INVESTIGATING TEACHER LEARNING DURING A VIDEO CLUB IN A SECONDARY SCHOOL MATHEMATICS DEPARTMENT

by

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Abstract

This study explored how a video club could be used to help develop teacher’s professional vision by investigating how teachers’ professional vision changed over time. In addition, the role of the facilitator was studied to determine how it contributed to the development of professional vision. The facilitation techniques appear to be the reason why the expected growth in professional vision did not occur. While video clubs are a valuable way of embedding professional development with artifacts from the classroom, care must be taken with the facilitation techniques employed.
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Chapter 1  Introduction

1.1  Introduction

The National Council for Teachers of Mathematics (NCTM, 2000) and the National Research Council (1989) called for major reforms to be made in the field of mathematics instruction. “In reality,” says the NRC, “no one can teach mathematics. Effective teachers are those who can stimulate students to learn mathematics” (p. 58). Instead of just telling students how to do certain mathematical procedures, as in the past, teachers are now asked to be a facilitator and help students construct their own knowledge.

Teachers will need help so they may change their practice and the NCTM document called for teachers to examine what they are doing in the classroom. In order to do this teachers need to be able to take part in “ongoing, sustained professional development” (NCTM, 2000, p. 369) that will show them how to become more aware of what events are taking place during a lesson. Specifically, the NCTM asks teachers to “collaborate on problems of mathematics teaching and regularly visit one another's classrooms to learn from, and critique, colleagues' teaching” (NCTM, 2000, p. 367).

As part of their growth as teacher-learners, teachers are expected to visit classrooms and reflect on what they see happening in those classrooms. These visits can happen in a live format, in the form of observations; however, another way of examining another’s teaching is by forming a video club with other teachers in the school and watching the teaching episode at a later time. A video club, similar to a book club, is made up of a group of teachers who watch a clip of one of the group member’s classes and discuss it. Sherin (2007) claims that teachers can learn how to improve their teaching when they participate in video club. Being a member of a video club helps teachers support each other “as a community of learners that model effective, life-long learning for their students and peers” (Berg & Smith, 1996, p. 37).
1.2 Rationale

In order to meet the expectations outlined in the NCTM (2000) document, teachers must rethink the way they are currently teaching. Teaching is very complex and is made up of many components, including: a) questioning, b) listening and responding constructively, c) attention to errors and misconceptions, c) teaching with enthusiasm and motivating pupils, d) management of time and pace, e) monitoring and intervening, f) high expectations for work and behaviour, and g) relationships with pupils (Tanner 2000). In order to improve teaching in the areas noted by Tanner (2000), teachers need to look at their own professional development and their own practice as teachers in the classroom.

Hiebert (2003) points out that, if the average classroom is going to improve, teachers need to start opening our doors and letting other people in to examine our teaching. He argues:

Teachers and educators around the country are beginning to see that the goal of improving teaching--improving students' opportunities to learn can only be reached by a path that the United States has never taken before. This new path moves educators away from a view of teaching as a solitary activity, owned personally by each teacher. It moves them toward a view of teaching as a professional activity open to collective observations, study, and improvement. It invites ordinary teachers to recognize and accept the responsibility for improving not only their own practice, but the shared practice of the profession. For this new path to be traveled, however, teachers will need to open their classroom doors and, rather than evaluating each other, begin studying their practices as a professional responsibility common to all. (p. 56)

Some models of professional development have been described as the equivalent of “yo-yo dieting” (Ball, 1999, p. 4). A teacher attends a workshop or conference that is “often intellectually superficial, disconnected…and non cumulative” (Ball, 1999, p. 3). The information from many of these workshops is soon forgotten and teachers return to teaching exactly the same way as before. Indeed, the NCTM (2000) document “Principles and Standards for School Mathematics” concurs with Ball and says that “the current practice of offering occasional workshops and in-service days does not and will not suffice” (p. 369). Consequently, teachers need to move away from only using the traditional forms of professional development.
Instead, learning communities need to embrace models of professional development that may provide ongoing and sustained development for teachers.

This paper examines the benefits and challenges of one of those models, the video club. When changing the culture behind teaching, it is important for teachers to examine themselves and study what is working in their classroom and what is not. While a lesson is in progress, teachers are able to briefly reflect on their practice, but, at the end of a lesson, many of those reflections and thoughts may have been forgotten. The videotape serves as an artifact of the teacher’s practice and Ball (1994) encourages teachers to situate our professional discussions in those artifacts in order to “ground the conversation in ways that are virtually impossible when referents are remote…” (p. 17).

It is possible to study a video of one’s teaching alone and there may be some benefit for teacher learning. However, the collegial aspect of the reflection is extremely important as “opportunities for jointing reflecting on teaching are critical in developing reflective practices” (Frederiksen, 1998, p. 227). The effectiveness of studying videos in conjunction with colleagues was studied by Clifford (2007) in his doctoral thesis. In this study, Clifford found that “video as a professional development tool was found to be most effective when it was used in conjunction with collaborative follow-up discussion and was even more effective when the discussion was focused around a mutually agreed upon theme” (p. 80).

More research is needed in the use of video for mathematics teacher professional development. Sherin (2007) notes that “there is little empirical evidence to support the claim that videotapes of classroom instruction can be an effective context for teacher learning” (p. 384). This sentiment is shared by Borko (2008) who notes that “there has been relatively little systematic research on the feasibility or effectiveness of the various types and uses of video in teacher professional development” (p. 419).
In addition, most, if not all, video clubs in the literature have been conducted by outside researchers as the facilitators. Sherin (2007) would like to see different facilitation techniques studied. This study will serve this request: first it will add to the robustness of information collected about video clubs. Secondly, it will explore the effectiveness of a video club with a teacher-colleague facilitator.

1.3 Research Questions

If teachers are to base their instructional decisions on their students’ mathematical thinking, then they need to be able to notice and interpret the events in their classroom. The ways that teachers notice and interpret classroom events is captured in the concept of professional vision. Sherin’s (2006) definition of professional vision is based on the work of Goodwin (1994) and, in the context of education, means “the ability to notice and interpret significant features of classroom interactions” (p. 1). She refers to the ability to notice as selective attention and the ability to interpret events as knowledge based reasoning. These ideas will form the framework for my first research question:

**How did teachers’ professional vision, as assessed through the video club discussions, change over time?**

The video clubs described in the literature review had an outside researcher as the facilitator (Borko, 2008; Clifford, 2007; Schafer, 2006; Sherin, 2003, 2005, 2006, 2007, 2009). In order for the video clubs to be a viable professional development tool, teachers, and not outside researchers, will be running the clubs. This leads me to my second research question:

**How does the role of the internal facilitator contribute to the development of professional vision in the club?**
1.4 Background of the Researcher

The school in which this research took place was a large, well established all-boys private school in a major city. I had been teaching for thirteen years, five in the public school system and eight in the private school setting. I taught four classes, instead of the normal full-time load of five, over two days and was a Senior House Adviser, a pastoral position, which I did in lieu of the fifth class. I was teaching the grade eleven and twelve Ontario curriculum concurrently with the curriculum from the International Baccalaureate program Mathematics, at the Standard and Higher Level. This was my first time running my own professional development session as well as the first time I had participated in a video club and observed my own teaching, or the teaching of others.

I was also the current Chair of the Mathematics Department. The Chair rotated every five years and was a liaison between the administration and the department. The chair had no authority over members of the department.
Chapter Two: Critical Review of the Literature

2.1 Background

I will examine the literature surrounding the use of video as a tool for professional development for teachers. I will investigate four main areas of the research that are relevant to my study: (a) theories of learning; (b) professional development models; (c) the research on the use of video for professional development; (d) how participating in a video club can help improve teaching.

2.2 Theories of Learning

Given that one wishes to develop teachers’ professional vision, teachers will have to change their current ways of noticing in the classroom. These changes will mean that teachers will have to do a lot of learning and will need support in their quest to change. Consequently, one must take a deeper look at teacher learning.

One perspective on teacher learning is known as the situative perspective. The situative perspective is based on the assumption that “knowing and learning are constructed through participation in the discourse and community, and are situated in particular physical and social contexts” (Borko, 2008, p. 418). This perspective considers the individual learner who constructs her own learning. It also contextualizes that learning. The idea that one perspective can consolidate both the individual and the community is one of the strengths of this framework, like bi-focal lenses that allow us to see objects close at hand as well as objects in the distance. Teachers are learning about teaching at many points in their day: in the classroom, talking to a student in the hall, or on the phone with a parent. As a result, it makes sense that the teacher is not simply viewed as a learner from the constructivist perspective, in which one has to “have experience with the phenomenon to create meaning for themselves” (Mosenthal & Ball, 1992, p. 348), but also as someone who will learn from the community in which they are a member. The
situative perspective draws from the ideas described by constructivist theorists and then goes beyond that to contextualize the experience. It seems to make sense that while one may construct one’s own knowledge, the place and time in which one does so affects the learning that has taken place.

Individual teacher learning is not always predictable. Some teachers will change their practice quickly, others will take more time. What they are asked to change will also affect how easily teachers can learn a new practice. For example, Borko (2004) notes that “it appears easier for teachers to incorporate strategies for eliciting student thinking into their teaching than to use what they hear from their students to make instructional decisions” (p. 6). This implies that questioning techniques are easier to change than how teachers interpret and respond to student thinking.

Teacher learning that occurs in a group setting is also not always guaranteed. While it is relatively easy to get teachers to talk about teaching in general, it is more rare to get teachers to discuss teaching in a critical fashion (Putnam & Borko, 1997). In order to get teachers to this stage, a level of trust must be established between group members.

One factor that will help increase teaching learning is to ground that work in artifacts from the classroom since the context and activities will affect what they learn (Greeno, Collins & Resnick, 1996). These artifacts provide a powerful place for teachers to begin their discussions about instructional practices and student learning. It is thought that teachers must base their study on these artifacts from their classroom because the “changes that are called for in reform mathematics instruction are intimately tied to the complexities of practice and can’t be learned out of context” (Clifford, 2007, p. 4). By providing a group forum, grounded in artifacts of practice, like video, one is setting the stage for teacher learning.
A second factor that may help increase teacher learning is described by Thompson (1999) who argues that one must “create a sufficiently high level of cognitive dissonance to disturb in some fundamental way the equilibrium between teachers’ existing beliefs and practices…and their experience with subject matter, students’ learning and teaching…” (p. 355). The cognitive dissonance, i.e. shock factor, may come from watching their own classroom and seeing themselves for the first time or from watching how other teachers conduct their classroom. This may force some teachers to reexamine their own beliefs and learn new ones.

Teachers need to learn to notice and become aware of what is going on in their classroom. It is upon this idea of teacher learning grounded in artifacts of practice that will form the framework for a successful professional development model.

2.3 Professional Development

In this section I describe the different goals that one may have for professional development. I then argue that the primary goal of professional development should be to improve student learning. A model that will help teachers focus on their classroom and the student is then discussed. This model involves having teachers learn to focus and notice the daily events by using artifacts from their classroom and discussing these artifacts with their colleagues.

2.3.1 Professional Development – Defining the Goal

“Teacher professional development is essential to efforts to improve our schools” (Borko, 2004, p. 3) and some models of professional development do not seem to have changed our education system. Borko (2004) argues forcefully that:

the professional development currently available to teachers is woefully inadequate. Each year, schools, districts and the federal government spend millions, if not billions, of dollars on in-service seminars and other forms of professional development that are fragmented, intellectually superficial, and do not take into account what we know about how teachers learn. (p. 3)
In order to judge whether or not a professional development model is effective, it is important to consider the goal of that particular professional development. Hawley (1999) describes several types of professional development models and discusses which types may be effective for which situations. For example, a training model, in which teachers attend a workshop and learn how to do something, may be effective in transmitting information, such as how the graphing calculator functions (Hawley, 1999). If one wishes to simply have some personal growth, then goal setting at the individual level could be the most effective (Hawley, 1999). The Teachers as Scholars (TAS) program did not have a direct goal of improving student learning but was designed to have teachers go back to school as learners, attending classes put on by professors. The goal of this professional development experience was personal growth and “the initial research has shown that teachers feel renewed after the experience and have been able to incorporate new ideas into their instructional practices” (Kelleher, 2003, p. 752). Thus this type of professional development is successful on its own terms.

It can be argued that the primary goal of professional development should be to improve student learning. If one wishes to transform and change one’s teaching with the goal of trying to improve student learning, then the current format of workshops and conferences will not suffice. Teachers must learn new ways of looking at their classroom and this means situating their learning in the classroom. “Professional development must be embedded in teachers’ daily work to improve student learning” (Kelleher, 2003, p. 752) and involve artifacts of practice such as lesson plans or student work. This again implies that the situative perspective of teacher learning is the best framework with which to view this professional development. With this goal in mind, the “observer/assessment” (peer coaching) and the “teacher-researcher” (teacher conducting her own empirical research) models (Hawley, 1999) are the best ones to base our
professional development strategies upon as both are embedded in the day-to-day work of the teaching professional.

### 2.3.2 Developing a Model to Improve Student Learning

An effective professional development model, with a goal of improving student learning, can be based on the situative perspective which is concerned with how teachers learn. One must also consider the goals and structure of this experience.

First, this model of professional development needs to help teachers focus on classroom dynamics and how students are interacting with the mathematics during the lesson. It must not simply look outside the classroom in search of new techniques (such as cooperative learning) for communicating mathematics but be directed inwards at the classroom and must take note of the small questions and events that take place daily.

If teachers are going to be able to react to student’s ideas and questions and moderate the classroom discourse, they must learn to be aware of how they see events as they unfold during the lesson. Sherin (2009) believes that professional vision, as defined by Goodwin (1994) is a good framework for outlining how participating in a video club is a worthwhile professional development activity for teachers. Goodwin (1994) states that, “the ability to see a meaningful event is not a transparent, psychological process but instead a socially situated activity accomplished through the deployment of a range of historically constituted discursive practices” (p. 606). In the case of the classroom, the meaningful event could be thought of as the question a student is asking or an idea a student has raised. In order to be able to respond to the question in a manner that is in step with the reform ideas, teachers need to notice and interpret what is going on in our classrooms.

Van Es (2008) describes the act of noticing an event as selective attention and the interpretation of that event as knowledge-based reasoning. She argues that it is the dynamic
interplay of these two events that make up a teacher’s professional vision. The knowledge-based reasoning can take place at three levels: descriptive, evaluative and interpretive. The descriptive level is when a teacher merely describes what a student has said or done; the evaluative level would be when a teacher judges what a student has said or done; and the interpretive level occurs when a teacher begins to infer what a student meant based on what was said (Sherin, 2009). It is important to make the distinction between these three types of knowledge-based reasoning because each successive type implies a deeper understanding of the event. It is thought that, if teachers can learn to understand what a student is thinking, that they will be better able to respond to them and improve student learning.

After becoming aware of their classroom events, the teachers need to change their teaching practice to best improve student learning and “develop a repertoire of practice that is consistent with the new understanding that teachers are building” (Thompson, 1999, p. 356). Teachers need time to process this new information in order to understand it and integrate into what they already do in the classroom. Indeed, one of the most important outcomes of professional development is “skill development, and consistent and appropriate use of newly acquired knowledge” (Hawley, 1999, p. 136).

The model should also incorporate artifacts of practice. Researchers have shown that professional development does work “when they have adequate opportunities to learn and when these opportunities are focused on content; grounded in artifacts of practice, such as curriculum, videotape, or student work; supported over time; and embedded in a system of assessment and curriculum that support learning” (Hill, 2004, p. 217). However, teachers must be cautious because not all professional development is well executed, despite the lists of standards that academics have developed (Hill, 2004). In fact, the “standards have never been studied
systematically to understand whether they can differentiate between “good” professional development and “bad” (Hill, 2004, p. 218).

Lastly, while good professional development is characterized by helping teachers become more aware of their classroom it also:

- offers opportunities for observation, critique and reflection;
- it provides opportunities for group support and collaboration; and
- it involves deliberate evaluation and feedback by skilled practitioners with expertise about good teaching. (Elmore, 1999, p. 263)

This implies that collegial support and classroom based practice are also important design features of a good professional development that will transform teaching. If these are combined with the aforementioned cognitive dissonance and time to reflect in order to change one’s repertoire of practice, one could have designed an effective transformative professional development experience.

All professional development models, whatever their goal may be, must be part of a cyclical process for teachers. One framework was discussed by Kelleher (2003). In this model teachers must set their goals, choose the best form of professional development, and go through the professional development. They then must reflect on their goals, make changes and try to measure the effect on student learning, if possible.

To conclude, I argue that an effective transformative professional development cycle, using professional vision as our framework, incorporating artifacts of practice, creating cognitive dissonance and having group discussions about the artifact will incorporate many, if not all, the aspects of an effective professional development model.

2.4 Video as a tool

Improving teachers’ practice means focusing on what takes place in the classroom. Practice-based professional development (Ball, 2009) is centered upon artifacts from the classroom such as lesson plans, student work or, in this case, video. By studying the lesson
plans, student work, or video, teachers are studying their teaching in context and are able to learn from it.

Video is a permanent record of the classroom and the teacher’s practice. This artifact can be a powerful tool to help teachers examine their teaching carefully (Borko, 2004). It has been used in teacher training programs for years (Fuller, 1973) and is thought to be a valuable way to assess and learn about teaching. Sherin (2006) argues that, “watching and reflecting on video is thought to be a valuable activity for teachers, one that has the potential to foster teacher learning” (p. 1). Video also provides a forum for teachers to discuss their students and their teaching in their local context with others. Using video allows flexibility for meeting times to discuss the teaching and so many more members may participate if need be. It is important to create professional development models that can include many teachers, because having a professional learning community can increase learning and improve instruction.

If it may be argued that video can be an important tool for teacher development, then what are the specific benefits derived from watching oneself, or someone else, on video? One could simply observe someone’s class and take notes and discuss that later. However, when watching someone teach live, it is possible to miss a lot of significant events in the classroom simply because there is so much going on. It seems to make sense that it will be easier for teachers to study their own, and someone else’s teaching if one watches a video, as it allows the participants to stop the video and rewind and watch it again. This is obviously not able to happen when one observes a lesson live. It can be difficult to remember what happened and exactly what was said during an observation, despite taking field notes. Teachers are able to learn by closely examining and discussing the artifact and field notes may not give the kind of details and show the same nuances, such as the expression on a student’s face, as video.
Watching one’s own teaching can be beneficial. For example, Borko (2008) investigated the kind of conversations teachers had about their teaching after watching their own teaching on video, as part of a professional development program, and looked at how those conversations changed over two years. She found that “for many viewing and discussing video was the most valuable aspect of their participation in the program” (p. 434) but more importantly that “the participants in our program engaged in increasingly reflective and productive full-group conversations around video.” (p. 435)

The video club in Borko’s (2008) study was facilitated by outside researchers and the teachers were mainly from different schools. In Sherin’s (2002) earlier work, only two teachers allowed themselves to be filmed for the club because the other two participants were too self-conscious to be filmed in front of their colleagues, but she still felt that everyone benefited from the experience.

More recent studies have colleagues who participated in the video club together (Sherin, 2009). However, another study only had one meeting of the video club because the teachers, all from the same school, were simply too uncomfortable (Grossman, Wineburg and Woolworth 2001). The researchers suggested that it was because the teachers did not have a very collegial department.

In order to feel safe while opening up oneself to critique, Borko (2008) supports Grossman’s conclusion and notes that “teachers must feel part of a safe and supportive professional environment. They should also feel confident that showing their videos will provide learning opportunities for themselves and their colleagues, and that the atmosphere will be one of productive discourse” (p. 421). Borko (2008) points to work of Frykholm (1998) who suggests that trust must be developed between teachers in order to “enable challenging discussions about teaching and learning, and maintain a balance between respecting individual community
members and critically analysing issues in their teaching” (p. 421). It is important for teachers to feel that they are in a safe environment before they feel comfortable opening their classroom doors and allowing their work to be filmed.

### 2.4.1 Using Video Clubs to Develop Professional Vision

Earlier, I argued that one should use professional vision as part of the framework for an effective professional development. How can video clubs develop professional vision? In order to examine this, teachers must learn how to study the video clubs to see if they are developing the professional vision. One aspect I will discuss in detail is the rationale behind the coding used to analyse the video club discussions. The coding is specifically chosen to help draw our attention to the aspects of professional vision that are important: noticing and interpreting classroom events.

In order to analyse the ability to notice student thinking, known as selective attention, Sherin (2006) transcribed each video club meeting and classified the conversation into idea units which were then classified by actor: teacher or student. Those same idea units were also classified by topic: classroom climate, classroom management, pedagogy, mathematical thinking and other. This was done because it was important to understand not just who the teachers were discussing but what they were discussing. In order to improve student learning it is important that researchers have evidence that teachers are paying attention to what students are thinking about.

Next, “once a teacher’s attention is drawn to a particular event, … the teacher will begin to reason about that event based on his or her knowledge and understanding” (Sherin, 2007, p. 385). Teachers’ ability to reason about student thinking, knowledge-based reasoning, was analysed by coding each idea unit in terms of whether that idea unit was describing, evaluating or interpreting the actor in the clip.
In her studies, Sherin and van Es (2009) found that the video club positively influenced the teachers’ professional vision. They reported that the teachers’ ability to notice and attend to student thinking in the class improved and that participating in the video club also positively influenced their instructional practice. Specifically, Sherin (2007) noted a decrease in the amount of facilitation required to elicit student thinking comments from the group which implies that the teachers were beginning to notice this on their own. Similar findings were reported in studies conducted by Rosebery & Puttick (1998) and Borko (2008). Participating in the video club helped make the teachers better interpreters of their students’ thinking and made them more able to notice the significant moments in the classroom (Sherin, 2006a). While the initial conversations focused on the teachers’ decisions and actions, those conversations changed over time to become more focused on student thinking. In addition, Sherin (2009) notes that teachers’ comments about the lesson became less descriptive and evaluative and more interpretive. When teachers are more aware of, and able to interpret student ideas, van Es argues that they will be able to better respond to the student’s thinking and thus improve student learning in the classroom (van Es, 2009).

Based on Sherin’s studies it is difficult to tell if the increase in student thinking is a real upwards trend, or simply the content of the final video club. In some studies she shows the data for each meeting, but in others she only tells the reader the data for the first and last meeting of the club. For example, in her 2009 paper, Sherin & van Es had a total of seven idea units for both Video Club 1 and Video Club 7 (p. 26). In the first meeting the teachers discussed the students in two idea units (29%) and in the final video club meeting the teachers discussed the student in 6 idea units (86%). It is difficult to tell if the increase is statistically significant or if it was a one-off result, especially since there is no data given on video clubs two, three, four or five.
2.5 Summary

In this chapter, I argued that teacher learning can be effectively viewed from the situative perspective. In that context, teacher learning takes place both at the individual level as well as in context. It is important that teachers learn to develop their professional vision in order to improve student learning because it will help them to learn to notice what their students are thinking, interpret that thinking and respond to their students in a manner that will help the student to learn. Video clubs are thought to be an effective professional development model because they will incorporate the ideas from the situative perspective. While teachers may not learn about their teaching in the actual moment in the classroom, I argue that they are still learning in context. They are reviewing the video of their class, alongside their peers, in their school which I feel is learning in context. Sherin’s (2009) study showed that this situated learning will help develop teachers’ professional vision and enable them to notice more in their classroom.
Chapter Three: Methodology

3.1 Research Design

Qualitative research takes a very different approach to research than quantitative research. A quantitative researcher asks a research question at the beginning of their study and then sees whether or not the data supports her hypothesis. The qualitative researcher has a more flexible approach and has to adjust her research questions as she uncovers and delves deeper into her area of interest. Indeed the “researcher must look for both frequent and rare events and remain open to disconfirming evidence” (Louie, 2003, p. 163). It is important to stay flexible during the study.

In this study I have used a qualitative approach to code the idea units (Jacobs and Morita, 2002) which surfaced during the video club meetings. The coding was based on the methods used in other studies (Sherin, 2007; Borko, 2008). While this approach quantifies what is really a piece of qualitative data, doing so helps us to identify patterns and trends in the conversations.

3.2 Participants

The four participants were all members of the mathematics department. The teachers each had between five and thirteen years experience as a high school mathematics teacher (see Table 1). One teacher taught grade nine and ten mathematics while the others focused on grades eleven and twelve mathematics.

<table>
<thead>
<tr>
<th>Table 1: Experience of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beth</td>
</tr>
<tr>
<td>James</td>
</tr>
<tr>
<td>Jane</td>
</tr>
<tr>
<td>Amy</td>
</tr>
</tbody>
</table>
3.3 Creation of the Video Club

I formed the video club with four other teachers, my role being both as a facilitator and a participant which is a technique known as “participant-as-observer” (Fraenkel, 1995, p. 384). It was important to establish a level of trust and intimacy within the group and it was crucial that, while we did not have to have similar ideas of the best way to teach, we did have to respect and trust one another. I tried to establish this trust by allowing the teachers in the department to choose whether or not to be involved in the club. We had a frank discussion about my role as chair of the department and a simultaneous researcher-participant. I also made it clear that they could participate in the club without having to have their teaching filmed and that they could change their mind at any time with no repercussions.

3.4 Clip Selection

There was a specific criteria that I used when selecting the clips we observed. First, I limited the segment to between three to five minutes in length so we could focus on one particular aspect of the lesson. Secondly, the segment was chosen to provide a look into student thinking. Sherin (2006b) found that the most important aspect of the video is whether it shows a “window” into student thinking. “Low depth” is when the students perform a routine task and “high depth” is when students engage in more of a problem solving type task. The student thinking could be seen in “verbal explanations and through their written work. In addition, there may be nonverbal windows…: gestures, facial expressions” (Sherin, 2006b, p. 9). She found that the depth and clarity of the student thinking could be low or high, and teachers would still have productive and interesting conversations. I endeavoured to select clips that clearly illustrated student thinking.
3.5 Structure of the Video Club Meeting

Each classroom clip was taped and transcribed. The videos were filmed on a MacBook laptop computer, which has a built in camera. The laptop was set up at the back of the room before the classes started and filmed through the entire class. During each session, the video club watched a video segment selected by me, and discussed what happened in the segment. The video club meeting was filmed on the same computer and also transcribed.

I prepared questions in order to facilitate the discussion (Appendix A). The prompts were based on student thinking in the video and specifically asked teachers to discuss the student conceptions, classroom discourse and the mathematics (Sherin et al, 2007). However, I allowed the conversation to fall into whatever pattern and theme the group seemed to take up. The goal of the discussion was to ask ourselves what was happening in the clip and what we noticed, as Sherin and van Es (2003) recommend. This involved “making sense of a student’s strategy, analyzing why a particular concept was confusing for the class, or exploring how an explanation did or did not respond to a student’s question” (Sherin & van Es, 2003, p. 92). Unfortunately, this didn’t exactly happen as expected, and will be discussed later.

Each meeting took place at lunchtime and lasted between 25 and 35 minutes, approximately once a month for six months for a total of six meetings. It should be noted that only five are recorded in this study because the film of one of the meetings was lost when the computer crashed.

The reason we met over the course of several months was partly due to the realities of teaching and also based on the work of Thompson (1999) who believed that for real change to occur, teachers need time to think so they can resolve the dissonance between what they think went on in the classroom and that which they observed in the video. As the club took place over six sessions, teachers had time to digest the video, and the information shared.
Initially, I selected one section of my Calculus and Vectors class to film in January and used a clip from that class as our initial focus of conversation for our first and second meetings. Subsequently, three of the four teachers agreed to have their classes filmed which occurred during the same week of school. The fourth member of the group did not have a class filmed because of scheduling conflicts (see Table 2).

<table>
<thead>
<tr>
<th>Data Collected</th>
<th>Deirdre</th>
<th>Beth</th>
<th>Jane</th>
<th>James</th>
<th>Amy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Club of Film Used</td>
<td>1, 2</td>
<td>5</td>
<td>N/A</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

### 3.6 Transcript Analysis

I examined the video club transcripts and looked for any patterns or themes to our conversation as they related to the research question: How did the conversation that took place during the video club change over the course of the club meetings?

The analysis of the video club transcript was based on the work of Sherin (2006). I selected a transcript at random and divided the entire conversation into idea units (Sherin, 2006) which are defined as portions of the conversation in which a particular concept was discussed. I ignored any irrelevant conversation, like the administration of the club or personal matters such as in this example:

D….anyone want their class filmed next week? As many classes as we can do…

A: I am not here next week. (Video Club 2)

I then gave another teacher, who was not a participant in the study, an uncoded transcript of the same video club meeting and she independently divided it into idea units according to the framework provided. The inter-rater reliability was 84% and agreement was reached by consensus.
Based on Sherin’s (2006) work, the next step was to code each idea unit in terms of:

a) who the actor was (the person being discussed in the segment)

b) what topic were they discussing (math thinking, pedagogy, climate or management),

c) what stance did they discuss from (did they describe, evaluate or interpret the event?), and

d) Who initiated the idea unit? (facilitator or the participating teachers)

Sherin (2009) used actor and topic to help determine what the participants were paying attention to in the video (called selective attention) and she used stance to investigate how the participants were reasoning about the event. Initiation was used to establish whether the amount of facilitation required decreased over time (i.e., did the teachers start to learn what to look for in the video without outside prompts).

However, as I went through the transcript, I found it difficult to classify the conversation in this manner. There were times teachers were discussing teachers and students but not those directly in the video clip. For example, in Video Club meeting 4, teachers are discussing whether or not a student should be forced to listen to a different method of solving a problem when that student already knows one solution. Some idea units were not about the student in the video or about the video at all. There were initially classified as “other” for the Actor component of the idea unit for lack of a better classification. As I realized the number of “other” was growing, I had to go back and figure out a way to classify them in a meaningful way. These conversations were important and relevant and it did not make sense to just ignore them because they were not directly related to the video. Other researchers have also included non-video centred comments in their data set. Sherin writes, “When teachers discussed their own classrooms, we continued to code for actor, topic, stance, etc.” (Sherin, personal communication, December 4, 2009).
I returned to each of these idea units and reclassified them by student or teacher as the actor and then made sure to make the distinction in my results between idea units that related directly to the video and those that did not. Again, I gave the transcript and the revised coding schema to the outside researcher who classified each idea unit by the topic, actor and stance. The inter-rater reliability was 91%, 87%, 83% respectively.

I wanted to investigate the nature of our discussions from a different perspective. If our conversations did not focus on student thinking and mathematics, then what was discussed during the sessions? In order to study this I first noted which topic we discussed the most, in this case it was pedagogy. I then returned to the idea units that were classified in that manner and listed all of them. Beside each idea unit, I wrote down a one line summary of what was discussed in that idea unit regarding that topic. For example, I wrote “questioning” beside Video Club 3, idea unit 4 because they were discussing questioning techniques during that idea unit. I repeated this for each idea unit that was classified as “pedagogy” for each video club meeting. Finally, I looked for overall patterns within and between each video club meeting and began to formulate some ideas of what we were discussing when we discussed pedagogy. I identified a theme when it became the majority of the video club meeting conversation for that idea unit topic.

3.7 Facilitation Analysis – A Self-Study

In order to study my facilitation, I had to rely on some self-study methodology which is discussed next.

3.7.1 Defining and Justifying the Self-Study Methodology

As the data was analysed, it became apparent to me that my facilitation techniques may have affected the nature of the conversation over the course of the club. Consequently, I did an analysis of my facilitation.
I argue that I am not simply reflecting on my own facilitation; rather, I am actually conducting a self-study. Self-study is different from reflection in that “reflection is a personal process of thinking, refining, reframing, and developing actions. Self-study takes these processes and makes them public, thus leading to another series of processes that need to reside outside the individual” (Loughran, 1998, p 15). Since my analysis will be public and I will document clearly my methods in this paper, I feel this part of the analysis may be classified as a self-study.

Dinkelman (2003) argues that “if teaching is what teacher educators do, and teaching must include reflection, then self-study, as a form of reflection, ought to be an essential part of the activity of teacher educators” (p. 8). A self-study is simply when one studies something about oneself. Hamilton defines self-study as “the study of one’s self, one’s actions, one’s ideas…Self-study also involves a thoughtful look at texts read, experiences had, people known, and ideas considered” (p 236). It is the combination of one’s perspective on one’s self, supported by evidence from outside one's self.

At times, there appears to be a gap between the research done in education and what is adopted in practice. Mills (2001) suggested in his work that “for public theory to influence educational practice, it must be translated through the personal. Only when a theory can be seen to have efficacy in a practical arena will that theory have life.” (p. 15). This seems to mean that in order for some theory to be adopted, it must have been useful to someone. In order to determine if a theory is useful for a person, one should study their own experience of that phenomenon. The self-study is very beneficial in this case. If participating in video clubs is beneficial and increases professional vision then it is important that it is investigated from the perspective of an actual teacher.
The literature compares the benefits and areas of difficulties in self-study as a research form. Louie (2003) argues that “rather than play the role of passive participants, faculty members engaged in self-study research actively control the purpose, agenda, and timing of their work as well as its outcomes. Self-study research also enables faculty members to create a tangible product from their work in the form of teaching knowledge that is transferable to colleagues.” (p 151). Self-study also helps teachers to improve their teaching as it gives them a better picture of themselves as educators (Louie, 2003). For these reasons, I argue that a self-study is an appropriate way of analysing my facilitation techniques.

3.7.2 Conditions for a Successful Self-Study

I have based the framework for a successful self-study on the work of Louie (2003). The self-study is particularly vulnerable to criticism regarding the validity or trustworthiness of its results and so must be explicitly addressed.

Collaboration is an important component of the self-study. Knowing that more than one set of eyes have looked at the work improves the chance that it will “ring true” for others (Louie, 2003). I hope that my collaboration with the colleague who helped me analyse the transcripts will provide some level of validity. However, Loughan (1998) emphasises that, in order to generalize my findings so that I can say that they can be applied to more than just my specific situation, I will have to have more wide interactions with colleagues. I hope that the publication of my findings will be the first step in this process. In this way, my work will contribute to the greater teaching community, another requirement listed by Louie (2003) as part of a good self-study.

Another condition for a successful self-study is that the researcher must have a “willingness to reveal and confront the self” (Louie, 2003, p. 159). I believe that, because I was willing to videotape myself and use my own teaching as the subject of the first two video club
meetings, is some evidence that I am willing to look closely at my own teaching. I hope that I have designed and analysed my research so that my self-study will be seen as valid to others in the community.

3.7.3 Data Analysis

In order to satisfy the conditions for a valid set of data in a self-study, I needed to be very clear about my methods and work in consultation with a colleague. I chose to use the same teacher who helped me analyse my data to ensure my facilitation data collection made sense.

I re-read the transcripts several times looking for patterns. Slowly, I started to see patterns in the types of questions I was asking and not asking. For example, I realized I never once asked one of the questions from my prompting sheet in any of the video club meetings. I also noted how my facilitation changed from meeting to meetings. In collaboration with my teacher-consultant, I used two sources of data to verify my findings regarding my facilitation. The first comes from some of my prior analysis about who initiated each idea unit. This gives a quantitative analysis of my facilitation because one can see which direction I was driving the conversation. I also wanted to show evidence from the transcripts of the trends I thought were illustrated in tables 4-7. In order to do this, I looked at the transcripts as my second data source. I gave the consultant researcher each video club transcript and asked her to circle comments in each transcript where she thought I had lead the conversation away from, or towards, student thinking. I had circled my own comments on my copies of the transcripts. We compared comments and discussed the overall patterns we noted from video club to video club along with the quantitative evidence. Then we reached consensus regarding which transcription quotes would best illustrate my argument.
3.8 Ethical Considerations

I followed all the procedures outlined by the Ontario Institute for Studies in Education in its Ethical Review Procedure. The principal, teachers, students and guardians of the students read a letter (see Appendices D, F, H, J) that outlined the project and signed a letter of free and informed consent (see Appendices E, G, I, K). There was no real possibility of harm, and all participants were allowed to withdraw from the study with no repercussions at any time. All the names of the participants and the school were changed such that all participants will remain anonymous. The video will be destroyed after the needed clips have been obtained and those clips will be stored in a locked and secure place to which the principal researcher has access.
Chapter Four: Findings

4.1 Introduction

In this chapter, I will outline the content of each video clip watched. I intend to look at my results using the professional development framework outlined earlier. I will focus on the two aspects of selective attention: actor and topic. How the teachers reasoned about these events will be discussed in the section on stance.

I then will examine my facilitation techniques. I think that it is of interest to examine the effect of the facilitation on the outcome of the video club because it is possible that if teachers decide to conduct their own video clubs, this study will provide them with some ideas of the problems they may encounter when conducting their own club.

Finally, I will look back at the topic that was the focus of our conversations. Although the teachers did not discuss student thinking as much as I had anticipated, I intend to illustrate what the teachers did discuss during the video club meetings.

4.1.1 Video Clip Content

During each video club meeting, we watched a clip of a teacher’s class. In most meetings, we just looked at one clip and in one class we examined two clips from the same class. This may be seen in Table 3:

<table>
<thead>
<tr>
<th>V.C.</th>
<th>Teacher viewed</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Feb. 19</td>
<td>Deirdre</td>
<td>Clip #1: Students were given the problem $f(x) = 2\ln x - 3$ and asked to find the $x$ intercept. Watched D interacting with a student who was having trouble solving it. Clip #2: Students were asked to find the derivative of $f(x) = \ln(x^2)$ versus $f(x) = (\ln x)^2$ versus $f(x) = \ln(\ln x)$ and the students and D were discussing the difference between the three problems.</td>
</tr>
<tr>
<td>2: Apr 14</td>
<td>Deirdre</td>
<td>D was leading the class through a discussion and some group work to help them see that the area under a curve is just the antiderivative.</td>
</tr>
<tr>
<td>3: May 27</td>
<td>Amy</td>
<td>A was taking up a question about factoring and answering questions from students about the problem they were struggling with.</td>
</tr>
<tr>
<td>4: June 8</td>
<td>James</td>
<td>J was showing three ways to do the same problem and going through the solutions while answering questions from the class.</td>
</tr>
<tr>
<td>5: June 16</td>
<td>Beth</td>
<td>B was introducing radians to the class using a model of a pie and relating it to the number of cuts one would make in the pie to the angles $\pi/4$, $\pi/3$ etc.</td>
</tr>
</tbody>
</table>
4.1.2 Actor

In the analysis of the video club conversations, I will first focus on the participant’s selective attention (actor) and discuss how they are reasoning about that event.

As seen in Table 4, each idea unit was classified by the actor in the clip: teacher, student or Video Club. The Video Club section refers to comments that related to the clip but were not about the teacher or the student. Possible examples include: setting the context for the clip or asking questions about the class it was or administration related to the functioning of the club itself.

<table>
<thead>
<tr>
<th>Comments related directly to video</th>
<th>VC 1</th>
<th>VC 2</th>
<th>VC 3</th>
<th>VC 4</th>
<th>VC 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>5</td>
<td>38%</td>
<td>6</td>
<td>55%</td>
<td>5</td>
</tr>
<tr>
<td>Student</td>
<td>3</td>
<td>23%</td>
<td>0</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>Video Club</td>
<td>4</td>
<td>31%</td>
<td>2</td>
<td>18%</td>
<td>0</td>
</tr>
<tr>
<td>Comment which did not relate directly to video</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>1</td>
<td>8%</td>
<td>3</td>
<td>27%</td>
<td>4</td>
</tr>
<tr>
<td>Student</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>4</td>
</tr>
<tr>
<td>Total Idea Units</td>
<td>13</td>
<td>100%</td>
<td>11</td>
<td>100%</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>6</td>
<td>46%</td>
<td>9</td>
<td>82%</td>
<td>9</td>
</tr>
<tr>
<td>Student</td>
<td>3</td>
<td>23%</td>
<td>0</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td>Video Club</td>
<td>4</td>
<td>31%</td>
<td>2</td>
<td>18%</td>
<td>0</td>
</tr>
</tbody>
</table>

There were two further classifications of comments teachers made about the clips: comments related directly to the video, and those that did not relate to the video but were reflections on the speaker’s own experience. For example, in this excerpt the actor is the student “G” who is actually in the clip the group is watching:

A: You know what I really liked about it. When you know, G, asked you a question and repeated it and he flipped his understanding.

D: Yeah
A: You said “not that’s not what you said”. So if he had just said that first sentence you would have just assume he understood but since he asked the question again and spoke about it twice, he actually didn’t understand it.

D: No, he didn’t understand it.  

(Video Club 1, February 19, 2009)

In this second example, the actor is still the student, but the conversation did not directly relate to the video itself.

A: So if you think about what’s the whole big picture of school we want to make functioning adults. The unit circle is not….

B: That’s right.

A: We are trying to make them.

J: We are trying to teach them to learn how to learn.

A: To be polite and communicate and work in groups. If you read studies from people hiring kids out of university, the biggest problem is that kids have is not the knowledge – you can always learn knowledge – it’s the communication, the group work, the problem solving, the thinking, and that if we could graduate kids that could be good at that then that would be good.

(Video Club 5, June 16, 2009)

It was imperative that I include this distinction because I noticed many comments were not about the clip itself (the conversation would drift to and from the video).

In this study, the club talked less about the teacher in the video over the course of the club but talked more about themselves and their own practice over the same timeframe. They did not talk more about the students, however they usually discussed the students a significant portion of the time (23%, 0%, 35%, 63%, 27%). The reason they did not discuss the student thinking in the second video club meeting may have been related to the facilitation, which I will discuss in more detail later.

Finally, the teachers talked less about the video club itself over the course of the meetings. I believe this is due to the fact that the novelty of participating in a video had worn off after the first meeting and they understood what to expect.
Another part of the analysis involved studying who initiated each idea unit. If I, as the facilitator, had been the only one starting conversations that discuss the student and student thinking, then I would not able to reasonably conclude that the teachers began talking more about student thinking over the course of the club. The facilitator could just be moving the conversation in that direction each time. Table 5 summarizes who initiated each relevant aspect of the conversation.

**Table 5: Initiation of Conversation**

<table>
<thead>
<tr>
<th>ACTOR</th>
<th>INITATOR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comments related directly to video</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>Facilitator</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Teachers</td>
<td></td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Student</td>
<td>Facilitator</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Teachers</td>
<td></td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Comment which did not relate directly to video</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>Facilitator</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Teachers</td>
<td></td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Student</td>
<td>Facilitator</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Teachers</td>
<td></td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>9</td>
<td>9</td>
<td>14</td>
<td>21</td>
<td>15</td>
</tr>
</tbody>
</table>

Expected and unexpected results emerge in Table 5. I did initiate fewer parts of the conversation that focused on the teacher in the video over time and the teachers in the video began to focus less on the teacher in the video as well. However, the teachers did continue to talk about teachers outside of the video with great regularity over time. That said, the number of idea units are very small (although not dissimilar to other studies) and while they might not be statistically significant, they do give us a sense of what is taking place.
Sherin’s (2009) studies found that the number of teacher-initiated idea units relating to the student increased over time while the number of facilitator-initiated units decreased. This indicated that the teachers learned to pay attention to the students in the video over time and began to start conversations that focused on the students. The facilitator did not need to direct the teachers’ attention towards the students over time, as they would do this on their own. In my study, there is no trend visible. The student focus varies considerably from session to session and that variation is seen in both the facilitator-initiated idea units (11%, 0%, 21%, 24%, 7%) and the teacher-initiated idea units (22%, 0%, 14%, 43%, 20%). This is another reason why the quality of facilitation may have influenced the type of conversation had during the meeting and will be discussed in more detail later.

4.1.3 Topic

Selective attention is defined by both whom the teachers are paying attention to (actor) and what they are discussing (topic). The following table displays the analysis of topic.

<table>
<thead>
<tr>
<th>Topic</th>
<th>VC 1</th>
<th>VC 2</th>
<th>VC 3</th>
<th>VC 4</th>
<th>VC 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Climate</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Classroom Management</td>
<td>3 23%</td>
<td>3 27%</td>
<td>1 7%</td>
<td>5 23%</td>
<td>1 7%</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>2 15%</td>
<td>5 45%</td>
<td>12 86%</td>
<td>11 50%</td>
<td>3 20%</td>
</tr>
<tr>
<td>Mathematics Thinking</td>
<td>4 31%</td>
<td>1 9%</td>
<td>1 7%</td>
<td>4 18%</td>
<td>7 47%</td>
</tr>
<tr>
<td>Other</td>
<td>4 31%</td>
<td>2 18%</td>
<td>0 0%</td>
<td>2 9%</td>
<td>4 27%</td>
</tr>
<tr>
<td><strong>Total Idea Units</strong></td>
<td>13 100%</td>
<td>11 100%</td>
<td>14 100%</td>
<td>22 100%</td>
<td>15 100%</td>
</tr>
</tbody>
</table>

Classroom climate was never discussed in any of the Video Club meetings. The results regarding climate were very similar to other studies done and were not the focus of the teachers’ attention (Sherin, 2009). It may be because the video did not pick up the subtle nuances in the classroom that teachers did not discuss it at all or it may be because the conversation was never directed towards that aspect of the classroom.
Sherin (2007) notes that “student conceptions and pedagogy were in fact the two most common raised topics by teachers….while pedagogy remained an important focus of attention for teachers throughout the video clubs, the teachers also began to generate discussions of student conceptions” (p 388). In my study, pedagogy was the dominant topic in 3 of the 5 sessions while mathematics thinking was the most popular in 2 of the 5 sessions. While my pedagogy results are not unexpected, I did not find the great increase in mathematics thinking I was anticipating. In addition, classroom management was also an underlying topic which was not found in other studies.

4.1.4 Stance

The second important area to consider when discussing how the nature of the conversation changed over time is examining how teachers’ knowledge-based reasoning changed. The literature reviewed divided knowledge-based reasoning into three stances: descriptive comments, evaluative comments and interpretive comments. Descriptive reasoning is the basic form of reasoning in which a teacher simply describes what it noticed in the video. For example, in Video Club Two meeting Jane says, “Did someone say the anti derivative or did you say that? It sounded like someone said it but I couldn’t hear.” An evaluative stance is one in which a teacher is determining the value of what occurred in the clip as is seen when Beth says, “I think in this case you could have asked three or four more questions…You could have led them and they could have come up with the antiderivative” (Video Club 2, April 14, 2009). This evaluative stance may be implied, and not explicitly stated. Finally, an interpretive stance is one in which a teacher makes inferences on what it witnessed in the video. This can be observed in the following segment:

D: So he was trying to do this: $e^3 = 2x - 1$. So then he wrote it and he still could not solve it.

B: Because he did not see e to the three as a number. (Video Club 1, February 19, 2009)
The teacher does not know what this student was thinking, but was interpreting what she saw in the video and inferred.

It should be noted that it was difficult to classify some statements as simply evaluative or simply interpretive because sometimes there would be both in the same idea unit or even the same sentence. An example of this is evident when Amy said, “You know what I really liked about it. When you know, G, asked you a question and repeated it and he flipped his understanding” (Video Club 1, February 19, 2009). Amy begins by stating that she likes the clip (evaluative) but then goes on to interpret the student’s comments in that same segment. In these cases, I classified the comment by the “deepest” stance that was present in the idea unit.

With regards to stance, I was looking for a significant change, from a descriptive or simply evaluative stance to a more interpretive stance. For example, during the first video club meeting the teachers were not even sure what to comment on as Beth said, “We want you to tell us what we want to talk about. Then we want to talk about it. We are hesitant to say what comes to our mind. We don’t know what comes to our mind.” (Video Club 1, February 19, 2009)

In the final video club meeting Beth had figured out what to talk about and was able to initiate more of the conversation as she discussed her clip:

One thing I wanted to mention, and I know you talked about this before D, but were there any (reads from the prompt sheet) places in the clip where there was an opportunity to run with an idea or a thought that a student had? Definitely where you paused it earlier with the pi over eight because there are eight pieces. I totally did not address that question because, in my head, this is what I have got to teach and this is what I have got to do. Even though I heard that question, I did not go with it. He will figure it out after when he sees the whole picture, he’ll figure it out. Whereas it would have taken me one minute to say ahh… over eight yeah there are eight pieces. Where’s pi, well there’s really two pi We could have covered half the unit circle and saw that there were four cuts. Then we’d have the whole circle but this line is really one cut.

(Video Club 5, June 16, 2009)

There seems to be a more interpretive stance taken here by Beth compared to her remarks in the first meeting. Beth is discussing her own thinking, the student’s thinking and is interpreting
what happened in her own class. The fact that she is discussing her own teaching “I totally
didn’t address that question” as well as discussing what the student might think, “he will figure it
out after he sees the whole picture…” implies that she has developing her knowledge-based
reasoning. She is not simply describing what happened by saying something like “I missed that
question he asked” nor is she only evaluating her teaching, although there is an element of
evaluation in her comment. She is attempting to interpret what went on in that moment, how she
missed a student’s question and completely skipped over it.

Beth is reflecting on her actions and why she made that decision and she admits “it would
have taken me one minute to say ahhh over eight there are eight pieces”. She is figuring out the
mathematics and what her students did not understand and how to fix it as well when she says
“we could have covered half the unit circle and saw that there were four cuts.” I felt that this one
example may perhaps be indicative of the potential of this type of professional development if
continued over the long term. Table 7 illustrates the stance taken by the teachers.

<table>
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<th>VC 2</th>
<th>VC 3</th>
<th>VC 4</th>
<th>VC 5</th>
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<td>2</td>
<td>18%</td>
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<td></td>
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<td>100%</td>
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<td>100%</td>
</tr>
</tbody>
</table>

When the actor was the “video club” we did not classify those comments as being
descriptive, evaluative or interpretive and instead classified them as “other”. This is because
those comments were comments such as “Can you explain?”,”Is this class in period 1 or period
2? “Is this class standard level or studies” rather than discussion comments. These numbers are
very small and not statistically significant.
The table shows that there were few descriptive comments, which is not entirely unexpected as they were quite low in other studies. The evaluative comments were very frequent and did not decrease over time as I expected. The interpretive comments did not increase over time as I anticipated.

4.2 Discussions Around Pedagogy

Many of the conversations that took place in my video club meetings were regarding pedagogy. The specific issues surrounding pedagogy stemmed from the video the teachers watched but were not necessarily directly related to the video content. The video acted as a jumping off point for conversations. Strategies for differentiation and questioning strategies were the main themes I identified. Also of interest was that discussions surrounding the mathematics involved only occurred rarely.

Two of the video club meetings had conversations that focused on how to employ strategies to differentiate the lesson. When we were discussing a lesson on factoring in which the teacher was wondering how to challenge her top students, while also reviewing with her struggling students, this discussion took place:

JM: There’s definitely an opportunity for differentiation there. One kid could create the hardest factoring problem they can come up with and give it to someone else to try and solve and vice versa

D: Oh, that’s a good idea.

JM: Or, give a contest. Or, find the C questions in the chapter and that’s hard b/c you lose control of where they are at…..

A: Or you are supposed to start each unit with a diagnostic and I never do that. The purpose of the diagnostic test is to separate the kids into groups. So then you can differentiate more.

(Video Club 3, May 27, 2009)
There were several strategies mentioned that could have helped the teacher enrich the material for her stronger students while helping her other students review the difficult material. Teachers would give advice of this sort to each other and shared what they did in their classroom.

Another discussion that touched on differentiation was in regards to a student who was not paying attention to the lesson. The teacher had written three different solutions to a problem on the board and was going over it with the class. The student was not paying attention to the explanation, and instead was looking intently at one of the explanations still written on the board.

A: The whole thing James was doing was to show them three methods. So if they are not going to watch that method. I do not know, for me and my comfort I want them to listen and it is also a good habit. Pay attention to what’s being talked about. And if you need time you need to speak up and say can I have a minute to write this down.

D: And that is true too. I can sort of see both sides because I know as a student once I decided I liked one method I do not want to hear any more.

B: Yeh.

A: That’s not good. That’s not being opened minded.

D: I know. That’s not being open minded.

A: That’s like saying, I don’t want to learn elimination. I just want to use substitution. Well..

D: That’s a good argument. That make sense.

(Video Club 4, June 8, 2009)

Different teachers had different ideas about what to do with a student who was not paying attention to this part of the lesson. Later on in the same meeting the teachers were still discussing whether the student should have been forced to listen to the explanation from the teacher about the three solutions, or whether it was a form of differentiation not to make a strong student take certain notes or listen to a certain explanation, just because the rest of the class has to do it. As James later says, “I leave him to himself because he is an independent learner” to which Amy replies, “I think the bottom line is to know your kids” (Video Club 4, June 8, 2009).
The next pedagogical issue that was raised during the meetings touched upon questioning strategies used by the teacher in the video. Teachers were happy to give suggestions about what to do when the questioning was seen to be less than perfect. For example,

B: You asked a question and then jumped in. You didn’t give time for them to process the question to get the answer. There was a little pause and then you gave the answer.

A: I think to that if one kid shouts out the answer that’s why you want to have kids raise their hands because if one kids shouts out the answer after one minute you need to give the other kids two minutes because if someone shouts out the answer then they stop thinking.

B: For me, the answer to hand up verse non hand up is, in a lesson like that when you perhaps didn’t have think of your questions exactly before you were giving the lesson. You know the problems but having them shout out popcorn style to keep the flow is good. But sometimes where you are really trying to develop a concept you want to give that whole class a chance to think about that problem

(Video Club 2, April 14, 2009)

The teachers evaluated what the teacher had done and then made some concrete suggestions regarding how to best improve the situation. There were many other strategies mentioned by the teachers: counting to ten and putting one’s own hand up. A teacher also mentioned how to choose questions carefully in order to generate a better discussion.

James: Some of them you were, at the beginning you would ask a question and answer it yourself. The first question, when you are finding the area of a square, it sounds really basic but maybe that’s an opportunity for the kids to think. It’s that situation whereby they are not required to think until you make them give an answer even though it’s a really basic question may even engage them in the guided discovery. If you actually ask them to answer it. Can anyone tell me the area of the square? Therefore, if we add a curve, can anyone tell me, hands up, how might I find the area if it’s under a curve? I wonder what might happen if we move that over; and it’s a square and a triangle, what might I do now? And that process, if you’ve asked the first couple of questions with the hands up, they might pick up the hands up concept a little later on. But it engages them if you pick five or six different kids.

A: I think too, and I do this and I hear kids do it all the time, but when you say to kids “this is easy” that sometimes it can be degrading to kids where it’s not easy. I know you say “obviously it’s four” and they didn’t’ think it was easy that that makes them feel Bad.

D: It’s the area of a square though.
A: That’s true but as Jeff was saying you are right. They probably have not done a questions with the area of the circle minus the square since they were in year two or year one so it makes them recall information from then.  

(Video Club 2, April 14, 2009) 

The comments did not necessarily relate directly to the video all the time but were always generated by the video that was observed. 

Lastly, the lesson content was not a focus of the conversations. The mathematics was discussed in two idea units in Video Club 5, but not in any of the other thirty-five idea units that involved discussions surrounding pedagogy. This is similar to findings reported by Miller and Zhou (2007) which state that U.S. viewers of videos are more likely to make comments about general pedagogical issues and fewer comments about the mathematics actually being taught. 

4.3 Facilitation 

Over the course of this study, it became apparent that the facilitation seemed to have a large influence over what was discussed. Hill also warns readers that the “quality of the product, capacity of the providers, transfer and coherence” (2009, p. 470) are all problems with the current professional development models. I highlight the previous sentence because I believe that what Hill says is at the core of why I chose to study my facilitation. 

My study did not get the results I expected. The teachers did not spend more time talking about the student, there was not a general increase in the discussions that focused on mathematical thinking, the facilitator-initiated student centred idea units did not decrease over time, and there was no increase in teachers’ interpretive comments. Consequently, I had to look back at the video club and look for reasons for these differences.
What I discovered was that, in the first video club meeting, I seemed unsure about what I was doing. I also seemed nervous about working with my peers in this manner and lost my focus even though I had written prompt questions in front of me as is evident here:

J: When we are looking at these what are we supposed to be thinking about and looking at? (5:40) And looking for?

D: Absolutely, anything. Absolutely – it is things like what is your initial reaction to the clip. And it can be comments like – you know what it’s too hard to hear...or it would be more interesting if this happened or if I could see this part of the lesson it would more interesting. Anything, or in fact the more critical reactions I can get, the better selection I can do for the next clip. Does that make sense? (Video Club 1, February 19, 2009)

When I said “anything, anything” I misdirected the conversation. I know I was aware of what I was supposed to look for because earlier in the video club. I commented, “With the clip, I did some reading about what you are supposed to pick. I read that you are supposed to pick ones with a lot of student thought in them so that’s why I picked this one.” (Video Club 1, February 19, 2009) Also, later in the same meeting, as I tried to direct the conversation towards looking at student thinking, one can see that I also drove the conversation towards the quality of the pedagogy as seen here:

D: Even this explanation. Where I said to Graham..... He’s trying to figure out the e to the x thing. Which I do not care how many times I teach it – I will never be comfortable with it. I do not know if the explanation I gave him was good. I don’t know if me saying…”3 equals for the e..yeah it was this...like it was this – to find the x – intercept – (writing on a page). So he was trying to do this So e to the three = 2x -1. So then he wrote….and he still couldn’t solve that. (29:50)

B: Because he didn’t see e to the three as a number.

D: Yeah

B: Because he didn’t see e to the three as a number. Yeah (Video Club 1, February 19, 2009)

The next example later in the same video club meeting illustrates that I did have an idea that I was supposed to help direct the teachers to discuss student thinking. That said, I also
didn’t encourage conversation related to student thinking, even when it was brought forward by a teacher, for example:

   A: You know what I really liked about it. When you know, G, asked you a question and repeated it and he flipped his understanding.

   D: Yeah

   A: You said “not that’s not what you said”. So if he had just said that first sentence you would have just assume he understood but since he asked the question again and spoke about it twice, he actually didn’t understand it.

   D: No, he didn’t understand it.

   A: Right, If he had just said the first two lines. If you had moved on you would have thought, oh, he gets it. He didn’t right. I mean it’s easy to ask kids to repeat stuff back to you to see if they get it or not and then see if they really understand.

   D: That’s a good point. I didn’t think of that.(9:30) silence for 8 seconds.

   James: In terms of the actual sound I find it hard to hear. So whether you put microphones on the kids so you can hear them.

   (Video Club 1, February 19, 2009)

My answers are short and I didn’t encourage anyone else to comment on that or use it as a place to jump into a deeper discussion about what he was thinking. This may have been why the next comment, from James, after 8 seconds of silence was about the sound of the video instead.

   Overall, I lost sight of what I was supposed to do. I believe this was due to nervousness, lack of a clear focus, and preoccupation with the quality of the video.

   In Video Club 2 meeting I actually derailed the conversation from the beginning as seen here as I comment before I show the video:

   I’m trying to get them to figure out that the antiderivative is the area. I will start at minute 14 and then go to the end. When we are doing these conversations, we have to keep them focused on mathematics and mathematics teaching as opposed to classroom management that’s why it was good I went to see my professor because she said that would be another whole set of data I would have to compare. It would be a good thing for us to talk about in general if we did this on our own but (read from the sheet given to the members)..so are my questions too short or long? How could I improve them? Can you suggest some questions and when you would have asked them? Does it matter if I
make them raise their hands? Discovery learning or inquiry based learning is something that many people encourage. When do you think it is appropriate to use it – all the time, some of the time, never? Is coverage more important than depth of knowledge or is there some balance? How can we find that balance?

(Video Club 2, April 14, 2009)

This is why there was not conversation related to the student in Video Club 2 meeting. I actively tried to get them to discuss something else. This conclusion may be confirmed if one looks at Table 4 and sees that in Video Club 2 meeting, I did not facilitate any of the idea units in which the actor was the student.

The third Video Club meeting I handed out the class transcript with the following typed at the top of the page:

Focus: Questioning technique/Student Thinking

- Let’s watch it through first and discuss. Feel free to ask me to stop the tape at any time to clarify something or discuss something of interest right away.
- General thoughts on the clip?
- How can we see if a student understands something?
- Comments on questioning (types of questions, frequency etc)?
- Were there any openings or insights into the aspects of this topic that students are confused by in the segment?
- Were there any places in the clip where there was an opportunity to “run” with an idea or thought a student had?
- Do you feel the boys had a good understanding by the end of the segment? What contributes to that?

I believe that this list of questions is evidence of my refocus on my purpose and shows that I started to truly understand what discussion I wanted to encourage during this video club meetings. I also started to lead the conversation in the right direction when I brought up something a student mentions about quadratics and trinomials when doing a factoring problem:

D: The trinomial part were you thinking of?
A: Maybe

D: Because I couldn’t hear when I was transcribing it on my headphones. Now I hear some kids did say trinomial. I thought it was interesting that one kid said quadratic
B: quadratic

D: and I think that was an opportunity to like pause for a second and like say, I could see that being like, quadratic, trinomial. When is a quadratic a trinomial and when is a trinomial a quadratic? When is a quadratic not a trinomial?

A: Right. I think what they were fighting with (12:35) there because the last question it wasn’t a quadratic it was a trinomial. So that’s interesting that I could have done that. They were saying oh, $x^5+x^4+1$, can you factor that? No. Right.

D: What they are thinking is…(12:54) whenever there are three terms…I can do this…

A: I can factor

D: …this brackety bracket thing she makes us do. I didn’t really think about that til I saw this and he’s thinking….oh…..

(Video Club 3, May 27, 2009)

While I believe this signified a change in the conversations, I also note that I am still connecting the teacher to the student and am not solely focused on the student and their thinking.

The percentage of the conversation that focused on the student increased from Video Clubs 1 and 2 (23%, 0%, see Table 4) to this meeting (35%). Again, when one looks at Table 5, the facilitator initiated the conversation about the student 21% of the time, a big jump from the 0% in the previous video club meeting.

In Video Club 4 meeting I actually stopped the tape and we watched a student looking at solutions on the board and discussed what he was thinking for several minutes.

D: No no no. I see it there. He’s probably still looking at the side board and he’s not ready to go on yet he’s still there going hmmm

B: And I think it’s okay in this setting

D: (still pretending to be the student) and I’m moving this over here and over here.

J: But I see that in one respect he is sitting there and not listening to me but in another respect when I have finished writing, knowing this kid and I know he’s a kid who can read the solution and follow it –so does he have to actually listen to what I am saying and follow the solution to get anything out of it. Can’t he just look at that solution and look at his own solution and look at the third solution and go – I like that part that and I like that part there and …

(Video Club 4, June 8, 2009)
The fact that we watched a student over again was a first for the video club and it resulted in a conversation that very focused on the student (36% of student comments directly related to the video; 63% overall). The facilitator initiated the conversation that focused on the student 24% (Table 6) of the time which was more than the previous video club and only discussed the teacher 5% of the time. This indicates that I had progressed somewhat in my ability as a facilitator.

By the last video club meeting I knew what I was looking for and even stopped the tape at the beginning of a session at a point when a student commented that if you slice a pie with four cuts, that you should get sectors of $\frac{\pi}{8}$ radians because there were eight pieces.

Group watches clip for 2 minutes (3:22)

D: I just want to stop it for one second. That one over eight, because there are eight pieces that never even crossed my mind

B: And it’s so good to go with because it’s two pi and it would be so good to run with it but I didn’t.

A: Because it’s a whole circle.

D: Because I took a pie and made it into eight pieces and that’s way that analogy maybe could be confusing.

(Video Club 5, June 16, 2009)

While the discussion is still referring to what the teacher should have said and done, at least it is in response to a comment from a student.

The teachers also seemed to be more confident about what we were doing and began directing the conversation, even reading from the prompt sheet as seen here:

B: One thing I wanted to mention, and I know you talked about this before Deirdre, but were there any (reads from the prompt sheet) places in the clip where there was an opportunity to run with an idea or a thought that a student had. Definitely where you paused it earlier with the pi over eight because there are eight pieces. I totally didn’t address that question because in my head this is what I have got to teach and this is what I have got to do. Even though I heard that question, I didn’t go with it. I was like, he’ll
figure it out after when he sees the whole picture, he’ll figure it out. Whereas it would have taken me one minute to say over eight yeah there are eight pieces. Where’s pie, well there’s really two pie We could have covered half the unit circle and saw that there were four cuts. Then we’d have the whole circle but this line is really one cut.

(Video Club 5, June 16, 2009)

I also argue that the ratio of facilitator to teacher student focused idea units increased slightly over time. Table 5 shows us that I only initiated the conversation 7% of the time and the teachers discussed the student 20% of the time. It was not the most significant amount of time we had spent focused on the student, but it was the best ratio of facilitator to teacher initiated conversations to date. This can be seen in Table 8.

<table>
<thead>
<tr>
<th>Initiator</th>
<th>VC1</th>
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<th>VC3</th>
<th>VC4</th>
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</table>

One can see that the ratio started high, decreased (when I derailed the conversation in session 2) and went back up again which I argue could imply an improvement in my facilitation. Still, even with this possible improvement I was not always successful at redirecting the conversation back to the student and the thinking seen in the tape itself. I never read out loud any of my prompts in any video club meetings, except in Video Club 2 which were not the ones I was supposed to use.

4.4 Summary

When using the lens of professional vision to analyse my data, I found several unanticipated results. First I focused on the actor in the video. While the teachers did discuss students a significant portion of the time, the focus on the student did not increase over time.
Teachers tended to speak less about the teacher in the video, which was anticipated, but increased their teacher focus by reflecting upon their own teaching and practice. In terms of who initiated the conversation regarding the student, no visible trend was detectable.

I also studied the topics the group discussed. In this analysis, the level of discussion surrounding classroom climate (low focus) and pedagogy (varied) was not unexpected. However, we did discuss classroom management issues more often than seen in other studies. In addition, I did not see the increase in mathematics thinking that was hoped for.

The second dimension of professional vision, that of knowledge-based reasoning, also did not yield the results anticipated. There were few descriptive comments, which was a little unusual. The evaluative stance was high and did not decrease over time. The interpretive stance varied and did not increase as expected over time.

My facilitation was not focussed and varied from literally misdirecting an entire meeting, to more subtle forms of misdirection such as attempting to discuss the student and the student’s mathematical thinking but managing to link it back to teacher and pedagogy. There was some improvement shown in the ratio of student focused ideas that may indicate that, if the clubs had continued, I was beginning to do a better job with my facilitation. Doing this self-study has helped me become a better facilitator and made me more aware of the importance of good facilitation in a video club.

The conversations that were had by this video club focused mainly upon issues surrounding pedagogy. Those issues were prompted by the video content and allowed teachers to share their ideas and experience with the group.
Chapter Five: Discussion

5.1 Major Findings

In this thesis I wanted to investigate the answers to the following questions:

**Question 1: How did teachers’ professional vision, as assessed through the video club discussions, change over time?**

I structured my study around the professional vision framework as defined by Sherin (2007). My results were not what I had anticipated based on Sherin’s other papers and I came to understand it was most likely my facilitation that affected the results. This is a finding in and of itself. Sherin (2006b) encouraged further research into “the context in which the video club takes place, the effect of the video club facilitator, and even the order in which the video clips are presented” (p.24). I believe my analysis shows that the facilitation played a role in how the conversation in the video club changed over time. This is important to note.

Learning theorists believe it is important to create situation in which teachers can examine student thinking. For example, Davis (1990) believes that creating opportunities for teachers to be able to examine student thinking is one of the keys to being able to understand how the student is constructing the information and thus allow us to help the students create the appropriate mathematical construction. It is important to be able to know what students know so we can help them reconcile their thinking (Ball, 1997; Leron & Hazzon, 2009). This video club was intended to be the place where teachers would be prodded to begin to focus their attention on the student in the video and encouraged to examine student thinking. It was hoped that as the members attended more sessions, that they would discuss the student and their thinking more often. This did not occur in this video club.

The teachers’ professional vision did not change in the way that I expected over time. I expected the teachers to begin to pay more attention to the students over the course of the five
meetings. In fact, there was no conclusive pattern that I could discern. When examining Table 4 I noticed that my results are not similar to Sherin’s studies. In her studies, the teachers talked less about the teachers over time and more about the students over time. In my study, there was no upward increase noticeable.

The teachers also did not focus on mathematical thinking as I had anticipated. Instead, most of the conversation was directed towards pedagogy. In addition, the interpretive comments made did not increase over time.

**Question 2: How does the role of the internal facilitator contribute to the development of professional vision in the club?**

I chose to study the facilitation which I believed was at the root of the reason why my results were not what was expected. While I acknowledge that the selection of the clips, time of day the club was held and its length and the participants may have also affected the results to varying degrees I have evidence that there were definite problems with the facilitation. I argue that if the facilitation was poor, all of those other aspects may not have been able to overcome the facilitation errors that were made.

In fact, I did show that the lack of focus in the facilitation was a contributing factor to the lack of development of the professional vision of the participants. Facilitation seems to be a more finely nuanced skill than I had anticipated. Being able to direct a conversation in a certain direction requires more practice than I would have imagined.

**5.2 Implications for Professional Development**

The study has implications for schools and professional development programs. If one wants to create video clubs within one’s school, it is not as simple as giving teachers the equipment and the time. The experience will not automatically increase student learning with the assumption that the video club will help teachers focus on students and their thinking. If we
want to see positive outcomes the facilitators will need to be aware of the pitfalls and will need training.

The video club model has the potential of being an effective model in that it meets many of the requirements for a good professional development outlined in the literature. The club is grounded in artifacts of practice (Hill, 2004; Elmore, 1990), and is also supported over time with regular meetings. The club “offers opportunities for observation, critique and reflection; it provided opportunities for group support…and involves deliberate evaluation and feedback by skilled practitioners with expertise about good teaching” (Elmore, 1999, p. 263). Indeed, if the participants watch themselves teach in one of the sessions, it can also be a transformative experience, one that has the potential to “disturb in some fundamental way the equilibrium between teachers’ existing beliefs and practices” (Thompson, 1999, p. 355). This is another requirement of good professional development experiences and I believe that watching oneself on video can shake the equilibrium of many practitioners.

The fact that this video club was not an effective one, based on the measure that the focus on student thinking did not increase over time, does not mean that it does not have the potential to be. Evidence for this may be found in the studies conducted by other researchers such as Sherin (2006) and Borko (2008). It also tells us that, even when a professional development model seems to fit all the important criteria, it does not necessarily mean it is going to be effective. We must always consider the human and environmental components. For example: Who is facilitating this experience? Who are the participants? What clips were chosen? What was the condition under which the video club was conducted? Teacher enjoyment may not be a good indication of a good professional development as it may not improve the teacher as a practitioner and thus may not help us reach the ultimate goal of increasing student learning.
This study provides further evidence video does not always produce the outcomes that are desired (Fuller, 1973). Just because we are grounding our professional development in a video, does not necessarily mean that teacher learning will occur.

5.3 Recommendations for Creating a Video Club

One of my goals when writing this project was to figure out how teachers could make this a sustainable project in their own school. Wagner (2008) argues forcefully that, “I truly believe that viewing and discussing videos of teaching and supervising is the single most effective strategy for improving instruction in all schools; yet it is almost never done” (p 142). If experts feel that watching videotapes of one’s teaching is so vitally important, why is it never done? The factors that seemed to support this particular video club were:

1. the technology availability, know-how and support from school
2. willingness of teachers to devote their time
3. facilitation techniques
4. clip selection
5. atmosphere in the club.

I will address each of these factors.

5.3.1 Technology

In the past, when researchers have used video recording equipment to record classes, there was generally a second person in the room filming the class. While the quality was very good, for a teacher, it would mean going to find the equipment in his or her school, signing it out, learning how to use it and finding someone else to do the filming. While new technology has made all of this much easier it may still be intimidating for some people.

With the onset of the digital age, the technology is within many more peoples’ reach at this point. From inexpensive video cameras, video recorders in the form of built-in camera or
web cameras, or the video capabilities of cell phones, the ability to record by video is easier than ever before. However, learning how to capture and store the videos can be overwhelming for the technophobe. Good resources for help may lie within the school from a fellow teacher to the students themselves.

The teachers who are facilitating the video club need to make sure they have training in how to film and store the videos to watch. One should expect to film twice as much footage as one needs to watch (for example, if you want to meet twice, film at least four classes). This is because, in some classes, you will find there may be lots of student-teacher interaction and many things to discuss. Other classes may be more teacher-centred with little to comment on. The students may be doing group work which is hard to film because of the noise level in the room. One must be prepared for plans to change.

In addition, the laptop was unobtrusive as it was a standard part of the classroom environment and so probably had less of an effect on the dynamics of a classroom. This suggests that these videos are perhaps a more accurate snap shot of a teacher’s classroom than if an administrator drops in for an evaluation. The “invisible” visitor, easily forgotten in a few moments, means that students will ask their regular questions without being self-conscious. Having a not-so-perfect lesson gives teachers something interesting to discuss (Sherin (2006b), Shulman (1996), Seago (2004)). If we want to help teachers learn how to observe student thinking in the midst of their lessons, I believe it is important that the lessons look realistic. Indeed, Miller and Zhou state that “what makes video compelling is their ability…to communicate to viewers something of the chaos and complexity of classroom interactions” (2007, p. 332). It is not absolutely necessary for teachers to identify with a classroom in a video to learn how to change the object of their attention; however, having the classroom look realistic may make it easier for teachers to relate to it.
5.3.2 Finding Participants

The second factor in the success of the video club was finding willing participants. Time is another often cited restriction when it comes to teachers being able to meet. Teachers often say they don’t have the time to visit one another classes. In this study, only two of the four participants (of five if you include the researcher) had ever watched any other teacher teach live before and one of the two had only done it once for twenty minutes. When I was first investigating video clubs I noted that some video clubs required a large time commitment (Borko, 2008) involving a summer commitment or a full day off each month to participate in the program. Others were about forty minutes to one hour long (Sherin, 2009, 2005) and while that time commitment seemed more reasonable, the clubs were entirely organized by full-time researchers.

One of the goals of this project was to see how the clubs would play out with no full-time researcher involved and to also shed some light on what factors support productive discussions.

The school year is busy and most professional development is done on days when there is no school so teachers do not feel rushed and harried. The problem, at least for my school, was that it was difficult to carve out time on those days for this type of professional development. School districts and schools usually set up their professional development far in advance and our school does not encourage individual plans such as this one. Therefore, we had to find time do to it during the school year. I would recommend after school meetings as lunch was quite rushed. However, lunch did work for us and all of the participants said that they enjoyed the experience. However, this year when I asked faculty if they wanted to participate in a video club, only one person out of a faculty of approximately sixty people wanted to participate.
5.3.3 Facilitation Techniques

As documented in this thesis facilitation is one of the key aspects to a successful video club. Create prompts that will encourage teachers to talk about student thinking. Simply saying “What do you notice?” may not send the conversation in an appropriate direction. A facilitator should read from the prompts, be comfortable with silence and not be afraid to rewind the tape and repeat a part that shows student thinking. They can attempt to keep the conversation focused on the video and its content although the conversation may drift back to the teachers’ own classroom and practice. I believe it is important to try and keep the conversation focused on the video because, otherwise, the conversation may change and end up having nothing to do with the video.

In addition, as I was a participant in the video club and was member of the department, that aspect may have affected my results. However, the study of the actual dynamics of colleagues studying colleagues may actually be a more realistic scenario if video clubs are going to be more commonly adopted as a form of professional development.

5.3.4 Clip Selection

Sherin’s (2006b) study points out that it is not easy to predict which clips will encourage productive conversation. She found that clips with both high and low depth of student thinking generated good conversations. It is the engagement level of the student that signifies the depth, not the task itself (Sherin, 2006, p. 9). The clarity of the student’s thinking (to viewers) was also an important factor. If a clip was low in clarity, then it may lead to productive conversations because the teachers have to figure out what the child is thinking. In this case the depth can be high or low. When the clarity is high then the depth must be high as well so the teachers can find something to talk about. With these factors in mind, it is up to the facilitator to choose something that will generate conversation.
5.3.5 Establishing a Productive Environment

The last important factor to support a successful video club is to create an atmosphere of trust between the participants. For the first two club meetings, I put myself in the video that we watched. After the second meeting, I asked if anyone else wanted to volunteer and everyone said yes. At that point, they all felt more comfortable about being videotaped and knew the focus was not going to be on them, but about the students and their learning.

Ultimately, I wanted to know if this form of professional development would be sustainable. I am still not sure about the answer to that question. The studies conducted by Sherin and Borko indicate that significant learning can take place in terms of teacher refining their professional vision. As a grassroots initiative, this would be difficult to maintain over the years, which is one of the conditions of successful professional development. This is supported by my own experience that while all the teachers indicated that they enjoyed the experience and would repeat it, when called up to volunteer, only one of the four volunteered the next year.

If this is going to be successful, it will need to be developed at a school-wide or district-wide level so that teachers encouraged to do this by being given time.

5.4 Reflections of the Researcher

I learned many things during this process. The first was the challenge with working with the video technology. Storing the large video files and transferring them from place to place turned out to be more of a challenge than I first anticipated. My computer crashed during one of the sessions and I lost our entire conversation, which was frustrating. In addition, I was concerned that I would be very nervous about watching myself on video and sharing my classroom with others. It was difficult the first time. However, subsequent encounters with myself on video and watching my class with the others became progressively easier. I have now filmed several more of my classes and am sharing them at a conference in June 2010.
Furthermore, choosing the clip was very difficult and what was usable varied from teacher to teacher. If a teacher did not encourage active conversation, it was hard to find clips that had obvious samples of student thinking.

The second challenge I did not anticipate was how hard it was to get the conversation started. People were unsure of what to say. I felt that perhaps they were confused about the difference between a discussion about student thinking and an evaluation of the teaching. This was most likely because I did not discuss this clearly with them at the beginning. It would have been a good idea to model what I wanted them to focus on at the beginning. It was this lack of focus that I believe affected my results.

As I began to analyze the transcripts, I began to see that teachers were not paying more attention to student thinking, nor were they beginning to interpret the video more often and the facilitation required did not decrease in the manner that it had in Sherin’s work. I asked myself, why?

There are several differences between Sherin’s studies and mine: the facilitator as teacher-researcher; the video club meetings were shorter and during the school day; the video clips chosen were different and the participants were different. I do not believe that the time of day necessarily affected the discussions, and I had no way of ascertaining if the participants in my study were the source of the discrepancy. However, I was the lone facilitator and it seemed more likely that the fault was somehow mine. I decided to see if the facilitation was part of the reason for the discrepancy.

I chose not to study the clip selection because I believed that if the facilitation was at fault then I was not going to be able to analyse if the clip was good or not because my results would have been misled by the poor facilitation. In order to determine the clip quality I would have rated it in terms of its quality and then compared the rating of the video clip with the productivity
the video club in which it was watched. However, if the facilitation was at fault, then that comparison would have been invalid. Consequently, I decided that it would not be productive to analyse the quality of the clip.

Finally, I learned a lot about my own teaching. I realized that some criticism that students have voiced in the past are in fact true. For example, I teach quickly, like I am in a rush. I am like that in life and I rush through everything and am always in a hurry. I found it beneficial to watch myself on video and face that reality in a supportive environment instead of hearing it at parent-teacher interviews and getting defensive about it. I could not ignore it and having people around to draw my attention to it in a kind way was great. I always give the answers and never let kid think. I also have to watch the way I handle questions and deal with the way some kids take over the class. I need to use some of their suggestions: put my hand up to indicate they should have theirs up; ask them to think instead of answering; wait for a certain number of hands to come up before I accept an answer. I liked James’s suggestion that this allows the kids to get engaged instead of simply sitting there like wine glasses waiting to be filled.

Right after this video club meeting I had to teach and I immediately used some of the suggestions from my colleagues. I slowed down. I let kids do the discovery activity I designed instead of rushing them to the punch line. I told them I would wait for six hands to go up before I accepted an answer. I waited between my questions and the answer. I told them to think about it – and not give me any answers. I just slowed down. I have to obviously keep practicing this skill so it becomes part of me. But at least I am aware and am making the change. I am impatient and I have to work on that.
5.3 Recommendations for Further Research

Further analysis should look at training teachers in facilitating these clubs and then conduct a similar study, under similar conditions to see if teachers do refine their professional vision. In addition, it may be important to study how the time of day of the club and it’s length affect the outcome. Were the participants feeling too rushed and not able to focus due to the timing (lunch) of the meeting? Further, is this form of professional development successful with all teachers or are the teachers who have chosen to attend these sessions by their very nature self-reflective and keen, since they are attending these sessions voluntarily? Sherin has done more work looking at how to select video clips and it would be helpful if that work was expanded upon to include a rubric to help teachers select video clips that will produce a productive conversation.

5.6 Conclusion

In other studies, video clubs have been shown to an effective way to teach teachers to learn to notice student thinking. The results from this study suggest that the facilitation techniques employed during a video club are a major factor in the success of the video club, in terms of developing teachers’ professional vision.
References


Hill, Heather (2009). Fixing teacher professional development: a broken system of professional learning requires decisive action in order to ensure wise expenditure of limited resources. Phi Delta Kappan, 90(7), 470.


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Appendices
Appendix A

Video Club Discussion Questions

Focus: Student Thinking

• General thoughts on the clip?
• What did you notice in this exchange?
• How can we see if a student understands something?
• Were there any openings or insights into the aspects of this topic that students are confused by in the segment?
• Were there any places in the clip where there was an opportunity to “run” with an idea or thought a student had?
• Do you feel the boys had a good understanding by the end of the segment? What contributes to that?
Appendix B

Reflection Questions

I will reflect on my perceptions of myself as a teacher before the video taping took place, and then document my perceptions after each session. Possible questions I may reflect upon are:

1. Comment on how the process of being videotaped and entering into discussion with one’s colleagues feels.
2. How would I describe my teaching? Did watching the video with the club change my perception of my teaching? If so, how?
3. Describe what is involved in this process of setting up the video club. What supports were available? What made it more difficult?
4. What did I learn from the video club?
5. What feedback did I get from my colleagues? What was my reaction?
6. Do I feel that this experience impacted my teaching in any way? If so, how?
Appendix C

Interview Questions

- What do teachers learn from the process of taking part in a video club?
- How does the conversation that takes place during the video club change over the course of the club?
- How do teachers who participate in the video club feel about themselves as professionals after undergoing this process?

1. On a scale of 1 to 10 (10 being very useful) how useful did you find the video club in terms of your professional development? Can you explain why you gave it that rating?
2. On a scale from 1 to 10 how useful do you feel going to conferences is? Can you explain why you gave it that rating?
3. On a scale from 1 to 10 how useful is going to workshops? Can you explain why you gave it that rating?
4. Have you observed other teachers at this school while they taught? Can you compare your experience of watching live teaching versus watching the video?
5. Do you think participating in the club affected your own teaching at all? If so, how? If not, can you suggest any reasons why not?
6. Did your participation in the club change your perception of yourself as a professional? Did it change your perception of anyone else? In what way?
7. Did your participation in the video club change the way you think about any aspects of the classroom? Why?
8. What did you like or dislike about participating in the video club? What would you change? (prompts: time of day; frequency; choice of video clip)
9. How did you feel participating in the club affected relationships between the participants?

If you chose to be filmed….
10. How did the presence of the camera affect your students during the class? How does this compare to when you are being evaluated by a human being?
11. How did it feel to be filmed?
12. Do you feel watching your own teaching was a valuable experience? Was it more or less valuable than watching someone else teach?
13. Did observing your own teaching change your perception of yourself? In what way?

For all participants….
14. Would you participate in a video club again?
15. Any more comments?
Appendix D

Information Letter for the Principal

December 10, 2008

Dear ____________:

Further to our conversation in September 2008, this letter is to explain the purpose of the research I am going to conduct at ____________ between January and June 2009 as part of my Master of Arts thesis which is based out of the University of Toronto.

In order for teachers to improve as professionals the research says that it is important for teachers to undergo sustained and on-going professional development that relates to the classroom. In fact, much of the research encourages teachers to regularly visit one another’s classrooms to learn from each other’s teaching. Indeed, the ________ Essential Agreements states in point six of the document that faculty must commit “to learning and sharing knowledge and expertise”.

In the spirit of that essential agreement I would like to conduct a study of a video club as a means of professional development within the mathematics department. In this club, three to four teachers (myself included) will watch a five minute video of one of their classes every two weeks for five to seven weeks (some teacher’s classrooms will be filmed more than once). The discussion that takes place in the video club will be video taped and transcribed during each meeting. It is these video transcripts that will be the focus of the research.

My research questions are:
1) How can videotaped teacher practice be used for professional development in a video club?
2) How does the conversation that takes place during the video club change over the course of the club?
3) How do teachers who participate in the video club feel about themselves as professionals after undergoing this process?

There are no anticipated risks to the subjects participating in the study and you are welcome to review and comment on any parts of the dissertation that represents this research before publication. All the participants may withdraw at any time without reason.

If you have any further questions, please do not hesitate to contact me. Please sign both copies of the attached consent form and keep one for your records.

Deirdre Timusk
Appendix E

Consent Form for Principal

I, (name), principal of (school), consent to have Deirdre Timusk conduct research for the study entitled:

Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

with selected teachers at (school).

The nature and purpose of the research has been explained to me by Deirdre Timusk, who is conducting the research at the Ontario Institute for Studies in Education at the University of Toronto under the supervision of Professor Indigo Esmonde. A copy of the letter explaining the study is attached.

I understand that there are no anticipated risks or benefits to the subjects from participating in the study and that I may review and comment on any parts of the dissertation that represents this research before publication.

The researcher is authorized to proceed on the understanding that I may withdraw my consent at any time, without reason.

Witness _______________________________

Signed: _______________________________

(Principal)

Date: ________________________________

Please sign two copies and keep one copy for your records.
Appendix F

Information Letter for the Teacher

December 10, 2008

Dear Mathematics Department Member:

Further to our conversation in September 2008, this letter is to explain the purpose of the research I am going to conduct at (school) between January and June 2009 as part of my Master of Arts thesis from the University of Toronto entitled: Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

In order for teachers to improve as professionals, the research says that it is important for teachers to undergo sustained and on-going professional development that relates to the classroom. In fact, much of the research encourages teachers to regularly visit one another’s classrooms to learn from each other’s teaching. Indeed, Essential Agreements states in point six of the document that faculty must commit “to learning and sharing knowledge and expertise”.

In the spirit of that essential agreement, I would like to conduct a study of a video club as a means of professional development within the mathematics department. In this club, three to four teachers (myself included) will watch a five minute video of one of their classes every two weeks for five to seven weeks (some teacher’s classrooms will be filmed more than once). The discussion that takes place in the video club will be video taped and transcribed during each meeting. It is these video transcripts that will be the focus of the research. You will be expected to attend five 30 minute sessions, to be held at lunch time, over the course of the five months and participate in the conversations during this club. In addition, you will be expected to complete a short questionnaire and an interview after the final club meeting.

My research questions are:
1) How can videotaped teacher practice be used for professional development in a video club?
2) How does the conversation that takes place during the video club change over the course of the club?
3) How do teachers who participate in the video club feel about themselves as professionals after undergoing this process?

There are no anticipated risks to the subjects participating in the study and you are welcome to review and comment on any parts of the dissertation that represents this research before publication. Participants may withdraw at any time without reason. All names will be changed (coded) and the interview and video material will be kept in a locked desk for five years, at which time it will be safely destroyed.

If you have any further questions, please do not hesitate to contact me. If you wish to participate in this study, please sign both copies of the attached consent form and keep one for your records.

Deirdre Timusk, principal investigator
Appendix G

Consent Form for Teachers

I, ____________________________________, consent to participate in the research study entitled:

Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

The nature and general purpose of the research procedure has been explained to me by Deirdre Timusk who is conducting the research at the Ontario Institute for Studies in Education of the University of Toronto under the supervision of Professor Indigo Esmonde. A copy of the letter explaining the study is attached.

The researcher is authorized to proceed on the understanding that I may withdraw from the study at any time, without reason.

I understand that there are no anticipated risks or benefits from participating in the study and that I may review and comment on any parts of the dissertation that represents this research before publication.

Witness ________________________________

Signature ________________________________

Date ___________________________________

Audio/Videotaping Authorization and Release

I authorize Deirdre Timusk (the Principal Investigator) to create photographs, video and audio recordings of my likeness and/or voice, for use in research activities related to the project:

Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

I understand that these recordings will not be licensed but may be presented at a conference in a presentation at one point in the future. Please initial here if you are comfortable with the possibility that the recording may be presented at a conference: __________________. If this is not initialled, I will assume that you are not granting me permission to use this tape publically and I will not use any segment with your image as part of the presentation.

Signature ________________________________

Date ___________________________________

Please sign two copies and keep one for your records.
Appendix H

Information Letter for Students

December 10, 2008

Dear Students:

Please be informed that your classes may be videotaped during one or more classes between January 2009 and June 2009. All video taped material will be used exclusively by the mathematics department at this school in order to study teacher lessons, and student thinking in our quest to continually improve the mathematics instruction.

If you are uncomfortable with being video taped please let me know and I will ensure that I will not show any footage from the video in which you appear as part of the study.

All video taped material will be stored securely in a locked cabinet and destroyed after five years after the submission of the Master of Arts thesis of Deirdre Timusk entitled: Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

Please feel free to address any questions or concerns to your mathematics teacher or Mrs. Timusk.

Mrs. Deirdre Timusk
Appendix I

Consent Form for Students

I, ________________________________, consent to participate in the research study entitled:

Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

The nature and general purpose of the research procedure has been explained to me by Deirdre Timusk who is conducting the research at the Ontario Institute for Studies in Education of the University of Toronto under the supervision of Professor Indigo Esmonde. A copy of the letter explaining the study is attached.

The researcher is authorized to proceed on the understanding that I may withdraw from the study at any time, without reason. Participation is entirely voluntary. If you decide to participate, you may withdraw from this study at any time without giving a reason.

I understand that there are no anticipated risks or benefits from participating in the study.

Witness ________________________________

Signature ________________________________

Date ________________________________

Audio/Videotaping Authorization and Release

I authorize Deirdre Timusk (the Principal Investigator) to create photographs, video and audio recordings of my likeness and/or voice, for use in research activities related to the project:

Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.

I understand that these recordings will not be licensed or otherwise provided to other researchers, and will not be published to the public at large, without my additional consent.

Witness ________________________________

Signature ________________________________

Date ________________________________

Please sign two copies and keep one for your records.
Appendix J

Information Letter for Guardians of Students

Dear Parent or Guardian of UCC Student:

This letter is to explain the purpose of the research I will be conducting at this school between January and June 2009 in your son’s mathematics classroom as part of my Master of Arts Thesis at the University of Toronto.

In order for teachers to improve as professionals the research says that it is important for teachers to undergo sustained and on-going professional development that relates to the classroom. In fact, much of the research encourages teachers to regularly visit one another’s classrooms to learn from each other’s teaching. Indeed, the Essential Agreements states in point six of the document that faculty must commit “to learning and sharing knowledge and expertise”.

In the spirit of that essential agreement I would like to conduct a study of a video club as a means of professional development within the mathematics department. In this club, three to four teachers (myself included) will watch a five minute video of one of their classes every two weeks for five to seven weeks (some teacher’s classrooms will be filmed more than once). The discussion that takes place in the video club will be video taped and transcribed during each meeting. It is these video transcripts that will be the focus of the research.

There are no anticipated risks to the subjects participating in the study and all the participants may withdraw at any time without reason.

If you have any further questions, please do not hesitate to contact me. Please sign both copies of the attached consent form and keep one for your records.

Thank you.

Mrs Deirdre Timusk
Appendix K

Assent Form for Guardians of Students

I give permission for ______________________________, to participate in the
(Student’s name)
research study entitled:

**Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.**

I have read the attached letter explaining the nature, purpose and procedures of the study. I understand that Deirdre Timusk is conducting the research at the Ontario Institute for Studies in Education of the University of Toronto under the supervision of Professor Indigo Esmonde.

The researcher is authorized to proceed on the understanding that I may withdraw my son/ward from the study at any time, without reason.

I understand that there are no anticipated risks or benefits to my son/ward from participating in the study.

Signature ______________________________

Date ________________

**Audio/Videotaping Authorization and Release**

I authorize Deirdre Timusk (the Principal Investigator) to create photographs, video and audio recordings of my son/ward _________________________’s (Student’s name) likeness and/or voice, for use in research activities related to the project:

**Investigating Teacher Learning during a Video Club in a Secondary School Mathematics Department.**

I understand that these recordings will not be licensed or otherwise provided to other researchers, and will not be published to the public at large, without my additional consent.

Signature ______________________________

Date ________________

Please sign two copies and keep one for your records

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