sign may be in the background.
- C. After 9/11 and the creating of the Department of Homeland Security, greater precautions must be taken before videotaping in a public area.
- D. Local law enforcement may need to be contacted before public videotaping.

XIX. Video Business Agreements

- A. Name of video production.
- B. Dates of production.
- C. Purpose of project.
- D. Names of those involved in producing video.
- E. Intended audience.
- F. Location and setting of video.
- G. Explanation of any interruption of normal use of property.
- H. Guarantee of the return of property to original condition.
- I. Method of duplication or distribution.
- J. Signatures of property owners and those responsible for video.

XX. Types of Indoor Video Studios

- A. Standard News Show.
- B. Informal Talk Show Set.

XXI. Studio Recommendations

- A. Approximately 18' by 16'.
- B. Air-conditioned – constant 72°.
- C. No unnecessary items and no empty spaces in background.
- D. Platform 2' high, 5'-6' long and 4'-5' wide.
- E. Backdrop Subtle and unobtrusive: 10' high and 13' wide.
- F. Flat can placed in the back of the set.
- G. Include chromakey background.

XXII. Three Point Lighting

- A. Key Light – Covers the left-hand side of the subject's face. Located 45° to the right or left of the camera.
- B. Fill Light – Covers the opposite side of the subject's face. Located 45° to the right or left of the camera.
- C. Back Light – Placed behind the talent near ground level and pointed upward, slightly toward the background. Helps decrease the shadow caused by key light.

XXIII. Media Production Room

- A. Adjacent to video studio with window.
- B. Production-room computer system could include audio and video-editing software.
- C. CD and DVD burner, capture card, speakers, external hard drive, audio card, microphone, and headphones.
- D. Analog to digital converter device.
- E. Separate VCR dubbing unit with monitors.
- F. Audio-mixing console.
- G. Media Distribution Unit.

XXIV. Preplanning Checklist

- A. Purpose, intended audience, summary paragraph.
- B. List of required graphics, photos, audio, or video clips.
- C. Necessary copyright, permissions, and clearances.
- D. Production schedule.
- E. Equipment needed.
- F. Props needed.
- G. Location(s) identified.
- H. Talent(s) identified.

XXV. Preparing Storyboards

- A. Drawings of key scenes with notes on dialogue, sound effects, music, and special effects.
- B. Semi-scripted versus fully-scripted shows.
- C. Can be sketched by hand or use a general software package or created with storyboard specific software.
- D. Storyboard preparation software - Atomic Learning's FREE *VideoStoryboard Pro*. <<http://www.atomiclearning.com/storyboardpro>>

XXVI. Production Tips - Shooting Edit-Ready Video

- A. Shoot to Edit.
- B. First frames are "establishing shots".
- C. During the actual shoot, keep the tape rolling whenever possible.
- D. Record play of A-roll (the main event) and B-roll footage (other shots).
- E. Learn to use the camcorder's manual controls.
- F. Use a light indoors.
- G. Do not overuse the zoom.
- H. Do not pan back and forth.
- I. Follow the action.
- J. Record 10 seconds of tape before the action starts and ten seconds after the action ends.
- K. Do not center the subject – remember the 'Rule of Thirds'.

XXVII. Composition Guidelines

- A. Content takes precedence over form.
- B. Strive for a feeling of unity.
- C. Each scene needs to be composed around a single center of interest.
- D. Observe proper subject placement.
- E. Balance the mass.
- F. Maintain tonal balance.
- G. Use pleasing use of line.
- H. Use colors and tones to convey meaning.
- I. Movement within the frames evokes meaning.
- J. For best results, the camera should be physically moved as opposed to using the zoom features.

XXVIII. Field of View

- A. A long shot (LS) frames a wide field of view of the subject and its surrounds.
- B. A medium shot (MS) frames more of the subject while still revealing some of the background.
- C. A close-up shot (CU) focuses the viewer's attention on specific details.
- D. An extreme close-up shot (XCU) frames only a portion of the subject. It is a very dramatic shot that can generate great visual excitement.
- E. Point-of-View Shot
 1. Shoots from the subject's position.
 2. Viewer sees what the subject sees.

XXIX. Preparing Titles

- A. Should be light text on a dark background.
- B. Use a sans-serif font.
- C. Use large font.
- D. Use semi-bold and boldface type weights.
- E. Make sure the titles remain on the screen long enough to be read.
- F. Keep the opening titles simple.
- G. Fade the titles in and out.
- H. Select font colors with care.
- I. Titles should be distinguishable from the background and not compete with the background.

XXX. Adding Transitions

- A. Video edits usually flow from track A to track B.
- B. A simple cut from one clip to the next is a neutral transition that does not communicate anything.
- C. A fade-in to black signified an end.
- D. A cross dissolve, in which the first clip begins the fade-out while the next clip appears to fade in, is a smooth transition that signifies continuity.
- E. A jump cut occurs when the shot before does not relate to the shot after it.

XXXI. Adding Still Images to Video

- A. To add a still picture into a video clip, a single video frame can be extracted and saved as a still picture.
- B. Stills should be changed to the aspect ration 4:3.
- C. Pictures prepared in a photo-editing software package can be imported into a timeline.
- D. Video is 72 dpi.

XXXII. Still Photo Display Styles

- A. Format chosen is a balancing act between compression practicality and personal preference and clarity.
- B. Ability to pan and zoom over the image giving an impression of motion. (Ken Burns effect)
- C. Moving Montage.
- D. Use a picture-in-picture effect of a small still inserted into a video.

XXXIII. Adding Special Effects

- A. Includes slow motion, fast motion, stobe reverse image, and a multitude of other digital effects.
- B. Overuse of special effects can distract the viewer or slow the computer.
- C. Video filters are special effects that can dramatically change the video's appearance.
- D. Masks and overlays blend one video with another video or image, allowing only a portion of the original to show through.

XXXIV. Multiple Video Layers

- A. Video-compositing is a cross between animation and video editing.
- B. Enables the user to animate static images or video files across another static image backdrop or a moving video background.
- C. Chroma-keying.
- D. Transparency or opacity of a video clip can be altered in many editing programs.

XXXV. Finalizing and Rendering

- A. Make sure there is enough disk space.
- B. It will take at least double the size of the video to render it.
- C. Once a video is rendered, it is ready for output.
- D. For archival purposes outputting back to a digital video tape is the best option.

XXXVI. Sample Projects

- A. "Why Do Rainbows Occur?"
<<http://www.uwstout.edu/soe/profdev/video/videos/rainbow.mov>>
Author: Mark Linnenburger, high school Physical Science (This movie is 5,097 KB and may take a few moments to download. Download the [QuickTime plugin](#).)
Lake Zurich, Illinois
- B. "Here's Looking at You - Diagnostic Medical Imaging"
< <http://www.uwstout.edu/soe/profdev/video/videos/medicalimaging.rm>>
(This movie is 18,400 KB. (Download the [RealPlayer](#).)
Author: Mary Hopple, High School Biology
Jersey Shore, Pennsylvania
- C. "The Baseball Factory Instructional Series"
< <http://www.uwstout.edu/soe/profdev/video/videos/classfinal.wmv>>
(This movie is 2,556 KB. Download the [WindowsMedia Player](#).)
Author: Barry Bilkey, Special Education
Davenport West High School, Davenport, Iowa
- D. "Introduction to the Basics of Preparing Computer Video"
<<http://www.uwstout.edu/soe/profdev/video/videos/VideoWithiMovie3.mov>>
Author: Ed Case – England (This movie is 4,575 KB Download the [QuickTime plugin](#).)
- E. "Video Production at Charles City High School"
<<http://www.uwstout.edu/soe/profdev/video/videos/alpam.mov>>
(This movie is 2,200 KB. Download the [QuickTime plugin](#).)
Author: Al Bode, high school Spanish, and Pam Erbe, media specialist
Charles City, Iowa

F. "Dog Sledding 101"

<<http://www.uwstout.edu/soe/profdev/video/videos/dogsledding101.mov>>

(This movie is 12,333 KB. Download the [QuickTime plugin](#).)

Author: Shayne Russell, media specialist

Mt. Laurel Hartford School, Mt. Laurel, New Jersey

G. "Dubuque Arboretum Botanical Gardens" (Download the [RealPlayer](#).)

<[http://www.lincoln.dubuque.k12.ia.us/videoessays/](http://www.lincoln.dubuque.k12.ia.us/videoessays/DubuqueArboretum_BotanicalGardens_56K.rm)

[DubuqueArboretum_BotanicalGardens_56K.rm](#)>

Author: Sandy Hanley, media specialist

Lincoln Elementary, Dubuque, Iowa

H. You Can Play the Blues

<<http://www.uwstout.edu/soe/profdev/video/videos/blues.rm>>

Author: Colleen Morgan, K-8

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