

A Basic Guide and Support for Video Recording Teachers in the Classroom

By John Ittelson, Ph.D., and George Lorenzo

A Brief History and Introduction

In the late 1880s, Thomas Edison's Kinetoscope became known as one of the earliest progenitors of a device that presented moving images. The Kinetoscope was a contraption with a peephole, magnifying lenses, a series of spools with film, a flashing electric lamp and a shutter. It basically presented a rapid series of still frames.¹

The Kinetoscope was state-of-the-art for its time, but not long after Edison invented the Kinetoscope, the silent film industry (with music as the backdrop) was born and thrived during the middle 1890s and well into the 1920s. Talking films then came onto the scene on October 6, 1927, when the movie "Jazz Singer" featured Al Jolson prophetically saying "Wait a minute, wait a minute. You ain't heard nothin' yet!"²

Taking another leap forward, comes television, which actually dates back to 1928, but the boom in television sales really did not occur until post World War II. Color TV and remote controls came in the mid 1950s.³

Quickly jumping forward to modern times, we now have TiVo (<http://www.tivo.com>), which automatically finds and digitally records all of your favorite TV shows.

The Digital Era

In this new digital era, we are witnessing a phenomenal growth spurt in how we record and present video and audio. With an inexpensive video recorder in the palm of your hand, you can record whatever you want and publish it on the Internet in seconds. This kind of growth in video technology has happened quicker than the somewhat comparative Moore's law, in which the entire information technology sector continues to race forward at remarkable speed.

Suddenly, as if overnight, dynamic digital videos are being created and watched online in unprecedented numbers by a new world of amateur videographers. This phenomenon is obviously and vigorously on display at YouTube.com, where one of last year's top videos featured stampeding buffaloes. The "Battle of Kruger" video, showing a herd of buffaloes, a pride of lions and a crocodile fighting over a calf, has been watched more than 21 million times.⁴

Websites like YouTube where visitors can upload and share videos are commonplace today. A video sharing website that fits within the context of this report, for instance, is called Teacher Tube (<http://www.teachertube.com>).

A fairly comprehensive list of video sharing websites, with live links, is provided by Wikipedia.⁵ LightReading.com, a

website for the Telecom industry, lists the top ten video sharing websites.⁶ As of this writing, the number one spot was held by <http://www.blip.tv>, which creates and publishes a wide variety of news and entertainment videos online and offers a free service for anyone to post their video programming on their website. As noted on its website, "BlipTV has a distribution network that reaches hundreds of millions: built-in syndication to AOL Video, Yahoo! Video, MySpace, Facebook, Twitter, Flickr, MSN Video, Google Video, Blinkx, iTunes and the Apple TV, Blogger, WordPress.com and much more."⁷ For the top ten video sharing services, see DVGuru.com.⁸

No More Porta Paks

This capability to easily produce and publish digital video has taken educators into new and fascinating realms of teaching, learning, community building and information sharing. With the growing availability of inexpensive video equipment and editing software, along with today's common access to high bandwidth, it has become easier than ever for teachers to create digital videos for a wide variety of educational purposes.

In the past, dating back to the 1960s, microteaching became the term and method known for videotaping teachers in the classroom. Microteaching was developed by Dwight Allen at the Stanford Teacher Education Program, who "emphasized a teach, review and reflect, re-teach approach, using actual school students as authentic audiences."⁹

In the 1970s, the typical device used for a microteaching recording was a Sony AV-3400 Porta Pak, featuring an open reel portable recording and playback system that weighed about 20 lbs and cost, in 1970 dollars, \$1,495. It had a self-contained rechargeable battery pack that provided 45 minutes of continuous operation with the camera.¹⁰



The much lower cost (fairly sophisticated video recorders are now in our cell phones), smaller size and convenience of video recording today brings educators a much-easier-to-adopt tool than ever before, enabling them to

- enhance their instruction;
- increase their educational technology skills;
- have their students create digital videos for homework assignments and group-study projects;
- reveal a student's progress to parents and other interested parties or stakeholders;
- announce and publish online new and important educational practices or community-building events;
- self reflect on and demonstrate their teaching capabilities; and
- facilitate systems and processes whereby teacher educators, mentors and administrators can review the work of preservice and inservice teachers in order to provide constructive feedback to improve their practice.

This report provides an explanation of how video is being used for teacher preparation and enhancement, emphasizing why digital video is growing in popularity. It also offers a brief guide to a good number of basic techniques and strategies for creating effective digital video presentations.

The Right Stuff

It is often said that to become part of this growing phenomenon, all you need is a video camera, video capture and editing software and a computer with a broadband Internet connection (for ease in posting to the web). But to create, edit and publish dynamic video for educational purposes requires a lot more skill and know-how than just having the right equipment and the ability to push the right buttons.

As digital video grows in usage and importance in almost every industry sector today, preservice teachers, in particular, will want to learn everything they can about how to create and use digital video technologies to enhance both their teaching capabilities and educational technology skills. Additionally, a growing number of professional educators recognize that the acquisition of digital videography skills is more than just a worthwhile pursuit. In fact, the acquisition of such skills may become an imperative in the not-too-distant future for both preservice and inservice teachers.

As noted by Michael P. Klentschy, who is a superintendent of schools in California, "teacher analysis of video, both of themselves and others, is an essential factor for improving



teacher practice and developing a professional knowledge base for teaching.”¹¹

Seeing is Believing

Historically, educators have always struggled with discovering what really constitutes good teaching. In 2000, Alexander Nguyen, a writing fellow at The American Prospect wrote that “good teaching is a complicated issue precisely because it is both elusive and obvious at the same time.” He added that good teaching typically falls prey to being defined too narrowly or too vaguely. “But it also responds to the I-know-it-when-I-see-it principle.”¹²

Yet, if this is the case, then the key to finding good teachers for American schools may not lie in trying to agree on what good teaching is or attempting to measure it, but in actually watching teachers in action. The key may be to evaluate their performance in real classrooms in authentic settings, in front of students. We do know good teaching when we see it.¹³

Nguyen went on to show how state teacher credential and licensing agencies in California, Wisconsin, Kansas, Connecticut, New York, Indiana, North Carolina and Arizona were all adopting and effectively using videotaping systems and processes for performance-based assessments of teachers. He also noted that as far back as the mid-1980s, in the state of Connecticut, teacher certification candidates were required to videotape two lesson segments as part of a teaching portfolio they submitted for evaluation during their second year of teaching.¹⁴

Study Reveals the “True Profession of Teaching”

In 1994-95, an unprecedented exploratory research project for the Third International Mathematics and Science Study

(TIMSS) collected videotaped records of 231 eighth-grade mathematics lessons held in classrooms from Germany, Japan and the United States. The tapes were encoded and stored digitally on CD-ROMs and then analyzed on the content and organization of the lessons, as well as on the instructional practices of the teachers.¹⁵

The key findings of the TIMSS project were:

- The content of U.S. mathematics classes requires less high-level thought than classes in Germany and Japan.
- U.S. mathematics teachers' typical goal is to teach students how to do something, while Japanese teachers' goal is to help them understand mathematical concepts.
- Japanese classes share many features called for by U.S. mathematics reforms, while U.S. classes are less likely to exhibit these features.
- Although most U.S. math teachers report familiarity with reform recommendations, relatively few apply the key points in their classrooms.¹⁶

One of the TIMSS project's primary investigators, James Stigler, and teacher/co-author James Hiebert, wrote that the benefits of videotaping outweigh its methodological challenges and labor-intensive demands, but videotaping has ambiguous characteristics as well.

Video provides the researcher with two kinds of data: visual images rich in descriptive power and quantifiable indicators that summarize the contents of large numbers of images. Visual images are vivid and powerful, but they can mislead. They can create such a powerful impression that the viewer is seduced into thinking that a single case tells the whole story.¹⁷

To overcome any such elements of seduction, the TIMSS researchers developed a sophisticated system that coded aspects of the class that made a difference in the mathematics being learned by the students. These coded aspects included categories such as the nature of tasks, the kind of work expected of students, and the nature of the classroom discourse.

In the end, Stigler and Hiebert claimed that the biggest long-term problem identified through the videotaping study was "not how we teach now but that we have no way of getting better."¹⁸

National Board's Recording Guide

Support for, and acknowledgement of, videotaping as being highly effective for teacher performance assessment, as

well as for teacher self-reflection, was bolstered in the mid to late 1990s by the National Board for Professional Teaching Standards (NBPTS). At that time, NBPTS started to request that its teacher certification candidates create two classroom-based video recordings showing how they interact with their students.

The purpose of the video is to provide NBPTS "with as authentic and complete a view of the candidate's teaching as possible."¹⁹ Some of the recording guidelines and suggestions for producing high-quality recordings, include:

- In addition to having minimum equipment (camera, tape, CDs, recordable DVDs, tripod, extension cord), an optional external microphone and headphones are recommended.
- No stopping and restarting of the camera at any time.
- Video must show the faces of teacher and students.
- Position camera at the side of the room, not facing windows.
- Aim camera at the speaker but in a position to also capture participating students.
- Consider using dark markers on chart paper taped to a chalkboard as opposed to using chalk and a chalkboard.
- If it is necessary to move camera while recording, set the zoom lens to its widest setting to reduce shakiness.
- Increase light in the room but do not aim camera at a source of light.
- Improve sound quality by turning off fans, air conditioner, fish tank pumps, etc., and avoid recording where there might be other extraneous noise (e.g. band practice, recess).
- Use an external microphone that can be kept close to the person speaking. Place a piece of foam pad under the microphone to diminish noise.²⁰

Variety of Recording Guidelines and Styles

While the NBPTS video recording guidelines are indeed useful, they are only the proverbial tip of the iceberg for getting a full understanding of how to produce a high quality





and professional digital video representation of a teacher in his or her classroom interacting with students.

Teachers need to understand that a variety of video production configurations can be applied for a variety of circumstances. As one educator explained:

Since there is no mandated videotaping style, try out lots. Certified teachers will attest to having been successful with many different taping techniques. The choice partly depends on you classroom’s physical characteristics, partly on the arrangement of students, and partly on your own preferences. Candidates have been successful with a camera set up in the corner and always running, with someone behind a camera on a tripod, and with someone holding the camera and moving about.²¹

Video recording is not the same as movie making. A movie production includes actors, directors, writers and more. Teachers making video recordings must do the writing, acting and directing themselves. Their goal is to produce something that effectively captures the learning process and the interactions happening inside the classroom. This is a complex endeavor.

Having a teaching professional operate the camera - having someone who understands the dynamics of what’s really happening inside of a classroom - is a good idea. The camera person should be fully aware of the goals and objectives of your video recording project and have a keen understanding of your lesson plan.

Shot Lingo

An understanding of the terminology and techniques used in movie making can be beneficial to the teacher who wants to record his or her class. Thinking about what you want to capture on the camera is critical. Many films and television shows start with a long shot and then move to a short shot.

Screen writers use these terms to get a message to a director. In the classroom, however, you don’t have a screen writer’s advance suggestions. You might want to focus on a work station, for instance, or an exercise being displayed on the chalkboard. Overall, you will want to figure out, with some precision, how and what you are going to capture.

At the very least, an understanding of some basic videography techniques, such as “Shot Lingo,” could prove to be very helpful in designing any video. For instance, as provided by Kyle Casidy at videomaker.com, there are seven basic types of shots that you’ll want to consider:

Extreme Close Ups - Shows the eyes, nose and mouth, cropping off the top of the head and chin, often revealing/highlighting emotions.

Close Ups - Head shots or head and chest shots.

Medium Close Ups - Head and chest shots, sometimes of two or three people standing next to each other.

Medium Shots - From waist or thighs upwards and provides an opportunity to show some of the environment, such as items on a table.

Medium Long - Shows an entire person, head to foot and provides an opportunity to show much more of the environment, such as a portion of the classroom.

Long Shot - Further back than a medium long shot, making people look smaller than their surroundings.

Extreme Long Shot - People are not so much of the focus as is the entire surrounding environment.²²

More on Shots

To provide some additional nuts and bolts advice and information about the nature of shots, we refer back to the TIMSS project. In a section titled “Basic Principles for Documenting Classroom Lessons,” two principles guided videographers in their choices of where to point the camera for the TIMSS project (one camera in each classroom was utilized):

1. Document the perspective of an ideal student.
2. Document the teacher.

The ideal student is one who is paying attention to the lesson as it unfolds, and it is assumed that the ideal student does what the majority of students do. For those instances when the ideal student is not watching or attending to the teacher, such as when he or she is working on a given task in a group or individually, teachers will sometimes walk around the class,

monitoring students' work. The videographer should follow the teacher with the camera to get a sense for what the students are doing. For those instances in which the teacher does not circulate through the class and stays at the board or at his or her desk, the camera should alternate between the teacher and the ideal student, slowly panning away from the teacher to the students and then back to the teacher. Once focused back on the teacher, the videographer remains there until the students' activity changes in a significant way (e.g., new materials are introduced or they break into groups), at which time the panning back and forth occurs again.²³

Also, the Schoolhouse Video Project (SHV), a PBS-sponsored project related to teaching K-12 students and teachers how to create broadcast quality videos, provides a number of video-production tips and advice on its website at www.SchoolhouseVideo.org. SHV advises camera operators to not have subjects look directly into the camera and do not have subjects hold a microphone. Instead, use a wireless microphone or have someone hold a microphone off camera.²⁴

Lighting

In a section on lighting, SHV explains that while digital cameras shoot well under florescent lights for closeups, medium and long shots can become dark unless supplemental lighting is applied. SHV advises that lighting should be added where appropriate and that the camera's white balance should be set before shooting. You can typically program a digital camera to balance white in different lighting conditions. It is also suggested that teachers experiment with different lighting arrangements before shooting.²⁵

Audio and Microphones

Some audio experts will advise using a wireless Lavalier microphone for interview-related projects. Lavaliers are those small microphones that can be clipped onto a lapel, and they screen out ambient sound.

A wireless microphone allows the teacher maximum flexibility to move around the classroom without a wire possibly getting in the way. These systems include a transmitter worn by the teacher, and a receiver that is connected to a microphone input on the video recorder. Low cost wireless microphones can introduce noise, so be sure to purchase a system that works well.²⁶

Headphones should be used to check the audio feed. The video recorder operator should be wearing headphones in order to catch audio problems immediately.²⁷

In some ways good audio is more important than good video. The National Science Foundation's Presidential Awards

for Excellence in Mathematics and Science Teaching requires a video as part of the award application process. The purpose of the video is to show that students are engaged in the learning process and interacting with the teacher. In a video tips section of the awards website it is noted that applicants should "consider using multiple microphones for the teacher and students. Historically, the greatest difficulty has been in hearing student-to-student interactions and students' responses to teachers' questions due to excessive background noise."²⁸

In short, a video recording in which the applicant evaluators can't hear the dynamics of class interactions, even if the evaluators can see it clearly, will result in a waste of time and energy for all parties concerned.

A great resource on all things related to digital audio can be accessed at www.transom.org, a non-profit organization administered by Atlantic Public Media.

Hardware, Software and Resources

Of course, what hardware and software is needed to ultimately create and archive videos is another concern, and one that changes so quickly that it is almost impossible to keep up with what is the latest and greatest technology available today. Videotapes, for instance, are being replaced by electronic memory, compact flash and/or secure digital cards.

An interesting example of a videotaping environment that was created for a teacher preparation program in a physical and health education department can be found at Adelphi University. Here, a Macintosh-based system was built that centered on digital video to create instructional materials and student projects that were more closely connected to the actual experience of teaching. The new video taping system created at Adelphi ultimately allowed faculty to successfully create "opportunities for students to review personal performances for reflection, self-evaluation and goal setting."²⁹

In addition to having digital video cameras capable of supporting a FireWire connection to Macintosh computers for transferring and storing videos, the Adelphi system had a



backup storage system consisting of an external hard drive for storing Quick Time files (a medium-quality 3-minute Quick Time file is about 30 megabytes). iMovie software already installed on the Macintosh computers was the editing program used. (For PC users, Adobe Premiere is typically the software editing program of choice.) Adelphi also provided a variety of support services to help with the smooth adoption of video technology, including substantial instructional and information technology services and a required course in computer applications.³⁰

The manner in which Adelphi configured its system is only one of many ways that video recording can be incorporated into a teacher preparation environment. There are many variations that a college of education, school or district can take under consideration.

If you are in the market for a good video camera, check out the popular name brands, such as Sony, Panasonic, Canon and AIPTEK. Videomaker.com provides an extensive section of video camera reviews along with an online comparison shopping function.

If you are interested in learning about how video cameras are becoming even more compact and cheaper, take a look at Pure Digital's Flip Video products (<http://www.theflip.com>), which are pocket-size video cameras that sell for as little as \$119.99 "Flips" are currently the No. 1 best-selling video camera at Amazon and Target.com with sales overall expected to top 1 million early this year. A new Flip Video Ultra Video - available in five colors - comes with improved resolution, a better microphone and a slot for a tripod.³¹

Video Capturing and Editing

Credentialing and licensing programs typically do not allow for editing, instead requiring teachers to supply a videotaping without stops and starts in order to get an overall true picture of how the teacher and students interacted. However, for a much wider variety of video recording purposes in educational settings, editing is a vital process that every videographer must eventually master.

As for video capturing and editing software, Apple computers come with iMovie for free, and PCs with Microsoft operating systems come with MovieMaker for free. Two other free video editing software products that can be downloaded online include Avidemux (<http://fixounet.free.fr/avidemux/>) and VideoSpin (<http://www.videospin.com/>).

There's also a lot of high-performance, professional-grade video editing software products on the market that range in price and performance. Adobe Premiere Pro, Apple's Final Cut Pro, Pinnacle's Avid Liquid and Sony's Vegas Pro are



some of the name brands that fall under this category.

For some great tips on editing, see the Videography for Educators website published by the Apple Learning Exchange. In a section titled "The Art of Editing," it is suggested that videographers "think of editing as using video, audio, stills, and creativity to tell a story from beginning to end." Additionally, you should divide your project into scenes.

Think of a project as broken into "scenes," with each scene appearing as one block of continuous time. Use simple cuts, rather than transitions within a scene. This will give the appearance of real time video even if the content was not captured continuously. Viewers should feel as if they are watching the scene in its entirety, from beginning to end.³²

Editing for Self-Reflection and Improved Teaching

The video editing process is typically utilized in a way that fosters self-reflection and hence fosters teacher improvement. This was proven to be the case in a study conducted and written about by Randy Yerrick, Donna Ross and Philip Molebash from the Center for Research in Mathematics and Science Education at San Diego State University.

The context for the study was a science methods course for postbaccalaureate students who were preservice teachers in public schools in which they had access to mentors, children and a realistic view of technology and teaching. Their first task, after becoming familiar with how to record and edit, was to interview elementary students about core scientific ideas (e.g., seasons, moon phases, heat transfer, photosynthesis, current flow) and compile a representative 5 minute iMovie from 90 minutes of footage they had collected.

Interviewing and editing a digital video to capture and communicate children's beliefs was helpful in identify-

ing access points into children's beliefs. It also provided some ideas on how to begin to insert contrary evidence to perturb children's nonscientific thinking when the preservice teachers were ultimately required to teach their lesson and provided an authentic reason for the preservice teachers to learn the science content themselves.³³

The next step was for these preservice teachers to view iMovies created by past students and local teachers who demonstrated exemplary science teaching. They also viewed a variety of exemplary curriculum projects that were available on websites such as Project Wild (<http://www.projectwild.org>) and/or GLOBE (<http://www.globe.gov>). The preservice teachers were then required to plan, facilitate, teach and videotape a one-hour lesson with the same children they had interviewed. Then, they were required to edit what they recorded and reflect on what had occurred during the lesson.³⁴

Yerrick et al took all of the preservice teachers' recordings and reflections and identified those teachers who had most likely achieved the goals of the science methods course. They then utilized a phenomenological methodology/approach that ultimately brought them to the following three assertions:

1. Digital video projects became central artifacts in shifting preservice teachers' reflections from themselves to children's thinking.
2. Students adjusted their planning and instruction based upon lessons learned by reflecting during their video editing.
3. Students expanded their notions of teaching expertise by reflecting via video editing.³⁵

Simple Yet Effective

Janet English, director of education services at KOCE-TV in Orange County, California, who is also a seventh and eighth grade science and multimedia communications teacher and a

2003 Presidential Award for Excellence in Mathematics and Science recipient, recommends that applicants for the awards program take a simple approach when producing their videos. English, who has also evaluated video tapes for the presidential awards program, says that the video recording process should have a video camera on a sturdy tripod; a portable, compact audio mixer that plugs into the camera; and two microphones, one for the teacher and another for the students.

Audio mixers come in a variety of shapes, sizes and price ranges. For more information, see Videomaker.com.³⁶ English warned videographers to definitely not rely on a video recorder's built-in microphone because it is not powerful enough to capture audio beyond a short range. Have a second person holding a microphone and moving close to the students as they respond to questions.

English also suggests that teachers try to create the most unobtrusive environment as possible, explaining that it's a good idea to get students accustomed to having a video recorder and microphone system in the room prior to making the final video. Overall, "video is one of the most powerful tools you can have," English says. "You don't realize how you come across unless you watch a video of yourself."³⁷

Indeed, video recording of teachers in the classroom obviously has its benefits, and it has definitely reached the radar screens of educators worldwide.

People of all ages are adopting the latest video recording technologies and willingly sharing their recordings on the ever-increasing network of video-sharing websites. Prices for recorders, microphones, software and other video recording peripherals continue to drop as well as shrink in size and become easier to use. Plus, broadband access is becoming more commonplace in homes everywhere. All this points to the education sector increasingly adopting video technologies and for teachers to steadily become adept videographers and/or users of easily accessible digital programs to enhance teaching and learning in new and profound ways.

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End Notes:

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