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Instructor Elizabeth van Es, second from left, helps Tracy Lundblad analyze student learning during a class at the University of California, Irvine.

VIEWER DISCUSSION IS ADVISED

Video clubs focus teacher discussion on student learning

By Elizabeth A. van Es

It's Wednesday afternoon, and a group of 4th- and 5th-grade teachers gather after school. They seat themselves around a TV monitor and discuss their day. As they get settled, a facilitator sets up the VCR and hands out transcripts for the video the group will view. The facilitator begins by saying, "Are we ready to start? Today we'll watch a clip from Drew's class. Students were adding and subtracting decimals and then writing numbers in decimal form. We'll watch a few segments with different students solving problems and then talk about what they understand. OK?"

The first segment, about five minutes long, shows two students using different strategies to add and subtract decimals. One student, Keara, comes to the board to explain how she added 3.9 plus 8.5, and another student, David, shares his strategy for solving 9.4 minus 9.25.

After viewing the segment, the facilitator asks, "What do you notice?"

One teacher responds, "I don't think they understand the difference between whole numbers and decimals. When Keara was doing addition, she wasn't sure if it was supposed to be 1.24 or 12.4. But if you asked her if eight plus four is closer to 12 or one, I think she'd understand."

Another teacher explains, "Yeah, because when she wrote the 12, she didn't keep everything lined up. That's where she had the problem." Later she adds, "But then, she ended up putting it in the right place, so that means she had an idea of what she was doing."

The teachers continue discussing the clip in this fashion, analyzing what the students said and did to get insight into their understanding.

Each month, these seven teachers get together and watch video clips from their classrooms on computer monitors or television screens. They are members of a video club (Sherin, 2000). A video club is a group of teachers who meet on a regular basis to view and dis-

cuss video segments from their classrooms. In a video club, the group establishes the goals, then tapes and selects the video segments for viewing. Ensuring productive learning experiences for teachers requires careful design and facilitation.

SETTING UP A VIDEO CLUB

Here, I'll describe a video club I facilitated and use that example to highlight considerations for setting up a video club.

The goal of the club that I designed and facilitated was to help teachers learn to attend to and reason about student thinking — what I refer to as *noticing*. A key component of expertise in teaching, regardless of the content area, is being able to listen carefully to students and observe closely what they say and do, using these observations to make teaching decisions. Several reform movements advocate that teachers adopt a student-centered approach to instruction, one that is responsive to student ideas (American Association for the Advancement of Science, 1993; National Council of Teachers of Mathematics, 2000). Thus, *noticing student thinking* is a worthwhile skill for teachers to develop.

Over the months that we met to view and discuss video from their classrooms, the teachers changed in several ways (van Es & Sherin, 2008; Sherin & van Es, 2009).

1. First, they paid close attention to student thinking as they viewed the video segments together. Initially, they talked about the overall feeling of the classroom and student behavior in the clips. Over time, they analyzed specific student ideas.

2. We also found that the teachers changed their interactions with students in the classroom (van Es &



Rachel Phelps and Jason Neves study a video of a math lesson for young students.

Sherin, in press). They made student thinking more visible throughout the lesson, inquired into student work and ideas, and probed students to explain their thinking in more detail. They took time to slow down their teaching and engage in conversations with students, and they created classroom environments where students probed each other's thinking.

3. Finally, they believed that participating in the video club made a difference for their teaching. As one teacher noted, "The video club made me rethink teaching. Part of it is just having dialogue with professionals about learning ... [and] really talking about kids' thinking."

These results were encouraging. They show that analyzing video can be useful for teachers.

BENEFITS FOR SCHOOLS

So how can other schools benefit from video clubs?

Starting a video club requires three considerations: establishing the group and defining the goals, videotaping and selecting clips, and facilitating the meetings (see box below).

ESTABLISHING THE GROUP AND DEFINING GOALS

Who will be involved matters for the focus of the group's activities, just as the purpose influences who will participate. In the video club I facilitated, a district-level curriculum coordinator partnered with a university research group of which I was a part, and together we identified the focus of helping teachers learn to notice student mathematical thinking.

This became the group's goal for two reasons. First, research highlights that teachers who attend to student ideas learn about their students and about teaching, resulting in cycles of teacher and student learning (Borko, Jacobs, Eiteljorg, & Pittman, 2008). Second, the school was in its third year of using a reform-based curriculum, and the administrator thought that it would be

useful for the teachers to view each other teaching lessons from the curriculum and to examine the nature of student learning that resulted. We were building on the concept that teacher development needs to be based in teachers' daily practice and that teachers should examine the relationship between teaching, student learning, and content (see Cohen, Raudenbush, & Ball, 2003).

In the video club we facilitated, we found that focusing on student thinking was particularly powerful for the video club group, as they learned to listen carefully to student ideas and use those ideas to inform their teaching. But looking at student thinking was not a natural focus for teachers. As facilitators, we needed to model looking at student thinking. We found that student errors, solution strategies, student-initiated questions and comments, and correct answers and explanations provided access to student thinking that enabled the group to examine what students did and did not understand (see box on p. 57).

Simply showing clips that highlighted student thinking was not sufficient. Rather, we prompted teachers to examine student thinking in detail by asking them to look at and discuss what we observed students do and heard them say in the clips.

For example, we pointed out interesting ideas that were illustrated in the clip: "But I'm confused about Thomas's drawing. If he was trying to figure out a quarter of 60, why did he find a quarter of 100? How did that help him?"

We also asked them to infer what the student work and thinking revealed about their understanding: "So, if we had to guess, do these students understand part to whole?"

Additionally, when the discussions moved away from the video clips, we redirected the group to consider what we observed: "Can I just bring us back to the video?" or "Well, let's look at the video and see what the students did."

These kinds of prompts, coupled with videos that revealed interesting student thinking, helped the group learn to look for similar revealing moments in their teaching.

Consider the following example from another segment from Derrell's class. He begins by dictating decimal values and students write them in decimal form. At one point, Derrell states the numeral "five-hundred-three-thousandths." The students write their answers on individual slate boards and show them to Derrell. Derrell invites a student, Erica, to share how she would write five-hundred-three-thousandths. He writes on the board the digits, 503, and Erica tells him to place the decimal between the five and the zero. Derrell states

Considerations for establishing a video club

<p>Establishing the group and defining the goals</p>	<ul style="list-style-type: none"> • Who will participate? • What will the group's goals be?
<p>Videotaping and selecting clips</p>	<ul style="list-style-type: none"> • Who will videotape in the classrooms? • Who will select and prepare clips for the group to view?
<p>Facilitating the meetings</p>	<ul style="list-style-type: none"> • Who will facilitate the meetings? • How will the facilitator maintain a clear focus for the group?

that it would be read as “five and three-hundredths.” Erica then tells him to move the decimal point in front of the five. After this exchange, another student, Tyler, asks, “How can it be a hundred, on the right side of the decimal? You said a hundred, not a hundredth. How can it be a whole number? How can you say it as a whole number if it’s on the right side of the decimal?”

In the video club meeting, the group tried to figure out Tyler’s question. One teacher thinks Tyler wonders if all of the values on the right side of the decimal should end in a “-th.” Another teacher thinks that Tyler thought Derrell said “five-hundred and three-thousandths” so he wants to write it as five hundred in whole number form and three-thousandths in decimal form. One of the facilitators wonders if he was confused by the number of places: How can there be only three places if they are talking about thousandths, since there are four digits for the thousands place in whole numbers? Finally, another facilitator suggests that Tyler may be wondering why the five is not in the second place, since that is the place for hundredths. This segment highlighted a student error and a student-initiated question and allowed the group to see that there may be multiple ways to interpret a student question or statement. They also saw that student questions or statements should not be dismissed and are worthy of discussion.

VIDEOTAPING AND SELECTING CLIPS

What is videotaped and what is selected to share in the meetings need to align with the group’s goals. For our video club, we captured images of student thinking as they occurred in the classroom. We videotaped students in conversation and zoomed in on a pair or group of students as they worked through a lesson. We also focused on whole-class discussions, particularly students explaining their work displayed on the board. As we videotaped, we looked for instances when student thinking was visible, either through talk or through the work they displayed. More access to student work and talk allowed greater opportunities for teachers to analyze thinking. Also, we found that clips in which their thinking was not readily obvious also enabled meaningful discussions.

If it was unclear or not easy to figure out what students said or did, the group worked harder to try to determine what the students might be thinking and understanding (Sherin, Linsenmeier, & van Es, 2009). But simply having clips that have interesting ideas is not enough.

FACILITATING THE MEETING

One of the challenges of teachers sharing video from

Analyzing student thinking in video

Student conceptions	Ideas students have about a concept at the start and throughout a lesson as discussed in class.
Errors	Mistakes students make (e.g. solving problems, interpreting literary works, conducting labs) and why they make such mistakes.
Student strategies	Different approaches students use to complete a task (e.g. solve math problems or construct a historical argument).
Student-initiated questions and comments	Different questions and comments that students raise throughout a lesson.
Correct answers and explanations	Students’ explanations for arriving at correct answers, solutions, and understandings.

their teaching is that they will often celebrate each other’s teaching and not critically analyze what occurred (Ball, 1994). A facilitator is essential to keep the group focused on this goal. Our video club was facilitated by a research team as part of the university-school partnership that had experience analyzing video. School leaders, instructional coaches, and group members can facilitate video clubs as well.

First, the group creates a calendar for sharing video. Then the teacher being taped identifies a lesson in which students will share their work and communicate their thinking. It is important that someone other than the teacher handles the camera during the lesson and captures as much student talk and work as possible. After videotaping, the facilitator and teacher review the tape and identify segments of student thinking for the meeting. As they identify segments to watch, the facilitator makes note of interesting issues to highlight in the meeting if the teachers do not raise them on their own.

During the meeting, the teacher and facilitator provide background about the lesson to set up the clip. After watching the segment, the facilitator opens the discussion and asks teachers to share what they found noteworthy. The facilitator chooses which ideas will help the group examine student thinking and focuses the discussion on these issues. If teachers do not raise interesting ideas from the clip, the facilitator asks questions to focus the discussion, such as, “Did you see the counting strategy James used?” or “What was Samantha’s idea about natural selection?” While discussing particular

events related to student thinking, the facilitator probes the teachers to use evidence from the clips to develop their analyses. This process of opening, focusing, and probing honors teacher input and ensures that the group remains focused on its goal of learning to analyze student thinking.

IMPACT OF VIDEO ANALYSIS ON TEACHERS' PRACTICE

In our study, we observed that all of the teachers developed in important ways. They learned to make student thinking visible in their teaching. That is, they publicly recognized unsolicited student ideas and invited students to ask a question or raise their ideas to contribute to the lesson. For instance, they noticed when a student raised a hand and wanted to comment: "Oh, Martin has an idea," or they invited students to ask questions: "Who wants to ask Maria a question?"

Teachers provided extended opportunities for student thinking by prompting students to take time to work through their ideas: "Let's give some people time to think" or "I don't know. I want you to try to figure it out."

Furthermore, they elicited multiple methods or solutions for the group to analyze and discuss. Rather than accept only one explanation or solution, the teachers invited several students to share their ideas, which enabled students to make mathematical connections. We also observed that the teachers probed students to explain their thinking and then probed their explanations.

Finally, we observed the teachers learning while teaching. In particular, when students shared a strategy with which the teachers were less familiar or when they did not articulate their thinking clearly, the teachers made statements such as, "Wait a second, I don't understand. Can you tell me again what you did?" or "Let me think about that for a second."

These teaching moves were similar to those we used to analyze the video segments in the video club meetings. We looked for instances of visible student thinking, we probed the specifics and tried to understand their thinking, and we indicated when we needed to learn more in order to interpret their ideas.

A video club is a fairly simple way to use technology for teacher learning. Video captures classroom interactions that teachers may not have noticed when they were teaching and allows them to revisit noteworthy

events that they were unable to examine initially. Furthermore, video clubs allow teachers time and space to share with their colleagues what they do in their classrooms and use their teaching as the focus of their professional development. While I use examples from elementary mathematics, teachers across content areas can benefit from viewing video from their classrooms. Noticing student thinking is a critical skill for all teachers. Video clubs are one way that teachers can learn to hone these skills while also developing strategies for inquiring into student thinking as they teach.

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