

**Discussing Discussion:**

**A Video Club in the Service of National Board Preparation**

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## **Abstract**

This paper examines a group of five secondary mathematics teachers who met sixteen times over a five month period to watch and discuss video excerpts of their teaching. The explicit purpose of the meetings was to assist the teachers as they prepared video-based teaching portfolios for submission to the National Board for Professional Teaching Standards. Analysis reveals that the meetings served both as a place to vet potential video clips and as a place where the teachers engaged in intensive discussions about mathematical discourse. In particular, the teachers investigated three discourse-related themes, namely: (1) techniques for discourse facilitation, (2) contextual factors that support and constrain mathematical discourse, and (3) criteria for the evaluation of mathematical discourse. Analysis also highlights the ways in which teachers learned as a result of their conversations around video. This research adds to what we know about the role of video in teacher learning, and also provides insights into the ways in which preparing for National Board certification can provide professional development opportunities for teachers.

Alice: Did the setup of my discussion give you an idea of how to setup something for yourself?

Natasha: Yeah. I'm getting a better sense, 'cause I can't use the large group discussions that I have. Those weren't discussions those were really just presentations of homework. So that's giving me a better idea.

Teresa (to Alice): I like how in your video you just kind of posed this question. Like, "How [does] this work – geometrically?"

Natasha: Yeah.

Teresa: I just wanted a little more time to think about it before you started. So I figured that the kids needed some more time [also]. But I like that really focused question to everyone. And, then giving everyone the chance to think or talk about it.

Alice: It would have better if they had actually thought about it, talked about other group's [ideas].

The preceding excerpt comes from a *video club* meeting in which a group of five high school mathematics teachers met together to watch and discuss excerpts of their teaching. The teachers met weekly for five months as they prepared video-based teaching portfolios for submission to the National Board for Professional Teaching Standards (NBPTS). A sixth mathematics teacher from the same school, who had previously received National Board certification, served as a facilitator. The group had as its explicit goal to share videos from each others' classrooms that they might want to include in their portfolios. What took place, however, was that the video club served both as a place to vet potential video clips and as a place where the teachers engaged in intensive discussions about "discussion."

In this paper, we examine the nature of teachers' conversations about mathematical discourse and how the teachers reported learning as a result of these conversations. This research adds to what we know about the role of video in teacher learning, and also provides insights into the ways in which preparing for National Board certification can provide professional development opportunities for teachers. The teachers in this study learned not simply because they were viewing video together, but because they were trying to understand and learn to

recognize the National Board standards as they were revealed in the day-to-day work of teaching.

### **Video Clubs and the National Board for Professional Teaching Standards**

It is quite common in the U.S. for preservice teachers to examine videos of their own teaching as part of their teacher education coursework (McIntrye, Byrd, & Foxx, 1996). In contrast, veteran teachers are generally videotaped with less frequency. There is an irony here, however, as preservice teachers have been found to interpret video excerpts in a much more superficial manner than do experienced teachers (Copeland, Birmingham, DeMeulle, D'Emidio-Caston, & Natal, 1994). Much as they do during instruction, veteran teachers draw on complex schema to interpret the interactions that appear on video, as well as focus their viewing on key events that occur (Berliner, 1994; Leinhardt & Greeno, 1986). Thus, despite its scarcity, self-reflection via video appears to hold much promise for veteran teachers.

Over the past decade, however, more and more veteran teachers have become engaged in video analyses of their teaching in an effort to become certified by the National Board for Professional Teaching Standards (NBPTS). Founded in 1987, the NBPTS began to review teachers' materials for certification in 1993. As part of the certification process, teachers are required to submit video-based portfolios which include two uninterrupted fifteen-minute segments of videotaped lessons from their classrooms as well as narrative analyses of the videos. To date, over 47,500 teachers in the U.S. have received National Board certification, with many more having completed the application process but not receiving Board certification.

Many state and local programs have been developed in an effort to support teachers as they prepare their materials for submission. One example is the establishment of forums in which teachers have the opportunity to watch and discuss video excerpts of their teaching with peers

(Frederiksen, Sipusic, Sherin & Wolfe, 1999). It is this context that is the focus of our current research.

### **Video Clubs as a Forum for Teacher Learning**

Video has long been considered a valuable context for teacher learning. Video is thought to capture much of the complexity inherent in teaching. Yet, at the same time, video offers teachers the luxury of being able to reflect on what they see take place, rather than needing to respond immediately as is the case during instruction. Since the 1960s when video equipment became more affordable, a variety of video-based programs for teachers have been popular including micro-teaching, interaction analysis, and video cases (Sherin, 2004a).

One such program called *video clubs* (Sherin, 2000) or *video study groups* (Tochon, 1999) consists of a group of teachers who meet together to view excerpts of each other's classrooms. In some cases, an outside facilitator serves to guide the group's conversations, while in other cases, teachers self-facilitate the ensuing discussions (van Es & Sherin, in press). Another variation among video clubs concerns whether participants select a specific focus for discussion that is sustained across meetings and clips, or whether the discussion focus varies in light of the particular video excerpt that is viewed (Tochon, 1999).

Despite these different design features, research on video clubs highlights several ways in which this context can support key areas of teacher learning. First, video clubs provide an opportunity for the development of teacher community as teachers work together to make sense of instructional interactions. Gwyn-Paquette (2001) uses the notion of "collaborative reflection" to indicate the ways in which video club participants jointly develop interpretations of what took place in the video. Second, video clubs foster teachers' ability to notice significant features of classroom practices (Sherin & Han, 2004; van Es & Sherin, under review-a). For example, teachers in one

video club initially tended to focus their attention only on the teachers' actions in the video. Over time, however, the teachers came to attend to both the teachers' and the students' actions in the video — and in more sophisticated ways than had been the case at first (Sherin & Han, 2004).

Third, video clubs have been shown to lead to changes in teachers' practices. For example, Sherin (2004b) describes the case of a teacher self-report of trying out new techniques that she had viewed in a previous video club. In another example, a teacher described applying a similar analytic approach during instruction, that he had developed in the video club context (Sherin, 2001). More recent data provides evidence of changes in instruction that directly relate to the topics discussed in the video club. Specifically, in a video club in which teachers were asked to look closely at the students' ideas that appeared on the video, the teachers also came to pay closer attention to student thinking during instruction (van Es & Sherin, under review-b).

### **Preparing a NBPTS Portfolio as a Professional Development Activity**

Researchers exploring the NBPTS program examine a variety of issues. For example, some studies investigate the extent to which National Board Certified Teachers (NBCTs) promote academic achievement among their students, as compared with teachers who did not receive certification (e.g., Vandevort, Amrein-Beardsley, & Berliner, 2004). Other research explores the certification process itself, and the extent to which developing a portfolio for submission provides opportunities for teacher reflection and growth. For instance, Hyler, Sato, Miller, Samson-Adamek & Atkin (2005) explored the influence of the certification process on teachers' classroom assessment practices. In other work, Gaddis (2002), examined changes in participants' beliefs about students learning as they prepared portfolios for submission.

As reported by the NBPTS (2001), 80% of NBCTs claimed that the “National Board Certification process was better than other professional development experiences” (p.1), and

83% stated that they became more reflective about teaching as a result of applying for National Board Certification. Such claims are buttressed by a wealth of testimonials from NBCTs describing the positive influence of developing a portfolio on their teaching and on their commitment to the field (e.g., Jenkins, 2000).

Still, relatively little is known about the ways in which developing a NBPTS portfolio leads to teacher learning. One exception is the work of Shulman (2003) which suggests that the process provides teachers with a practical vision of what effective teaching looks like — a vision that can then direct teachers' interpretation of their own teaching practices. In this paper, we look closely at the conversations that take place as teachers work together toward the common goal of NBPTS certification. We seek to understand both the nature of the conversations as well as the ways in which the teachers' comments provide evidence of their learning.

## **Research Design**

### **Riverview High School**

Riverview<sup>1</sup> is an elite high school in a large urban school district located in the Midwestern U.S. In order to attend Riverview, students have to exhibit high levels of achievement with respect to grades, standardized tests, and an entrance examination. The school is reported to have one of the highest attendance and graduation rates in the city. During the data collection period, approximately two in four students were white, one in four students was Asian-American, with the remainder being Hispanic- or African-American. Less than a quarter of the Riverview population was classified as low income in contrast to the district rate in which well over half of the students were classified as such.

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<sup>1</sup>The names of the school, teachers, and students are pseudonyms.

## **Video Club Participants**

In May 2003, prior to the beginning of the study, five of the eight teachers in the mathematics department at Riverview enrolled in a district wide program for National Board Certification. The program paid the participants' application fee of \$2300, provided a pre-candidacy informational meeting about the NBPTS program, and placed each applicant in a National Board support group for the coming academic year.

The five participants ranged in age from early-thirties to late-fifties. All were experienced teachers, having taught from seven to more than twenty years.<sup>2</sup> Three of the teachers were European-American, one was Korean-American, and one was African-American. The teachers taught some combination of either AP Statistics or AP Calculus and Years 1 to 4 from the Interactive Mathematics Program (IMP) (Fendel, Resek, Alper, Fraser, 2000). IMP is a research-based four-year mathematics program, aligned with the standards of the National Council of Teachers of Mathematics (NCTM, 2000). Riverview's use of this curriculum represents the department's commitment to standards-based reforms in secondary mathematics. To be clear, rather than being dictated by the district or school administration, the Riverview mathematics teachers chose to use this material.

NBPTS offers over 20 different certificates for applicants. The teachers in this study all applied for the Mathematics: Adolescence and Young Adulthood certificate. The teachers expressed a variety of reasons for applying for National Board certification including increased prestige and salary<sup>3</sup>, professional recognition, and the desire to become more effective as a

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<sup>2</sup>To be eligible for National Board Certification, a teacher must have completed a minimum of three years of teaching.

<sup>3</sup> Illinois teachers receive a stipend of \$3000 per year for 10 years after receiving National Board Certification.

teacher. It was also of interest to them that they would have the opportunity to go through the process with their colleagues.

The district organizers placed all five Riverview teachers in the same support group for the coming academic year, 2003-04. Each support group was assigned a facilitator, a teacher from the district who had previously received National Board Certification. In this case, the mathematics department chair from Riverview High School was asked to serve as the facilitator. Aside from assigning each group a facilitator, the district did not dictate the form of the support group's work nor the role of the facilitator. In describing his goals for the group, the facilitator explained that he would only "loosely structure" the teachers' discussions of video, and expected the conversations to arise informally, based on the teachers' interests.

### **Riverview Video Club**

In August of 2003, the researchers contacted the district headquarters to inquire about the possibility of observing a National Board support group in the area of mathematics. The researchers had previously facilitated and studied video clubs designed to support mathematics teachers' learning about student thinking, and were interested in extending this work into video clubs that served other purposes. The Riverview support group was nominated by the district, and on contacting the teachers, all agreed to participate in the study. To be clear, the researchers did not have a participatory role in the Riverview Video Club.

The Riverview Video Club met sixteen times over a five-month period. The meetings lasted approximately one hour and were held at the end of the school day. At each meeting, the teachers watched excerpts from either one or two videotaped lessons. In all, the participants watched and discussed 21 videoclips, each lasting 15-25 minutes. The format of the meeting was generally the same. The teacher whose video was being shown would provide a brief

introduction, noting the topic of the lesson that was video taped. Following the viewing of the video excerpt, the teachers would discuss the video clip for 15-30 minutes. All of the video club meetings were videotaped and field notes were taken. The field notes indicated which teachers were present at each meeting, the various topics of conversation, and the nature of the video clips that were viewed.

All six video club participants were interviewed prior to the first meeting and following the final video club meeting. Relevant for this study is the portion of the interview that asked participants their reasons for applying for National Board Certification, and in the case of the facilitator, his goals for facilitation. In the exit interview, participants were asked to discuss the impact of the video club discussion on their knowledge of mathematics, on their knowledge of student thinking, on their teaching practices, and on their National Board portfolio.

### **Data Analysis**

Data analysis consisted of three main phases and was induced from the data (Emerson, Fretz, & Shaw, 1995; Glaser & Strauss, xxx). In the first phase, all 16 video club meetings were transcribed and segmented into “idea units” (Jacobs & Morita, xxx) representing distinct topics of conversation. Next, open coding was used on the segmented transcriptions to identify the key issues discussed by the teachers (Emerson, Fretz, and Shaw, 1995). The following eight codes emerged: discourse, student thinking, mathematics, curriculum, National Board certification, school context, video club goals and norms, and technical concerns about recording and playing videotaped lessons. All idea units were coded as relating to one of these eight topics, with a few outliers placed in an “other” category. In order to assess the reliability of this coding, a second researcher similarly coded 8 of the 16 meeting. Inter-rater reliability was xx %. Disagreements were resolved through consensus.

The second phase of analysis explored which of the eight topics were discussed most often by the teachers. To investigate this, we counted the number of segments per coding category (Table 1) as well as the percent time on each segment, relative to the total time of each video club meeting (Table 2). This process revealed that the teachers most often discussed issues related to discourse.

In the third phase of analysis, we conducted a second round of open coding on the 56 discourse segments that had been identified previously. We found that the teachers' comments fell into three categories. We then looked closely within each of these categories in order to better understand the nature of the teachers' comments in these areas and whether this changed over time. In addition, we noted, for each discourse segment whether the teachers discussed learning about discourse, and whether they mentioned the National Board certification process.<sup>4</sup>

## **Results**

Over the course of the video club meetings, the teachers had more than fifty extended discussions about mathematical discourse. We first describe three related themes that came up repeatedly in the teachers' comments. Following this, we discuss the nature of the teachers' learning as they discussed classroom discourse during the video club meetings.

### **Discussing Discussion in the Riverview Video Club**

The teachers in the Riverview Video Club discussed three distinct, but overlapping, themes concerning classroom discourse: (a) they described instructional techniques for promoting classroom discourse; (b) they mentioned contextual factors that constrained and

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<sup>4</sup> Any segments that related primarily to issues related to National Board certification were coded in a different category (National Board certification). However, at times, in the midst of talking about classroom discourse, the teachers mentioned the certification process and we noted this.

supported classroom discourse, and (c) they identified criteria for evaluating mathematical discussions.

### **Techniques for the Promotion of Effective Discourse**

In this section we describe pedagogical techniques that the Riverview teachers put forth as ways to promote mathematical discourse in their classrooms. This was a frequent topic of conversation in the video clubs, with 86% (48 of the 56) of the discourse chunks coded as addressing techniques. The techniques discussed fell into two general categories, namely: communicative and structural techniques (Table 3).

#### *Communicative Techniques.*

Communicative techniques concerned the teacher's use of verbal and non-verbal communication in the moment-to-moment flow of instruction. Communicative techniques were frequently discussed, with 66%, or 37 of the 56 discourse segments referencing communicative techniques. According to the Riverview teachers communicative techniques served a number of functions, including, producing elaborate student responses, requiring students to respond to each other, "probing" students' understanding of mathematics, and "bringing in" some of the less vocal students. As we describe below, most of the communicative techniques concerned either techniques for posing questions or techniques for responding to students' ideas.

In interviews Alice and Mike claimed that they saw the video club as a space where they and their colleagues could examine and improve their "questioning strategies." In an interview we conducted before the video club began Mike claimed that his experienced colleague Alice and he thought that reflecting on questioning strategies was perhaps "the most important thing" that teachers can do to improve their practice. Indeed, on several occasions in the video club,

Mike and Alice suggested that their colleagues watch their own videotaped lessons in order to better understand the types of questions they asked and how they asked them promoted students' discussions of mathematics. The following excerpt from Meeting 6 indicates the importance question posing as a communicative technique:

- Alice: What I thought you could do is go through and make a list of your questions.  
Rita: Questions that I asked [in the videotaped lesson]?  
Alice: Mmm, hmm. And see if [your students] think they are good questions ... and see how much response you got from the kids. And then if you think that's good – like satisfied with that – then you should use it and write about it.  
Natasha: Oh, I see what you're saying. So, looking back at your questions gives you an idea of what it is you're trying to get from the kids. Is that what you mean?  
Rita: Yeah.  
Alice: Um, yeah. The way you ask the question – were you making it obvious what answer you wanted? Or were you asking a question that seemed like a genuine question and ... you wanted to hear what they said.

The idea that questions be genuine in the sense that they do not produce a predictable response was a theme that the teachers revisited in several video club meetings. In Meeting 5, Alice suggested that good questions come without “preconceived answers” and, in Meeting 6, she suggested that they should generate, at least some, “unintended” responses.

Communicative techniques for responding to student ideas were also often considered by the group. In fact, not responding directly to students, not indicating one's thoughts as a teacher, and maintaining a non-evaluative stance were seen as valuable techniques for the promotion of effective mathematical discussions. The following segment from Meeting 6 captures this idea:

- Rita: I tried not to respond. ... When they were talking about the blocking issue [in statistics] I tried not to really interfere and to let them sort it out by themselves and to not show which is right and which is wrong. ...  
Natasha: I guess I've been trying to do more of that too. Cause I realize that I give them feedback if the answer's good there's a nod or there's something in my response that ends it then and doesn't contribute to the continuation of a discussion.”  
Alice (nods at Natasha, jokingly): Okay. So, that's a right answer?  
Natasha: Yeah, and I won't even say that the right answer, it's just a...  
Rita: ... bodily reaction.

Natasha: Something about your reaction.

Rita: ... a look on your face or something.

Natasha: Or a nod or something.

As this excerpt illustrates, communicative techniques could be both discursive and non-discursive (e.g., bodily reactions). While what teachers said was important, through video, the teachers were also able to attend to such things as the teacher's use of body language and facial expressions during instruction. In Meeting 1, Teresa's colleagues spoke admiringly of her technique of not giving an indication of what she was thinking during a whole class discussion with her "voice inflection."

### *Structural Techniques*

The second type of techniques for the promotion of effective discourse concerned the structural nature of classroom discourse. These techniques concerned the ways teachers (re)structured their classroom learning environments in order to promote more effective discourse. Along these lines, the Riverview teachers discussed techniques they could use to manage four types of classroom features, namely: (1) the required curriculum, (2) the physical classroom environment, (3) temporally-situated routines, and (4) existing behavioral norms. While not as commonly discussed as communicative techniques, structural techniques were discussed in 41% or 23 of the 56 discourse segments.

To begin with, the Riverview teachers noted techniques for navigating the required curriculum in order to produce an effective discussion. On the one hand, they discussed selecting the "right type of activity" - one that was "appropriately confusing" and, if possible, "debatable." On the other hand, the teachers discussed redesigning activities so that they became appropriately confusing or debatable. For example, in Meeting 9, Erin presented her redesign of a fairly traditional calculus lesson on the Mean Value Theorem in order to allow her students to

move “from the car example to like a general example [with] more math symbols.” ... In the final meeting, Alice summed up the importance of selecting and creating the effective activities for the promotion of discourse when she stated, “as far as I’m concerned, my work was in ... picking out the problems [so I could] recede into the background in discussions.”

Second, the Riverview teachers noted that the physical organization of the classroom and how people are positioned within it could be manipulated in order to promote more effective communication. In Meeting 10, Alice claimed, “we want them to be talking more, and therefore maybe I could just set up the room differently so they’re all facing kinda in, and you know, so they would look, and then turn their head back they would be talking to each other across the room, instead of all looking towards the front of the room.” Relatedly, the teachers discussed how the organization of the classroom could be used to structure activities and, therefore, help promote effective discourse. To be clear, at several early meetings, Mike suggested that his colleagues “turn it over to [students] to discuss” in small groups first in order to “set the stage” for whole class discussions or to reenergize a whole class discussion.

Third, the way that the teacher structured instruction temporally, that is, in terms of creating and altering classroom routines, was also important. Thus, for example, the Riverview teachers talked about setting up a daily routine where students could time discuss their own mathematical ideas. More broadly, as the discussion of navigating the curriculum indicated, the Riverview teachers claimed that they provided spaces for students to first grapple with ideas before they used more didactic approaches. In Meeting 12, Mike asked the rhetorical questions “what does that say when you shortcut things like that ... when the teacher just says here’s the formula? ... Or, even going further, that if you allow two minutes of group conversation that all the kids will get it.”

Fourth, and finally, the Riverview teachers noted how important it was to set parameters for students' behavioral and discursive engagement. In Meeting 9, for example, they discussed how requiring students to first raise their hands before contributing to whole class discussions shapes conversations in different ways. In Meeting 7 Alice brings up the idea that non-competitive peer-to-peer collaboration in small group settings was a valued norm that, if implemented correctly, could produce more effective discourse:

Alice: Today I told them that they had these five problems, and they had to include everybody in their group, in their discussion. And they were actually pretty good about that, ... in most of the groups they were actually trying to include everybody, and work together. And going at the same rate. I said, no fair skipping ahead, because you don't think you can do a problem. And don't go so fast that you get way ahead of everybody else; try and kinda stay together and all that. And that worked pretty well. You know, to get them to act like they were good at working in groups.

Mike: So because you told them that, did you feel like otherwise they would be going at completely different paces?

Alice: They do some real individualistic things.

Thus, the Riverview teachers indicated that setting up effective classroom norms required regular pedagogical attention. Some classes required more overt attention to creating these norms than others. In Meeting 9, Mike admitted that he was struggling to set up effective norms for participation in one of his classes. In what appeared as a reversal of roles, Rita told Mike, the group facilitator, "well, I know you don't like that Mike, but maybe you like need to take a day and set down the rules and say 'this is how our discussions are going to be.'"

In closing this section, we note that there was some interplay between communicative and structural techniques. That said, however, structural techniques were clearly premeditated and less "in the moment" than communicative techniques. Structural techniques were also less immediately tied to discourse and, if time on topic is an indication, were either not as salient to the teachers in videotaped lessons or, perhaps, not as big of a concern as communicative

techniques. Again, structural techniques were discussed in 23 or 41% of the 56 discourse segments whereas communicative techniques were discussed in 37 or 66% of the 56 discourse segments.

### **Constraints To Promoting Discourse**

The Riverview teachers regularly considered how contextual factors such as differences between groups of students and curricula accounted for variation in mathematical discussions. Indeed, conversations about the constraints imposed by their instructional context emerged in 19 or 34% of the 56 discourse segments (Table 3). While they noted factors that helped promote mathematical discussions (e.g., highly motivated students), for the most part, their discussions concentrated on contextual factors that constrained discourse and were, in their opinion, largely beyond their ability to control.

#### *Curricular Constraints*

According to the Riverview teachers, classroom discourse was shaped by mathematics as a discipline, by sub-disciplines of mathematics such as Statistics, by the (published) curriculum one uses, and by one's place in that curriculum. In fact, they indicated that the required curriculum placed considerable constraints on their efforts to promote effective discourse for sustained periods of time (i.e., 15 minutes), as required by the NBPTS in whole class discussions in particular.

First, the Riverview teachers implied that the nature of, and possibilities for, discussions in secondary mathematics were very different than those in other disciplines such as English. They claimed on three occasions that, while it was their goal, whole class discussions that ran for fifteen-minutes were rare, even non-existent, in secondary mathematics. In Meeting 6, for

example, Alice stated that, the Riverview teachers were “not used to having discussions this long.” Rita agreed, stating, “15 minutes is a *long* time,” to which Natasha, jokingly responded, “it’s like, ‘*okay*, I need to move on now’...” In the last meeting when she was discussing a 15 minute discussion she had with her Calculus class, Alice suggested that the National Board requirement that whole class discussions be 15 minutes, while not impossible, was restrictive and possibly unnecessary in secondary mathematics:

Alice: It’s been hard for all of us to have long discussions. But what happened that day in [my] class isn’t really different from what usually happens. Except that we wouldn’t go on doing it for so long. You know?

Mike & Rita: Mmm, hmm.

Alice: And so it might happen for two or three minutes and then we’d go and do something else.

To be clear, Alice and her colleagues should not be seen as resisting innovative practices. Rather, they seemed to think that interspersing a mathematics lesson with several relatively short (e.g., three minute) mathematical discussions was more appropriate to facilitate student learning in secondary mathematics than 15 minute discussions.

The Riverview teachers also seemed to feel constrained by the secondary curriculum and they described it as providing relatively scarce and uneven opportunities for the promotion of long stretches (i.e., 15 minutes) of effective discourse. In the first Meeting, Erin stated, “it’s hard to have a calculus discussion,” to which, Rita responded, “yeah my statistics discussions are pretty flat.” In Meeting 4, Mike challenged Rita’s position a bit when he stated, “in the designing experiments you know, I found that the kids like to talk about experiments that they’ve heard of.” Interestingly, however, in Meeting 3, Rita wondered if the topic of experimental design would even be considered actual mathematics, stating, “I know that to us that that [designing experiments] is part of a math class but do they [the National Boards] see it as part of a math class? I mean that [i.e., her videotaped lesson] didn’t look like math too much, you know?” In

this discussion, Rita implied that in order to get good discussions, the topic may not even be considered mathematics. Indeed, in Meeting 5, Alice, who taught calculus but had never taught statistics, claimed, “it seems like it’d be easier to get a discussion going in a Statistics class [than in Calculus] because of its sociological connections.”

They juxtaposed their ability to promote mathematical discussions in advanced courses such as AP Statistics and Calculus with their more elementary IMP classes. They implied that discussions of mathematics came more easily and with more regularity in the IMP curriculum. That said, however, the IMP curriculum was also described by the teachers as providing uneven and, in places, infrequent opportunities for the promotion of sustained mathematical discourse. In Meeting 1, Mike claimed that he did not think there was much in terms of promoting effective discourse in the “Meadows and Malls” unit, a five week unit from IMP Year 3. The other teachers countered by recommending the activity that began Meadows and Malls as a place to have an effective discussion. However, one activity in a unit of more than thirty activities, was an indication the teachers saw large portions of even a secondary curriculum designed around promoting student thinking as infertile territory for the promotion of effective discourse. In fact, in the early video club meetings, the teachers discussed planning ahead to videotape “good” lessons that they would not teach for another several weeks. At the end of the first meeting, for example, Erin listed off the five curricular units in IMP Year 4 and claimed that she was worried about not getting to the “good stuff” before the National Board portfolios were due.

### *The Effect of Institutional and Classroom Contexts*

In addition to noting the ways that curriculum constrained their ability to promote long stretches of effective mathematical discourse, the teachers had a number of conversations about the ways in which the school and classroom contexts shape classroom discourse. That is, they

discussed the ways that teaching the right kids, the right class, the right school, at the right time of day, affected the conversations they were able to capture on videotape.

- Alice: Rita came in to my seventh period class and taped the discussion ... and it wasn't – it just didn't go well.  
Mike: Oh, that's too bad.  
Alice: So, I was really struggling to get them to talk ... they've gotten a lot better about knowing why the graph is the way it is with the amplitude and the period ... [but] they're not real conversant.

As this example shows, at times the teachers discussed the challenges presented by students who talk a lot versus “non-conversant” students. Similarly, in Meeting 10 the Riverview teachers discussed the difference that having one or two absences on a given day can have on the discussion and activity. At other times, teachers noted the impact of whether or not a class had a good rapport. Consider, for instance, the following excerpt from Meeting 9:

- Mike: How can you get somebody to respond to what somebody has just said?  
Teresa: That happened a lot, you know, in [Erin's clip]....  
Erin: Yeah, I don't know ... I mean you have to have that rapport in the class where they feel like they can just do that.”  
Mike: Right.  
Erin: You know, which I think that a lot of the kids in that class just have.

The above quote indicates that having an atmosphere where students have a particular rapport with each other — where they show moderate interest and respond to each other's ideas, was perceived as being beyond the teachers' ability to control. Instead, getting groups of students with good rapport depended in large part, on the luck of the draw. Of course, the Riverview teachers did not see fostering effective whole class and small conversations as being completely beyond their ability to control. Their discussions about techniques for the promotion of effective discourse clearly indicated that they felt, for example, that they could create a classroom atmosphere where students “feel safe enough” to make mistakes.

Finally, the Riverview teachers also recognized that their conversations were shaped (positively) by the larger societal context in which Riverview was situated. They discussed the fact that Riverview, as an elite school, attracted privileged and highly motivated types of students that made their work somewhat easier than, perhaps, teachers in less elite settings:

Alice: And what we're saying is that kids at this school are extraordinarily suggestible in those ways, like, if you [tell] them 'work well with each other today' they actually will.

Mike: It's amazing.... (Laughs.)

Rita: Scary.

Natasha: Most times they aim to please.

In discussing students from less elite schools, Alice, who had taught for many years in neighborhood schools before coming to Riverview, stated, "Kids are the same everywhere except ... it's different here. ...In most of the other schools... kids would be kind of sometimes inattentive [or] kinda active at best." Thus, the teachers realized that differences between classrooms and schools translated positively into the quality of mathematical discussions they were able to have with their students.

### **Evaluative Criteria for Classroom Discourse**

Third, the Riverview teachers often described what effective mathematical discourse looked like and identified particular features of the discourse that they used to judge such quality. Such discussions of criteria that could be used to evaluate classroom discourse was a common theme; in all, the teachers discussed evaluative criteria in 86% (48 out of 56) of the discourse segments.

Across the discourse segments, the teachers repeatedly described six specific criteria for recognizing effective – they referred to it as “worthwhile” – mathematical discussions (Table 3). The first two criteria directly concern how students participate in the videotaped lesson. This includes the nature of: (1) *student talk*, whether or not students respond verbally to the tasks and

prompts provided and the extent to which they do; and (2) *student collaboration*, the extent to which students work with other students, in small groups in particular. The next two criteria concern the extent to which the mathematics featured in the lesson is: (3) *problematic*, namely, the extent to which the mathematics in the lesson poses genuine problems for the students, and (4) *student-driven*, based on and sustained by students' ideas. The final two criteria look closely at the teacher's role in shaping the discourse. These criteria ask whether or not the whole class or small group discussion is: (5) *balanced*, in the sense that the teacher's presence is minimally felt, but felt enough to positively shape the conversation; and (6) *equitable*, in the sense that the teacher actively works to include all students, particularly those from groups that have historically been marginalized in mathematics education (e.g., women, African Americans, students with disabilities). To illustrate these criteria, consider first the following excerpt.

Alice: Ideally, we want them to be talking more....

Natasha: How would you do that?

Teresa: Or if you gave them time to talk to each other. You know, not one person at a time, but talking in groups to each other. Then that would've been discussion, you know? Discourse. Like kinda what Erin was doing.

Alice's comment, that "ideally, we want them to be talking more" refers to the *student talk* criterion. This was perhaps the roughest measure of an effective discussion, simply to note whether or not students were speaking. Teresa then brought up the *student collaboration* criterion when suggesting that Alice might have had students talk to each other in small group settings. As one might expect, the student collaboration criterion generally came up in discussions of small group work rather than in discussions of whole class discourse.

The following excerpt from the fifth meeting illustrates one way that the criteria about mathematics – that the discussion be about problematic mathematics and student driven – came up in discussions:

Natasha: I didn't want to watch any more of it because it does go very, very slowly and there are spurts and that seems to be the way my Stats class goes. There are times when they do respond to each other: 'I disagree with [what] someone said. I think it was this.'

Teresa: Do you know what makes that happen?

Natasha: If it's an issue that's not clear. So, if they're presenting something that someone can have a different opinion about. So, it's something that's still a little bit fuzzy in their minds as to what the correct answer should be. But they don't – it's not a burst of activity. So some people have one answer and some have another, so it's just getting them to express the things they wonder about and why.

When Natasha claimed that there were “times” that her students built on one another's ideas she was claiming that, when it was at its best, discourse about statistics was *student driven*. In addition, Natasha claimed that effective bursts of student-driven discourse occur when students are engaged with *problematic* mathematics – mathematics that is “fuzzy in their minds” and open to differing student opinions. In Meeting 3, Teresa made a similar observation about a videotaped lesson she presented, “there wasn't that much discourse or anything because they all got it.” While it may seem obvious that the mathematics should be engaging to students in this sense, several scholars have noted that U. S. teachers generally avoid allowing their students struggle with problematic tasks (Stigler & Hiebert, xxx; Stein, Hennigsen, & Smith, xxx). Thus, it is not insignificant that the teachers include this as one of their criteria. Along these lines, in Meeting 9, Erin notes that student presentations are often used by mathematics teachers after the mathematical issues at hand are no longer problematic to students; as a result, students learn very little from each other in such contexts and the this arrangement for discussions often seems forced.

In terms of the last two criteria, consider the following brief interaction between Alice and Natasha from in the sixth meeting. In particular, the teachers mention that effective discourse might be defined in terms of the amount of time that students talk with respect to each other (i.e., equity) or with respect to the teacher (i.e., balance).

Natasha: I guess I'm still not convinced on what it is, [on] how we know that it's a good discussion. Is it that we're trying to get all students involved? Some combination of getting all students involved plus getting them to deal with some issue they still have trouble understanding?

Alice: I think that a really good class discussion is... you as a teacher inserting yourself as little as possible. And you would only be asking questions that make the kids clarify their own ideas rather than asking them ... questions that you already have a preconceived answer for.

When Alice claims that a good class discussion is one in which the teacher is inserting herself as little as possible she is addressing the notion of *balance*. In Meeting 9, Erin describes balance as being “a middle ground between telling them everything and then just putting the overhead there and not saying a word and letting them all figure it out.” In other words, the teacher's controlling presence should be minimized, yet present enough to positively direct the discourse and learning. In discussing this issue, the teachers are echoing a dilemma described extensively in the mathematics education literature — that of the challenge teachers face in wanting to promote student talk but also needing to move the discussion in a particular mathematical direction (Mir add refs).

Finally, when, in the excerpt above, Natasha asks if teachers should “get all students involved” she appears to have been asking how *equitable* the discussion needs to be in order for it to be considered good. While the equity was not considered as often as the previous three criteria it certainly was a concern. Equity was discussed in 14%, or 8 of the 56 segments on discourse. The excerpt from Meeting 9 below illustrates the recurring theme that unequal participation is the norm in secondary mathematics:

Mike: If you were to plot out the amount of time that each individual student [talked. [If] you made a bar chart or something, of the amount of time that they contribute to class discourse, over the semester or whatever. What that would look like?

Rita (laughs): It wouldn't good.

Mike: Would we be happy with it?

- Teresa: No. ... Well I think, I mean, it's not going to be even. Each kid's frequency isn't going to be the same as everybody else's. But I don't know if that's necessarily a bad thing.
- Erin: Yeah. I don't think it has to be.
- Mike: Right. Not that it – but would you be comfortable with the results given the fact that we know it's not going to be an equal distribution or probably close to an equal distribution?
- Alice: Well the whole purpose of having these discussions is so that kids can learn. And let's say that we have twenty kids in our class and that one kid that always yells out or certain kids talk more than others, do the rest of them learn from that outburst? Or when they answer really soon before they think about it. I think they probably don't learn as much from that.
- Erin: It's like a lecture.

Indeed, Teresa makes the point that unequal participation may not be “a bad thing” and, in response, Alice reminds her colleagues that the primary purpose of classroom discussions is to facilitate learning for the majority. Thus, while equitable student participation in discourse is a goal, it was apparently of secondary importance to fostering learning.

We end this section by noting that the Riverview teachers indicated that these criteria for a good conversation were interconnected. For example, student-driven conversations seemed more likely to occur when the mathematics was problematic to students. That said, the criteria could also act in opposition as well. For example, requiring equal – related to but different from equitable – contributions from students might work against student-driven conversations, [as Alice and Teresa seemed to be warning in the equity-related excerpt above.] Finally, it should also be noted that the teachers did not necessarily perceive these six these criteria as forming a coherent framework in the form that we present here.

### **Teacher Learning in the Riverview Video Club**

As the previous section illustrated, the teachers had many rich conversations about discourse during the video club meetings. These conversations explored issues of student participation and learning, and the teachers' role in supporting classroom discourse. In addition

to investigating what discourse-related topics the teachers discussed, we also explored whether these discussions served as contexts for teacher learning. Here we present three different ways that the teachers described learning during those segments of the video club meetings focused on discourse (Table 4). Furthermore, we illustrate two key shifts in the conversations that we believe provide additional evidence of teacher learning and the role that the NBPTS played in that learning.

### *Learning from Viewing Other's Instruction*

In describing her reasons for participating in the video club, Alice explained in the pre-interview that, “I really hope that ...we’ll become more aware of what each of us [is] doing and gain a better repertoire of [teaching practices].” The data reveal that this kind of sharing of practices did in fact take place. Beginning with the first meeting, watching each other on video provided the teachers with new instructional ideas — ideas that, on several occasions, the teachers later reported having tried out in their classrooms. For example, in Meeting 6, Rita recalled a technique she had observed Teresa using and subsequently tried out, noting, “I’m trying to be more ‘Teresa-like’ ...I tried not to respond.” Like Rita, Natasha also claimed to be working on becoming less evaluative in the way she responded to student ideas in a manner similar to Teresa. While discussions of classroom discourse were likely not the only context in which teachers were learning from viewing each other’s teaching, our analysis for this paper focused exclusively on those segments.

### *Learning from Viewing Oneself on Video*

- Rita: It’s funny when you watch your tape. You see things that you didn’t notice in class or that you don’t remember noticing.... I mean I don’t know about you, but I notice ... things I didn’t pick up when I was sitting there [in class].
- Mike: Oh, sure.

Alice: Yeah. I noticed that in my ... small group [clip]. Things that I didn't really hear [during the lesson.]”

In addition to learning from viewing others' videos, the teachers commented on learning from reflecting on their own teaching via video. Explicit self-reflection on the part of the presenting video club teacher occurred in more than one-third of the discourse related chunks. As the excerpt above indicates, it was common for the Riverview teachers to remark that they saw things when viewing their classrooms on video that they had not noticed during instruction. At several points, the teachers commented on student actions and statements that had not stood out to them during instruction, but that seemed significant when watching the video of their lesson.

The most common statements of learning through self-reflection, however, concerned noticing specific actions that they themselves had taken, or not taken, and the effect this had on the promotion of effective student discourse. The following quote comes from Meeting 9 after Erin had presented a videotaped lesson to the group:

Erin: One of the ways that video helps me is that, I was waiting to see...how quick am I to be like – ‘Yeah! That’s right!’” Or like, am I just waiting and then just pouncing on it when someone says something. And I try not to. And that’s what I was trying to watch. ... But now, after trying to do this kind of thing, I realized that I did have too much control and just letting go ... That’s one of the things that I can learn from that. Like when I watch it again, I can think about where I might not have said something or where I might have not answered as quickly.

As Erin claimed here, the Riverview teachers appeared to see videotaped lessons as a valuable tool for self-reflection and improving one's pedagogy. All of the Riverview teachers, in fact, appeared to be using video to think deeply about different aspects of their pedagogy. If Erin was working on becoming less controlling, Rita was working on exerting more control over classroom discourse. In Meeting 4, Rita commented that, “After I watched this...I realized I was doing a lot of that just one-on-one” in small group settings. Rita's statements indicated

improvement in this area, in later meetings she repeatedly discussed how she was attempting to draw more students into the small group conversations she was involved with.

### *Learning from Viewing Teaching with Peers*

Viewing one's own teaching on video was also a catalyst for change due to the feedback and suggestions participants received from their colleagues in the video club. In Meeting 9, Mike summed up this process as “discussing [your teaching] with your colleagues [in order to make] adaptations the second time around.” As mentioned previously, after watching a lesson presented by Natasha in Meeting 5, Alice told Natasha that, “not too many of the questions you asked generated much response.” In the immediate conversation that followed the participants discussed specific questioning techniques that might have fostered more elaborate student comments in Natasha's lesson. Natasha and her colleagues came back to her use of questioning in several of the meetings that followed. One of the more commonly suggested techniques had to do with interspersing whole class discussions with short small group discussions. Similarly, in Meeting 2, in response to Teresa's video, Mike suggested that that she send students into small groups when a whole-class discussions seemed to hit a lull. Later in the meeting, Teresa returned to this idea, and stated her intention to try this technique out.

Mike made a suggestion that if I could have like had them go off in their groups for a minute. You know, take 60 seconds, whatever, 120 seconds to talk in groups and then have another whole class discussion, then it might have, kind of, focused them a bit more. So, I think I wanna try that in some other discussion.

Interestingly, Teresa was not the only participant to report utilizing this technique in subsequent meetings. In Meeting 2, Rita explained to the group, “I took Mike's idea and used it — sending them back into groups.” Natasha also claimed she used this suggested technique when, in Meeting 9, she stated: “We've talked about this idea more than once, and I guess I did it

today too where we were working on instantaneous speed and it was obvious that there was one question where kids really didn't know what to do. And I gave them a few minutes [in groups] to think about it. Before, I know I would have gotten the one response from the kid over here who always knows [the answer]." As these quotes illustrate, it was not uncommon for participants to offer suggestions for improving classroom discourse in response to the videos that their colleagues shared and for this to spur their colleagues to reflect on their teaching in a deep manner and to make changes accordingly. (See Table xxx.) More specifically, the teachers made suggestions to each other of this sort in approximately 30% of the discourse segments. Furthermore, in several meetings, teachers reported using the suggested ideas and techniques in their subsequent instruction.

To be clear, the three ways discussed here in which the video club context prompted teacher learning were not independent. As was mentioned above, watching and discussing another's teacher's video may have prompted teachers to look differently at their own teaching. Furthermore, as reported above, suggestions made directly in response to one teachers' instruction, may have prompted changes in another teacher's practices.

### *From Superficial to Substantive Aspects of Discussion*

In the preceding sections, we highlighted the teachers' comments about their learning during the video club meetings. In addition, our analysis revealed that the nature of the teachers' conversations shifted over time in ways that indicate other aspects of learning. We discuss the first of these shifts here. Specifically, as the meetings progressed, there was a shift in *how* the teachers discussed the criteria that they raised for evaluating effective discussions. This occurred in two main ways. First, over time, the teachers expressed more confidence concerning the essential features of effective discourse. In particular, in the first eight meetings, Natasha, Rita,

and Teresa each made statements indicating that they were unsure of what effective discourse looked like in practice. Such was not the case in the later video club meetings. Instead, in the second eight meetings, all five teachers showed agreement with the six criteria for evaluating classroom discourse described earlier (i.e., balance, student-driven, etc.). This suggests that the teachers had jointly constructed understandings of classroom discourse that went beyond their own initial individual understandings.

In addition, in the early meetings, the teachers' comments tended to focus on surface-level features of the discourse that was observed in videotaped lessons. After viewing videotaped lessons, the teachers would comment on whether or not students were talking much, whether students were responding to the teacher, or where, in the classroom the teacher was located. Such comments included, "I don't think the students were very engaged," and "You dance around a lot." To be clear, this is not to say that the amount of student talk and student activity are unimportant features of an effective lesson. On the contrary, they can be critical. Our point here, however, is that over time, rather than focus on overt features of the discourse that were immediately observable on the video, the Riverview teachers came to look more deeply inside the videotaped lesson to what and how participants were involved and to what prompted certain forms of discourse. Furthermore, in doing so, the teachers' comments seemed to focus more consistently on substantive issues of classroom discourse, such as the mathematical content of students' comments and the tension in soliciting student ideas and pushing a conversation forward mathematically. For example, in later meetings it was more common for teachers to ask the following types of questions: "Where did he get that [idea]?" "Is the problem that... they're not plotting points. They're just looking at the line?" "Do we really want all students involved?"

*Discussing the NBPTS standards*

A second, but not unrelated, shift that we report concerns the nature of the teachers' comments about the NBPTS standards in their discussions of classroom discourse.<sup>5</sup> In three, somewhat overlapping, phases, the teachers came to jointly use the NBPTS constructs and terminology to analyze the classroom discourse that was viewed. First, the earliest video club meetings the National Board framework did not enter the teachers' conversations of classroom discourse in a substantive way. Instead they appeared to rely on their own understandings to discuss each other's videotaped lessons. Furthermore, most of the explicit references to the National Board in Meetings 1-4 concerned relatively straightforward technical issues and, as such, were superficial in terms of understanding classroom discourse. For instance, the teachers repeatedly discussed the fact that their videotaped lesson had to be 15 minutes of uninterrupted activity and that the teacher's voice, but not those of the students, had to be audible throughout. It was also the case that in these earlier meetings, only Teresa and the facilitator, Mike, indicated that they had read the National Board documents and, as a result, their colleagues turned to them repeatedly for guidance.

In Meetings 5 – 10, the teachers began to jointly construct clearer but relatively informal collective understanding of the NBPTS standards. With the exception of Teresa, the teachers continued to select videotaped lessons to share in the video club without having seriously considered the National Board guidelines. In Meeting 7, for example, after presenting her videotaped lesson to the group, Alice claimed, "so I was just doing what I always do ... I haven't read the directions about what I'm supposed to be doing." At the same time, however, Mike and

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<sup>5</sup> In the initial phase of analysis we noted segments of discussion that were primarily about the NBPTS program. Though not the focus of this paper, we note that such segments occurred throughout the 16 meetings, and that both the number of segments and the length of time of the segments increased from the first eight meetings to the final eight meetings.

Teresa provided more substantive information concerning what the NBPTS would consider as evidence of effective discourse. Consider the following segment from Meeting 8:

- Teresa: These are all things that you should write about.  
Natasha: Okay, yeah.  
Mike: It's good to make references to another year.  
Alice: Uh-huh, yeah.  
Mike (to Teresa): There's room to do that, right?  
Teresa: Yeah, cause there's lots of stuff about ...  
Mike: Planning.  
Teresa: About planning ... based on what you know about the kids and stuff.  
Natasha: Oh.

In addition, as in this excerpt from Meeting 9, the teachers together considered what the NBPTS was looking for, though without explicit use of the NBPTS standards or terminology per se:

- Alice: So, it's a full-class discussion. Who should be talking the most? Should it be 50-50 teachers and students or should it be more students or more teacher?  
Mike: What do you think? I don't think the guidelines are going to [tell us]."  
Erin: I think the key thing for that is just ...doing things as a whole class as opposed to you just sitting there with one group.  
Alice: Maybe what I meant to say is "What would be a good one?" Like one that they would consider [level 4]."<sup>6</sup>  
Rita: I think one thing that they're looking for...is that the students are responding to each other. Whether or not that means you're helping them do that or they're just doing it by themselves."

Finally, in Meetings 11 – 16, the NBPTS framework played an overt role in shaping the video club conversations and in particular, the teachers' conversations about classroom discourse. As shown in Table 2, in Meeting 11, the teachers spent most of their time (41 minutes) directly discussing the National Board requirements. At this point, it seemed clear that all of the members had carefully read significant portions of the NBPTS materials. Indeed, at this meeting and those that followed, the teachers worked together to directly relate the NBPTS standards to the videos that were being viewed. The teachers increasingly attached focused National Board

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<sup>6</sup> Portfolio entries are scored from Level 4 to Level 1, with Level 4 being the highest level of proficiency.

terminology to the classroom discussions that they were viewing in the video club meetings. They frequently pointed out moments that provided opportunities to write about “equity,” for example. They also began bringing and directly referencing particulars in the NBPTS handbook. In such moments, it was clear that the NBPTS framework was structuring both what the teachers were looking for in the videos of their classroom discussions and how they talked about what they saw.

Of course, the teachers might have evaluated their videotaped lessons according to similar standards in earlier meetings. Yet, with one or two exceptions, they did not make such explicit references to the NBPTS requirements in earlier video club meetings. In contrast, in the later meetings, the teachers were well aware they were using official NBPTS terminology and often joked about this fact in a self-conscious manner.

Teresa: That’s evidence of you doing informal assessments of where the kids are.  
Rita: Nice one, Teresa.

In this quote from Meeting 13, Rita humorously commends Teresa on her use of the phrase “informal assessments.” Moreover, such references to NBPTS terminology occurred four times in this meeting alone. In sum, over time, the teachers came to increasingly use NBPTS goals and terms as a backdrop for talking about effective classroom discourse.

### **Discussion**

Throughout this paper, we have provided excerpts of conversations from the 16 video club meetings. These excerpts reveal that the conversations that took place in the Riverview Video Club were quite different from what is often reported in the literature on the nature of discourse among teachers. In contrast to notions of privacy and autonomy (Little, 1993), here the

teachers opened up their (videotaped) classrooms for comments from their peers, challenged each other's practices, and considered how to effectively represent their teaching for the NBPTS.

### **Discussing Discussion**

One of the central results of this research is to note that a primary focus of the teachers' discussion was classroom discourse. In some respects, this finding is not too surprising. First of all, the teachers were required to submit, as part of their NBPTS portfolios, two videotaped lessons – one in a whole class and one in a small group setting – where they facilitated mathematical discourse among their students. Furthermore, mathematics education reform efforts in the U.S., of which the Riverview participants were quite familiar, emphasizes the need for mathematical discourse (NCTM, 1991, 2000) and the teachers' role in this process. This common focus likely provided a point of synergy for the teachers' conversations.

What we find of particular interest here, however, concerns the *nature* of the teachers' conversations about discourse. It seems natural that the teachers made explicit suggestions for improving the lessons viewed in the video club. In fact, prior research demonstrates that teachers' responses to video are often initially evaluative and focused on the teachers' actions (e.g., Sherin & Han, 2004). Our data suggests something similar. Furthermore, teachers in urban contexts are thought to be particularly sensitive to their teaching contexts (Striff & Luna, 2006; other ref Mir). Thus, the teachers' comments about the influence of context on discourse illustrates, to some extent, their awareness of the particular demands of teaching in an urban environment, and the uniqueness of being an elite school in an urban district.

What is striking in this context then, is the extent to which the teachers explicitly indicated to each other the criteria they were using to evaluate classroom discourse. Researchers have, for many years, discussed the largely tacit nature of teacher knowledge, and of the need to

find ways for teachers to make their “wisdom of practice” explicit (Shulman, xxxx). The Riverview Video Club appears to have served such a purpose. Specifically, in the video club meetings the teachers examined what they understood to be “effective classroom discussion.” Thus, they discussed the importance of “student collaboration” and “problematic mathematical content.” And they gave life to these terms through the video excerpts, even in cases where the videos did not successfully demonstrate a criteria. Through this work, the teachers developed a shared vision of productive mathematical discourse and a shared language for describing it.

A second striking aspect of the teachers’ reliance on evaluative criteria for exploring classroom discourse is that the initial criteria discussed came from the teachers themselves. While the goal of NBPTS submission certainly shaped the Riverview discussions, it is important to note that the teachers did not come into the video club saying “Okay, NBPTS says we need to look at facilitating, student reasoning, and equity. Let’s do that.” In contrast, the conversations started with the teachers’ own understandings of and terminology for discussing classroom discourse, and over time, NBPTS terminology was used to help refine those ideas. Thus, while the teachers were certainly aware that their teaching, and their portfolios, would be judged against the NBPTS standards, it was their own standards that were used as a starting place for analysis. This seemed to provide an important grounding for the teachers’ discussions, that could then be enhanced by information provided and questions posed in the NBPTS application materials. Furthermore, the teachers’ own understandings of classroom discourse, that had surfaced in the early video club meetings, were a resource that the teachers called on as they worked to interpret the NBPTS standards in the later meetings. In fact, it seemed critical to the teachers’ discussions of NBPTS that they had first had the opportunity to deeply explore their

personal understandings of classroom discourse, and the limitations in their understanding of and implementation of this practice.

### **Designing Video Clubs for Teacher Learning**

We believe that the Riverview Video Club provides a valuable example of a structured video club that can serve as a catalyst for teacher learning. Our focus in this paper, however, has been on the discussions that took place in the video club meetings, and not on the design per se. Therefore, before concluding, we raise several questions concerning the design of video-based professional development in general, and the Riverview Video Club in particular.

First, we note that while the general purpose of the Riverview Video Club was quite specific (to prepare portfolios for submission to the NBTPS), the way that goal was carried out by the facilitator (and even by the participants) was only loosely structured. There was no careful plan of what-to-do-when that participants were expected to follow, and, as discussed previously, it seems likely that four of the five participants did not even read the application materials until almost six weeks prior to the submission deadline. Yet the NBPTS goal strongly influenced the nature of the teachers' work. Their emphasis on discussions and on evaluative criteria were likely because they knew that they had to demonstrate some set of standards around classroom discourse. This suggests that professional development that has a clearly stated and shared purpose, can be effective, even when the professional development sessions themselves are not highly structured.

Second, and related, concerns the role of the facilitator. While the facilitator of the Riverview Video Club was both the department chair and a NB certified teacher, the other participants did not appear to accord him special status in the video club meetings. Instead, his role as commentator and evaluator of the video clips viewed was much the same as the other

teachers. It is true, however, that he did not share video from his teaching at the meetings, but in other ways, his participation did not stand apart from the other teachers. Of course, this may have been Mike's intended facilitation style, to be "one of the gang." We believe this is an important question for future research, to understand the ways in which different facilitation techniques influence the ways in which teachers learn in a video club over time.

Third, we note the lack of resources from outside of the school in the running of the Riverview Video Club. While the school district paid the teachers' application fees, and set them up, to some extent, as a formal NB support group, neither resources nor personnel from the district were used to maintain the video club. The teachers videotaped themselves or each other, selected excerpts to share in the meetings, and to a large extent, appeared to self-facilitate the video club meetings. This suggests that video clubs may be an appropriate forum to be used more widely for teacher professional development on a local level. Many questions remain however, including the extent to which a video club at a particular school site could be maintained over time, how new participants would be accommodated, and how the shifting nature of a video club's purpose would influence the ensuing discussions.

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Table 1. Discussion Segments by Topic per Meeting

|                  | # of Segments | Discourse | NBPTS | Student Thinking | Video Club | Curriculum | Math | Technical Issues | Other |
|------------------|---------------|-----------|-------|------------------|------------|------------|------|------------------|-------|
| Meeting 1        | 10            | 4         | 2     | 1                | 3          | 0          | 0    | 0                | 0     |
| Meeting 2        | 11            | 3         | 3     | 1                | 1          | 1          | 1    | 1                | 0     |
| Meeting 3        | 13            | 5         | 4     | 2                | 0          | 0          | 1    | 1                | 0     |
| Meeting 4        | 11            | 2         | 5     | 3                | 0          | 0          | 0    | 1                | 0     |
| Meeting 5        | 7             | 3         | 1     | 0                | 0          | 2          | 1    | 0                | 0     |
| Meeting 6        | 12            | 4         | 0     | 2                | 1          | 2          | 0    | 2                | 1     |
| Meeting 7        | 13            | 5         | 2     | 1                | 1          | 0          | 0    | 3                | 1     |
| Meeting 8        | 11            | 5         | 2     | 1                | 1          | 0          | 0    | 2                | 0     |
| Meeting 9        | 11            | 3         | 3     | 0                | 2          | 0          | 1    | 1                | 1     |
| Meeting 10       | 12            | 5         | 4     | 2                | 0          | 0          | 0    | 1                | 0     |
| Meeting 11       | 23            | 4         | 11    | 5                | 1          | 1          | 0    | 1                | 0     |
| Meeting 12       | 10            | 2         | 3     | 3                | 0          | 2          | 0    | 0                | 0     |
| Meeting 13       | 15            | 5         | 5     | 2                | 0          | 1          | 0    | 2                | 0     |
| Meeting 14       | 9             | 1         | 4     | 2                | 0          | 0          | 1    | 1                | 0     |
| Meeting 15       | 10            | 1         | 2     | 4                | 0          | 1          | 1    | 1                | 0     |
| Meeting 16       | 14            | 4         | 2     | 3                | 1          | 0          | 3    | 0                | 1     |
| Total # Segments | 192           | 56        | 53    | 32               | 11         | 10         | 9    | 17               | 4     |

Table 2. Minutes on Topic per Meeting

|              | Discourse | National Boards | Student Thinking | Curriculum | Video Club | Math | Technical | Other | Watch Clip |
|--------------|-----------|-----------------|------------------|------------|------------|------|-----------|-------|------------|
| Meeting 1    | 14        | 4               | 4                | 0          | 4          | 0    | 0         | 0     | 23         |
| Meeting 2    | 4         | 18              | 1                | 3          | 5          | 3    | 4         | 0     | 0          |
| Meeting 3    | 9         | 7               | 2                | 0          | 0          | 1    | 4         | 0     | 28         |
| Meeting 4    | 4         | 7               | 4                | 0          | 0          | 0    | 1         | 0     | 33         |
| Meeting 5    | 14        | 1               | 0                | 4          | 0          | 2    | 0         | 0     | 21         |
| Meeting 6    | 15        | 0               | 2                | 2          | 1          | 0    | 9         | 1     | 18         |
| Meeting 7    | 11        | 3               | 1                | 0          | 1          | 0    | 5         | 1     | 24         |
| Meeting 8    | 17        | 4               | 3                | 0          | 2          | 0    | 2         | 0     | 19         |
| Meeting 9    | 25        | 6               | 0                | 0          | 5          | 1    | 2         | 1     | 20         |
| Meeting 10   | 6         | 5               | 3                | 0          | 0          | 0    | 2         | 0     | 36         |
| Meeting 11   | 5         | 41              | 11               | 2          | 1          | 0    | 1         | 0     | 30         |
| Meeting 12   | 9         | 5               | 4                | 6          | 0          | 0    | 1         | 0     | 17         |
| Meeting 13   | 7         | 9               | 1                | 2          | 0          | 0    | 3         | 0     | 32         |
| Meeting 14   | 4         | 22              | 5                | 0          | 0          | 2    | 1         | 0     | 16         |
| Meeting 15   | 2         | 1               | 7                | 3          | 0          | 2    | 1         | 0     | 17         |
| Meeting 16   | 13        | 4               | 5                | 0          | 4          | 8    | 0         | 2     | 16         |
| Total Time : | 159       | 137             | 53               | 22         | 23         | 19   | 36        | 5     | 350        |