

Video for Teacher Learning: A Developing Practice

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Video for Teacher Learning: a field in development

Introduction

After creating and user-testing a set of videos for the Noyce Foundation that introduce coaching and highlight its processes, we follow up with a broader discussion of how video cases are being used to help support teacher learning for both pre-service and practicing teachers. We base our discussions on a review of recent literature and case materials (both products and online archives), and we frame our discussion around four main topics: (1) What video uniquely sets up as learning possibilities; (2), what can be learned from using video cases; (3), contextual design issues to be considered when creating video cases; and (4), decisions about video practice, technology and scale related to the use of video cases in teacher education and teacher professional development. We highlight issues to be taken into consideration in teacher learning with video and hope the review will be useful to those interested in using and creating video for teacher education or professional development settings.

Unique Affordances of Video for Teacher Learning

In Sherin's (2004) chapter in *Using Video in Teacher Education*, the author describes how video programs used in teacher education were created and used in ways that aligned with the visions of teaching and learning that were popular at the time. For example, when behaviorism was the leading paradigm in teacher learning, video played a role in the development of microteaching. Similarly, video was incorporated into interaction analysis when it was popular in the 1970s. In her chapter, Sherin argues that teacher educators should focus on the affordances that are particular to video and how they can leverage these unique qualities to help teachers. Here we discuss features of video and the new possibilities they allow for both preservice and inservice teachers.

One of the most obvious advantages of using video as an "artifact of practice" is the versatility/manipulability of video data. Although presenting a model lesson or having teachers watch the same lesson provides participants with a single and shared case to discuss, video enables the users to (quote) "pause, replay, and/or manipulate" footage to help highlight particular aspects of teaching (Brophy, 2004, xi). This feature of video allows teachers to revisit moments in teaching and reflect on them from multiple perspectives. With a model lesson that is often done live in a class or seminar, teachers would have to rely on memory and could not return to the instruction to focus on specific details or with a new question in mind.

Another advantage of video is the capacity of the medium to capture the classroom. In comparison to narrative cases, video cases “offer an immediacy not possible in narrative cases” and convey a richer form of input that “capture[s] more of the social fabric of the situation, greater context, and more detail of classroom practice” (Clarke & Hollingsworth, 2000). As narrative cases are often used to explore pedagogical dilemmas and help support teacher decision making, video cases would allow teachers to better understand the complexities and contextual features of the classroom that are a pivotal part of teacher decision making. Using videos to expose viewers to the complexity of a classroom would be particularly significant for novice and pre-service teachers. The use of video cases can help pre-service teachers “view complex, interactive situations that are in a constant state of flux and can begin to acquire pedagogical tools for situations in which there are no easy, clear-cut answers” (Cannings & Talley, 2002, p.367).

The unique affordances of video have also opened up new possibilities for the use of video in research on teacher learning. For instance, the ability to replay video footage and use it as a shared artifact of practice has allowed video cases to serve as a measurement tool. In a 2005 article in *Reading Research and Instruction*, Smith described a study in which researchers used pre-service teachers’ analysis of the same video case as a pre and post test measure of teachers’ growth in inquiry mindedness. In the study, set in the context of reading instruction, investigators rated novice teachers by creating and using a scale that compared the responses of novice teachers to those of expert observers in reading instruction. It was the ability to have both expert and novice teachers view the same artifact of practice that allowed researchers to both create the scale and administer a pre and post assessment with the same instance of teaching.

As technology is continually advancing, we should keep Sherin’s argument in mind and continue to think about how new programs and emergent technology might be used to support and advance teacher learning.

We have touched on what the literature has highlighted as the potential for teacher learning from video cases. We turn more to the literature, and in particular research studies, to look at how (the purposes for which) teacher educators and professional developers have used video cases to support teacher preparation and development.

Uses of Video Cases for Teacher Learning

The use of case studies as a leading pedagogical tool for professional learning has been established in the areas of business, law, and medicine for some time now. More recently, scholars in education such as Shulman, Wasserman, and Merseth have described the potential of using case studies for teacher learning. In her 1994 article, Merseth (1994) outlined three purposes case studies of teaching can serve: as exemplars of teaching, to practice decision making or “thinking like a teacher,” and to stimulate personal reflection. We discuss both these and other uses of video cases that were described in our review of educational research and scholarship on the use of video for teacher learning in both teacher education and in-service professional development.

Seeing teaching. Due to richness of video data, video cases can be particularly useful in serving as models of teaching, particularly for approaches and pedagogies teachers are less familiar with. In his introduction to *Using Video in Teacher Education*, Brophy (2004) notes that video cases can be used to orient future teachers to models of teaching they are not likely to see in local classrooms such as more innovative or reform-oriented models such as problem-based teaching (p. xi). Although video cases can help both practicing and novice teachers in learning to implement a new approach or method of teaching, this is particularly important for pre-service teachers whose models of teaching to date are often drawn from their own experiences as a teacher or what Lortie (1975) refers to as “apprenticeship of observation.”

Although Brophy speaks specifically to use of cases as models of future teachers, Clarke and Hollingsworth (2000) and St. John and Stokes (2003) have noted that in general video cases can help teachers understand theories and make them more concrete. The ability to view a teacher enacting a pedagogy in context allows theory to come to life for all teachers, what St. John and Stokes refer to as “bringing images to the blind”, and helps teachers to reflect on when and how these images of teaching may best be integrated into their classroom practice.

Thinking like a teacher. As noted in the previous section, the versatility and manipulability of video data are some of the unique affordances that make video so powerful. It is these characteristics that make video an ideal medium for creating cases for teachers to analyze and practice their decision-making. For pre-service teachers, video cases are particularly valuable in developing their ability to “think like a teacher.” One example of this can be found in the Smith (2005) study. Teacher education

students in a reading methods course analyzed and discussed four video cases in addition to working one on one with struggling readers. The study found that these students showed gains on their posttest in their description, analysis, and responses on what they would do if given a chance to work one-on-one with the student in the video. The authors concluded that working with the video cases had helped teacher candidates develop their “habits of inquiry.”

Noticing. The work of Miriam Sherin and Elizabeth van Es (2005) has highlighted the utility of videos in helping teacher candidates “learn to notice” what happens in the classroom. This is particularly important for pre-service teachers as research on expertise in teaching has noted that it is difficult for novices to distinguish between more and less important aspects of what they are seeing a classroom (Bransford, Brown, & Cocking, 2000). Pre-service teachers participated in three hour-long sessions with the Video Analysis Support Tool (VAST) as part of a study. The software allowed the participants to look at their own teaching and scaffolded the analysis process through prompts. The researchers then coded the narrative essays of twelve teachers (six who had used the software and six who had not used the software) and found that the pre-service teachers who had used the videos with the VAST software “became more discriminating in what they noticed” in that they could identify significant interactions rather than just describing/narrating what they had seen in the video (Sherin & van Es, 2005, p.485). The teachers using the software also moved from an evaluative stance on teaching in which they judged whether moves were right or wrong to a more interpretive stance in which they looked to see what influence particular moves had on learning. The researchers also noticed that the students who had used the software increased in the number of comments in their essays that were supported by evidence from the video.

The benefits of using video in developing teacher’s ability to “notice” have also been described in the in-service literature. In another study conducted by Sherin and van Es (2005) in which four middle school math teachers participated in a year long video club, researchers found that similar to the pre-service teachers in the VAST study, the four practicing teachers moved to a more interpretive stance and provided more evidence-based comments over time. In addition to these shifts, the in-service teachers who participated in the video club shifted from focusing on pedagogy to noticing student thinking.

Focusing on student thinking. This last point on focusing on student thinking is another purpose for which video can serve as a powerful tool. In the *Turning to the Evidence* study that compared two sets of professional development resources that included student work,

videotapes, and transcripts drawn from the classroom, researchers found that teachers in the treatment group were able to focus more on mathematics and the potential of students' ideas. Teachers in the group that used video cases were able to look beyond the accuracy of student responses and focus on the particulars of student thinking and the ways students thinking related to important mathematical ideas and habits of mind. Although this study is an example from a study of professional development, video cases can help both practicing and veteran teachers analyze aspects of teaching such as representations of content or and/or student thinking in a more sustained way than they might be able to do while teaching in their own classroom.

Ways of talking about teaching. As the video cases are often used in groups of teachers either in a course in teacher education or a professional development group, an additional purpose that video cases serve is to help teachers develop a vocabulary and norms for talking about teaching. Clark and Hollingsworth (2000) contend that through participating in data driven conversations, video cases may introduce teachers to new kinds of vocabulary to describe teaching practice. The results of studies such as those discussed above (Sherin & van Es, 2005; Smith, 2005) demonstrate that teachers working with videos are also able to provide more detailed responses about teaching by supporting their comments with specific examples from the videos.

These first two sections have highlighted the purposes and potential for using video to support teacher learning and presented a few studies in which researchers have identified benefits to using video cases in teacher education and professional development. However, what we still have to address are the supports and design considerations that should be taken into account to make video cases a powerful tool for teacher learning. This is the topic to which we now turn.

Context Design Issues/Considerations

That studies document the value of learning with video for both pre-service and in-service teachers is only part of the equation. Using video is complicated further by the design issues that accompany commitments to it. If video is shown to help teachers develop their beliefs, pedagogies and new models of teaching, reflective abilities, and abilities to investigate the development of student thinking, it clearly can be used to address much of the learning landscape for teachers. Because the territory is so vast, design issues are critical and impact the nature of practices established in using video. Design issues range from consideration of who the teacher-learner is to how to design video for the learning outcomes being sought.

The most defining question here is, “who are the learners?” Pre-service teachers, in-service teachers and even education leaders have a lot to learn from video, but each group has different needs, different outcomes and different time frames associated with the work. This question is also complicated by questions about culture. Research showed that teachers from different cultures saw different things in video clips of teaching (Miller & Zhou, 2007). Knowing who the teachers are who will be working with video could turn out to be an important factor. We take up on only a cursory discussion of differences in the needs of pre-service and in-service teachers and are able to show how they affect design and implementation considerations.

Scaffolds for pre-service teachers. Much of the focus of pre-service education is to look at and come to understand teaching and classroom practice. Video cases can help provide pre-service teachers with views of teaching, classroom practice, models of innovative teaching and teacher and student interaction. For example, several studies reviewed examined the formation of pre-service teachers’ beliefs about teaching. Teacher education studies have described that teacher candidates’ prior beliefs can influence how and what they learn in a teacher education program (Richardson, 1996 cited in Yadav and Koehler, 2007). A study by Yadav and Koehler (2007) on the use of a video resource, *Reading Classroom Explorer (RCE)*, investigated how beliefs might influence what teacher candidates learn from video cases (p.341). After six weeks, candidates were asked to choose a clip, describe what the teacher was doing, why it was a good example of reading instruction for beginning readers, and what else the teacher could do to improve her literacy practice (p.342). The results showed that epistemological beliefs served as the lens candidates used. The researchers concluded that that the goal should be to get multiple beliefs about teaching on the table, possibly by pairing teachers with partners that have different beliefs, and by designing cases that “confront prior beliefs” (p. 358). The fact that pre-service teachers can look at video in class for six weeks and not have a change in point of view speaks to how important it is for video tasks to have framing that helps to reach the educational goals desired for their users. There are degrees of structure that are provided, from open-ended tasks in which teacher candidates choose an issue or question they want to investigate to highly structured materials. Some highly scaffolded video environments do exist such as Mathematics and Teaching Through Hypermedia (M.A.T.H) (Lampert & Ball, 1998). M.A.T.H. enables pre-service teachers to have such frames and scaffolds as they examine and reflect on the practice of experienced teachers.

Make your own video for analysis. While pre-service teachers can use video of other teachers for being introduced to practice and coming to understand classroom lessons, the structure and timeframe of teacher education programs enables the use of video to study one's own practice. Teacher candidates use software such as VAST that scaffolds analysis of their practice. Having pre-service teachers develop their own video to observe involves much production complexity, yet it allows the students of teaching to reflect on and learn from their classroom teaching experiences. It also enables candidates to choose what they are going to record, to know their lesson goals, develop the lesson, and then step back from it for reflection. It has the disadvantages of having high overhead for production and for needing to break through candidate's emotions around examination of their teaching, possibly focusing them on other than what might be best to learn at the time of analysis. The "make your own" classroom video model is sometimes instantiated as a requirement of teacher education programs. This is also the model that is used as part of the induction process for National Board certification of teachers, but this may be one of a few instances for make your own video for practicing teachers.

Constraints with inservice teachers. Video learning with in-service teachers involves a different set of learning objectives and contextual constraints. Unlike pre-service teachers, establishing core beliefs about teaching would not be the most likely goal. In-service teachers may need to examine and reflect on how questioning and inquiry happens in the classroom, how to understand and/or adopt innovative pedagogies, or to delve into the development of student thinking in a content area. It is also important for teachers to be members of communities of learners and to be critical colleagues. Teaching is a profession plagued with outside evaluation, so it is crucial for an atmosphere of trust must be established before critique is possible. Situational constraints are many--the work loads that teachers carry, the structure of time on the job, and the limited opportunities for professional development—all frame the design of what it can mean to learn with video.

Importing video for in-service. The "make your own" classroom video is a possible model here, with Sherin doing research that showed teacher learning in video clubs. Yet, the method is fraught with trouble for in-service teachers who have heavy loads, little time, and fewer opportunities for the scaffolding and persistence of pre-service courses. Prepared lessons of teachers and classrooms external to their networks may be easier to use because they short-cut all of the time demands of video creation, avoid issues of personalization, and may present candidate's with pre-set aspects of teaching on which to focus. This is especially critical for in-service teachers. Remembering that using video

over an extended period of time yielded results indicates that that teachers and their educators would need to commit to approximately one session per month or even a multiple year commitment (Sherin and Han 2003; Education Development Center, 2006). One study reported that teachers said that after sessions with video they were thinking of applying their understandings “in the next academic year” (Education Development Center, 2006). Working with imported video may help get the learning process off the ground for in-service teachers.

Need for coaching. Like their pre-service counterparts, in-service teachers also need coaching or scaffolds for their learning. St. John & Stokes (2003) assert how critical it is to build scaffolds to support teachers’ productive interactions with video cases. Many video materials require guidance by a skilled coach (Rowley & Hart, 1996). The availability and use of video cases will often depend on those that are organizing and facilitating professional development. One critical question is how teacher educators providing professional development take to the use of video in their work and whether or not they see it as a part of their practice or repertoires. Video learning is unlikely to become a mainstream practice unless teacher educators adopt it and become proficient with it. We noted that pre-service teachers often have exposure to video and it is part of the practice of teacher education programs. Program faculty adopt video work as part of their practice (in both teaching and research). This is not necessarily so in school districts. At this time, there is little research that indicates teachers learn independently with video outside of organized professional development settings. Some video materials have built in structures such as step-by-step workshops or ways to interrogate the videos complete with viewing suggestions and questions to answer. Others have “experts” making commentary, pointing out what to view, or suggesting paths through the videos, that may be promising ways to design (Van den Berg, Jansen, & Blijleven, 2004).

More structures for independent work with video materials are being developed as the field of distance learning becomes more sophisticated and as video becomes a more instantiated part of teacher professional practice, yet little research has been done on the topic of the automated scaffold, guidance or coaching. One could imagine creating intelligent avatars that bring teachers through the video analysis process, but that vision is years away. In the meantime, the success of video for in-service teacher learning lies in the hands of the teacher educators and facilitators and their abilities to focus professional development with video.

Production issues

There are many production issues that are considered when creating video learning materials and environments. Opinions vary widely on these issues, so we present them as trade-off spaces that need consideration in the design process. These trade-offs affect the ways the video environments are generative, so they deserve attention when video materials are being created. It is possible to create work-arounds if these are not considered, and frankly, the early stages of video for teacher learning are fraught with ways to work around the shortcomings of the video production process.

Length: Short — Long

The length of video segments varies in different models. Those who decide to offer short clips do so by making decisions about what constitutes a segment or an event worthy of analysis. Designing with short segments means that the producer has made some theoretical and practical decisions about how to look at a certain point in time. Short clips mean that less context and background knowledge are provided for any segment. Those basing their work on Spiro's cognitive flexibility theory tend to use short clips but have teachers view the clips multiple times from different perspectives as supported by the theory. Teachers are asked to pay attention to different details. They also show teachers the same technique being used in contrasting ways to show how it can be adapted to the local context or current contingencies (Brophy, 2004, xiii). Others like Ball allow teachers to see the evolution of a class over a year (Lampert & Ball, 1998). The choice for what length of video constitutes a viewable segment may also have to do with the level of detail being looked at or the questions being asked. If you want to examine in detail student thinking, short clips of students in conversation may make sense. If you are looking for the development of a technique or the parts of a lesson, the segments might be longer.

Raw Footage — Edited Footage

Lampert and Ball have each videotaped a year of their elementary math teaching and made the videos available in a database. Their classes were videotaped every day. The records constitute a complex and comprehensive look at teaching and learning in math classrooms with experienced teachers who were working to establish particular disciplinary practices with their students. It's all on tape. They created materials that sat outside of the videos that help teachers interrogate and analyze them. The ability to access raw footage leaves it to the user to determine what aspect to highlight or study in the videos.

Others have sought to edit footage as a way to help teachers have clearer inroads. With editing, nonproductive segments, distractions, and segments with technical problems are eliminated. An example of how

editing can be helpful is to choose several clips of video that exemplify something you want teachers to see such as teacher question and student response segments. It is thought that editing can remove distractions for the teacher-learner.

Footage: Real or Staged?

Should footage be of naturally occurring classroom events, should it be staged, or should it be performed according to a script? All three levels exist in currently available video materials. While proponents of naturally occurring video believe that it has the power to give people the power to observe and come to understand real practice, naturally occurring classroom video presents problems. Generally, sound is difficult to control in real classrooms. They tend to be loud and full of people and objects that interfere with sound quality and recording in a live classroom often puts developers at the peril of playground and street noise. Sound cleaners and boosting technologies may or may not mitigate these effects in the editing room. Accompanying transcripts or subtitles can help.

In their 2002 article, Cannings and Talley suggest that you may have to stage classrooms to obtain good quality audio. Staging a classroom can take many forms. Sometimes it means moving a teacher and the class to a studio and holding class there. In other videos, it meant having a smaller subset of students in a studio while maintaining a real lesson. In some videos, it meant scripting a lesson and/or techniques and performing for the cameras. The trade off is that gains in technical quality of the video mean loss of authenticity of the classrooms experience.

Focus on Practice: average — exemplary practice

Decisions must be made about whether or not and how much it matters whether teachers analyze everyday teaching or teaching that has been sought out because it is identified as exemplary. Both are desirable. Pre-service teachers or those who make their own video for analysis are not expecting exemplars and are still able to learn a great deal from watching their videos. On the other hand, it can be exhilarating (or some times intimidating) for teachers to be able to see footage of those they see are the best in their field. There is a place for each, especially as video learning becomes more ingrained in professional development.

Technology Practice and Scale Issues: no bandwidth — wide bandwidth

Production and access to video materials is changing with technology development, and we can anticipate that there will be continual evolution. St. John & Stokes (2003) contend that video materials that are more flexible and require less sophistication are more broadly implementable

than those requiring more fidelity and more sophistication (even though they may have a deeper influence).

This is so on the technology front. Video for teachers started with 35mm film, moved to videotape, migrated to CDs and DVDs, and now to internet-based streaming. There is a definite correlation between technology development and the production and use of video materials. It is generally the case that as it gets easier to have capacity for creating and editing video, video is proliferating as a learning tool.

In 2002, Cannings and Talley anticipated the benefits of faster Internet speed/web technology on video production and viewing. They noted that group shots, zooming and camera sweeps don't show up well on the web (p. 367) and that many projects used 3-8 minute clips because of bandwidth constraints. In our recent work we found that many schools and teachers were still unable to properly handle streaming video in professional development contexts, and preferred to have a CD or a DVD. There is still a ways to go in relation to taking advantage of the latest technology developments even when video itself seems a comfortable media for teachers. Still, we can expect more and more comfort and ability to work with video in the future as more people transact with visual media.

Conclusion/Future Research:

In this report, we have looked at the purposes for which video can and has been used in support of teacher learning and the design considerations for creating and designing video materials to be used in teacher education and in-service professional development. We conclude this report with three areas or questions that might be explored in future research and thinking around the topic of the use of video for teacher learning.

Descriptions of the potential of video cases for supporting teacher learning are evident in the literature, yet there is a surprising dearth of research on the effectiveness of video cases in impacting teacher practice in both novice and practicing teachers. The studies that do exist generally find that there has been growth in teacher beliefs and knowledge but future research might look more closely on if and how the use of video cases in teacher education and professional development impact the classroom instruction of novice and veteran teachers.

An additional question that might be further explored is regarding the frequency of use of video cases in both teacher education and professional development. In looking at online archives, we could not find

reports on the number of users or data on who is accessing the sites. We still need to see if and why video cases are being used and if not, why not? We note that video cases can serve different purposes for novice and veteran teachers, and we recognize the crucial role that faculty, coaches, and teacher educators play in making teacher learning with video possible. Which of these populations is most often using the video materials and for what purposes?

Future work might also consider how current theories on teacher development might influence the purposes for which video cases are used and the implications this might have for how they are designed. It might also take up design, experimentation and research of the many design and implementation considerations such as those mentioned in this report. We envision the continuation of teacher learning with video and look forward to solutions to many of the current issues and constraints.

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Products/Materials Referenced

Online Cases/Materials:

Annenberg Foundation - www.learner.org

Teachscape

<http://www.teachscape.com/html/ts/nps/index.html>

LessonLab

<http://www.lessonlab.com>

Carnegie – QUEST

<http://perspectives.carnegiefoundation.org/programs/index.asp?key=34>

Videos of teaching and then how teacher educators use those videos in their classroom

Case Technologies for Early Literacy Learning-CTELL

<http://ctell.uconn.edu>

Packaged Materials and Products

Boaler, J., & Humphreys, C. *Connecting Mathematical Ideas: Middle School Video Cases to Support Teaching and Learning*. Portsmouth, NH: Heinemann.

(Book with disc)

Inspired By Standards: Middle school teacher at work. VITAL: Video for Teacher Learning Cases Project. WestEd. Shelley Goldman, Producer.

(DVD, CD with workshops)

Coaching Essentials. Video-based, multi-media resources for teacher professional development. Stanford University. Shelley Goldman, Producer.

(CD with teacher educator material)

Products Cited in Cannings and Talley, 2000

Understanding Teaching: Implementing the NCTM Professional Standards for Teaching Mathematics – Association for Supervision and Curriculum Development (ASCD) and Arizona State University

Four CD-ROMs with video, expert audio commentary, and other materials to help preK-06 teachers with understanding and implementing the NCTM Professional Standards for Teaching Mathematics, 46 video vignettes, 8 videos to help teachers identify standards

Making Weighty Decisions –Syracuse University, New York (1999)

Classroom video - 40 minutes of edited video for each day of four one day lesson sequences – helps “preservice teachers understand the complexity of the classroom, become better observers of classroom interactions, and learn to reflect on their own developing practice” (Cannings & Talley, 2000, p.363)

A Classroom View – Austin Independent School District and University of Texas (1999)

CD-ROM with 150 vignettes about integrating technology into K-12 classes/curriculum

InTime (Integrating New Technologies Into the Methods of Education - University of Northern Iowa (2000)

Provides resources for teacher educators (methods faculty) to help them in “revising their courses, modeling technology integration, and assisting pre-service teachers to integrate technology into their lesson units” - “provides video scenarios of Prek-12 teachers integrating technology” (Cannings & Talley, 2000, p.364-365)

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