PRACTICES OF USING VIDEO RECORDS AS A RESOURCE IN TEACHER EDUCATION

Deborah Loewenberg Ball

Weizmann Institute of Science • Rehovot, Israel • 7 January 2014

SCHOOL OF EDUCATION
UNIVERSITY OF MICHIGAN

OVERVIEW

1. Set the context for the wide popularity of using video records of teaching in teacher education
2. What can video records of teaching make possible?
3. Investigating: What does teaching with video records entail?
4. Next steps for developing practice in the use of video records

WHAT I BRING TO THIS QUESTION

- As a primary grades teacher, my own teaching has been regularly videotaped every year for the last 25 years
- I have been using videotape records of teaching in my teaching in teacher education and professional development for just as long
- Currently teaching in a new teacher preparation program in which video records of teaching are a core resource for the program's curriculum, which focuses on high-leverage practices of teaching

VIDEO AS A RESOURCE, CA. 1990 → PRESENT

- Rapid advances in the technology for capturing classroom instruction
- Video records of teaching widely available
  - Records of teachers' own teaching
  - Records of other teachers' teaching
  - Commercially produced videos with commentary and collections (e.g., Annenberg, Teaching Channel, MET-x,) and libraries (e.g., the Teaching and Learning Exploratory at the University of Michigan)
- Acccess to instructional practice as text for developing knowledge and skill

THE TECHNOLOGY HAS ADVANCED MORE RAPIDLY THAN THE PROFESSION

- Video is like a “manipulative” (e.g., like base ten blocks): it is not magic (Prediger: “not self-contained”)
- Underdeveloped instructional practice for using video
- Confounding of video types (e.g., teachers’ own videos and videos from public collections)
- No professional system for searching collections, no common standard for quality, indexing

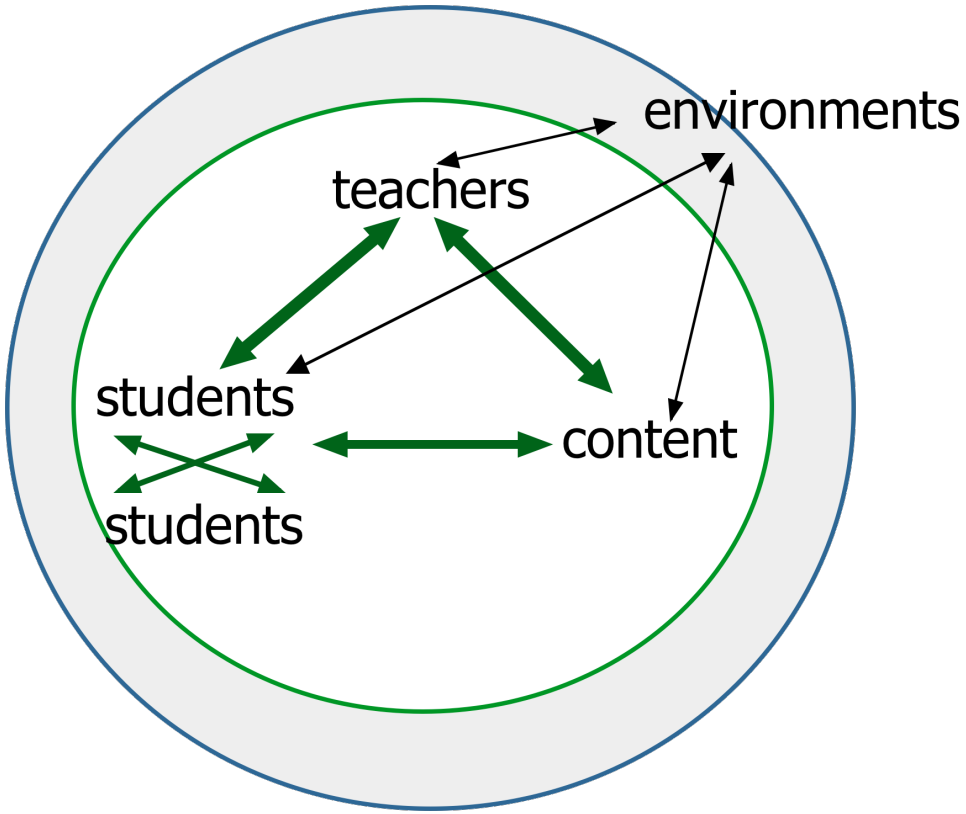
INSTRUCTIONAL PRACTICE FOR USING VIDEO

- Weakly developed: most common uses seem to be to:
  - Exemplify “best practice” according to some perspective
  - View and discuss (e.g., what did you notice?)
  - Analyze with some frame (e.g., participation structures, find examples of teacher moves related to participation, what did student(s) seem to understand)
- Large faith in the basic value of “seeing” and discussing teaching

NEED FOR MORE DETAILED DEVELOPMENT OF PRACTICES FOR INSTRUCTIONAL USES OF VIDEO

1. Learning goals for teachers/teaching interns
2. How the use of video can be used for that learning goal
3. Specific practices

WHAT IS "RESPONSIBLE" TEACHING?



Takes responsibility for:

1. deliberately maximizing the quality of the interactions . . .
2. . . . in ways that maximize the probability that students learn
3. . . . worthwhile content and skills

EDUCATION

THREE LEARNING GOALS

1. Develop and practice mathematical knowledge for teaching (MKT; Ball & Bass, 2001; Hill, Rowan, & Ball, 2005; Ball, Thames, & Phelps, 2008)
2. Identify and unpack techniques and approaches to solve particular recurrent pedagogical problems
3. Learn to hear and interpret (common or unexpected) student thinking in a specific mathematical content domain

EXAMPLES OF LEARNING GOALS FOR SPECIFIC HIGH-LEVERAGE PRACTICES

- Practicing explaining or modeling core content
- Appraising and modifying tasks
- Designing methods for assessing students' thinking
- Developing skills for analyzing, learning from, and improving one's own practice
- Developing content knowledge for teaching (CKT) (subject matter knowledge as well as pedagogical content knowledge) (Ball, Thames, and Phelps, 2008)

EXAMPLES OF PEDAGOGICAL PRACTICES ALIGNED WITH SPECIFIC LEARNING GOALS

1. Structuring opportunities to work on CKT
2. Solving pedagogical problems
3. Hearing and interpreting student thinking

1. Examining and comparing solution sets
2. How to take up and record student solutions
3. Designing a question to figure out what students are thinking

DEVELOPING MATHEMATICAL KNOWLEDGE FOR TEACHING (MKT)

Children's task:

I have pennies (1¢), nickels (5¢), and dimes (10¢) in my pockets. If I pull out two coins, what amounts of money might I have?

Prove that you have found all of the amounts possible.

I have pennies (1¢), nickels (5¢), and dimes (10¢) in my pocket.
If I pull out two coins, what amounts of money might I have?
Prove that you have found all of the amounts possible.

WORK WITH THE TASK TO LEARN MKT

Goal: To develop MKT, not just pretend to be a child learning the same mathematics

1. What counts as a solution to this problem? (i.e., what are the conditions for a solution?) (**CCK**)
2. How many solutions are there to this problem? (**CCK**)
3. Is it more difficult to add a fourth coin (e.g., quarters) or to increase the number of coins drawn to three? What is your reasoning? (**SCK**)
4. What is the difference between asking for "amounts" or "combinations"? (**SCK**)

2. SOLVING PEDAGOGICAL PROBLEMS

1. Formulate a question to ask each child to write in his/her notebook that would engage them and allow you to learn what each one has learned about: ***(HLP: designing ways to assess student understanding)***
   - Proving the completeness of the solution set
   - The notion of conditions of a problem
   - Making sense of and interpreting a problem like this
2. Think about how you would take up and record solutions on the board during the discussion
   - Enumerate possible options.
   - Consider affordances and limitations of each option.

WHY ATTEND TO THE USE OF PUBLIC SPACE IN A MATH DISCUSSION?

Strategic use of public recording….

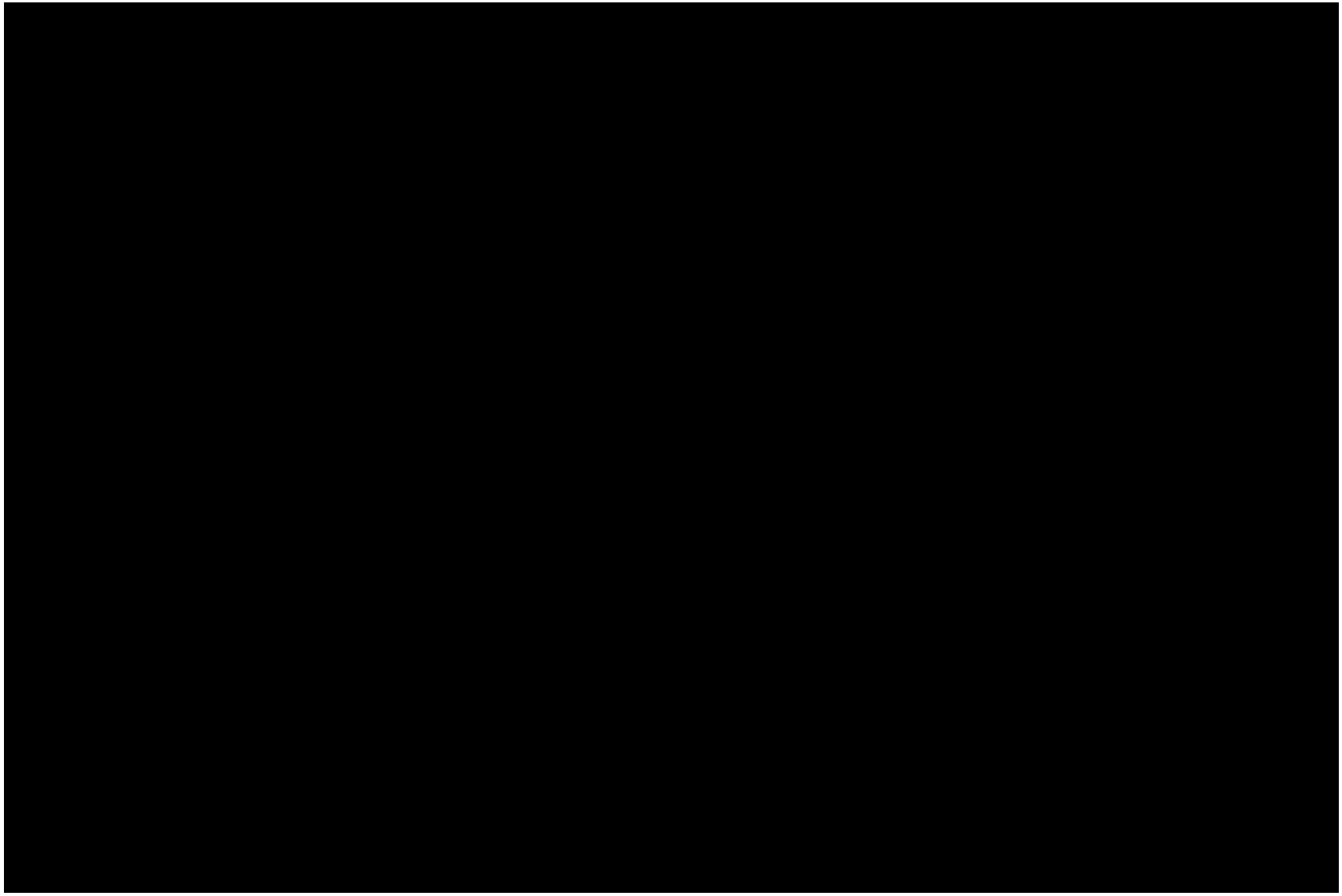
- Makes it possible for students to remember and revisit what has been discussed
- Models mathematical practices and the use of language
- Connects ideas and support students in seeing mathematical structure
- Supports students in attending to and using one another's ideas
- Conclude lessons/discussions
- Make records from a lesson for subsequent use in later work

EDUCATION

QUESTIONS TO CONSIDER….

1. What will be recorded during the lesson?
2. What materials and/or representations will be needed to help support the recording of ideas? (e.g., multiple copies of task, magnetic base ten blocks, blank table) Are the markers or writing utensils in good shape and will they enable you to write legibly and clearly?
3. Do you need to practice recording some aspect ahead of time?
4. What medium will be used? (e.g., blackboard/whiteboard, overhead, document camera, poster paper)
5. Will any ideas be difficult to record? (e.g., reasoning strategies described orally) If so, how will you record them?
6. Will students record? If so, when and what will they record?
7. What do you want your public space to look like at the end of the discussion?

EDUCATION



EDUCATION

3. LEARNING TO HEAR, ELICIT, AND INTERPRET COMMON PATTERNS OF STUDENT THINKING

- Practicing listening carefully to student talk, replaying as needed, and watching student writing and gesture
- Noticing use of language and terms and practicing not assuming what students mean
- Studying practices of probing/eliciting and practicing designing probing/eliciting questions

DURING THE EIGHT MINUTES PREVIOUS

Shea: I was just thinking about six, that it's a. . . I'm just thinking. I'm just thinking it can be an odd number, too, 'cause there could be two, four, six, and two, three twos, that'd make six ...And two *threes*, that it could be an odd and an *even* number. Both. *Three* things to make it and there could be *two* things to make it.

Tina, Kip, others question and challenge. Then –

Lin: I think what he is saying is that it's almost, see, I think what he's saying is that you have three groups of two. And three is an odd number so six can be an odd number *and* a even number.

Lin: It's not according to like. . . . how many groups it is. . . . If you call six an odd number, then why do you not call *ten* an odd number and an even number, or why don't you call *other*, like numbers an odd number and an even number?

Shea: I didn't think of it that way. Thank you for bringing it up, so I say ten can be an odd and an even.

Lin: Yeah, but what about *other* numbers?! . . . if you keep on going on like that and you say that other numbers are odd and even, maybe we'll end it up with *all* numbers are odd and even. Then it won't make sense that all numbers should be odd and even, because if all numbers were odd *and* even, we wouldn't be even having this *discussion!*

Teacher: So it's important to see if we can try to figure this one out.

EDUCATION

DEVELOPING PRACTICES OF TEACHING TEACHING (WITH VIDEO RECORDS)

- Unpacking "content knowledge for teaching" with respect to **knowledge of teaching** – in other words, knowledge of teaching practice in ways that make it learnable by others
  - Ways to represent and explain specific aspects of teaching
  - Understanding of how teachers think about and practice teaching
  - Approaches to teach specific teaching practices: tasks, activities

TYPES OF TASKS

- Exercises in CKT and pedaogical knowledge and reasoning
- Solving CKT or pedagogical problems
- Practice with mathematical and instructional talk
- Analyzing others' solutions

DIFFERENT TASK TYPES CAN BE DESIGNED FOR THE SAME VIDEO

	Exercises in MKT and pedagogical reasoning	Solving MKT or pedagogical problems	Practice with mathematical and instructional talk	Analyzing others' solutions
Two-coin problem, interpreting problem	What counts as a solution to this problem? (i.e., what are the conditions for a solution?) Etc.	Is it more difficult to add a fourth coin (e.g., quarters) or to increase the number of coins drawn to three? What is your reasoning?	How (exactly) would you word and pose a specific question about the task? How (exactly) would you explain what the problem is asking?	What did you notice about this teacher's approach to setting up the problem?
Recording two-coin problem	What are different possible systems of notation for recording solutions?	How would you take up and record solutions to this problem?	How would you explain(exactly) how we know that there are exactly 6 solutions to this problem?	What were affordances and pitfalls of this teacher's approach to recording?
Ogechi's explanation of odd numbers	What is Ogechi's idea?	How might you engage the rest of the class in hearing, making sense of, and considering Ogechi's idea?	What (exactly) would you ask the class or say to them about Ogechi's idea?	What did you notice about what the teacher did with Ogechi at the beginning of the segment? What was the teacher managing in this segment and what did it seem to accomplish or impede?

NEXT STEPS

1. Articulate and develop CKTT: content knowledge for teaching teaching
2. Specify explicit learning goals for learning teaching practice
3. Expand ways in which video can be a context for learning to enact specific high-leverage practices, not just analyze them
4. Develop taxonomy and classification of videos, and principles for choosing
5. Specify instructional designs to use video as a resource for particular learning goals

THANK YOU!

dball@umich.edu

Slides will be available on my website

("Google" Deborah Ball)