

INTERACTIVE VIDEO-CASE-BASED TPD PROGRAMS: FIVE CRITICAL SUCCESS FACTORS¹

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Introduction

Discussion of teaching cases can make a significant difference in teacher preparation, as long as it helps teachers reflect on their professional practices, by reviewing both other teachers' cases and their own documented experiences (Barnett, 1998). On this basis, teachers build, or refine, teaching knowledge. In the last two decades there have been major efforts for creating, using and learning from teaching cases, most of them in written manner and/or with videotaped episodes (Barnett, 1998; Sherin, 2003, In press). More recently, with the increasing affordability of digital video cameras and mass storage devices by the educational sector, plus the growing existence of powerful and user-friendly software for editing and managing multimedia databases, a new kind of teaching case has emerged (Georgi & Redmond, 2003; Nemirovsky, Lara-Meloy, Earnest, & Ribeiro, 2001; Sherin, In press). It is common now to talk about digital portfolios that make use of multimedia documents that tell the story of a teaching case (Clark, Neal, & Goeman, 2003; Kelly, Rankin, & de Freitas, 2003; Reilly, 2003; Royer, 2003), as well as about video cases or videopapers (Nemirovsky, Lara-Meloy, Earnest, & Ribeiro, 2001). These video cases have become a new way of doing Teacher Professional Development (TPD) and are an important object of study from multiple perspectives in the educational setting (Barnett, 1998; Dexter & Greenbow, 2002; Joint Venture, 2000; Nathan & Kalmon, 2000; Pfeiffer-Childs et al., 2001).

The evolution of Internet connections has also contributed to the educational use of digital video cases. It is increasingly common to have high-bandwidth access at school facilities; many educators also have home PCs with access to Internet. In addition, stream-video technologies, as well as CD ROMs devices, have helped to deliver digital video cases to be discussed by teachers. In this way, it is possible to create learning communities of teachers that discuss video cases either online, onsite, or both, as in fact educators are now doing at a growing number of school districts (S. Barab, MaKinster, Moore, & Cunningham, 2001; S. A. Barab, Barnett, & Squire, 2002; Brown Yoder, 2002; Brownyn, 2002; deCourcy Hinds, 2002; Moore & Barab, 2002; Waddoups, Levin, & Levin, 2000; Wenger, McDermott, & Snyder, 2002). In addition, there is a significant² commercial offering of video-case based TPD opportunities, as well as a rising number of teachers that build their own video-cases (Barnett & Friedman, 1997; Nathan & Kalmon, 2000) and of school districts that build local collections of teaching-cases to be used with TPD purposes (Edens, 2003).

What empirical knowledge can be used as a framework for building and offering TPD using video cases? What, in addition to existing knowledge about TPD, can be used as a foundation for the creation and offering of interactive video case-based TPD programs? This presentation will share what the Seeing Math Telecommunications Project has clarified in this regard, by in depth studying of the pilot experiences that the project is conducting in four school districts. This paper shares the basic concepts that have orientated the design of these experiences, as well as what has emerged from two years of implementation and reflection on the running pilots.

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² See, for example, <http://teachscape.com> or http://www.riverdeep.net/pro_development/index.jhtml or <http://www.intel.com/education>

Departure point

There are many ways of approaching teachers' preparation and continuing education. Basic beliefs about teaching and learning are behind each of them, and different needs and circumstances will lead to different valid and well-founded ways of doing TPD. Let us share our departure point.

Society of the 21st century needs to prepare teachers that are significantly different from any in the past. Educators must be willing to help students develop their potential, rather than simply filling their heads with proved knowledge (Benne, 1982; Alvaro H. Galvis, 1998; Mead & Heyman, 1975). Teachers must think of education as a lifelong process—not a mere preparation for future life (Lindeman, 1926). Education and learning must be seen as continuous processes of changing our internal structures based on deep processing of external and internal events that challenge our mental and affective structures (Lyndsay & Norman, 1972; Norman, 1980; Piaget, 1970, 1971; Rummelhart & Norman, 1978; Wertheimer, 1944)—instead of discrete events that occur during schooling. Teachers must appreciate the value of different kinds of learning experiences as source of knowledge—exposive, active or interactive experiences (Forté, 1997)—finding educational value in multiple media that are available for learning, and recognizing a central role for them in the leadership and orchestration of these learning environments and media (A.H. Galvis, 1998; Lampert & Ball, 1998). Professional development in this context, like teaching, is about decision making—designing optimal opportunities tailored to the unique situation (Loucks-Horsley, 1998) and, as a consequence, it is audience-based. No single model of TPD will work for all (Borassi & Fonzi, 2002).

The ideas outlined above are behind reformed education and are reflected in teaching standards that give frame to the suggested content and processes of different disciplines at the distinct school levels. *Principles and Standards for School Mathematics* (NCTM, 2000), for instance, is the national frame of reference in the mathematics field. Projects such as *Seeing Math* (Concord Consortium, 2001) consider that the greatest challenge generated by the new mathematics standards is that effective implementation of those standards requires teachers to make fundamental changes in teaching practice, acquire deeper understanding of content, and become familiar with technology. Video case-based math TPD seems to be an appropriate avenue for attending to these challenges, and this is the central focus of *Seeing Math*.

Our interactive video cases and our pilot sites

The *Seeing Math Telecommunications Project* has added the force of audio, video and interactive computer tools to the already powerful case study method. *Seeing Math* is developing nine Web-based video case studies³ that provide mathematics professional development courses for elementary and middle school teachers. *Seeing Math* case studies utilize both real-life narratives and guided inquiry to craft a unique learning experience. By going into real teacher's classrooms and presenting problems they face and the solutions that grow from imperfect situations, *Seeing Math* provides a rich source of insight that all teachers can use to develop their own practice (Lu & Rose, 2003). *Seeing Math* video cases are objects of study to be analyzed, not imitated; initiate shared inquiry about a given teaching model, rather than transmit one; are authored by a professional group of producers and educators, adhering to a production standard, while allowing flexibility for the uniqueness of each case; these video cases also exhibit a clearly defined pedagogy, as chosen by the creator of the video case (Galvis & Nemirovsky, 2003).

Four school districts have participated in the pilot testing of the *Seeing Math* interactive video cases⁴, self-selected from a group of invited school districts. Each of the participating pilot school districts designated a math leader, usually its math coordinator, or the person in charge of math TPD, to assume the role of *facilitator*. This is a challenging role, since the onsite facilitator must serve as a bridge between the school

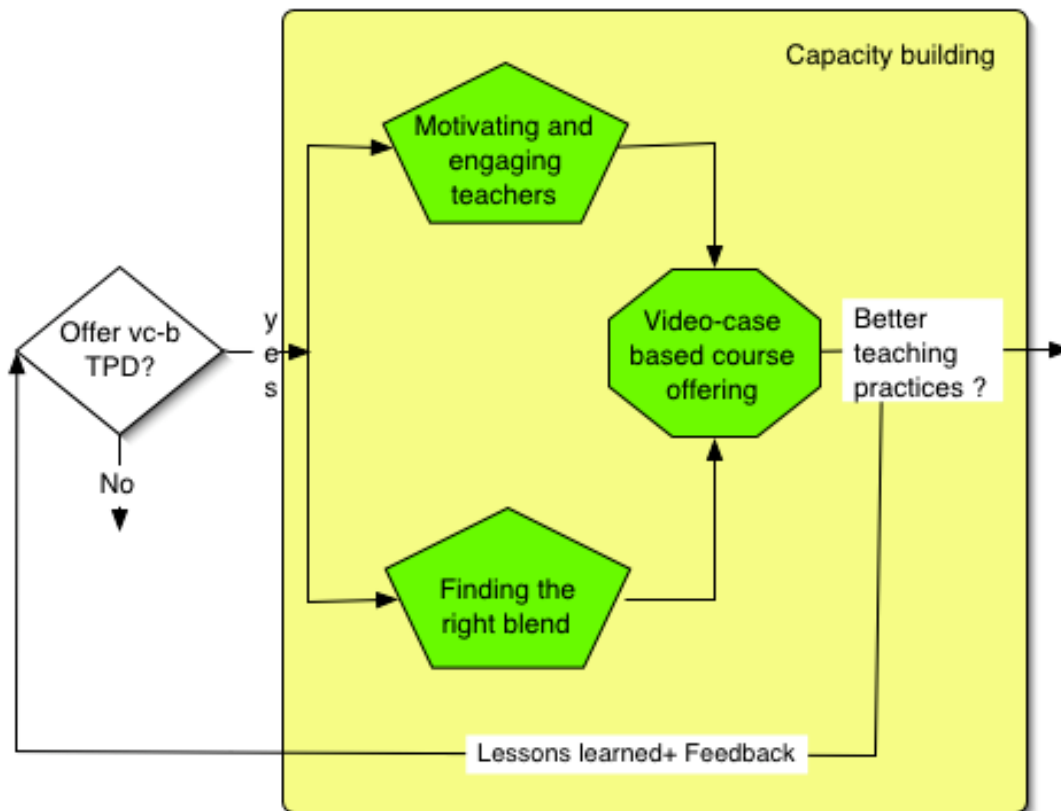
³ See a summary of the nine video cases and sample videoclips at <http://seeingmath.concord.org/screenroom/>

⁴ See details about participating school districts at http://seeingmath.concord.org/participants/pilot_schools/

district and its teachers' needs, and the possibilities that the Seeing Math curriculum offers; this person also serves as an educational change agent, helping teachers overcome situational or technological barriers for effective participation in the course. Participating teachers are small groups of math educators, teachers that want to grow professionally by means of reflecting on math teaching practices, and that are open to rethink their professional practices with the help of a local community of practice.

Critical success factors (CSF) for the establishment of interactive video-case-based TPD

Through two years of gradual implementation of video case-based TPD in four pilot school districts, the Seeing Math project has identified CSF⁵, tied to four different moments of each TPD cycle:



- *Pedagogic and organizational coherence* is a CSF that may affect the choice, or not, of video case-based TPD by a given school district. Its periodic assessment becomes important.
- *Right blending, in different dimensions, fostering a sense of community, and monitoring indicators of community health,* are three CSF that have to be considered through the structuring and offering of video case-based TPD, in a continuous manner through the TPD process.
- *Explore innovative development directions* is a CSF that has to be considered at the end of each video case-based TPD cycle, as a strategy for favoring expansion and sustainability.

⁵ A CSF is an element of a project that can determine its success or failure: it has to be done properly for the project to be successful, and/or, it may lead the project to fail when it is not done properly.

CSF 1. Pedagogical and organizational coherence

In the Seeing Math project 20 school districts were initially invited to participate. These twenty school districts reflected diverse geographical, social, and academic situations. Eight responded with initial expressions of interest. A subsequent process of further conversations ended up with self-selected four participating school districts. Looking back at the selection process we recognize that the most critical factors were the pedagogical and organizational coherence between the content and format of the video cases and the professional and institutional priorities of the invited school districts. What do we mean?

- *Pedagogical coherence.* The participant school districts need to see that the content of the videocases raises issues that are highly relevant to the educational approaches they are trying to develop. This is a complex matter to assess because each particular case can be interpreted in countless ways and not always the connections that participants would recognize are easy or even feasible to anticipate. Nevertheless, educational coordinators or leading teachers need to evaluate to what extent the teaching practices exemplified in the cases will prompt rich discussions related to matters highly significant to the participants. Those school districts that saw value in the discussion of cases and ideas that could be “stirrers” of the issues they were trying to deal with, joined the project. In order to favor this added value, the Seeing Math project focused its effort (Schwartz & Palmer, 2003) on what are called “targets of difficulty” (Harvard Graduate School of Education, 1997), that is, curricular topics that are both crucial to students’ further progress in the field, and widely recognized as difficult to teach and learn. It was then important for the participants to have a shared sense of the mathematical themes taught in the cases as targets of difficulty.
- *Organizational coherence.* Offering computer- and Internet-mediated TPD requires more than availability of multimedia computers and Internet connections at the school buildings. Participating teachers may have only limited access to these resources during school periods, they may not be computer literate or they may feel threatened when they are exposed to interaction with others on the Web. Whether they have home access to computers and the Internet also counts. Some of the school districts declined to participate because they could not offer enough Internet access and support to their teachers. A major obstacle for the participation of some of the invited school districts was the lack of an onsite facilitator. In addition, another determining factor was the ability to provide financial compensation to teachers and to make some of their time during working hours available for their participation in the project.

CSF2. Right blending, in different dimensions

When the Seeing Math project started we did not have a clear sense for the role of the face-to-face meetings in relation to the online interactions. The practice showed us that they were crucial. In the face-to-face meetings the teachers felt freer to participate, more spontaneous, and more “themselves”. These meetings also stimulated their online participation because they created a space to share their impressions on what had been said via digital forums and to “check” with each other before initiating new posts. Another contribution of the face-to-face meetings was to articulate links between the local reality of the school and the postings coming from other schools and experiences.

The need to blend online and onsite interactions is only one of the dimensions along which the project found important to situate itself. The following is a list of other dimensions that were important to conceptualize in the Seeing Math project, recognizing that there may be many variations in the way some blends can be implemented (Galvis & Nemirovsky, 2003):

- Facilitator moderates from the side, not from the center – in either synchronous, face-to-face or asynchronous, Web dialogue. Because of our pedagogic model, inquiry-based learning, it was critical to favor moderation from the side.

- Both professional and personal interests and needs drive discussions. With this unrestricted blending of discussion drivers, the project has found that more relevant discussions can be launched and nurtured, managing the tensions that emerge from the curriculum and from its implementation by the teachers.
- Discussions are focused around both local and shared, “supralocal” issues. Building communities of learners at different levels (local –at the school district level, or “supralocal” –across school districts) demands to find issues that are relevant at each level and to offer the appropriate spaces, or forums, for their discussions. This is a blend that requires identifying issues that are appealing and relevant for each community.
- Participants are both intrinsically and extrinsically motivated and rewarded. This unrestricted blending recognizes the relative importance that the locus of control may have on teachers that practice their profession in different contexts and that have different levels of professional development.
- Discussions are grounded in video and classroom experience – not merely in participants’ ideas and opinions. In order to deepen the discussions and the rich potential of video cases for teacher professional development, we realized the need to “ground” the discussions in the particulars of the video case and the actual experiences of the teachers in their classrooms.
- Video case study and the participants’ classroom practices are integrated. Teachers studying a video case may not be teaching the same content to the same kind of students, but the identification of key ideas behind the video case worth trying in their classroom, as well as the experimentation of these with their own students, allows to integrate both experiences. This blending of modeled and real learning experiences help developing a reflective practitioner.

CSF3. Fostering a sense of community

Student teachers participate in formal learning experiences only if they add value to their personal or professional pathways; they need to feel that they are contributing to the experience, that their contributions are recognized, and that it is safe to speak out their minds. Our project experience led us to conclude that the following three aspects are critical in order to foster a sense of community of student teachers:

- *Generating trust.* Engaging teachers in video case-based TPD requires the facilitator to be able to demonstrate to teachers the added value of this type of reflection on their teaching practices as a member of a community of practice, that is, a group that shares goals and has trust in each other for keeping an open dialogue about professional practices (Wenger, 2002). Acknowledging and valuing the diverse contributions to this reflective process was a key element for the facilitators’ ability to engage their school districts in the project.
- *Ensuring conditions for effective online and face-to-face interaction.* A balance is required between the amount of effort that participants can devote to TPD and the amount of work per week that the experience demands. Video case studies, requiring participants to view videos, read supporting materials, and post to a discussion board, are time-consuming. Face-to-face meetings also demand time – synchronous and after-work availability; and computer and communication technologies are not always available any where any moment. Any of these elements will affect teacher participation.
- *Breaking the ice.* Community building among distributed teachers is not an easy task, regardless of their common teaching discipline and independently of the institutional distribution of the group (across school districts, within a school district, or even in the same school building). One of the most demanding efforts on the part of the onsite facilitator is to generate reliance between participating teachers and to engage them in dialogues that make them feel comfortable sharing different personal and professional ideas. Technology familiarization is also important, since teachers felt uncomfortable when technology was not under their control and effective participation. .

CSF4. Monitoring indicators of community health

Researchers (S. Barab et al., 2001; S. A. Barab et al., 2002; Moore & Barab, 2002; Waddoups et al., 2000; Wenger et al., 2002) have found that a well-designed community of practice has a sense of aliveness and, as a consequence, must continuously seek a healthy status, at each of its different levels of participation (core, active and peripheral).

- Facilitators and their support group are the core community of video case-based TPD at each school district. Twice a year face-to-face leadership meetings between project leaders and project facilitators, focused on understanding the status of the project in each participating school district and associated reasons, has helped monitoring facilitators' internal motivation and satisfaction with their role, as well as their commitment with the initiative and their leadership.
- Teachers at each school district conform local active communities. Weekly follow up of teachers' contributions in on site and online dialogues, has helped local facilitators monitor the level of trust among local members, as well as to find out new tensions, and new opportunities, that may affect the level of participation as individuals or as a group. On the other hand, individual and group reflections on teaching proposals, or teaching experiments, created or implemented by participating teachers, help monitoring the impact of video case-based TPD on teaching practices.
- A virtual network of teachers, distributed across participating school districts, conform the peripheral community. Continuous monitoring, by the part of the core community, of social and professional dialogues that emerge between these teachers, allows facilitators to foster a healthy peripheral community.

CSF5. Explore innovative development directions

A successful pilot experience does not ensure by itself a successful institutionalized experience (Sherry, 2002). In order to survive beyond the limits of a parent project, innovations need to create the means for their autonomous expansion. In our experience school districts have explored three innovative directions:

- Some school districts have expanded their facilitation group with leader teachers that help with video case-based TPD. Otherwise, it would not possible to scale-up the program.
- Some school districts promoted the generation of teacher-authored video case studies, as a complementary means for professional development. We want to identify the potential of teacher-created video cases for the teachers who created them and the role of the different audiences for this type of cases.
- Some school districts have considered contributing to, and benefiting from, digital libraries of video cases. This collaborative effort could makes available relevant teaching cases for different subjects and grade levels, while recognizing the work of teachers who have decided to open their classroom to public discussion.

Learning from video case-based TPD

We are in the initial stages of learning about video case-based TPD. Critical success factors in video case-based TPD, organized around different moments of the life cycle of an educational innovation, will serve interested school districts, and TPDers, to give proper attention to aspects that make a difference and to overcome some of the barriers that we have found are important deterrents of the process.

New directions in our investigation are the study of the interactions that happen at the interior of the different communities of teacher-learners and the dynamics of teachers building their own video cases. In the former study we are trying to understand different modalities of interaction and the nature of interventions that seem to prompt shifts between them. In the study on teacher-authored video cases we aim at capturing the tensions and relevance of this practice for the participating teachers.

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