

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/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
Eau Claire, WI



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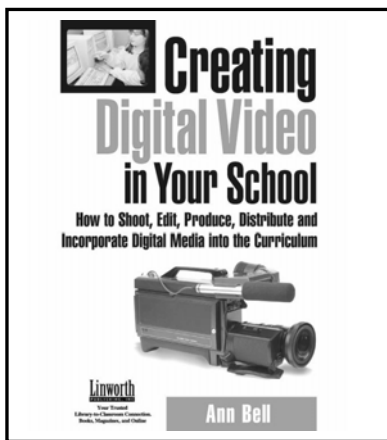
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Creating Digital Video in Your School: How to Shoot, Edit, Produce, Distribute and Incorporate Digital Media into the Curriculum

By Ann Bell

**This comprehensive, up-to-date guide will show you how to
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- Use the power of digital video to encourage student involvement in analytical thinking, script writing, performing, editing, proofreading and using computer and television technologies to meet and enhance their curriculum standards.
- Comprehensive and logically arranged to provide ready access to information for all levels of users.

Using this guide, teachers and media specialists can help their students increase their visual literacy, particularly media literacy and information literacy. This work takes the novice and intermediate user, step-by-step, through the elements that make up a quality video production, using the most current information. It covers all aspects of video production from the selection of hardware and software, understanding digital compression, pre-production, production and post-production tips and sharing the video in a variety of formats. It describes topics in a simple, straightforward manner, complete with index, glossary of terms and additional resources, both online and print.

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