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EXPLORING A PROGRAM FOR IMPROVING SUPERVISORY PRACTICES OF
MATHEMATICS COOPERATING TEACHERS

BY
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ABSTRACT

The purpose of the study was to understand how a program based on educative supervision supported the supervisory knowledge and practices of mathematics cooperating teachers. Educative supervision referred to a supervision style where the supervisors challenge student teachers' teaching methods by asking open-ended questions, discussing critical incidents from their teaching, moving away from being evaluative, and being sensitive to their zone of proximal development (Blanton, Berenson, & Norwood, 2001).

The case study method was followed in this study, where the case was the designed program. The program consisted of online discussions on reading materials or video clips, face to face communications, conducting weekly post-lesson conferences with the student teachers, and reflections on those post-lesson conferences. Three mathematics cooperating teachers and their student teachers were the participants of this study.

Qualitative data analysis techniques were applied to all data sets to understand how the program supported the supervisory knowledge and practices of the cooperating teachers. Data was mainly analyzed from three perspectives. First, the amount of conversational time used by each participant was calculated. Secondly, content of the post-lesson conferences was classified into the following categories: Mathematics, Pedagogy, Mathematics Pedagogy, Teacher-Student Relationship, Classroom Management, and General Teacher Growth. Thirdly, the types of communications used by each participant were collapsed into the following categories: Questioning, Assessing, Suggesting, Describing, Explaining, and Emotional talking.

Data analysis indicated some changes in the supervision style of the participating cooperating teachers towards the educative supervision. First, the percent of talking done by the student teachers in the post lesson conferences increased after the discussion of educative supervision in the program. Secondly, mathematics pedagogy became the most discussed content category in the post-lesson conferences. Furthermore, the depth of talks on mathematics pedagogy grew. Thirdly, the cooperating teachers moved away from conveying their feedback directly to the student teachers; they started asking open-ended questions to have the student teachers reflect on their teaching. Finally, having student teachers reflect on their teaching became a central goal for all of the cooperating teachers.

CHAPTER-1

INTRODUCTION

Towards the end of 19th century, scientific methods came forward to study how people learn (Bransford, Brown, & Cocking, 2000). Behaviorism emerged by the beginning of the 20th century as a major learning theory of that time. It defined learning as a process of making connections between stimuli and responses. The main limitation of behaviorism was its focus on observable behavior. How the human mind functions was not among their main interests. Bransford et al. stated that in the late 1950s, the emergence of cognitive science occurred as the complexity of how people learn became apparent. Cognitive science used multiple disciplines to study how the human mind functions. The researchers' interests shifted to how learning with understanding occurs.

In the last three or four decades, constructivism and social constructivism have emerged as learning theories (Richardson, 2003). Constructivists argue that learners build new knowledge in connection to their existing knowledge. Knowledge is actively created in the human mind. As Richardson wrote, social constructivists emphasize “the ways in which power, the economy, political and social factors affect the ways in which groups of people form understanding and formal knowledge about their world” (p.1624). According to social constructivism, learning is inherently a social and cultural activity (Cobb & Yackel, 1996). Cobb and Yackel reconciled constructivism and social constructivism into one theory: emergent perspective. For emergent perspective, “Learning is viewed as a process of both active individual construction and enculturation” (p.221).

Constructivist learning theories have influenced mathematics education as well as other subject areas (Richardson, 2003). National Council of Teachers of Mathematics [NCTM] launched learning and teaching standards for school mathematics based on constructivist principles (NCTM, 1989, 1991, 2000). These standards led a reform movement that called for a change in the way mathematics is taught in classrooms. Many prospective mathematics teachers are exposed to reform ideas in mathematics during their undergraduate

education. It is important that all components of teacher education programs support their growth as reform-minded teachers because the implementation of teaching mathematics in the spirit of the reform movement is not straightforward (Frykholm, 1996).

One important component of teacher education programs is the student teaching experience. Student teachers get opportunities to implement what they learned in the teacher education programs during their student teaching experiences, under the supervision of a cooperating teacher and a university supervisor. It could be argued that from the emergent and social constructivist perspectives, knowledge about teaching is socially constructed. The student teachers actively construct knowledge about teaching mathematics in connection to their existing views of teaching mathematics. Additionally, the interactions between the student teachers and their supervisors shape their learning process during the student teaching experience. The student teachers link the theory with practice through jointly constructed learning communities (Frykholm, 1998). Student teachers will have more opportunities to inquire about the important aspects of teaching and learning mathematics systematically, when student teachers and their supervisors form a collaborative learning group. However, the teaching and learning philosophy of the supervisors may influence the learning process of the student teachers (Artzt 1999; Blanton, Berenson, & Norwood, 2001). For instance, Blanton et al. found that the university supervisors' use of 'educative' supervision, an approach that positions the student teacher as an active constructor of his or her knowledge about teaching, resulted in the university supervisor being able to support the student teacher's development in ways consistent with the teacher education program.

Guyton and McIntyre (1990) argued that supervision is the most important piece of student teaching: "The most significant occurrences center around supervision processes" (p.527). Compared to university supervisors, cooperating teachers have more opportunities to conduct supervisory conferences with student teachers. However, research has provided evidence for a need to support the supervisory practice of cooperating teachers, specifically about the content of their talk with the student teachers and also about the way they communicate with the student teachers in supervisory conferences (Borko and Mayfield, 1995; Painter and Wiener, 1979). Aligned with this suggestion, this study explored how a supervision program that derived from emergent and social constructivist ideas supported the supervisory knowledge and practice of cooperating teachers.

Several studies that explored supervision of mathematics student teachers were closely connected to reform in mathematics because the supervisors had a goal of supporting the student teachers to teach in the spirit of reform (Frykholm, 1998; Artzt 1999; Blanton et al., 2001). Similarly, the researcher of this study aims to contribute to the efforts in this area. Consequently, the discussions on supervision of mathematics student teachers would be incomplete without a discussion on reform ideas in mathematics education. In view of that, before discussing the supervision of student teachers further, I will briefly discuss what “reform” means in this study, addressing both learning mathematics and learning to teach mathematics.

First of all, I will examine how the nature of mathematics is described. Ernest (1991) stated that the absolutist paradigm dominated the philosophy of mathematics for over two thousand years. He challenged the absolutist view of mathematics that sees mathematical knowledge as certain and objective. Ernest proposed social constructivism as a new philosophy for mathematics. According to this view, mathematics is a social construct that results from problem posing and solving, and develops and changes continuously. Ernest and other scholars have challenged another traditional belief about the nature of mathematics: mathematics is culture and value free. They have argued that mathematics is bound by culture and affected by the value of its makers (Ernest, 1991; Frankenstein, 1995; Ladson-Billings, 1995; Tate, 1994).

Mathematics is no longer defined as a collection of facts and procedures to be mastered. It includes concepts and skills, and methods of communication, reasoning, exploring, conjecturing and problem solving (NCTM, 1989). Mathematics is perceived as a creation of the human mind, improving continuously as a part of human culture (Hersh, 1986). The needs of science and daily life reinforce the creation of new mathematical objects that are created from activity with the existing mathematical objects. Steen (1998) defined mathematics as the science of patterns and explained that “the mathematician seeks patterns in number, in space, in science, in computers, and in imagination” (p.487).

The new perceptions regarding the nature of mathematics brought implications for teaching and learning mathematics. Students are no longer perceived as passive recipients of the information. Instead, NCTM (1991) suggested that students should make conjectures, share ideas with other students and teachers, solve problems, explore a variety of examples,

reason and communicate mathematically, and argue with each other by relying on mathematical evidence. The teachers' role in teaching mathematics involves posing higher order level questions to promote students' mathematical reasoning, listening to and responding to the students, encouraging and expecting students to discover, explain, and discuss mathematical ideas, selecting worthwhile tasks, and deciding when to clarify an issue or let students struggle with it. Parallel to these ideas, Ernest (1991) suggested the following for mathematics education in schools:

- * School mathematics for all should be centrally concerned with human mathematical problem posing and solving.

- * Inquiry and investigation should occupy a central place in the school mathematics curriculum.

- * The fact that mathematics is a fallible and changing human construction should be explicitly admitted and embodied in the school mathematics curriculum.

- * The pedagogy employed should be process and inquiry focused, or else the previous implications are contradicted. (p.283)

Kilpatrick, Swafford, and Findell (2001) defined *mathematical proficiency* including cognitive changes for students to learn mathematics successfully. Mathematical proficiency has five components: conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition. Conceptual understanding means having a connected knowledge network. Procedural fluency implies being skillful in mathematical procedures. Strategic competence refers to having good problem solving ability. Adaptive reasoning indicates thinking logically about a mathematical situation. This includes analyzing the situation, reasoning inductively or deductively, thinking critically and reflectively, and justifying thoughts. In its reasoning and proof standard, NCTM (2000) suggested that reasoning and thinking analytically will help learners recognize patterns, structure, and regularities both in mathematics and real life. Productive disposition toward mathematics refers to making sense of mathematics and seeing it as useful in our lives. Kilpatrick et al. proposed that these five components of mathematical proficiency are interwoven and interdependent.

Cobb and Yackel (1996) suggested that teachers and students together create classroom social norms and these norms relate to individual's construction of knowledge.

Teachers are the leaders in the creation of classroom social norms. NCTM (2000) pointed out that improvement in mathematics education mostly depends on teachers. Teachers' knowledge and beliefs have an important impact on how they teach the subject matter (Florian & Dean, 2001). For example, if teachers believe that learning takes place best by listening, they are likely to follow traditional teaching methods (teaching by transmission). In such a classroom, the teacher explains the content to the students, and asks questions to them, whereas the students listen to the teacher, take notes, and answer the teacher's questions.

Teachers should be knowledgeable in at least content related pedagogy, content, curriculum, and students' cognition (Shulman, 1986; Fennema & Franke, 1992). The subject matter knowledge (content knowledge) is an essential component of teacher knowledge (Shulman, 1986; Ball & McDiarmid, 1990; Ma, 1999; Hill & Ball, 2004). Bransford et al. (2000) suggested that teachers should come to the teaching with the experience of in-depth study of the subject area themselves. Shulman argued that:

Teachers must not only be capable of defining for students the accepted truths in a domain. They must also be able to explain why a particular proposition is deemed warranted, why it is worth knowing, and how it relates to other propositions. (p.9)

Teachers who have a profound understanding of mathematics are able to do the following: make connections among mathematical concepts and procedures; appreciate different approaches to a solution and discuss their advantages and disadvantages; identify key ideas of mathematical strands (Ma, 1999). Teachers' understanding of subject-matter affects their efforts to help students learn that subject matter (Ball & McDiarmid, 1990). For example, NCTM (1991) discussed the importance of selecting worthwhile mathematics tasks for teaching mathematics. If teachers do not have a strong understanding of mathematics, they will not be able to select worthwhile mathematics tasks. Similarly, teachers' knowledge of their subject-matter will affect the kinds of questions they ask, the ideas they reinforce, and the way they use textbooks (Ball & McDiarmid, 1990).

A second type of knowledge that teachers should possess is pedagogical content knowledge. Shulman (1986) suggested that teachers should be able to represent and formulate mathematical topics to make them comprehensible to students. Pedagogical content knowledge involves knowing what makes the learning of topics easy or difficult, using a variety of representations and teaching methods, and transforming the subject-matter

knowledge to be comprehensible to learners. A powerful pedagogical content knowledge is one of the elements that will enable teachers to teach in the spirit of the recent reform movement (Even, 1993).

Shulman (1986) discussed three kinds of curricular knowledge that teachers should have. Firstly, teachers should understand curricular alternatives available for instruction. Secondly, teachers should be familiar with the curriculum materials for other subject areas under study by their students. Thirdly, teachers should be familiar with what the students have studied and will be studying in the teacher's subject area. These three kinds of curricular knowledge are important for teachers to have a rich curricular repertoire for teaching mathematics effectively, making connections among mathematical topics and between mathematics and other subject areas, building instruction on students' existing knowledge, and preparing students for future study of mathematics.

Another component of the knowledge structure that teachers should gain is knowledge of students' cognitions as suggested by Fennema and Franke (1992). Fennema and Franke cited a series of research conducted through a project called Cognitively Guided Instruction [CGI]. CGI primarily aims to help teachers make children's thinking central to their decisions about instruction. The cited studies showed that when teachers understood students' mathematical thinking in a specific mathematics domain, this knowledge made a positive effect on teachers' classroom instruction. Compared to control group teachers, teachers in the CGI project listened to students' explanations of their mental processes more, spent more time on problem solving, and accepted more problem solving strategies from the students. In a longitudinal study, Fennema, Carpenter, Franke, Levi, Jacobs, and Empson (1996) found similar effects of CGI on teachers' instruction. Additionally, they found that these changes in teachers' beliefs and practices were reflected in the achievement level of students. The problem solving performance and conceptual understanding of students increased during their study. The studies conducted regarding CGI provided evidence that knowledge of students' cognition should be a component of a teacher's knowledge network.

Until now, I have discussed what I mean by reform movement in mathematics education. It is expected that prospective mathematics teachers will learn these reform ideas during their undergraduate education in education programs at universities and implement them in their teaching. However, the implementation of teaching mathematics in the spirit of

the reform movement is not straightforward for the student teachers. Frykholm (1996) found that even though mathematics student teachers believed in the value of NCTM's Curriculum and Evaluation Standards for School Mathematics (1989), they did not implement them in their instruction. One explanation for this dilemma might be that teaching is a cultural activity (Stigler & Hiebert, 1999). Accordingly, teachers tend to teach in the way that they themselves were taught. Hiebert, Morris and Glass (2003) commented the following:

People learn to teach, in part, by growing up in a culture – by serving as passive apprentices for 12 years or more when they themselves were students. When they face the real challenges of the classroom, they often abandon new practices and revert to the teaching methods their teachers used. (p. 201)

Another possible explanation comes from McIntyre, Byrd, and Foxx (1996), who commented that prospective teachers are unable to grasp the whole idea of the reform movement due to the disconnectedness of teacher education programs' goals and curriculum. They experience each disconnected part of the curriculum without understanding the whole. Thus, their practice does not reflect reform ideas.

Mathematics education researchers are looking for ways to help prospective teachers teach in the spirit of the reform movement (Clift & Brady, 2005). One of the most important components of teacher education programs is student teaching since it offers an opportunity for prospective teachers to connect theory with practice (Guyton & McIntyre, 1990; Zeichner, 2002). During the student teaching experience, student teachers have opportunities to learn how students think, to observe experienced teachers, to teach under supervision, and to realize their own thoughts about teaching and learning (Feiman-Nemser & Buchmann, 1987).

The Handbook for Student Teaching (2004-2005) at a Southern University defined student teaching as follows:

That period of the teacher education program, organized and directed by the university, during which the student teacher is placed in an accredited school under the supervision of a fully certified classroom teacher who has completed clinical educator training and a university faculty member for a period of consecutive weeks. (p.2)

The student teacher is defined as the student of teaching. The main role of the cooperating teacher is defined as “to assist in developing the professional growth of the student teacher through demonstration of and instruction in teaching skills and attitudes” (p.2). The main responsibility of the university supervisor is identified as supervision and evaluation of the student teacher.

The handbook includes details of the roles and responsibilities for each member of the triad (student teacher, cooperating teacher, and university supervisor) in relation to other members. However, most of the statements are general statements. For example, student teachers are told that the cooperating teacher expects the student teacher to “demonstrate knowledge in your major teaching area” (p.4). Guyton and McIntyre (1990) commented that the general statements in the student teaching handbooks are freely interpreted by the triad members and there is not always agreement among the triad members about the roles and responsibilities of each other. Other research studies support the argument that there is a lack of agreement among triad members about roles, responsibilities, and expectations of each other (Koskela & Ganser, 1995; McIntyre et al., 1996). Guyton and McIntyre (1990) suggested that purposeful talk between triad members about roles and expectations of each other and objectives for the student teaching experience will help lessen the possible problems and frustrations during student teaching.

Researchers across different content areas have started to study the process of learning to teach in relation to the interactive and social nature of the learning environment (Clift & Brady, 2005). One component of this learning environment in student teaching results from the interaction between student teachers, cooperating teachers and university supervisors. Interestingly, there are only a few research studies that have investigated the interactions of mathematics student teachers, university supervisors, or cooperating teachers during the student teaching experience (e.g. Borko & Mayfield, 1995; Frykholm, 1998; Blanton et al., 2001). The lack of research in this area guided me to conduct a pilot study to better understand the supervision process of the mathematics student teachers.

In spring 2005, I conducted a pilot study under the supervision of Dr. Maria L. Fernández to examine the nature of communications between mathematics student teachers and cooperating teachers inside and outside of the presence of the university supervisor. Blanton et al. (2001) advocated “educative supervision” as an approach to supervise student

teachers. Educative supervision proposes that supervisors support student teachers' teaching by asking open-ended questions, discussing critical incidents from their teaching, and being sensitive to their developmental levels. In the pilot study, the constructs of educative and evaluative supervision (Blanton et al., 2001) were used to compare the nature of the feedback provided by the university supervisor and the cooperating teachers.

I, as the university supervisor, two middle school mathematics student teachers (Sandra and Amy), and their cooperating teachers participated in the pilot study. Data was collected from post-lesson conferences among the student teachers, their cooperating teachers, and the university supervisor, post-lesson conferences between the student teachers and their cooperating teachers, lesson observations, electronic communications with the cooperating teachers, and reflective journals written by the student teachers. Since the nature of the data was qualitative, qualitative data analysis techniques were applied to all of the data sets.

Transcripts from the audio-taped conferences were analyzed from three perspectives: (1) the supervision approaches (e.g., evaluative or educative), (2) the content of the communications, and (3) the amount of the communications. The communications expressed by the cooperating teacher or university supervisor leading each conference were unitized, coded, and collapsed into five categories: (1) Questioning—leader asked questions to understand the student teacher's thinking; (2) Describing—leader described specifics from direct observations of the student teacher's work; (3) Suggesting—leader made directive or nondirective suggestions related to the student teachers' work; (4) Assessing—leader provided assessments of aspects (in a general way) of the student teacher's work or ideas; and (5) Explicating—leader explained her own perspectives on issues based in theories or beliefs grounded in recent reforms or personal experience (Fernández & Erbilgin, 2007). The communications coded as part of the Questioning category were associated more with educative supervision while those coded as part of the Assessing category were more associated with evaluative supervision. Secondly, each post-lesson conference was unitized and coded with respect to the content of the communications. These codes were collapsed these codes into four content categories: mathematics, mathematics pedagogy, pedagogy, and classroom management. Finally, how much each participant spoke in the post-lesson conferences was determined by using the "word count" function of a word processor.

Figure 1.1 indicates the percentages of types of communications (questioning, describing, suggesting, assessing and explicating) by the cooperating teachers and the university supervisor found across the post-lesson conferences led by each. This figure reveals that the university supervisor primarily engaged in questioning during the conferences that she led (46% of total communications with Amy and 50% with Sandra). While the cooperating teachers primarily engaged in assessing. This analysis revealed the tendency of the university supervisor to approach supervisory conferences from an educative approach while the cooperating teachers approached these conferences from more of an evaluative approach.

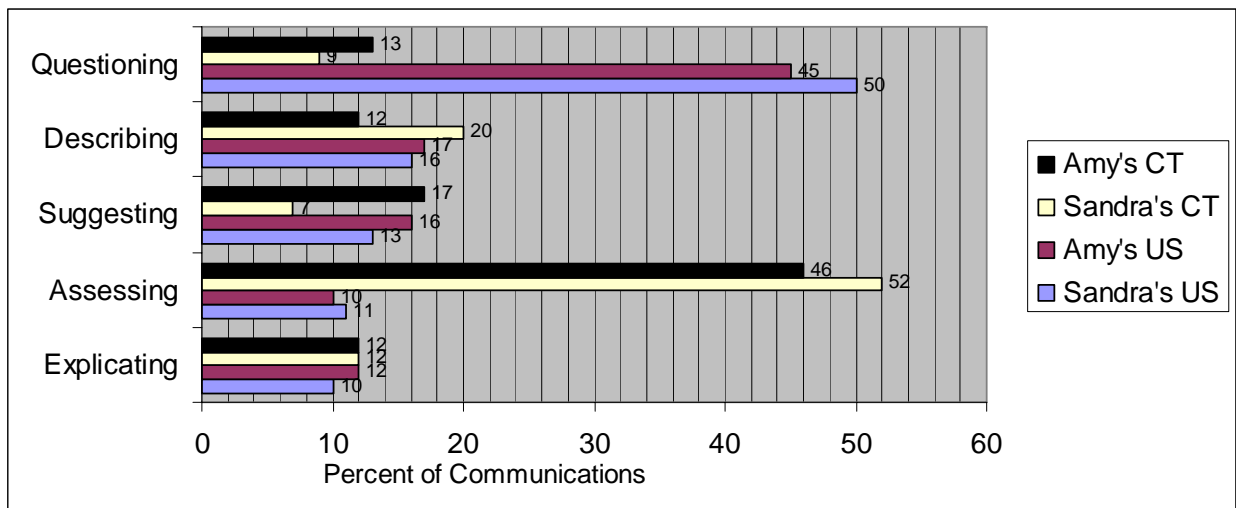


Figure 1.1 Types of Communications by CTs or US Leading Dyad or Triad Conferences (Fernández and Erbilgin, 2007)

The content analysis of the post-lesson conference communications revealed that one student teacher and cooperating teacher pair talked mostly about classroom management while the other pair had a focus on classroom management and mathematics pedagogy. With both pairs, the university supervisor led a discussion where they talked about mathematics pedagogy and pedagogy more than classroom management (see Figure 1.2). The focus of the

post-lesson conferences moved from classroom management to mathematics pedagogy when the university supervisor participated in the meetings. The content of the conversations between student teachers and cooperating teachers seems to be an area that needs attention in future studies. In order to offer productive learning experiences to student teachers, it is important that the post-lesson conferences include discussions on pedagogy, content-specific pedagogy, content, and student understanding (Feiman-Nemser & Buchmann, 1987; Blanton et al., 2001). Interestingly, there is a limited number of studies that investigated the content of the conversations between mathematics student teachers and their cooperating teachers (Borko & Mayfield, 1995).

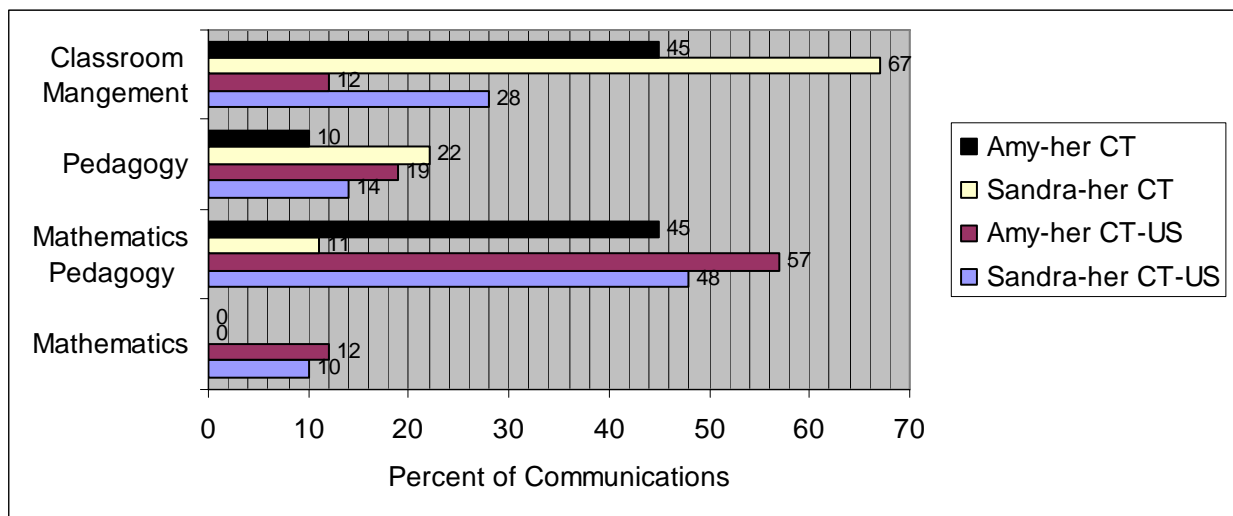


Figure 1.2 Types of Content in Conference Communications among Dyads and Triads (Fernández and Erbilgin, 2007)

Data analysis also revealed that in their dyad conferences, the cooperating teachers did more talking than the student teachers (Amy 47% while Michelle (CT) 53% and Sandra 23% while Susan (CT), 77%). On the other hand, the university supervisor engaged the student teachers and their cooperating teachers in discussions in ways that promoted more equitable amounts of contributions by each participant (Amy 33%, Michelle 32%, and the

university supervisor 35%; and then Sandra did 35%, Susan 34%, and the university supervisor 31%). Thus, the university supervisor, more than the cooperating teachers, seemed to draw out others' contributions to the conferences, an approach consistent with educative supervision.

Parallel to Zimpher, deVoss, and Nott's (1980) observations, one role of the university supervisor in the pilot study was found to be providing constructive criticism to the student teachers. Even though the cooperating teachers claimed to provide "constructive criticism" in their meetings, this was not evident in post-lesson conferences. Data analysis of the post-lesson conferences revealed that the cooperating teachers approved and did not question the student teachers' use of traditional teaching methods and low expectations for students. On the other hand, the university supervisor encouraged the student teachers to teach mathematics in the spirit of the reform movement. The student teachers tended to use teaching methods similar to their cooperating teachers. This might be one of the reasons for the lack of criticism from the cooperating teachers since they would be criticizing their own teaching methods. Feiman-Nemser and Buchmann (1987) argued that lack of constructive criticism from cooperating teachers together with a focus on classroom management will lead to unproductive learning experiences for the student teachers.

The findings of the pilot study suggested that a university supervisor who has a strong background in the pedagogy and subject matter that the student teacher is teaching, may hold an important role for the student teacher's professional development. For instance, such a university supervisor may provide feedback that focuses on content specific pedagogy that will help the student teacher make connections between the theory and practice.

A university supervisor may also contribute to the professional development of the cooperating teacher as in the case of Frykholm's (1998) study. Borko and Mayfield (1995) suggested that university supervisors may help cooperating teachers become teacher educators by modeling ways of observation and supervision of student teachers. The university supervisor and cooperating teachers in the pilot study demonstrated different approaches to the supervision of the student teachers. The university supervisor approached supervision more from an educative perspective whereas the cooperating teachers approached supervision more from an evaluative perspective. This finding opens an opportunity for making student teaching experiences more educative: aligned with the

suggestion of Borko and Mayfield, the university supervisors may help the cooperating teachers analyze their own supervisory practices with respect to types and content of the communications, in order to incorporate more educative supervision practices. Based on these ideas, I designed a program where the university supervisor assisted the development of the supervisory practice and knowledge of mathematics cooperating teachers. The study that will be explained in this paper explored how this program worked. The program offered opportunities to the cooperating teachers and the university supervisor for sharing ideas and resources, and learning from each other.

The role of the university supervisor in the professional development of student teachers has been discussed among teacher educators for a long time (Bowman, 1979; Zimpher et al., 1980; Borko & Mayfield, 1995). Whereas Bowman advocated elimination of supervision by university supervisors, Zimpher et al. reported significant activities of university supervisors during the student teaching experience. Traditionally, university supervisors visit student teachers three or four times during the student teaching experience (Frykholm, 1998). Each visit may include observation of a lesson taught by the student teacher and a post-lesson conference where the student teacher and the university supervisor reflect on the lesson. The cooperating teacher may also participate in the post-lesson conferences. The visit may also include a pre-lesson conference where the lesson plan is viewed and goals for the lesson are discussed. The current structure of the student teaching does not necessarily require frequent and educative interactions between the university supervisors and the cooperating teachers. This study explored an innovative program for student teaching where there were more opportunities for educative interactions between the university supervisor and the cooperating teachers.

Feiman-Nemser and Buchmann (1987) described student teaching experiences that are teacher education in which the student teachers learn the central tasks of teaching, are able to explore and extend student learning, think critically, have their beliefs and practices closer to each other, and see experience as a beginning of their learning rather than a culminating point. In such a student teaching experience, teacher educators, the cooperating teachers and university supervisors should have active roles in the learning processes of the student teachers. For example, cooperating teachers may model how to explore and extend student learning. University supervisors can help the student teachers connect their practice

with the theory and research. It was one of the goals of the program in this study to offer the student teachers a student teaching experience that was teacher education.

Currently, supervision of student teachers is done either by university faculty or graduate students or experienced teachers. All of these groups often have limited time. They have other responsibilities besides supervising student teachers. This is also true for cooperating teachers. In this program, the university supervisor assumed a broader role than the traditional role of a university supervisor. In addition to regular school visits and supervision of the student teacher, the university supervisor also communicated with the cooperating teachers continuously throughout the student teaching semester. In order to save time for the members of the student teaching experience, some of these communications were conducted online.

Mason (2000) found that online communications saved time for student teachers. Nevertheless, saving time was not the primary purpose for including online communications in my study. Online communications have been found to support reflective discourse, collective problem solving, and self-initiated professional dialogue (Mason, 2000), reduce communication problems between student teachers and university faculty (Salleh, 2002), and provide ongoing and fixed reference for cooperating teachers (Getz & Schnurman-Crook, 2001). Based on the findings of these research studies, online discussions were included in the program to support reflective discourse between the participants, provide time to think about problems occurring during the student teaching, solve problems collectively, save travel time, and give everyone a chance to reach the resources available online anytime.

The program of this study included online and face-to-face communications in which the university supervisor helped the cooperating teachers become aware of and internalize reform ideas in mathematics education, learn different modes of supervision, and improve the level of reflective thinking. The main focus was on improving the supervision process. It was also expected that the focus of the dialogues between student teachers and cooperating teachers would be on pedagogy, mathematics pedagogy, and mathematics. Accordingly, the overall goal of the program was helping the cooperating teachers become a teacher educator. The purpose of this study was to understand how such a program worked. The research question that guided this study was as follows.

- How does a program that focuses on educative supervision support the development of supervisory knowledge and practices of the mathematics cooperating teachers?

CHAPTER-2

LITERATURE REVIEW

The literature about the student teaching experience can be categorized into three groups: roles, experiences, perspectives and expectations of student teachers; roles, experiences, perspectives and expectations of cooperating teachers; and roles, experiences, perspectives and expectations of university supervisors. Research on student teaching can not solely study one member of this triad because each member has an effect on the other members and on the overall student teaching experience. However, some research studies focused primarily only on experiences, roles, perspectives, or expectations of one member, while others focused on two or all three members.

Student Teachers

I will start discussing the research studies that focused on student teachers by examining the difficulties that student teachers have in their placements. These “difficulties” refer to problems in adapting to the school and classroom setting, in learning to teach, and in implementing the reform ideas. Following this discussion of difficulties, I will present the research studies conducted to find out what makes a student teaching experience most beneficial for student teachers, and how to overcome discussed difficulties. Finally, I will provide an example student teaching experience from Japan.

Feiman-Nemser and Buchmann (1985) discussed three pitfalls that prospective teachers confront during their field experiences. The authors noted that student teaching is the continuum of student teachers’ experiences that started before their college education with parents and teachers. The teaching culture they experienced affects their practice as student teachers (Hiebert et al., 2003). According to Feiman-Nemser and Buchmann, the first pitfall that student teachers face is “unquestioned familiarity” (p.56). This means that student teachers view teaching and learning with a framework that they

gained from their own pre-college school experiences. This framework may prevent them from analyzing their student teaching experiences with reflection and critical thinking. An example for the unquestioned familiarity pitfall appeared in the Artzt (1999) study. The study included a student teaching experience where the student teacher believed that students learn best through the direct-teaching method. It was difficult for the student teacher to leave the security of the traditional teaching methods. Artzt noted that this student teacher learned by listening in China and it worked well for him. Therefore, he favored teaching by telling and at the beginning stages of the student teaching experience he did not feel a need to modify his teaching method.

The second pitfall that Feiman-Nemser and Buchmann (1985) discussed is the “two-worlds” (p.59) pitfall. One situation in which this pitfall may arise is when prospective teachers visit schools in order to conduct assignments given in college courses. Feiman-Nemser and Buchmann exemplified this pitfall with a sophomore student who was focusing on observations of students as required by his educational psychology instructor; however, he did not seem to comprehend the value of observation in teaching. Completing an assignment may not indicate that the prospective teacher understood the value of different components of the assignment in teaching. In some cases, completing an assignment simply rewards the prospective teacher with a grade. In other words, prospective teachers may not automatically connect what they learn in college courses with the practice of teaching.

Finally, Feiman-Nemser and Buchmann (1985) included “cross-purposes” (p.62) as the third pitfall. The authors exemplified this pitfall with a student teacher who took over all class responsibilities after the classroom norms were established by the cooperating teacher and it was the third week of her student teaching experience. The focus of the cooperating teacher was on her classroom; everything should run smoothly. However, the focus of the student teacher was learning to teach in this setting. Feiman-Nemser and Buchmann commented that such a student teaching experience would not necessarily be educative, since the cooperating teacher would not necessarily act as a teacher educator and thus the student teacher would not be encouraged to make decisions, be responsible, and develop reflective thinking on teaching and learning issues.

Frykholm (1996) conducted a study that revealed the “two-worlds” pitfall that was defined by Feiman-Nemser and Buchmann (1985). He investigated how reform guidelines in mathematics education such as NCTM’s (1989) *Curriculum and Evaluation Standards* [*Standards*] impact student teachers’ thinking and practice. Participants were 44 mathematics student teachers. Data was collected from post-lesson conferences, campus meetings, lesson observations, and questionnaires. The university program of the student teachers emphasized teaching mathematics aligned with the reform-based instruction. One of the major findings of this study was that even though the student teachers claimed that they believed in the *Standards* and that their teaching reflected the *Standards*, classroom observations revealed that the majority of the time student teachers did not implement the *Standards* in their lessons. Frykholm’s study demonstrated that “worlds of thought and action are legitimately different” (Feiman-Nemser & Buchmann, 1985, p.64).

One difficulty that student teachers might have in their student teaching experience is when the teaching and learning philosophies of their university program and cooperating teacher are not parallel. For example, Frykholm (1996) found that cooperating teachers did not put a pressure on student teachers to implement the *Standards* in their teachings. They rarely discussed the reform ideas in mathematics education with the student teachers. LaBoskey and Richert (2002) reported that faculty and supervisors in Mills College agreed that cooperating teachers’ teaching philosophy should parallel the College program’s principles in order to have good student teaching experiences. LaBoskey and Richert reported the case of a student teacher whose cooperating teacher was very directive in her teaching. The student teacher and her college courses put emphasis on an opposite view of teaching. Student teaching in this environment turned out to be detrimental to the student teacher’s learning. Moreover, the student teacher felt guilty, confused, and hopeless.

A similar student teaching experience was observed in the study conducted by Vacc and Bright (1999). One of the student teachers in their study had a cooperating teacher who had limited knowledge about the university program. Therefore, the student teacher did not experience a coherent support from the university and school. Even though her beliefs were parallel to the learning and teaching philosophy of her university

program, her instruction did not reflect them. Corrigan and Griswold (1963) found that when student teachers perceived a contradiction with the principles of the university program and the experience that they get during student teaching, they got confused about the soundness of the principles.

These studies imply that when the teaching and learning philosophies of university programs and schools are conflicting with each other, this may affect student teachers' practice and beliefs negatively; in a direction opposite to the reform movement. Therefore, it is important for student teachers to receive parallel messages from their cooperating teachers and university programs. Other teachers and administrative staff, and student characteristics in the placement school are also important factors for student teachers' professional development (Tang, 2003).

So far, I have discussed what difficulties student teachers face in their student teaching experience. Now, I will focus on what makes student teaching experiences educative for the student teachers, including how to overcome the mentioned difficulties. Feiman-Nemser and Buchmann (1985) recommended that overcoming the familiarity pitfall requires critical and reflective thinking when analyzing teaching experiences and awareness that our past school experiences shape our perceptions about schooling. Being flexible and open to new ideas helps student teachers see schooling with a larger vision; they think that their own experience of teaching and learning is one way of the many other possible ways of teaching and learning. Artzt (1999) created and used a structure for reflection with student teachers, which I think might be helpful in overcoming the familiarity pitfall. The structure is composed of pre-lesson reflections, post-lesson reflections, and weekly journals. Pre-lesson reflections include writing pre-lesson thoughts and lesson plans. Student teachers write pre-lesson thoughts using the following as a guide: goals for students, knowledge of students, knowledge of content, knowledge of pedagogy, the teacher's role in the lesson, the students' role in the lesson, anticipated difficulties, and sources used to get ideas and criteria for selection. Post lesson reflections include a post-lesson conference with the university supervisor and written post-lesson thoughts. In the post-lesson conference, student teachers initially share their thoughts about the lesson, and then the university supervisor shares ideas. The university supervisor asks questions to clarify issues and help the student teachers become aware of

how their lesson may inform their teaching and improve it. Student teachers write post-lesson thoughts that indicate strong and weak points of the lesson, and how it might be modified. The weekly journals record student teachers' ongoing experiences and ideas.

Artzt (1999) stated that she started using this reflection structure with her student teachers and she exemplified how she used the structure through two case studies. She concluded that this structure helped her to learn more about student teachers' motivations and dispositions. In turn, this helped her to facilitate changes in the beliefs and practices of student teachers. Artzt suggested that mathematics student teachers must continually be asked to analyze their knowledge, their beliefs, and their goals for students. As they effectively monitor student learning in their classroom, student teachers may feel a need for change in their instruction.

Artzt (1999) did not mention anything about the cooperating teachers in her two case studies. Therefore, we do not know what role the cooperating teachers had in a student teaching experience where the student teachers were encouraged to reflect systematically by the university supervisor. Nevertheless, I think that this reflection structure is a valuable tool for both university supervisors and cooperating teachers to promote reflective thinking in student teachers and thereby to reduce unquestioned familiarity pitfall. I shared the reflection structure developed by Artzt with the participant cooperating teachers and engaged them in discussions on how to promote reflective thinking of student teachers in the post-lesson conferences.

Feiman-Nemser and Buchmann (1985) noted that the two-world pitfall suggests to teacher educators that connecting university education and school practice is not straightforward for student teachers. University teacher education aims to teach student teachers to act with understanding and analyze the reasons and consequences of actions. Teacher educators should guide student teachers in connecting theory with practice. This suggests that the teacher educators supervising student teachers should be knowledgeable in the university program of the student teachers. Actually, student teachers appreciated university supervisors when they helped them see the connections between the practice and the college courses (Frykholm, 1998; Tang, 2003).

The third and last pitfall that Feiman-Nemser and Buchmann (1985) discussed was the cross-purposes pitfall. According to Feiman-Nemser and Buchmann, overcoming

the cross-purposes pitfall requires that the purposes of the classroom teachers and the purposes of the student teachers are more closely aligned. If cooperating teachers reflect on their own teaching and there is a professional community in the school, then the student teachers will get the message that reflection, experimentation, and collegiality are the norm in the teaching profession. Overcoming the cross-purposes pitfall also requires cooperating teachers to expand their roles to become teacher educators, which has benefits not only for them, such as reflection and communication, but also for teacher education in general. In fact, the role of teacher educator has long been suggested for the cooperating teachers among teacher educators (Painter & Wiener, 1979; Feiman-Nemser & Buchmann, 1987; Borko & Mayfield, 1995). This suggestion formed one of the driving forces of this study. Through the designed program, one goal was to help the cooperating teachers see themselves as teacher educators.

Tang (2003) analyzed the effect of challenge and support on student teachers' professional development in three facets of student teaching contexts; the action context, the socio-professional context, and the supervisory context. The action context refers to classrooms: Pupils have the most effect on student teachers' growth in this context. The socio-professional context includes student teachers' interactions with other teachers, peers, and personnel. The supervisory context refers to interactions with university supervisors. The student teacher experiences challenge when there is dissonance. Feeling safe, being valued, having authority over the classroom, and being able to take risks are examples of support that can be given to student teachers. Tang found that challenge opens gaps within the individual, such as lacking confidence about being a teacher, and support helps close those gaps. This process produces growth. High challenge in the action context, such as students with severe behavior problems, constituted unproductive learning experiences for the student teachers. In the socio-professional context, when the school provided both challenge and support, the student teachers experienced productive learning experiences, such as participating in the staff meetings. The supervisory context supported growth when the supervisors provided constructive criticism and connected theory with practice. Tang concluded that productive learning experiences occur when there is an appropriate mix of support and challenge. She suggested that universities and schools should cooperate to offer such an experience to student teachers. This implies

closer interactions between university supervisors and cooperating teachers in making the student teaching experience educative.

LaBoskey and Richert (2002) investigated the student teaching experience of two student teachers who had both weak and strong placements and who both were strong students in their program. The goal of their study was to identify good student teaching placements. Each student teacher taught in two different classrooms in two semesters. Both student teachers came from the same program that had the following principles. “Teaching is inherently moral work...Teaching is reflective work...Learning is developmental and constructivist...Teaching is connected in deep and important ways to subject matter...Teaching is collegial...Teaching is inherently political...” (p.9).

LaBoskey and Richert (2002) found that the classrooms which were good learning environments for students and teachers became good field placements for the student teachers. They called this “nested learning” (p. 26). Blending principles was found to be the second element that makes a student teaching experience good. The classrooms in which the university program’s principles are enacted offered the student teachers the most learning opportunities. Thirdly, the compatibility between student teachers and cooperating teachers increased student teachers’ reflection on their own learning and teaching. In the difficult settings, student teachers devoted their time negotiating their role within the setting, rather than reflecting on their development. Finally, student teachers need to feel safe in their placement classrooms in order to try out new techniques.

LaBoskey and Richert (2002) concluded that even the best prepared student teachers have difficulties in weak field placements. Based on their findings, they suggested having the least compatible placements come later in the student teaching experience. They also suggested designing the university coursework in such a way that it supports the program’s principles.

The major data source of the LaBoskey and Richert (2002) study was the student teachers’ journal entries. They analyzed journal entries to identify good student teaching placements. They did not directly require student teachers to write about what made their experience more or less effective. Instead, they deduced it from their journals. With a different methodology, Beck and Kosnik (2002) demonstrated more directly what student

teachers think about the components of good student teaching placements. They conducted semi-structured interviews with eleven student teachers to find out their ideas about what kind of student teaching would enhance their professional growth. In addition to interviews, the researchers administered a questionnaire that included questions related to what constitutes a good student teaching placement. They found that the student teachers valued emotional support and constructive feedback from the cooperating teachers, collegial relationship with the cooperating teachers, and flexibility in teaching.

The amount and kind of support given to student teachers from the cooperating teachers has been discussed in some studies. Maynard (1996) discussed that cooperating teachers provide too much support and not enough challenge to student teachers. Tang (2003) recommended providing an appropriate mix of support and challenge to promote professional growth of student teachers. Student teachers in Beck and Kosnik's (2002) study valued the emotional support from the cooperating teacher. They reported that emotional support helped them feel comfortable in the placement classroom. One student teacher stated that the emotional support from the cooperating teacher helped her experiment with different practices in her teaching.

Student teachers found it important to have a peer relationship with their cooperating teacher (Beck & Kosnik, 2002). They wanted to be treated as colleagues to gain students' cooperation and also to be in the role of a real teacher in order to have the actual power and responsibility of a teacher. They commented that the more responsibility and power they have, the more opportunities there are for them to develop professionally, such as adapting their own way of teaching, and making decisions. Likewise, student teachers at another college appreciated the autonomy provided from the university supervisors, such as figuring things out for themselves and making their own decisions (Freidus, 2002).

Student teachers valued flexibility in teaching content and method, constructive feedback from the cooperating teachers, and heavy, but not excessive, workload during student teaching (Beck & Kosnik, 2002). Goodell (2000) found that discussing a lesson with the cooperating teacher was important for the student teachers. Similarly, student teachers stated that the collaboration with the cooperating teacher, such as planning lessons together or sharing resources, was an important building block for their

professional development (Beck & Kosnik, 2002; Koerner, & Rust with Baumgartner, 2002). Beck and Kosnik reported that student teachers valued a sound approach to teaching and learning on the part of the cooperating teacher, which connects to one of the findings of LaBoskey and Richert (2002): the classrooms where the cooperating teachers demonstrated effective teaching offered the most learning opportunities to the student teachers.

It is interesting that student teachers' ideas about the components of a good student teaching experience in Beck and Kosnik's (2002) study were all related to cooperating teachers. This might be related to frequency, style and/or content of the supervisory conferences between student teachers and university supervisors. In other cases, student teachers thought it was important to receive feedback related to reform ideas in mathematics from the university supervisors and have trust, rapport, and continuous interaction with them (Frykholm, 1998), discuss critical incidents with the faculty educator (Goodell, 2000), and be encouraged to reflect on their own teaching (LaBoskey & Richert, 2002).

So far I have discussed components of good student teaching experiences. Now, I will present an example of a good student teaching experience from Japan. The effectiveness of Japanese education has been found in various research studies (Mayer, Sims & Tajika, 1995; Beaton, et al. 1996; Brenner, Herman, & Ho, 1999). The student teaching experience in Japan, studied by Peterson (2005), reflected some of the components of good student teaching experiences that have been reported above. Peterson examined the student teaching experience in mathematics education at each of the three universities in Japan. In contrast to the United States, on average, two to three student teachers worked with one cooperating teacher. Peterson collected data from the mathematics student teachers-cooperating teacher lesson planning conversations, lesson observations, and the post-lesson discussions. He found that the primary activities of student teachers were planning, teaching, and observing and critiquing lessons. In order to clarify these activities, Peterson provided details of the student teaching experience at one school. The general process of developing a lesson was preparing a lesson plan, discussing it in the group (the cooperating teacher and the other student teachers), reflecting on the lesson, modifying the lesson, and discussing, reflecting, and modifying

it again, if necessary. The cooperating teacher rarely told student teachers to teach in a certain way. His focus was helping the student teachers to predict what student responses they would get, to understand student thinking, and to keep in mind the goal of the lesson as they discussed the lesson. Clarity of pupil thinking and missed opportunities were the focus of the discussion after a student teacher taught the lesson.

Peterson (2005) did not report if the student teachers or cooperating teachers were satisfied with the current student teaching experience in Japan. Neither do we know how successful those student teachers were as classroom teachers. However, based on the good quality of Japanese education reported by research and the parallelism of it with the reform ideas in mathematics education, we may conclude that the student teaching in Japan contributes to professional development of student teachers and we may learn lessons from it. As Peterson reported, in his study the communications between the student teachers and cooperating teachers focused on mathematics pedagogy. Reflection was a key element in those discussions. Similarly, the program of this study aimed to encourage the participating teachers to have reflective post-lesson communications that were focused on mathematics pedagogy. In the introduction section, I discussed that cooperating teacher-student teacher dyads in the pilot study focused on classroom management or general teaching and learning issues in the post-lesson conferences. This study aimed to have conversations between dyads that focus on mathematics, how to teach and learn mathematics, student thinking, teaching and learning issues in general, and classroom management. The main goal was to help student teachers realize that these are the main tasks of teaching and help the student teachers recognize their beliefs on these components, how these beliefs shape their practices, and guide them to change their beliefs and practices as the reform suggests. The researcher believes that teachers' knowledge of mathematics and pedagogy, the way mathematics is taught in the classroom, attention to student thinking, and classroom management are all connected to each other. Therefore, in the post-lesson conferences, these components should be discussed in relation to each other. For example, the classroom management problems can be discussed in conjunction with the way mathematics is taught in that classroom. In the pilot study, the dyads discussed the classroom management problems as a separate problem.

University Supervisors

This section will start with a discussion of what roles university supervisors assume in the student teaching experience and an exploration of how to improve these roles. Next, I will analyze supervisor-supervisee conversations. The section will end with the examination of different supervision styles.

Student teachers, cooperating teachers, and university supervisors ranked observing student teachers' teaching and providing feedback as the most important role of the university supervisors (Enz, Freeman, & Wallin, 1996). Zimpher et al. (1980) noted that since university supervisors are outsiders to placement classrooms, this position gives them freedom to be analytical and give feedback to student teachers. Student teachers in Frykholm's study (1998) valued that university supervisors provided them feedback related to reform based ideas of mathematics education. Freidus (2002) reported that effective university supervisors listened and mined student teachers' thinking when providing feedback. Instead of telling the student teachers what to do, they tried to bring student teachers' knowledge out and helped them figure things out.

To be an evaluator is another role of the university supervisor (Zimpher et al., 1980; Slick, 1997). Slick explained how a university supervisor had difficulties in enacting the role of an evaluator while at the same time trying to assist the growth of the student teacher. The university supervisor in Slick's study desired a positive relationship both with the student teacher and the cooperating teacher. However, she also wanted to hold the university program's expectations and standards for the student teacher. This sometimes caused frustrations and communication struggles among the triad members. Slick suggested that teacher educators should help university supervisors in enacting expectations and standards of the university program established for the student teaching experience. She also suggested that the members of a student teaching triad should start communication prior to the student teaching to agree on expectations and standards. Finally, Slick suggested that university supervisors may utilize collegial communication with other university supervisors for understanding university expectations and goals, and sharing ideas about having effective communications with the cooperating teachers.

Such communication was the focus of the study conducted by Montecinos, et al. (2002). Their study reported the process and outcomes of a collaborative self study conducted by five female teacher educators to improve their supervision of student teachers. A sixth person assisted the group in implementing the self study. During the first four months, the group had informal, unstructured weekly meetings and discussed what is self study, specific supervisory incidents, or concerns about supervisory tasks. Later, they had more structured meetings: one member wrote a summary of key topics covered, each meeting started with a review of the previous meeting, one member read what she wrote in her journal after the previous meeting, the topic of the day was discussed, and the focus of the next meeting was determined. They decided to report their study using common themes reflecting what they learned from each other, how they facilitated growth of each other, and how they found common grounds.

The first theme was “Attend to the learning needs of the supervisor” (p.786). They realized that what they asked for their student teachers is similar to what the self-study group asked each member to do regarding their supervisory work. The second theme was “Attend to the learning needs of the student teacher” (p.787). Supervisors should understand student teachers’ needs and try to meet them rather than imposing on them their own expectations. The third theme was “Attend to student teacher’s biography” (p.788), such as knowing their values, beliefs, talents, and experiences. “Give the student teacher reassurance” (p.788) was the fourth theme. Supervisors should assure student teachers that they are there to assist them in becoming better teachers. Supervisors should attend to student teachers’ emotional needs. For example, after teaching, they could be asked how they felt rather than only asking how they think it went. Emotional support was found to be a component of a good student teaching experience by the student teachers (Beck & Kosnik, 2002). The fifth theme was “Distinguish good questions from bad questions” (p.789). Supervisors learned more about questioning during these meetings. For example, one supervisor mentioned that she realized that instead of offering solutions all the time, she should ask questions to help student teachers reflect on their practice. Finally, the sixth theme was “Attend to the structure of group and individual supervisory meetings” (p.790). Participants of the study group thought it important to define a protocol for their meetings with student teachers to

avoid having anecdotal level conversations. The Montecinos et al. (2002) study shows us the importance of collaboration between supervisors. By having a common goal to improve their supervision, the self study group reflected on their practice, shared ideas, recognized their own deficiencies, and suggested ways to improve their supervision. Such collaboration among the cooperating teachers may result in sharing ideas, collective problem solving, deliberation on supervisory beliefs and practices, and re-defining supervisory goals as well.

Freidus (2002) described the role of supervisors with four analogies: prospector, dramaturge, coach, and negotiator. Even though he examined supervisors in a Reading and Literacy Program, I think these roles may apply to other subject areas as well. Prospector referred to listening and mining student teachers' thinking and knowledge. As dramaturge, the supervisor supports student teachers' efforts to figure things out by offering information on teaching methods. The analogy of coach meant being honest and nurturing, helping student teachers recognize what they need to learn, and establishing a clear communication with the student teachers. This role of a university supervisor was also observed by Zimpher et al. (1980). They reported that one activity of the university supervisors was communicating the university program expectations to the student teachers and cooperating teachers. For example, university supervisors, like coaches, guided student teachers to take the responsibility of classes gradually. They asked student teachers to spend enough time on observation. The last analogy defined by Freidus is negotiator and it referred to facilitating a dialogue between the student teacher and the cooperating teacher. In each of these roles, supervisors helped student teachers to reflect on their practice, to recognize what they know, and to identify what they need to learn.

There might be several reasons for the effectiveness of the supervisors in the Freidus (2002) study. First of all, their supervision style put the focus of the conferences on student teachers. University supervisors posed analysis questions to student teachers to help them critique and reflect on their teaching. Secondly, from the article, one can infer the collegiality among the supervisors. They had common goals for the student teaching experience. Thirdly, the student teaching experience in their program was a yearlong experience, which helped the student teachers and university supervisors build trust and discuss issues from diverse perspectives. Fourthly, the supervisors were the experts of the

subject area that the student teachers were teaching. Lack of strong content knowledge on part of the university supervisor caused problems in another student teaching experience (Slick, 1998). Lastly, the student teachers were coming from a program that had a goal of educating teachers who are reflective and mindful, are knowledgeable of theory, and believe that teachers can contribute to social change. The cognitive level of the student teachers affects the quality of the conferences between them and their supervisors (Zeichner & Liston, 1985). All these factors probably helped the supervisors to be effective as described by Freidus.

In a different context, Slick (1998) described a student teaching experience where the university supervisor was called as a disenfranchised outsider. The university supervisor in Slick's study was a graduate student who had supervised 80 elementary and a few secondary student teachers. She had a background in drama and speech. At the time of the study, she was supervising five social studies student teachers who were non-traditional prospective teachers. The study focused on the student teaching experience of one student teacher. The cooperating teacher had 36 years of teaching experience and this was his first experience as a cooperating teacher. He had a reputation as an ineffective teacher and therefore the student teacher was not pleased with her placement. The university supervisor did not take any mediating effort even though she was aware of the situation. The relationship between the cooperating teacher and student teacher did not improve through the semester. Slick mentioned that it was not an educative experience for the student teacher.

Slick (1998) reported that the university supervisor had a desire to discuss supervision issues with her colleagues. She felt alone in enacting her role as a supervisor. For example, she did not have any guidance from the department in conducting student teaching seminars. Additionally, she was not provided information about placement decisions even though she requested it several times. The university supervisor wanted more collegial support. Another negativity in this student teaching experience occurred due to the university supervisor's lack of expertise in social studies. She was inadequate in answering the student teachers' social studies-specific pedagogy related questions. One student teacher expressed a desire for the university supervisor to be knowledgeable in the student teachers' content area in the course evaluation form.

Slick (1998) speculated that if the university supervisor had been given more support from the university program, she could have made a difference in the student teacher's learning. I agree with Slick in that the support from university faculty to supervisors, collegiality among the university supervisors, and the communication between university programs and schools are important. However, I also believe that the university supervisors' strong content knowledge is as important as those components. The following study investigated a student teaching experience which integrated most of the components discussed so far to make the supervision process effective.

Frykholm (1998) designed a program for student teaching, which resulted in a good experience for student teachers, university supervisors, and cooperating teachers. The participants were three dyads of student teachers and supervisors. The supervisors were graduate students from the mathematics education program, who were all engaged in research in mathematics education reform. They visited the student teachers every week and each visit included a pre-lesson conference and a post-lesson conference. The pre-lesson conference included clarification of the goals of the lesson and teaching strategies to be used. The focus of the post-lesson conference was the student teacher's thoughts and reflections on the lesson. Additionally, the student teachers and university supervisors had bi-weekly community meetings which included reflection, discussion, and sharing of ideas, lesson plans, or materials. The student teachers talked positively about trust, rapport, and the continuity of interaction between them and their supervisors. They felt that the supervisors were not outsiders. The supervisors expressed personal growth and growing interest in teacher education. Cooperating teachers participated in post-lesson conferences and those conferences engaged three communities (student teachers, university supervisors, and cooperating teachers) of mathematics education in discussions of issues and sharing of ideas related to the reform in mathematics education. Although it was not an intention of the study to examine how the program affected the cooperating teachers, the cooperating teachers expressed that they learned new ideas and gained insight about reform-based mathematics instruction. Frykholm concluded that the program connected theory with practice and the student teachers experienced reform based instruction as learners.

Until now, I have discussed the roles of the university supervisors in student teaching experiences. Now, I will present findings of research studies that examined the nature of conversations between university supervisors and student teachers. Borko and Mayfield (1995) explored the characteristics of the conferences between student teachers and their cooperating teachers and university supervisors. Participants included four middle school mathematics student teachers, their cooperating teachers, and three graduate students from a College of Education as university supervisors. Two of the university supervisors did not have strong backgrounds in mathematics. In this section, I will focus on the nature of the conversations between the student teachers and the university supervisors.

The university supervisors used a student teacher observation form while observing the student teachers and used it as a guideline during the conferences. This form focused on pedagogy (not mathematics specific) and instructional skills (not mathematics specific). The conversations between the supervisors and student teachers were mostly on general pedagogy and teaching skills with a focus on classroom management. The discussions about mathematics and mathematics-specific pedagogy were limited both in quality and quantity. There may be two reasons for the lack of deep and rich discussions on mathematics and how to teach or learn mathematics between the supervisors and student teachers. Firstly, the supervisors used an observation form that focused on general pedagogy and instructional skills during their visits. This form might have directed the content of the conversations. Secondly, the supervisors had limited knowledge in mathematics and mathematics-specific pedagogy, which negatively affected the quality of their feedback. The negative effect of lack of content and pedagogical-content knowledge on the part of the university supervisor was also found by Slick (1998). As a result, the student teachers in the Borko and Mayfield (1995) study reported very little change in their instructional practices due to the supervisor effect. Moreover, they expressed dissatisfaction with the infrequent interactions and lack of feedback from their university supervisors. Other data sources supported the student teachers' comments.

The student teachers in Beck and Kosnik's (2002) study held expectations for good student teaching experience that were mostly related to the cooperating teachers.

There was not a component related to the university supervisor. They had limited awareness of the role of the university supervisors in contributing to effective student teaching experiences.

In other studies where the university supervisors frequently interacted with student teachers, shared a common content knowledge background, and kept a reflective focus in their supervision, the student teachers talked positively about their interactions with the university supervisors (Frykholm, 1998; Freidus, 2002; LaBoskey & Richert, 2002), and there was a positive change in the student teacher's practices, as the reform suggests (Blanton et al., 2001). Therefore, the effect of the university supervisor on student teachers' beliefs and practices might depend on the structure of the supervision offered by universities. In the educative supervision that Blanton et al. advocated, the student teacher and the university supervisor talked about mathematics-specific pedagogy, general pedagogy, mathematical knowledge, knowledge of student understanding, classroom management, and teacher-student relationships. The conversations on mathematics-specific pedagogy dominated the conferences whereas the conversations on classroom management did not receive much emphasis.

Strong and Baron (2004) analyzed conversations between mentors and beginning teachers with a specific focus on suggestions made by mentors and responses of the novice teachers. Researchers examined 64 conversations between 16 veteran teacher mentors and beginning teachers. They categorized suggestions as direct suggestions or indirect suggestions and responses as acceptance and rejection. Out of 206 suggestions, 10 were direct, and the rest were indirect. Indirect suggestions were further classified into four categories: possibility, question, anecdote, and reformulation. Beginning teachers accepted 80% of the suggestions and rejected 20% of the suggestions. About one third of the responses were elaborated. The content of the discussions included teaching (70%), teaching and student (8%), student (18%), mentoring (2%), and subject matter (2%). Unfortunately, the researchers did not provide what these content categories mean.

Strong and Baron (2004) discussed why there were only a few direct suggestions and the linguistic forms of the mentors' indirect suggestions. They thought that this might be explained by the philosophy of the program of which the mentors and beginning teachers were a part. The program had a goal of training mentors who can promote

reasoning, engage the beginning teacher in reflective thinking, and who can listen, be non-judgmental, and non-evaluative. Consequently, mentors avoided direct suggestions. I question this study in the aspect that it analyzed the conversations from the suggestion-response perspective only (for example, what about analyzing the types of questions posed by the mentors). They did not analyze other communication types such as questioning, assessing or describing. Thereof, I think that we do not have a clear understanding of the nature of the conversations between participant mentors and novice teachers. Nevertheless, I think that this study informs us about the effect of the teacher training program on the mentors. The focus of the program affected the mentors' practice in a way that they avoided direct suggestions. Similarly, the focus of the program of my study might affect the cooperating teachers' supervision practice as desired.

Now, I will explore different supervision styles. I attended a course that was offered for cooperating teachers. The course advocated teaching clinical supervision to course participants. Clinical supervision has emerged as one of the most preferred models of supervision (Zeichner & Liston, 1985). In this model, a clinical educator supports the professional development of the beginning professional by using interpersonal communication skills that consist of unconditional positive regard, empathy, and congruence (Florida Department of Education, 1999). Active listening, open-ended exploration, clarification, focusing on feelings, responding, and facilitating are the main behaviors of the supervisor. Using concrete examples from the observed behavior increases the effectiveness of the communication. Zeichner and Liston explained that one of the main goals of a clinical supervisor is to help the supervisees be analytical of their actions and the focus of the supervision is on the rational analysis of the instruction. However, learning about clinical supervision is not enough to be an effective supervisor (Zeichner & Tabachnick, 1982). For example, on which aspects of teaching will supervisors guide supervisees to be analytical? Likewise, the level of the analysis and the ends of the analysis could be different for different clinical supervisors.

Zeichner and Tabachnik (1982) identified three different supervision styles based on nine supervisors' beliefs about supervision of student teachers: technical-instrumental approach, personal-growth-centered approach, and critical perspective. All the supervisors in this program expressed that they used clinical supervision. However, their

method of applying clinical supervision sounded different. Supervisors who used the technical-instrumental approach focused on instructional techniques and teaching skills, and helping student teachers implement the given curriculum creatively. Personal-growth-centered supervisors helped student teachers to reach their goals and to think about the reasons behind their actions in the classroom. Supervisors who maintained the critical perspective encouraged student teachers to recognize the relationships between the classroom culture and the school culture, as well as the relationships between the culture of the classroom and the community. They also supported the evaluation of what happens in the classroom from a moral perspective.

In a review of the literature on university supervision of student teaching, Zimpher (1987) reported vertical and horizontal approaches to supervision. In the vertical approach, there is a set of teacher behaviors that is desired for the student teachers to achieve. Through observation and feedback, student teachers are encouraged to gain those skills. On the other hand, in the horizontal approach student teachers and supervisors decide on short and long term goals collaboratively and reflect on the lessons with respect to those goals. In this approach, important parts of the discussion are beliefs, practices, and how they are related. Zimpher categorized the vertical approach as directive supervision and the horizontal approach as nondirective supervision. Directive supervision meant “offer the teacher immediate and useful advice for overcoming instructional difficulties” (p.138) and nondirective supervision meant “the supervisor uses interrogative statements to solicit opinions and to encourage the teacher to make suggestions, reflecting the teacher’s ideas and offering information as the teacher requests it” (p.138). Based on several research studies, Zimpher concluded that direct supervision might be better suited in the initial stages of the student teaching experience. As the student teacher gains confidence and analytic skills, they value more the use of a nondirective supervision approach. The clinical educator training book used in Florida with potential cooperating teachers made a similar suggestion and concluded that clinical supervisors balance the use of direct and indirect approaches (Florida Department of Education, 1999).

Zahorik (1988) conducted semi-structured interviews with 10 student teacher supervisors in an elementary education program to examine the observing and

conferencing role of the university supervisors. He classified supervision styles of the participants into two main categories: active style and reactive style, which are very similar to directive and nondirective supervision styles. Supervisors who used the active style gave prescriptions and interpretations to student teachers. Reactive style supervisors elicited student teachers' ideas and encouraged student teachers to analyze and clarify their ideas. Zahorik identified three kinds of goals (behaviors, ideas, and persons) that supervisors had for their student teachers. When the styles and goals are combined, three main types of supervision emerged: behavior prescription, idea interpreter, and person support. Behavior prescription and idea interpreter supervisors are under the active style category and person support supervisors are under the reactive style category. Given that their major goal is the acquisition of basic teaching skills and classroom management techniques, behavior prescription supervisors told student teachers which teaching skills they should use and which they should avoid. Idea interpreter supervisors shared their own beliefs with respect to schooling with the student teachers. They modeled and suggested teaching behaviors in order to make changes in the classroom and school. Person-support supervisors aimed to improve the problem solving ability of their student teachers. They actively listened to the student teachers' ideas, encouraged them to reflect on their teaching, and helped them come up with ways to improve their teaching.

Zahorik (1988) concluded that each supervisor had a preferred supervision style. However, they sometimes used other supervision styles as well. This was also observed in the supervisors that were part of the Zeichner and Tabachnick's (1982) study. Zahorik suggested that supervisors with different styles might work with the same student teacher at different stages of the student teaching experience. I think that this is not practically possible because of time and space constraints and also because this may prevent supervisors and student teachers from getting to know each other well. The finding that supervisors used different types of supervision styles suggests that supervisors might adapt their supervision style based on the needs of the student teachers. Zimpher (1987), as noted previously, reported that inexperienced student teachers mostly preferred direct supervision styles. However, I argue that their preference may not always show the most productive supervision process. I think that even though supervisors might use direct supervision at the initial stages of student teaching and depending on the needs of the

student teacher, they should continuously ask the student teachers questions encouraging reflection. Unless student teachers have the ownership of solving problems related to teaching and learning mathematics, I believe there will not be a long term change in their instruction. The following study demonstrates an effective supervision model implemented with a middle school mathematics student teacher.

Blanton, Berenson, and Norwood (2001) investigated a student teaching experience where the student teacher was encouraged to actively construct her knowledge about teaching. The supervisor as the more knowing person guided the student teacher's learning by asking open-ended questions, discussing the critical incidents that happened during her instruction, moving away from being evaluative, and being sensitive to her zone of proximal development. They called this type of supervision as educative supervision. It included frequent interactions with the student teacher; the university supervisor conducted weekly meetings with the student teacher. Each visit included an observation of the student teacher's teaching, a post-lesson conference with her, and observation of another lesson after the conference. The main purposes of the post-lesson conferences were to encourage the student teacher to recognize her interactions with the students, what these interactions suggested about student learning, and how possible modifications could be made to the lesson. The content of the post-lesson conferences included mathematics-specific pedagogy, general pedagogy, mathematical knowledge, knowledge of student understanding, classroom management, and teacher-student relationships, where mathematics-specific pedagogy dominated the conferences. The supervisor audio-taped her reflections after each visit. The student teacher kept weekly journals that included reflections on student learning, mathematics, and teaching mathematics.

By the third visit, based on the needs of the student teacher, the university supervisor chose to focus post-lesson conferences throughout the semester on the nature of mathematical discourse in the student teacher's classroom. This provided an instructional goal for the supervision. Blanton et al. (2001) suggested that the educative focus of the student teaching could have been decided with the student teacher so that she had a sense of more ownership for the change in her teaching. One of the essential components of educative supervision is asking open-ended questions to the student

teacher. The article included examples of open-ended questions that were asked in the supervision process with their evaluative counterparts. An example of an open-ended question is as follows. “How would you handle a similar situation in the future?” and the evaluative corresponding communication is “In the future, you should do this instead...” (p.189).

Blanton et al. (2001) concluded that in the supervision process, instead of being direct and doing authoritative evaluations of the student teacher, by performing an educative supervision as described above, the university supervisor was able to support the professional development of the student teacher. Classroom observations provided examples of positive changes in the student teacher’s practice. The authors called for more research studies to explore educative supervision. I think that educative supervision is very similar to clinical supervision. However, it adds more to it by having an educational focus, by defining effective instruction, and by deciding on the substance of the supervision. Educative supervision formed the theoretical basis for the supervision style of the program in this study. The cooperating teachers were encouraged to supervise student teachers from an educative perspective.

Cooperating Teachers

This section will start with a discussion of roles, experiences, and expectations of cooperating teachers in the student teaching experience. Afterwards, research on training programs designed for cooperating teachers will be presented.

Research studies have shown that cooperating teachers exert the main influence on student teachers’ practice during their student teaching experience (Vacc & Bright, 1999; Frykholm, 1996; LaBoskey & Richert, 2002). Nearly two thirds of the student teachers in Frykholm’s (1996) study imitated their cooperating teachers in their teaching. Cooperating teachers shape what student teachers learn in their student teaching experience by setting the emotional and intellectual tone (Feiman-Nemser & Buchmann, 1987). Therefore, how they carry out their role is very important for having an educative student teaching experience: This suggests a need to understand what roles cooperating teachers have in student teaching.

Research on cooperating teachers' perceptions of student teaching revealed that cooperating teachers felt responsible for the professional growth of student teachers (Koskela & Ganser, 1995; Arnold, 2002). Koskela and Ganser administered a survey to 302 cooperating teachers in order to investigate the role of cooperating teachers in the student teaching experience. They found that cooperating teachers saw themselves as directing the student teaching experience and supporting the professional growth of student teachers. Cooperating teachers recognized their importance in the student teaching experience and their influence on student teachers. They defined their role as a model for student teachers, a guide, or facilitator of growth. A similar view of cooperating teachers was shared by student teachers and university supervisors (Koerner, & Rust with Baumgartner, 2002).

As a model, cooperating teachers demonstrate teaching strategies and skills (Koskela & Ganser, 1995). The guiding role included sharing ideas and resources with the student teachers, providing constructive criticism, supporting in planning, management, organization, gaining content and pedagogical knowledge, and efficient use of time. The cooperating teachers facilitate student teachers' growth through motivation, encouragement, communication, and help build of confidence. Koskela and Ganser found that the cooperating teachers looked forward to giving and receiving ideas and materials, watching the growth of the student teachers and themselves, and getting more enthusiasm and energy from the student teachers. Arnold (2002) found that serving as a cooperating teacher helped teachers develop professionally. Cooperating teachers reported that the experience of being a cooperating teacher encouraged them to reflect on their own teaching. Moreover, they learned new activities, and methods for teaching their subject matter from the student teachers. They also focused on more careful lesson planning.

Even though cooperating teachers are one of the key elements of the student teaching experience, there is not always strong communication between them and university programs (Painter & Wiener, 1979). Cooperating teachers expressed ambiguity in universities' purposes and expectations for student teaching (Koskela & Ganser, 1995). Some of the expressions, which showed ambiguity, were related to the university supervisors' role, the cooperating teachers' role, how to evaluate student teachers, and power relationships. Responses to survey questions indicated a desire and a need to build

more communication between university programs and cooperating teachers. The program in this study acknowledges the important role that cooperating teachers have in the student teaching experience. One indirect goal of the program is to build more communication between the university supervisor and the cooperating teachers. The program also believes the value of communication among cooperating teachers. Communication, collegiality, and collective problem solving increased cooperating teachers' confidence and reflective thinking, and helped them reaffirm their principles and purposes for being teachers (Arnold, 2002). Therefore, the participant cooperating teachers were encouraged to share ideas and resources throughout the program.

The study that was conducted by Koskela and Ganser (1995) revealed how cooperating teachers perceived their roles in the student teaching experience. Some other studies provide information about how they enact their role. For example, Borko and Mayfield's (1995) study showed that cooperating teachers' beliefs about learning to teach and their perspectives of themselves as teacher educators affected their interactions with student teachers. Those cooperating teachers who believed that they should have an active role in the student teachers' learning had longer conferences with them and provided more feedback. These cooperating teachers were perceived by the student teachers as more influential. On the other hand, the cooperating teachers who believed that student teachers will learn merely from experience and they do not need to have an active role in the student teachers' learning had short conferences with the student teachers and did not provide much feedback.

Another finding of Borko and Mayfield (1995) is that the cooperating teachers and student teachers talked about pedagogy, mathematics, mathematics-specific pedagogy, and students. Nevertheless, most of the time their discussions about mathematics, pedagogy and mathematics-specific pedagogy were superficial; they did not have deep discussions on those issues; this was also found in the pilot study for this research. Borko and Mayfield stated that the student teachers hoped for feedback both from cooperating teachers and university supervisors but they learned not to ask for too much throughout the student teaching experience.

Borko and Mayfield (1995) suggested that cooperating teachers need help in enacting their roles as teacher educators. One cooperating teacher mentioned that he did

not know how to help the student teacher in the most efficient way. Other researchers also called for studies to support the professional growth of cooperating teachers (Painter and Wiener, 1979; Arnold, 2002). Borko and Mayfield proposed that university supervisors may spend their limited time by helping cooperating teachers instead of giving feedback to student teachers. Based on the literature of the university supervisors' role in student teaching (Zimpher et al., 1980; Frykholm, 1998; Blanton et al., 2001; Freidus, 2002), I do not agree with the idea of eliminating the interactions between student teachers and university supervisors. A university supervisor may help the student teacher teach as the reform suggests, may act as a bridge between schools and universities, and may be the only person that provides constructive criticism to the student teacher. I propose that the solution lies in changing the structure of student teaching in several ways. I will discuss some changes that are related to the roles of university supervisors and cooperating teachers. First of all, the university supervisors should have strong content, pedagogical content, and curricular knowledge. The importance of university supervisor's background was found in the pilot study as well as some other studies (Frykholm, 1998; Slick, 1998; Blanton et al., 2001). Secondly, sometimes experienced teachers are assigned as university supervisors. However, it should be acknowledged that experienced teachers will not necessarily supervise effectively (Thies-Sprinthall, 1986). Effective supervision requires preparation beyond learning formal administrative procedures or attending a workshop on how to conduct observations, and pre and post lesson conferences. Given the importance of student teaching in the professional development of prospective teachers, I propose that university supervisors may spend more time on the student teaching experience by adding some educative interaction time with the cooperating teachers. The program in this study aimed to have the university supervisor help cooperating teachers improve their knowledge and practice of supervision of student teachers. The methodology section will explain the program in detail.

As a final point, I will discuss the research studies that explored training programs for cooperating teachers. Most of these programs were conducted for prospective cooperating teachers. They varied in time, goals, and methods.

Training programs for cooperating teachers date back forty-five years. Perrodin (1961) explained that the Georgia Supervising Teacher Education Program consisted of a workshop for beginning cooperating teachers, internship for a year, and a follow-up workshop to discuss supervisory problems. There were careful selection procedures for the participants, including recommendations from the school principal and college personnel. As measured by the Minnesota Teacher Attitude Inventory, student teachers tended to make greater increases, such as getting along well with pupils in interpersonal relationships and being satisfied with teaching as a vocation, when placed with supervising teachers who completed the supervising teacher preparation program. Unfortunately, the article did not provide information about the content and process of the program workshops.

Painter and Wiener (1979) described a program whose goal for the prospective cooperating teachers was enhancing their professional quality. Professional quality referred to renewing cooperating teachers' knowledge of trends in curriculum development and classroom management, providing support for better evaluation of the student teachers, and helping cooperating teachers recognize the value of student teaching both for them and the student teachers. The eight-week program included the following processes. At the beginning of the semester, student teachers, cooperating teachers and university supervisors conducted a meeting where they discussed program goals and shared individual philosophies. The second part of the program included three one-hour conferences between cooperating teachers and university supervisors, where the university supervisor balanced time and topics between program goals and cooperating teachers' interests. In order to form a base for the discussions in these conferences, the cooperating teachers were mailed readings that included past student teachers' comments, such as problems and pleasures, and state standards for their grade level and/or subject area. Student teachers participated in one of these conferences. During the sixth week, cooperating teachers attended a college class in their major academic areas. The final component of the program was a three-hour session on campus that included professional growth activities and exhibits of student teacher projects.

Participating cooperating teachers were generally satisfied with the informal nature of the program. They suggested limiting the scope of the program. Campus

visitations were found to be helpful for cooperating teachers in understanding the college background of the student teachers and perceiving current trends in teacher education. Student teachers who were placed with the participant teachers experienced better communication with them compared to student teachers who were placed with cooperating teachers who did not participate in the study. The study did not attempt to measure any possible effect on cooperating teachers. I think one major limitation of this study was that the program did not have a focus as suggested by the participant cooperating teachers. Having an educational focus will provide an instructional goal for a program.

Thies-Sprinthall (1984) designed a program for improving the cognitive developmental maturity and behavioral skills of prospective cooperating teachers. The program was designed on the theory that people with high levels of cognitive capacity are more flexible in problem solving situations. The study was conducted with two groups of teachers, each group consisting of 10 and 12 teachers. Participants attended a two-semester sequence of a graduate course. The main goal of the program was to increase the flexibility of supervising teachers through role playing experiences. Role taking, careful and continuous guided reflection, balance between real experience and reflection/discussion, providing both support and challenge, and the continuity of the program were accepted as the conditions for psychological growth. The training components of the program were explaining a model, demonstrating it, peer teaching the model, and adapting and generalizing the model.

Although there was a positive trend, there was no significant increase in the first group participants' cognitive-developmental level. Teachers with low conceptual levels commented that they did not understand the goals of some experiences they had in the class. The researcher concluded that low conceptual level teachers needed more structure and concrete direction, at least at the initial stages of the program. Accordingly, she revised the curriculum. The revised curriculum was implemented with the second group of teachers. It was found that the participants improved their cognitive-developmental level and behavioral skills. They improved communication skills in regards to active listening. Another finding was that the participants evaluated the program positively.

The same researcher designed a mentor training program and an evaluation system (Thies-Sprinthall, 1986). The researcher taught mentoring to prospective mentors in two semesters. Then, the trainees became mentor educators. The program focused on effective teaching and clinical supervision. Participants explored supervision models by role playing. The mentor trainers spoke of growth in their practice and intellectual understanding of the mentoring process. They increased self knowledge and sense of autonomy with respect to mentor education by participating in the program. The mentors declared that they became more effective teachers compared to their teaching before the program. The beginning teachers talked positively about the trained mentors. They saw them as resources especially in classroom management, organizational issues, and inducing the school system. This perception of the beginning teachers helped me recognize a commonality in the prospective cooperating teacher education programs. The cooperating teacher education programs are usually designed for teachers from different content areas because there is a limited number of teachers from the same content area to make a class. These programs' focus is mostly on supervision styles and techniques, and generic teaching methods. The program in my study offers the opportunity of improving supervisory practices to the teachers from the same content area. The purpose in this design was to help the cooperating teachers focus on their content area, study more realistic examples, and share ideas on similar teaching and learning issues. The typical focus on classroom management is something that the program wanted to change toward a focus on content, pedagogy, content specific pedagogy, student thinking, classroom management, and schooling.

McIntyre and Killian (1987) investigated the effect of supervisory training for cooperating teachers on preservice teachers' professional development during early field experiences. Participants were 36 elementary and secondary education juniors completing the first level of a three-level field experience. Eleven student teachers were placed with trained cooperating teachers and 25 student teachers were placed with untrained cooperating teachers. The training was a three-credit graduate course whose focus was improving observation skills and providing critical feedback. The teachers took this course prior to becoming a cooperating teacher. Participants learned communication skills, helping student teachers to examine teaching problems, to ask for help, to explore

alternatives, and to propose and implement strategies for solutions. They also worked on making the evaluation process ongoing rather than summative. They composed a file for the student teachers to help them get used to the school and classroom. The file included a school map, lesson plan formats, disciplinary guidelines, and other similar documents.

The student teachers were administered a questionnaire at the end of each week of the semester and they were also interviewed. Cooperating teachers were also interviewed to validate the perceptions of the student teachers. Analysis of the data showed that the student teachers and cooperating teachers had parallel perceptions except that the cooperating teachers perceived more frequent interaction.

Student teachers with trained cooperating teachers engaged in full group teaching, interacted with cooperating teachers on planning and preparing classroom activities, received feedback from the cooperating teachers and interacted with students more than student teachers with cooperating teachers that were not trained. McIntyre and Killian (1987) thought that preparing a file for student teachers helped the cooperating teachers have more interactions with the student teachers than cooperating teachers who were not trained because the trained teachers did not engage in a haphazard approach. This study informed me that I should contact the participant cooperating teachers prior to the student teaching experience and discuss with them the ways to help the student teachers adjust to the school and classroom setting. Although this study is valuable in showing some positive effects of the training program on student teachers, it did not provide enough data to understand the quality of the interactions between the student teachers and the cooperating teachers. For example, we do not know what kind of feedback the cooperating teachers provided to the student teachers or what kind of supervision approach they used in their interactions and what effects it had. These are components that are missing in some other studies as well (Perrodin, 1961; Painter & Wiener, 1979; Thies-Sprinthall, 1986).

Another well known study on cooperating teacher training was conducted by Hauwiler, Abel, Ausel, and Sparapani (1988-89). The researchers described the development and implementation of a short term in-service program for cooperating teachers. The designers of the program agreed that the workshop should be short, practical, efficient, and portable. They brought insights from cooperating teachers in

planning the workshop. The workshop consisted of seven sessions and utilized technology and group work extensively. The general topics covered in those seven sessions were a review of recent research, designing a lesson observation guide, and supervising through the use of role playing.

An overview of effective teaching was discussed in the first session. The next three sessions were devoted to developing an observation guide and using it. Most of the cooperating teachers expressed that they did not use the guidelines given to them from the university. Participants role-played using their observation guides. They viewed videotaped vignettes and one teacher took the role of cooperating teacher and the other took the role of student teacher. The last three sessions were devoted to idea exchanging. Participant cooperating teachers suggested necessary things for a cooperating teacher to do to set the stage for the student teacher. These included: “orientation of the student teacher to the school; observation in the classroom; induction of the student teacher into the teaching role and staff relationships; instructional planning; actual teaching; evaluation and conferencing” (p.45). The participants evaluated the workshop positively. I think that one of the most valuable components of this program was having the cooperating teachers construct an observation form for the student teachers. This might have given them a sense of being a teacher educator since it is something they created collaboratively to help the growth of student teachers. Discussion on effective teaching is also essential since it will give a framework for observing and critiquing the teaching of the student teacher. However, I think that it is also important for cooperating teachers to consider how to communicate these observations to the student teacher. In other words, the supervision style that the cooperating teacher uses is important for the growth of the student teacher. The workshop did not include a discussion of different supervision styles as I inferred from the article.

The program that was explored in the present study did not attempt to prepare a classroom teacher for becoming a cooperating teacher. Instead, this program was designed to build on the previous education and experiences of cooperating teachers in the supervision of student teachers. The major goal of my program was to enhance the supervisory knowledge and practice of the participants when they were actually practicing supervision of a student teacher. Supervisory courses for classroom teachers

generally focus on generic teaching methodologies when they include episodes from classrooms. Teachers at high levels of cognitive development may generalize these ideas and apply them to their subject matter while teachers at low levels of cognitive development may not do this transition (Thies-Sprinthall, 1984). Thies-Sprinthall (1984) noted that professional development is not likely to occur in short amounts of time such as one semester. Therefore, the program in this study might help participants to internalize previous knowledge that they learned in the supervisory course as well as learning new knowledge such as educative supervision style and reform ideas in mathematics education.

CHAPTER-3

METHODOLOGY

Guyton and McIntyre (1990) suggested that research on student teaching should connect teacher education program goals, student teaching, and outcomes of student teaching as much as possible to provide more useful knowledge. Accordingly, this study aimed to connect goals of the mathematics education program at a Southern University [SU] with the student teaching experience by designing a program for improving the supervisory knowledge and practices of cooperating teachers. According to Guyton and McIntyre, the most important component of student teaching is supervision. McIntyre et al. (1996) suggested that there is a need to examine the supervision process qualitatively to understand how supervision affects student teachers' beliefs, behaviors and attitudes. The nature of the question of this study also suggested a need to study the supervision process qualitatively.

Case study is a useful method for understanding the phenomenon under investigation (Lincoln & Guba, 1985). Lincoln and Guba advocated case study as a powerful tool for a naturalistic inquiry. They mentioned that case study is the main tool for emic inquiry and it builds on readers' implicit knowledge, invites readers to search for internal consistency and to judge the transferability by studying the thick description it provides. The case study method was used in this study, where the case was the designed program. Patton (2002) discussed that case studies are often made up of nested and layered case studies. In the present study, the smaller case studies were the three dyads of student teachers and cooperating teachers. The purpose of conducting a case study is to collect, analyze and present comprehensive, systematic, and in-depth data about the studied case (Patton, 2002). Therefore, in order to understand the nature of the designed program, evaluate how it worked, observe its possible effects on the participants, and think about ways to improve it, I collected extensive data from different sources and with different techniques. The analytic levels of the study included factual, interpretative, and

evaluative levels (Lincoln & Guba, 1985). In other words, I presented descriptive data about the program, interpreted how the program worked, and finally evaluated it.

In this methodology section, I will first present the participants. Next, I will explain the program of the study. Lastly, I will explore methods of understanding how the program supported the mathematics cooperating teachers' knowledge and practice of supervision.

Participants

There were four mathematics cooperating teachers in town at the time of this study. The participants were chosen on a voluntary basis. Three cooperating teachers volunteered to participate in the program. These three volunteer teachers and their student teachers were the participants of this study. The student teachers were completing their undergraduate education at SU. All participants signed a consent form prior to data collection. Pseudonyms will be used throughout this paper for the participants as follows. The cooperating teachers will be Denise Johnson, Lauren Taylor, and Andrew Fletcher. The student teachers will be Adam Fair, Michele Williams, and Alison Cook. All student teachers and cooperating teachers were Caucasian.

Andrew Fletcher and Lauren Taylor were working at public high schools. Denise Johnson was working at the laboratory public high school of the SU. The cooperating teachers typically have the option of getting a fee waiver for 6 units at SU. The participant cooperating teachers of this study were paid \$125 in addition to having 6 units. The student teachers were not required any additional work except participating in one program face-to-face meeting. Therefore, no imbursement was given to them.

Andrew Fletcher was 53 years old and had been teaching for 31 years. At the time of this study, he was teaching Geometry to students whose grade level ranged from 9th to 12th. He supervised about 7 student teachers prior to this study. All of his student teachers were from SU. Ms. Cook completed her student teaching under the supervision of Mr. Fletcher. She was 26 years old. Ms. Cook was working part-time in a restaurant, taking a course at SU, and completing her student teaching experience all at the same time.

Lauren Taylor was 55 years old and had been teaching mathematics for 34 years. She had supervised about 8 student teachers who were all from SU. At the time of this study, she was teaching Advanced Placement statistics [AP statistics] and Pre-Calculus to students who ranged from 10th grade to 12th grade. Ms. Taylor attended 2 national AP conferences, 3 regional AP conferences, and several computer and calculator workshops in the last four years. Additionally, she was a member of NCTM and Florida Council of Teachers of Mathematics [FCTM]. Ms. Taylor's student teacher was Michelle Williams. Ms. Williams was 24 years old. She was assigned to Ms. Taylor's classroom before as part of her Practicum course, where she had to teach a unit in Ms. Taylor's classroom. Therefore, they knew each other prior to this student teaching experience. Ms. Williams changed her major from mathematics education to music education, and then back to mathematics education again. She had a minor degree in Statistics.

Denise Johnson was 55 years old and had been teaching for 32 years. At the time of this study she was teaching Geometry and Algebra-2 to students whose grade level ranged from 10th grade to 12th grade. She was also teaching one dual enrollment mathematics course for a community college. Ms. Johnson had completed a Masters of Art in teaching and was working on her doctoral education in the mathematics education program at SU. She was a member of NCTM, FCTM, and Mathematics Association of America [MAA]. The conferences that she attended in the last four years included NCTM regional 2004, T-cubed (Teachers Teaching with Technology) International 2004, 2005, and 2006. Ms. Johnson supervised 3 mathematics student teachers prior to this study. All of her student teachers were from SU. Ms. Johnson's student teacher was Adam Fair. Mr. Fair was 27 years old. He had graduated from a sports management program and worked for one of the State minor league teams. Then, he went back to school to major in mathematics education.

The researcher assumed the role of the university supervisor. She was a doctoral student in mathematics education at SU. She had taught mathematics for two years at secondary level and for one year at college level. Her background in supervision included attending a general course for the supervision of student teachers, participating as a co-university supervisor for two mathematics student teachers, and supervising three

mathematics student teachers. The researcher acted as a participant observer in all activities of the program and the student teaching experience.

The Program

The major goal of the program was to help cooperating teachers supervise the student teachers from an educative approach (Blanton et al., 2001). The theoretical basis of educative supervision is the notion of “zone of proximal development” defined by Vygotsky (1934/1978). Vygotsky defined two developmental levels: actual developmental level and zone of proximal development. The first level refers to already completed cycles of development in the person. The second one, zone of proximal development, means the developing stage of a person where the person can not accomplish the tasks on his/her own but can accomplish them under the guidance of a more knowing person. The functions of completing those tasks have not matured in that person yet, but they are in the process of maturation. Vygotsky argued that in order to describe a learner’s developmental level, one needs to take into consideration both the actual developmental level and the zone of proximal development. He further claimed that “what children can do with the assistance of others might be in some sense even more indicative of their mental development than what they can do alone” (p.85). These ideas could be transformed to the learning process of student teachers. The student teachers, as learners, were expected to accomplish reform-based mathematics instruction under the guidance of the more knowing staff, the cooperating teachers and the university supervisors.

Educative supervision requires cooperating teachers to ask open-ended questions, discuss the critical incidents that happened during the student teacher’s instruction, move away from being evaluative, and be sensitive to student teacher’s zone of proximal development (Blanton et al., 2001). This type of supervision is quite different from evaluative or traditional supervision that can be described as authoritative evaluations of student teachers’ teaching with a focus on classroom bureaucracy. Educative supervision was discussed in detail in program activities with the participant cooperating teachers. However, learning educative supervision may not end up guiding the student teacher to

teach as the reform suggests (Zeichner & Tabachnick, 1982). Therefore, mathematics education reform ideas were also discussed with the participants.

Thies-Sprinthall (1984) described the following components for a program in order for it to promote psychological growth in its participants. The program needs: (1) To have participants experience role playing; (2) Careful and continuous guided reflection; (3) A balance between real experiences and discussion/reflection; (4) To provide both challenge and support to participants; and (5) To be continuous. These suggestions helped with the design of the researcher's program. More importantly, I tried to base the program on emergent and social constructivist ideas. The program offered opportunities where the participants could jointly construct knowledge about educative supervision. Individual reflective activities were also included. Accordingly, the supervision program that I designed for this study consisted of online discussions on reading materials or video clips, face-to-face communications, conducting weekly post-lesson conferences with the student teachers, and reflections on those post-lesson conferences.

The program was designed for a period of 15 weeks to fit the student teaching experience. The cooperating teachers conducted three online discussions that were based on reading materials and a teaching video. The readings included materials related to reform ideas in mathematics education, educative supervision, and reflective thinking. The reading on reform was accompanied by a teaching video to enhance understanding of the reading material, and to form a basis for discussion and reflection. Please see Appendix A for a list of readings and the teaching video.

All readings were short in length to make the readings easier for the participants; they ranged from three to six pages. The articles were summarized in such a way that the most important components of the reading materials with respect to the program were included in the summaries. The focus of the first online discussion was reform in mathematics education. The second online discussion centered on educative supervision. The third online discussion included a reading that offered a reflective structure for student teaching. I will describe the first online discussion in detail to provide an example of the online discussion component of the program. For the first online discussion, each teacher was asked to read an article from the EDThoughts book (Sutton & Krueger,

2002) and watch the American and Japanese lessons from the Third International Mathematics and Science Study [TIMSS 1995] videotape (US Department of Education, 1997). The names of the articles and the sections of the videotape are given in Appendix A. The discussion questions for the first online discussion were as follows:

1. Please post a short summary of your reading. You may include in your summary what you found most important about your reading and why that was most important. Then, please share with the group some of your past observations on how the student teachers addressed the topic of your reading in their teaching and your suggestions for possible ways to help them. Please comment on or ask questions to other group members about their comments and respond to any questions/comments posted by others in relation to your postings.

2. Watch the videotape of the 8th grade mathematics lessons from the United States and Japan. Please respond to the following questions:

- * Compare the two lessons with respect to mathematical processes (i.e. problem solving, mathematical reasoning and proof, communication, connections, and representation) that they addressed.

- * How was the questioning of the teachers in the two classrooms similar or different to each other? How did the teachers' questions elicit mathematical thinking in the students?

In the first face-to-face meeting, the participant cooperating teachers and the researcher agreed on a procedure for conducting the online discussions. The readings and/or videotapes were to be given to the teachers on Mondays of the discussion weeks. They were supposed to post a comment on the Blackboard on the Wednesday of that same week. The following four days were to be a time period for the online discussion. We also agreed that each teacher was going to post at least one comment to the other two teachers and respond to any question the others asked to them. My role was to be the facilitator of their discussions. The agreed procedure for conducting the online discussions at times did not go as planned. This issue will be discussed in chapter-4.

In total the group conducted four face-to-face meetings. Before conducting the first face-to-face meeting, I had the participants fill out a survey about their supervisory beliefs and I also interviewed them. This provided me some information about their

backgrounds on supervision, current beliefs and practices on the supervision of student teachers, expectations from the program, and their access to technology. For instance, two cooperating teachers were not familiar with Blackboard. I helped them logging in and using the Blackboard. The first face-to-face meeting included the discussion of the program with the participant cooperating teachers. The program was open to the cooperating teachers' input. We negotiated the timeline of the program, how to conduct online discussions, and videotaping one of their post-lesson conferences and possibly sharing it with the group during a face-to-face meeting. The first meeting also included a discussion of how to welcome student teachers and help them integrate into the classroom and school setting. The researcher provided some research findings about what student teachers found valuable in other student teaching experiences.

The second face-to-face meeting included discussions about learning, learning to teach, the role of the cooperating teachers in helping student teachers teach from a reform perspective, the importance of supervisory conferences, and different modes of supervision (educative vs. evaluative). "Traditional supervision" and "educative supervision" were used in the program activities as if they had the same meaning. The focus of the second face-to-face meeting was on educative supervision. The cooperating teachers reflected on a transcript of a post-lesson conference between a student teacher and a cooperating teacher. In the third face-to-face meeting, each participant shared with the group one segment of their videotaped post-lesson conference with the student teacher. The teachers were asked to explain what goals they pursued in the video segment, and as a group discuss ways to improve the conversations to make it more educative. The teachers were also given opportunities to talk about supervision problems and find solutions for the problems collaboratively. The last face-to-face meeting brought student teachers and cooperating teachers together. This was the only program activity that the student teachers were invited to attend. The idea of inviting the student teachers to a face-to-face meeting came from the cooperating teachers. The participants read about NCTM's (1991) professional teaching standards in this last face-to-face meeting. They watched the US Algebra lesson in TIMSS 1995 video and reflected on it with a focus on supervision. The participants were asked to come up with ideas as how to communicate in a post-lesson conference with the teacher in the video. Additionally, the participants

read transcripts of two post-lesson conferences that represented different supervision styles (educative vs. evaluative). One goal in this meeting was to have the cooperating teachers listen to the opinions of student teachers on supervision while at the same time helping the student teachers become conscious of the different supervision styles.

As part of the program, the cooperating teachers were asked to conduct a formally planned post-lesson conference with the student teachers every week. Blanton et al. (2001) found that studying ones own practice is itself an intervention. Therefore, it was expected that by conducting weekly post-lesson conferences with the student teachers and reflecting on their supervision with the aid of readings and collegial discussions, the cooperating teachers would progress toward supervising from an educative approach. However, the pairs could not record a post-lesson conference every week. Mr. Fletcher-Ms. Cook recorded five post-lesson conferences, Ms. Taylor-Ms. Williams recorded six post-lesson conferences, and Ms. Johnson-Mr. Fair recorded 10 post-lesson conferences. The student teachers were asked to write a short reflection paragraph after each conference by answering the following two questions. How did you feel about the conference? What did you learn about teaching mathematics, mathematics, and/or your students? Ms. Cook wrote reflections for two post-lesson conferences. Ms. Williams wrote four and Mr. Fair wrote seven post-lesson conference reflections. Written reflections after post-lesson conferences provided insight into participants' thinking. It also helped triangulate the findings.

The cooperating teachers videotaped one post-lesson conference with their student teachers. The cooperating teachers were asked to watch the video and reflect on it. The videotaping activity took place after the cooperating teachers learned about educative supervision. This timeline was selected to let the cooperating teachers reflect on their supervision with the knowledge of an educative approach. The cooperating teachers were given reflective questions for writing the reflective thoughts for the videotaped post-lesson conference. Please see Appendix B for the reflection questions. Also, please see Appendix C for the timeline of the program.

The researcher acknowledges that the video and audio recording might have affected the participants' responses. For example, they might have provided a response

with more consideration than a regular talk with the other participant. All of these effects were considered during the data analysis.

Data collection

Data was collected through initial and final interviews with the cooperating teachers and student teachers, cooperating teachers' online communications, audiotapes of the face-to-face meetings, audiotapes of the post-lesson conferences between the cooperating teachers and the student teachers, cooperating teachers' reflections on their videotaped post-lesson conference, student teachers' reflections on the weekly post-lesson conferences, cooperating teachers' responses to a survey on student teacher supervision, cooperating teachers' reflection surveys on the program, lesson observations of student teachers, and dyad (university supervisor and the student teacher) or triad conferences after observation of student teachers' teaching by the university supervisor.

The details of online discussions, face-to-face meetings, post-lesson conferences between student teachers and cooperating teachers, and student teachers' reflections on these conferences were explained in "the program" section. Since the study included different types of meetings and conferences, in order to make the reading easy for the reader, I will call each activity of the program with a different name throughout the paper. The program face-to-face meetings will be called "face-to-face meetings," and similarly, program online discussions will be called "online discussions." The post-lesson conferences between the student teachers and cooperating teachers will be "post-lesson conferences." The post-lesson conferences that the university supervisor attended will be called either "dyad post-lesson conferences" or "triad post-lesson conferences," depending on the absence of the cooperating teacher.

I interviewed each cooperating teacher at the beginning and at the end of the program. My major purpose of conducting an initial interview with each teacher was to understand their supervisory knowledge and practices before the program was implemented. I also intended to learn about their current knowledge of reform in mathematics and student teachers' university education, their expectations from the program, and available technology in their classroom or school for implementing the

program. Some initial interview questions were as follows. “What do you think about how student teachers learn to teach? What is your role in their learning?” “Do you conference with your student teachers? How often? When (prior to lessons, post-lessons, at other times)?” “Would you describe briefly a typical post-lesson conference?” “What is your goal in a post-lesson conference?” “Is there a supervision style that you implement? If so, can you explain it please?” “Are there parts of your supervision that you want to improve?” “What do you expect to learn from this program?” “What do you think about the recent reform movement in mathematics education?” “What does the reform suggest for mathematics instruction?” In the initial interview, I showed a short teaching episode to the cooperating teachers and asked them if the teacher in the episode was their student teacher, what they would discuss in the post-lesson conference and how they would carry out that discussion. The final interview included some of the initial interview questions in order to improve the understanding of whether or not there had been a change in the supervisory beliefs and practices of the cooperating teachers. The cooperating teachers watched the same teaching episode as in the initial interview. They explained how they would carry out a post-lesson conference with the teacher in the video and what they would talk in that conference with her. Additionally, I used the final interview as a tool to clarify my understanding of how the program supported the participant cooperating teachers’ supervision. I shared some of my initial findings with them and received the cooperating teachers’ opinion about them. Some of the issues that were discussed were why the group did not have rich online discussions, what they thought about the face-to-face meetings, what could be done differently in future programs, and what they thought about my perception of how they changed their supervision throughout the semester. The final interview was one of the important sources for me to triangulate data and thereby enhance the credibility of the study.

All cooperating teachers completed a Survey of Beliefs about Supervision of Mathematics Student Teachers that was created by modifying the “Survey of Physical Educators’ Beliefs about Supervising Preservice Teachers” (Kahan, 2002). Kahan reported that his survey is reliable ($R = 0.85$ (Behavior); 0.87 (Effect); 0.72 (Preference); 0.85 (subscales combined)) and has internal consistency (Cronbach's alpha = 0.82 (Behavior, 16 items); 0.79 (Effect, 10 items); 0.75 (Preference, 9 items); 0.88 (subscales

combined, 35 items)). I adapted his survey in accordance with the purposes of my study. The survey is given in Appendix D. I used the survey results for the triangulation purposes, no generalization was made and no conclusion was made based merely on survey results. The cooperating teachers took this survey at the beginning and end of the study. The reason for administering this survey twice was to understand possible differences in the cooperating teachers' beliefs about supervision of student teachers before and after they participate in the program.

The cooperating teachers also completed another survey at the end of the program. This survey asked them questions to understand their overall reflection on the program. It will be called "reflection survey" and is given in Appendix E. The reflection survey provided important information about the teachers' assessment of the program activities, what they learned from them, and their opinions on educative supervision.

The university supervisor observed each student teacher's teaching six times during the semester. Detailed notes were taken during these observations. The majority of the time, the university supervisor conducted a post-lesson conference with the student teacher after the observation. The cooperating teachers were invited to some of these meetings. Conducting triad meetings helped everybody to be on the same page, holding similar goals for the student teaching experience. Another purpose of the triad meetings was modeling the educative supervision for the cooperating teachers.

In order to understand how the student teachers perceived the supervision of their cooperating teachers, they were interviewed once at the beginning and once at the end of the semester. The interview data was used for triangulation. The first interview was arranged so that the student teacher and the cooperating teacher conducted one or two post-lesson conferences (before the cooperating teachers read about educative supervision). Some interview questions were "Would you describe a typical post-lesson conference with your cooperating teacher?" "How satisfied are you with the supervision of your cooperating teacher? Are there any aspects of it that you would prefer were different? Please explain." "What is the focus of your post-lesson conferences? What do you discuss?" "Are there ways that these conferences promote your thinking? If yes, in what ways?" "Are there ways that these conferences inform your teaching?" The final interview included the same questions that were posed in the initial interview. However, I

also asked the student teachers if they perceived a change in the supervision style of their cooperating teachers and what they thought about it. They also read the post-lesson conference transcripts that I used in the fourth face-to-face meeting and described the parts that they liked in each conference and explained why. Interviews with the student teachers and student teachers' reflections after post-lesson conferences with their cooperating teachers provided data to understand how the student teachers perceived the supervision of their cooperating teachers. The interviewer paraphrased or summarized the interviewees' responses to ensure that what the researcher understood from their responses was, in fact, correct.

Data Analysis

Since the nature of the data was qualitative, qualitative data analysis techniques were applied to all the data sets. In qualitative research, researchers look for regularities, patterns, and topics that the data cover to create the coding categories (Bogdan, & Biklen, 1998). However, a pre-assigned coding system can also be used. The qualitative researcher codes all units of data in the study, where the unit of data might be a paragraph or a sentence. Then, the emerging themes are used to answer research questions.

I applied different coding strategies to different sets of data. Initially, I applied open-coding to program face-to-face meeting and online discussion transcripts. I looked for patterns and emerging themes to understand how the program activities supported the supervisory knowledge and practice of the participating cooperating teachers. In addition to open-coding, I determined the content of the program face-to-face meetings and online discussions. Arnold (2002) found that the cooperating teachers in her study discussed instructional issues, mentoring issues, and professional issues. Similarly, the content of the current supervision program discussions collapsed into the following categories: Supervision issues, instructional issues, and general educational issues. The conversations on the teachers' role as cooperating teachers, their relationships with the student teachers, communications in their post-lesson conferences, and their observations about the student teachers' teaching were coded under the supervision issues category. The conversations about the cooperating teachers' practices about mathematics instruction in their

classrooms were coded under the instructional issues category. This category also included conversations that focused on classroom instruction during analysis of a lesson without connecting it to supervision. The conversations about teaching and learning in general and in mathematics, and reform ideas in mathematics education were coded under the general educational issues category. Table 3.1 provides examples from the data in each category. Determining the main content categories in the program activities added to my understanding of how the program supported the cooperating teachers' supervision.

Table 3.1. Content of the Program Face-to-Face Meetings and Online Discussions

Content of the Program activities	Examples from data
Supervision issues	<ul style="list-style-type: none"> * You didn't target any specific lesson ... but you could be sitting down doing evaluations there doing questions. * In your conversation, I think you made her more aware of the changes more consciously. * I just wanted to ask are you still observing totally in the classroom while your interns are teaching?
Instructional issues	<ul style="list-style-type: none"> * That's usually what I come back with, I say, 'You don't want to work with fractions, you don't want to work with decimals? Gee, there are plenty of jobs out there that pay really good for kids that can do that.' That's what I usually come back with them. * American teacher asked many low level questions that he frequently quickly answered himself. * Sometimes when I do find what I think is a worthwhile activity in Algebra 2, I find that the students would rather be in the text and not challenged to think!

Table 3.1. Continued

Content of the Program activities	Examples from data
General educational issues	<p>* I feel learning takes place when it is processed with prior knowledge and the questions allow that reflection.</p> <p>* Planning for instruction of a specific topic should address factors such as students' related interests and experiences regarding the topic, various learning styles of those you are teaching, thinking/reasoning questions, and application possibilities.</p> <p>* So basically, if you like pose a question at the beginning of class, is that gonna be the best way to have them work together, figure it out for themselves, try to learn how to ask questions and see what they need to figure out to get the concept.</p>

I coded the transcripts from the audio-taped post-lesson conferences between the student teachers and cooperating teachers by using pre-assigned codes. My major goal in analyzing the post-lesson communications was to understand if there was a change in the supervision style of the cooperating teacher throughout the semester. In order to understand if such a change occurred, the post-lesson conference communications were analyzed from three perspectives: the amount of the conversational time used by the cooperating teachers and student teachers, the content of the post-lesson communications, and the communication type used by the cooperating teachers and the student teachers. Since the literature provided important knowledge in the content and communication type analysis of the post-lesson conference transcripts, I used pre-assigned codes in those analyses. However, I also kept an open mind because new codes could emerge during the data analysis even if pre-assigned codes are used (Miles & Huberman, 1994).

In order to determine how much each participant talked in a post-lesson conference, I used the “word count” function of a word processor. The purpose of determining how much each participant talked in the post-lesson conferences is to get an overall idea about who shared ideas and to what extent during the conferences. Traditional supervision views the cooperating teacher as the transmitter of knowledge and experience to the student teacher; therefore, a traditional cooperating teacher will tend to do more talking than the student teacher. Alternatively, educative supervision values that the student teachers express their ideas, suggestions, concerns, and analyze and reflect on their own teaching. This view suggests that the participants talk equally or the student teacher talks more than the cooperating teacher as in the study of Blanton et al. (2001).

The second perspective in analysis of the post-lesson communications was determination of the content. Knowing the content of the post-lesson conferences is important because it will give us insight into which direction the student teacher was guided regarding different areas of teaching mathematics. Based on the pilot study (Fernández and Erbilgin, 2007) and literature (Shulman, 1986; Fennema & Franke, 1992; Blanton et al., 2001), all units of data in the post-lesson conferences were initially classified into the following categories: Mathematics, Pedagogy, Mathematics Pedagogy, Teacher-Student Relationship, and Classroom Management. As the communications were coded, another content category emerged; General Teacher Growth. Hence, the analysis ended up with six content categories.

The conversation was categorized in the Mathematics category if it focused only on the mathematics. If the conversation included teaching or learning of a mathematical idea, students’ understanding of mathematical concepts, or teacher’s goals about teaching mathematics in that lesson, then it was categorized in the Mathematics Pedagogy category. The Pedagogy category included conversations on generic teaching issues such as teaching methods, motivation, student involvement, and assessment without a specific focus on mathematics. Conversations on student-teacher relationships, and specific students were categorized into the Teacher-Student Relationship category. The Classroom Management category included conversations about discipline, students’ responsibilities, effective use of time, and organization. General Teacher Growth

category consisted of communications about the role of the teacher, feelings about being a teacher, and how teachers grow in general. Please see Table 3.2 for examples from the data coded in each content category. For each pair, the percent of content categories was calculated by determining the word number in each category. The “word count” function of a word processor was used for this purpose.

Table 3.2. Content Categories in Post-lesson Conferences

Content Category	Example from Post-lesson Conferences
Mathematics	Tables calculate probability not z-scores.
Mathematics Pedagogy	Again, when they can, without you talking if they can kind of do the sharing like let Michael, when someone said “Why did you divide by 2” say “Hey Michael, tell me why did you divide by 2.”
Pedagogy	Yeah, sometimes you just have a relationship, and you say “Hey guys, you’re not responding. Let’s let’s, we are gonna work here together. Ok, everybody get a sheet of paper.”
Teacher-Student Relationship	To me there is always a balance so hard that’s spread thin but to allow sometime in class that you can connect with them personally or them sensing you caring is a big issue and I think they know that about you as well.

Table 3.2. Continued

Content Category	Example from Post-lesson Conferences
Classroom Management	They don't always raise their hand either, some of them are and what is so funny is that when you quiet them then they are totally insulted, you know...
General Teacher Growth	But you're on the right track. I don't see anything that isn't typical. I don't see anything that typically an intern, uh, that would do that you're not doing. Some of the same things that they had to learn through only experience is what you're doing now because the areas that I'm talking about now you're gonna get better as just the more you do it.

In addition to content coding and determining the amount of the conversational time used by each participant in the post-lesson conferences, the types of communications used were determined. Traditional supervision may be portrayed as direct, authoritative assessment of the student teacher's teaching with a focus on classroom bureaucracy (Blanton et al., 2001). Therefore, a traditional supervisor would be more interested in offering opinions, assessments, and suggestions than eliciting opinions of the student teacher (Tsui, Lopez-Real, Law, Tang, & Shum, 2001). On the other hand, an educative supervisor would be more interested in eliciting opinions than offering opinions. An educative supervisor would pose open-ended questions to the student teachers, mine their thinking, and support their growth by being sensitive to their developmental level.

Based on the pilot study (Fernández and Evrim, 2007), literature (Blanton et al., 2001; Tsui et al., 2001), and open coding of data, the communications in the post-lesson conferences were collapsed into the following categories: Questioning, Assessing, Suggesting, Describing, Explaining, and Emotional talking. Additionally, sub-categories

were defined for the questioning, assessing, describing, and suggesting categories. Table 3.3 provides examples from the data for each communication type. The description of each category and the sub-categories are as follows.

Questioning: The person poses a question or requests information or opinion. It has 5 sub-categories: **Requesting opinion-** The person requests that the other person share his/her opinions, suggestions, explanations, assessments, and reflections on the issues that they are discussing. **Requesting information-** The person asks questions to obtain information from the other person. **Requesting feeling-** The person asks about the other person's feelings. **Confirming-** The person asks questions to the other person to make sure he/she is understood correctly or he/she understood the other person correctly. This category also included questions by which the person suggests an answer in the question (leading questions). **Clarifying-** The person asks questions to have the other person clarify what he/she said, did or thought.

Assessing: The person offers an assessment about the student teachers teaching. **Positive Assessment-** The assessment refers to strength in the student teacher's teaching. **Negative Assessment-** The assessment refers to a weakness in the student teacher's teaching.

Describing: The person describes an event, observation, or interaction. **Describing Lesson Observations-** This sub-category includes descriptions from a lesson that the student teacher taught. **Describing General Things-** This sub-category involves all descriptions that are not specific to the lessons that the student teacher taught.

Suggesting: The person offers a suggestion related to student teacher's work. **Directive Suggestion-** The suggestion is offered in a direct way. **Nondirective Suggestion:** The suggestion is offered in an indirect way. **Justified Suggestion:** The person offers an explanation with the suggestion. **Unjustified Suggestion:** The person does not offer an explanation with the suggestion.

Explaining: The person explains his/her own perspective on issues related to teaching and learning.

Emotional talking: The person explains his/her feelings on issues related to teaching and learning. This category also includes cooperating teachers' conversations that emotionally support the student teachers.

Table 3.3. Communication Categories in Post-lesson Conferences

Communication Category	Example from Post-lesson Conferences
<p>Questioning</p> <ul style="list-style-type: none"> *Requesting Opinion *Requesting Information *Requesting Feeling *Confirming *Clarifying 	<ul style="list-style-type: none"> *So kind of reflect on what is happening so far *Did they remember that when you showed it to them? *Are you having fun? Aren't the kids wonderful? * You've already given a quiz on Friday right? * Because of it is Friday today and it is 6th period, was it a hard class to get through? *Just first period or first second periods?
<p>Assessing</p> <ul style="list-style-type: none"> *Positive Assessment *Negative Assessment 	<ul style="list-style-type: none"> *And the one other thing that you've done significant progress with is their organizational skills. * but first period it was boring.

Table 3.3. Continued

Communication Category	Example from Post-lesson Conferences
<p>Describing</p> <p>*Describing Lesson Observations</p> <p>*Describing General Things</p>	<p>* I noticed you gave them some time to start their assignment and there were very few questions from the kids.</p> <p>* Yeah, I kind of yesterday, the last two days I make a list of things what I need to do but yesterday it was like just so much that needed to be done.</p>
<p>Suggesting</p> <p>*Directive Suggestion</p> <p>*Nondirective Suggestion</p>	<p>*For example, show them parallel lines on the board and ask them if they remember what slope is</p> <p>* One thing that is always a good idea is to pick a child out and have them repeat what you just said.</p>
<p>Explaining</p>	<p>* I think what happened is when they were responding, you just started talking more and they started listening less</p>
<p>Emotional Talking</p>	<p>* That is important but you can relax a little bit because none of us are perfect up there at the board</p>

When analyzing the post-lesson communications from the communication-types perspective, I also examined how the cooperating teachers used different communication types in conjunction with each other. This analysis increased the understanding of the supervision style of the cooperating teachers. A combination of the three types of analyses (content analysis, determination of conversational time used by the participants, and communication type analysis) helped the researcher understand how the supervision style of the participant cooperating teachers changed throughout the semester. The researcher believes that evaluative and educative supervision approaches are two ends of a continuous supervision approach, like directive and nondirective supervision approaches. It was the aim of the program to have the participant cooperating teachers' supervision styles be closer to the educative end of the supervision.

Finally, I want to discuss the reliability and validity of the study. Reliability refers to replication of the study and getting the same results in quantitative studies. Qualitative studies are context bound and the traditional meaning of reliability can not be applied to qualitative studies. However, Lincoln and Guba (1985) suggested thinking about "dependability" in qualitative studies, which means given the data, the results should be dependable and consistent. To ensure dependability, the researcher triangulated the data. Patton (2002) proposed four ways of triangulation: methods triangulation, triangulation of sources, analyst triangulation, and theory/perspective triangulation. I used triangulation of sources in this study. This involved cross-checking the consistency of the findings by using different data collection techniques such as observation, interviewing, survey and tape-recordings.

External validity in quantitative studies refers to generalizability of the results. In qualitative studies, instead of generalization, the researcher lets the readers transfer the findings by offering thick descriptions. Internal validity is related to how close the results represent the reality. In qualitative study this means how much the researcher represented the participants' point of view. Since the data collection techniques mostly consisted of recordings, most of the data was not dependent on the researcher's observations or ideas. Additionally, I checked some of my findings with the participants in their final interviews. I incorporated their opinions to my findings to enhance internal validity or credibility as it is called by Lincoln and Guba (1985). Credibility is established through

rigorous methods for data collection and data analysis (Patton, 2002). I believe that I collected data from multiple data sources with multiple data collection techniques in a systematic way.

Limitations

One of the limitations of this study was that the researcher was inexperienced in implementing this kind of a program. I believe that I will apply what I learned from this study to future programs and will become a better facilitator of the cooperating teachers' discussions. A second limitation was that the participation in the program was mostly voluntary. The participants did not receive any certificate, or professional development points as a result of participating in the program. Additionally, there were no assessment criteria for their participation. Future research might investigate a similar program in another context where the participants receive more benefits as a result of their participation.

Another limitation of this study was that the study explored only the short-term effects of the program on the participants. It might be valuable to see in the long term if the outcomes of the program are still in effect.

CHAPTER-4

THE PROGRAM

In this chapter, I will first describe each cooperating teacher and their student teacher in detail. This description will include some demographic and background information about each participant. The description of the participants is included at the beginning of this chapter in order to help the reader better make sense of the participants while reading about how they engaged in the program activities. The findings about the supervisory beliefs and practices of the cooperating teachers during different stages of the program will be discussed in chapter-5. In this chapter, after describing the participants, I will present the findings from the program's face-to-face meetings and online discussions. I will discuss how the teachers reacted to the program philosophy, what they discussed with each other, how the program activities supported their supervision, and what obstacles there were to their implementation of educative supervision.

Pair 1: Andrew Fletcher and Alison Cook

Andrew Fletcher was 53 years old and had been teaching for 31 years. At the time of this study, he was teaching Geometry to students whose grade level ranged between 9th and 12th. He supervised about seven student teachers prior to this study. All of his student teachers were from the same Southern University [SU]. Mr. Fletcher has not attended any mathematics education professional development activity in the last four years.

Mr. Fletcher expressed that his main reasons for supervising student teachers were to lighten his workload, to offer student teachers new ideas, and to gain new ideas; the order represents the priority of his reasons. He attended a course on supervising student teachers less than 10 years ago. He learned how to supervise student teachers mainly by attending this course and also by repeated experiences in supervision. In the supervision course, he learned about communicating with student teachers, communicating with the

university, and making sure to address everything that the university suggested for student teachers to be successful. He did not remember the details of the course since it was a long time ago, but when I inquired about what he meant by the university's expectations, he mentioned making sure that the student teachers demonstrate the skills defined in the 12 Accomplished Practices evaluation form. The 12 Accomplished Practices were established in 1996 by the State Education Standards Commission (Florida Education Standards Commission, 1996). The Accomplished Practices were viewed as the main basis for assessing teacher performance. Accordingly, SU requires student teachers to effectively demonstrate the skills that are defined in the 12 Accomplished Practices evaluation form to pass their student teaching experience. The 12 categories in this form are assessment, communication, continuous improvement, critical thinking, diversity, ethics, human development & learning, subject matter knowledge, learning environments, planning, role of the teacher, and technology.

Alison Cook was 26 years old. She was working part-time in a restaurant, taking a course, and having her student teaching experience all at the same time. Mr. Fletcher made the following comment about her working situation: "She seems to handle it pretty well and if it's taking a toll on her, she doesn't show it. She's holding together pretty well" (Second post-lesson conference). The school at which Ms. Cook was having her student teaching experience was built in a more prominent area of town. Only 4% of the students were economically disadvantaged (Public School Review, 2000). Of the students, 85% were Caucasian, 10% were African American, 2% were Hispanic, and 2% were Asian/Pacific Islander. Ms. Cook reported that she had a high level of parental support. Higher or continued education was a priority for her students' parents.

I will describe the physical environment of the cooperating teachers' classrooms as well since it may offer an idea about their instruction. In Mr. Fletcher's classroom, there were mathematics comic strips, mathematics posters, and last year's students' symmetry art work on the walls. There were two teacher computers, one television, one overhead projector, and one LCD projector in the classroom. Students sat individually in rows, girls and boys mixed.

Mr. Fletcher was open to trying different teaching methods in his classroom. He encouraged Ms. Cook to try a variety of teaching methods until she found the best for

her. However, he did not seem to be an advocate of the reform-based mathematics instruction. Mr. Fletcher thought that different teaching methods might work differently depending on contextual factors. In the first online discussion, the cooperating teachers were asked to compare the US Geometry lesson with the Japanese Geometry lesson in the TIMSS 1995 video with respect to mathematical processes (i.e. problem solving, mathematical reasoning and proof, communication, connections, and representation) addressed. Mr. Fletcher's response to this question was:

Interesting contrast in styles ... The US clips seemed very familiar to many of the mathematics classrooms I've observed. Discussion of homework, directed methodical questioning, and a progressive development of topic has proven to be pretty effective for a long, long time.

The Japanese approach I watched, where self directed experimentation to problem solving begins a new lesson is, at times, a very effective styles as well. To say one style is more effective than another is unfair. The level of instruction, student learning style in the classroom, level of motivation, and topic all factor into which approach might be most effective. More than likely, a varied approach, incorporating both styles, would benefit any classroom. (First online discussion)

For this online discussion, each cooperating teacher was required to read an article from the EDThoughts (2002) book. The question asked them to compare the two lessons with respect to the mathematical processes. Even though the article that Mr. Fletcher read focused on mathematical processes, he did not use them as a base for comparing the two lessons. In other words, mathematical processes did not form the central attention while he was comparing the two lessons. Another note on the comments above is that he did not favor either of the teaching methods, rather he believed in a varied approach. He also voiced similar ideas in the second face-to-face program meeting.

In fact, Mr. Fletcher did not seem to have a good understanding of what reform ideas mean in mathematics education. One of the reasons that I tend to believe this is because he had not attended any mathematics education professional development activity (e.g. workshops, conferences) in the last four years, he was not a member of any professional mathematics organization, and he was not receiving any mathematics education journals at the time of this study. So even if he had learned about reform ideas

in previous years, he did not support that knowledge with additional resources in recent years. Another reason is that when I asked him what he thought about the reform in mathematics education he said that he did not know what that means and he asked me to tell him what it was. Then, I continued the conversation as follows:

Researcher: Are you familiar with the reform ideas in mathematics education such as NCTM principles and standards?

Mr. Fletcher: Oh, yes.

Researcher: What do you think this kind of reform, for example NCTM standards suggests for mathematics instruction?

Mr. Fletcher: We have to make sure they cover them. They have, well, the textbooks that we use, we make sure that all those standards are addressed in the textbook or we don't adopt the textbook to use.

Researcher: I see.

Mr. Fletcher: So about teaching the material in the textbook, we know we are covering our standards. Otherwise we wouldn't select that book to use in the first place.

Researcher: Yes. I want to understand your perspective about what kind of an instruction does reform suggest? Like when you observe a student teacher, what do you look for to understand if the student teacher is teaching as the reform suggests or not?

Mr. Fletcher: Oh, I see what you are saying. See, they all look for those specific things; I look to see they're covering the content. I know the content covers the standards. (Initial Interview)

He thought that the standards were more limited to content standards. He might have also referred to state standards because the textbooks covered the state standards. In any case, his focus on the content was clear rather than a focus on mathematical processes.

However, Mr. Fletcher's lack of knowledge in reform ideas does not mean that he did not teach as the reform suggests. His opinions on teaching mathematics included some parallel thoughts with a reform-based mathematics instruction. For example, he believed in using real-life related examples in mathematics lessons to help the students make sense of the mathematics. Student involvement was a key component for him while

observing a lesson. At times, he suggested to Ms. Cook that she guide the students to come up with mathematical ideas instead of spoon-feeding them. Nevertheless, when the reform-based mathematics instruction was discussed in the program, he did not seem to be an advocate of it. He thought that different teaching methods will work differently with different students as he expressed this idea when he was comparing American and Japanese lessons in the TIMSS 1995 video. One reason for this might be that he did not have a comprehensive understanding of what reform suggests for mathematics instruction. Since the program's focus was not on teaching the reform ideas to the cooperating teachers, reform-based mathematics instruction was not discussed in depth. Realistically, it could not be accomplished in such a program because of time limitations.

Pair 2: Lauren Taylor and Michelle Williams

Lauren Taylor was 55 years old and had been teaching mathematics for 34 years. At the time of this study, she was teaching AP statistics and Pre-Calculus to students who ranged between 10th grade to 12th grade. Ms. Taylor was quite involved in the professional development activities in her area. She attended two national AP conferences, three regional AP conferences, and several computer and calculator workshops in the last four years. Additionally, she was a member of NCTM and FCTM.

Michelle Williams was 24 years old. She was assigned to Ms. Taylor's classroom before student teaching as part of a Practicum course, where she had to teach a unit in Ms. Taylor's classroom. Therefore, they knew each other prior to this student teaching experience. At the time of the study, Ms. Williams was pregnant. She missed several days of her student teaching experience because she had doctor appointments in another city. The university supervisor and the cooperating teacher agreed to extend her student teaching experience one week to make up those days.

The school where Ms. Williams was completing her student teaching and Ms. Taylor was teaching was the largest high school in the city. Ms. Williams reported in her Teacher Work Sample that 62% of the student population in this high school was Caucasian, 31% was African American, 3 % was Hispanic, and 3% was Asian. There were 22 AP courses offered in the school and there was an open enrollment policy for

these courses; students who thought that they could succeed were eligible for registering to these courses. Ms. Taylor was proud of this policy.

Ms. Taylor's classroom walls were full of mathematics and education related posters. The tiles on the ceiling contained the names of students who graduated in previous years. The student desks were arranged so that half of the desks were positioned on one half of the classroom, in rows, and the other half of the desks on the other side with both groups facing towards the center of the room. There was a walking space for the teacher between the two groups of desks as well as walking space between each row of desks. There was one teacher computer, an LCD projector, and an overhead projector in the classroom. They frequently used the overhead projector for overhead transparencies and a calculator viewscreen. Ms. Taylor had a classroom set of TI-83 calculators. Students frequently used the calculators in statistics activities for different purposes such as calculation, randomization, or plotting data.

Ms. Taylor expressed that she was pretty familiar with the reform ideas in mathematics education. In fact, her attendance to conferences and workshops were signs of this familiarity. Ms. Taylor talked about some content alterations in statistics in recent years and said that "I think our world is very much changing and if we don't change with it I think that the math becomes not relevant" (Initial Interview). When I asked what reform means, she mentioned that it might mean different things to different people: "so I mean there isn't a single focus, not one reform, having student centered rooms, technology, you know, groups, there are probably a lot of aspects to reform in different people's opinions" (Initial Interview). She stated that she used calculators extensively in her lessons. Ms. Williams used Ms. Taylor's lesson plans until the midway during her student teaching experience. I observed that Ms. Taylor's lessons were to a great extent activity based, where the activities included worthwhile tasks; they were real-life related, fun to do, and had the potential to promote high-level thinking of the students.

Ms. Taylor had supervised about eight student teachers who were all from SU. Ms. Taylor attended a course on supervising student teachers about 20 years ago. She did not remember the details of that course. She stated that she mainly learned how to supervise student teachers by repeated supervising experiences, interacting with colleagues, and reading of literature. She also referred to the Student Teaching Handbook

and said that she got ideas from it. She elaborated this as “kind of reminding you not just kind of leaving in the first day, but you kind of know those” (Initial interview). Besides, she mentioned that she prepared a desk for Ms. Williams with some little presents on it prior to her arrival. In her response to a survey question, Ms. Taylor chose the following reasons for her to become a cooperating teacher: “I have something to offer,” “gaining new ideas,” and “lighten my load.” Her practice and beliefs about supervision will be discussed in chapter-5.

Pair 3: Denise Johnson and Adam Fair

Denise Johnson was 55 years old and had been teaching for 32 years. At the time of this study she was teaching Geometry and Algebra-2 to students whose grade level ranged from 10th to 12th. The algebra classes were honors classes and the geometry classes were regular classes. She was also teaching one dual enrollment mathematics course for a community college. Ms. Johnson had completed a Masters of Art in teaching and was working on her doctoral education in the mathematics education program at SU. She was a member of NCTM, FCTM, and MAA. The conferences that she attended in the last four years included NCTM regional 2004, T-cubed (Teachers Teaching with Technology) International 2004, 2005, and 2006.

Ms. Johnson had supervised three mathematics student teachers prior to this study. All of her student teachers were from SU. Ms. Johnson expressed that her main reasons for supervising student teachers were gaining new ideas, professional courtesy to the university, and refreshing her own teaching. In an informal communication, she also told me that one of her goals was to lighten her work load and thereby gain some time to work on her dissertation. Ms. Johnson learned how to supervise student teachers by repeated experience in supervision, attending a course on supervision, and interaction with colleagues. She had attended a course on supervising student teachers seven years ago. Similar to the other cooperating teachers, she did not remember the details of the course. She mentioned that one thing she remembered was the areas in which she should look for progress such as planning, assessment, and communication.

Adam Fair was 27 years old. The school at which Mr. Fair was completing his student teaching experience was a charter school sponsored by SU. The school aimed to represent a student population that was typical of school sites across the State. It provided a context open to research opportunities for educators.

Ms. Johnson's classroom walls were quite plain compared to the other two cooperating teachers; there were only some calculator posters on the walls. There were about seven computers that students could use in the room. Some other technological tools available in her room were one television, one overhead projector, a classroom set of graphing calculators, and a smart board. Since Mr. Fair was left-handed, the position of the smart board was not comfortable for him to write. Therefore, he rarely was able to use the smart board. In Ms. Johnson's classroom, students sat in rows at their individual desks.

Since Ms. Johnson was working on her dissertation, she was quite knowledgeable in reform ideas. She was specifically interested in using graphing calculators; on the school website, her expertise included graphing calculator applications and integrated math activities. Ms. Johnson was open to implement new teaching ideas. Several times, she encouraged Mr. Fair to implement some of my suggestions that were aligned with reform based instruction. On the other hand, Ms. Johnson described herself as a good student of a traditional teaching method. However, she also expressed that she tried to change her instruction to make it more aligned with the reform ideas. For example, every year she implemented non-traditional assessment techniques as she illustrated in the first online discussion: "This includes problems of the week, PowerPoint presentations, students teaching, student research, math autobiographies, discovery activities, group and individual projects" (Online discussion-1).

Ms. Johnson had some concerns about putting the theory of reform based instruction into practice. For example, in the first online discussion she wrote the following message to Mr. Fletcher who had written about finding real life related activities to improve instruction:

Finding meaningful activities is easier said than done though. Sometimes when I do find what I think is a worthwhile activity in Algebra 2, I find that the students would rather be in the text and not challenged to think! Students often say that

they want to know where the math is used but are very slow to embrace activities that they have to get out of their comfort zone for. I'm sorry this sounds so negative, but I just did a Forensic Science activity and felt a lot of resistance.

(Online discussion-1)

What I understood from this message was that Ms. Johnson tended to give up her instruction method due to student reaction instead of modifying her instruction. Another example to illustrate her approach to reform based instruction was from one of my visits to her classroom. One day, I observed Mr. Fair's geometry lesson and the three of us had a conference afterwards. After exchanging some ideas, I asked Mr. Fair how he could modify that lesson to increase student-student interaction. He suggested using group work, but he also had some concerns such as that some students would not contribute as much as others. At that point, Ms. Johnson agreed with him and did not think that the group activity would work with that group of students. I had a long discussion with Ms. Johnson in that conference to persuade her that group activity may work with that group of students after all. During our conference, the three of us designed a group activity about proving some geometry theorems. We discussed how to choose the group members, how to ask questions, how to select the students for answering the questions, and how to evaluate the students. In the end, Mr. Fair implemented the activity and as it turned out both Ms. Johnson and Mr. Fair liked it.

Finally, I would like to mention that Ms. Johnson had worthwhile calculator activities. However, she always used them as a separate part of her regular instruction. In the chapters that she used calculators, her approach was as follows. She taught the concepts without the calculator first. Then, she had a calculator week at the end of the chapters and she taught students how to use the calculators in solving problems related to that chapter and she also had them do some calculator activities related to that chapter's concepts.

Until now, I have provided some description about the participants. In the remainder of this chapter, I will discuss the program activities and how the participants engaged in those activities.

How did the program support the supervisory knowledge and practice of the cooperating teachers?

The main program activities were conducted in two settings: online discussions and face-to-face meetings. The cooperating teachers participated in three online discussions and four face-to-face meetings. The first online discussion focused on reform ideas in mathematics education, and the second and third online discussions focused on educative supervision. The first face-to-face meeting focused on introduction of the program, the second and third face-to-face meetings focused on educative supervision, and the fourth face-to-face meeting focused on educative supervision and NCTM professional teaching standards.

Before discussing the program activities, I would like to report what each cooperating teacher expected from the program. This will help us understand how each teacher reacted to the program activities. Initially, I introduced the program to the teachers as a program to support their supervisory knowledge and practice. However, I did not share with them the program philosophy because I did not want to influence their initial supervision practices. In the initial interview, I asked all of them what expectations they had about the program and what parts of their supervision they wanted to improve. It was interesting that none of the teachers' expectation for the program was related to enhancing their supervision style. Ms. Johnson requested more direction from the university. She said "If you are developing a program, it would be really nice to get instruction from the university as to these are the things that we would really like to see our teachers do" (Initial interview). On the contrary, Mr. Fletcher thought SU was doing a great job of explaining their expectations. When I asked Mr. Fletcher what parts of his supervision he would like to improve, he said that he wanted to improve his technology skills to offer his student teachers ideas in that area. He also suggested that it would be beneficial to student teachers if they interacted with classroom teachers more prior to the student teaching experience. Ms. Taylor did not mention a specific area that she wanted to improve in her supervision nor did she express any expectations for the program. She mentioned that she asked her previous student teachers if they had any requests from her to help them have better student teaching experiences. She had good relationships with all

of her previous student teachers. In fact, all of the participating teachers expressed that they had good relationships with their previous student teachers. They had good relationships with their student teachers during the present supervision program as well.

Hashweh (2003) identified five factors that can bring a change in teachers' practices: internal motivation, examination of current beliefs, constructing new knowledge, cognitive restructuring, and collaborative social climate. Teachers should feel conflict, dissonance, and dissatisfaction in order to desire a change in their practice. In light of this knowledge, it was difficult for the cooperating teachers in my study to get motivated to change their supervision style initially because they did not feel any conflict in their supervision. However, Hashweh conceded that teachers might not be aware of the conflicts in their practices or beliefs. In such situations, reflection, discussion, and deliberation are important to reveal the possible conflicts. The program activities intended to help the cooperating teachers analyze their current practice, gain new knowledge, and restructure their knowledge of supervision. Program face-to-face meetings and online discussions aimed to form a collaborative social climate for the teachers. In the rest of this section, I will elaborate on program activities and discuss how they supported or failed to support the participant cooperating teachers' supervision.

First, I will report the findings about what was discussed in the program activities. All conversations in the program face-to-face meetings and online discussions were coded into three categories: supervision issues, instructional issues, and general educational issues. Table 4.1 shows the percentage of each category in each program activity. Since the first face-to-face meeting was conducted in an informal atmosphere at a restaurant, I did not record it. Therefore, the percentages about the first face-to-face meeting do not exist.

Table 4.1. Types of Content across Program Activities

	Supervision Issues	Instructional Issues	General Educational Issues
First online discussion	35%	25%	39%
Second online discussion	52%	23%	25%
Second face-to-face meeting	92%	1%	7%
Third online discussion	96%	0%	4%
Third Face-to-face meeting	94%	4%	2%
Fourth face-to-face meeting	59%	21%	20%

The program was designed to support the supervisory practice and knowledge of cooperating teachers. Therefore, I expected high percentages in the supervision issues category in most of the program activities. Table 4.1 shows that in the second and third face-to-face meetings and the third online discussions, “supervision issues” was the most discussed topic. One program activity that had the lowest percentage in the supervision issues category was the first online discussion. I would like to mention that this program activity was on reform ideas in mathematics education. Additionally, it was conducted at the beginning of the study, before educative supervision was discussed in the program. Therefore, I did not expect high percentages for the supervision issues category in the first online discussion. Rather, it had a high percentage (39%) in the general educational issues category because we discussed about reform ideas in mathematics education. The second program activity was the second online discussion. Although the teachers discussed on supervision issues (52%), some of their conversations focused on classroom instruction (23%) rather than supervision of the student teachers. The examples for this kind of communication will be provided later in this section. Finally, I want to mention that the student teachers joined the fourth face-to-face meeting. They tended to focus on

classroom instruction rather than supervision issues and it influenced the percentages in each category for the fourth face-to-face meeting.

Now, I will discuss each program activity in detail. In the first face-to-face meeting, the cooperating teachers introduced themselves to each other. Mr. Fletcher and Ms. Taylor already knew each other, but Ms. Johnson did not know either of them. I gave each teacher the time line for the program that included a suggested date for each online discussion and face-to-face meeting. I briefly described the program activities to the cooperating teachers. However, I did not talk about educative supervision in this meeting because they had not conducted any conference with their student teachers yet. All three teachers accepted to participate in the program activities in the first face-to-face meeting. I asked them how they wanted to conduct the online discussions. We agreed that I would give them the reading materials on Monday of the discussion weeks; they would start posting comments on the blackboard on Wednesday of the same week, and continue discussion until the Sunday of that week. We also agreed that each teacher would write at least one comment to the other two teachers and respond to the questions that others may have asked of them. I explained to them that my role was going to be the facilitator of their discussions.

The first face-to-face meeting also included a discussion of how to welcome student teachers. Ms. Taylor mentioned that she prepared a desk for her student teacher. They discussed strategies to help the student teachers gradually take over the classes and learn the classroom context. For example, Mr. Fletcher told the group that he had his previous student teachers teaching part of a lesson before they took over any class totally. Ms. Taylor and Ms. Johnson told the group that they had their previous student teachers work with small groups in the beginning of the semester. I talked about some research findings such as what the student teachers valued in student teaching experiences. Additionally, I briefly discussed the importance of having conferences with student teachers and talking about mathematics pedagogy in those conferences.

One week after the first face-to-face meeting we had our first online discussion. Mr. Fletcher and Ms. Taylor had not used blackboard before. Their student teachers and I helped them to log on to blackboard, post comments, and respond to other teachers. Before discussing the teachers' responses in the first online discussion, I would like to

write some general patterns that I observed in all of the online discussions. I gave all the materials on Monday of the discussion weeks as we agreed in the first face-to-face meeting. However, the cooperating teachers did not participate as we agreed. Only Ms. Johnson posted her comments on time. There were times when some teachers posted their comments one week after the deadline. Typically, in the online discussions the teachers posted their comments only; there were few interactions among them. When they posted a comment to each other, most of the time, it was an expression of agreement and then statements of their own opinion on the same issue. In all of the three online discussions they never posed a question to each other. At times, I posed questions to them; some of my questions were responded to and some were not. My reminders about the agreed online discussion procedure before each online discussion did not change the situation.

Ms. Johnson took online classes before and was familiar with online discussions. In her final interview she shared that “The other supervising teachers were not into that at all. I have been used to doing it. So I went into it with...I wasn’t necessarily positive but I was used to it and I was ready to do it” (Final Interview). She posted a long message in the first online discussion and also posted comments to other teachers. However, the other teachers often did not participate on time. Ms. Taylor’s messages were very short and she did not post any comments to the other teachers. Mr. Fletcher posted long comments and he made comments to the other teachers but not on time. Etzioni and Etzioni (1999) indicated that in order to form a computer mediated community, participants should feel the other group members are accountable. Additionally, the feedback should be “from many to many” (p.244). In other words, each group member should receive feedback and also offer feedback to other participants. These characteristics were not established in our online discussions. As a result, Ms. Johnson’s enthusiasm for participation decreased and her messages became shorter. She did not post messages to the other teachers in the remaining two online discussions.

Mr. Fletcher and Ms. Taylor were new to online learning environments. This might be one reason for their late participation. Another reason might have been the fact that they seemed content with their supervision of student teachers. Their expectations for the program did not indicate that they felt a need to change their supervisory practices. Thus, they probably did not feel a need to participate in online discussions and learn more

about supervising student teachers. Additionally, this was a voluntary program. There were no consequences if they did not participate and the teachers were very busy. Both Mr. Fletcher and Ms. Taylor talked about how they had been very busy during the semester in their final interviews. Time seemed to be an obstacle for lack of rich communications among the group members in the online discussions. Nevertheless, there were some discussions that seemed to have supported their supervision practice and knowledge. I will discuss them in the following section.

For the first online discussion, the cooperating teachers read articles on reform ideas and watched the US and Japanese geometry lessons from the TIMSS 1995 video. Their comments in the online discussion revealed clues of their opinions on reform based mathematics instruction. Since I previously discussed what the cooperating teachers thought about reform ideas in mathematics education in depth, here I will briefly present my observations related to the first online discussion. Mr. Fletcher's comments revealed that he thought both traditional and reform based mathematics instruction had its place, depending on the student characteristics. Ms. Johnson explained that she integrated some reform ideas into her teaching but faced some challenges in doing so. In general, her comments were positive about reform based instruction. To the following comment that was posted by Ms. Taylor "We learn...10% of what we read, 20% of what we hear...70% of what we discuss with others...95% of what we teach others," Ms. Johnson responded "Great sign!" (First online discussion). About the TIMSS video, Ms. Johnson wrote that

After watching the video, I am determined not to look like the American teacher (even though I just got through teaching the same vocabulary that he was teaching and could relate!). I will as suggested, make sure that meaningful questions are planned daily even if it is a skills lesson." (First online discussion)

Reading the articles and the other cooperating teachers' comments, posting comments to them, and watching the video might have helped Ms. Johnson reflect on her own teaching and refresh her knowledge on reform based instruction.

Ms. Taylor's comment suggested that she was already familiar with reform ideas in mathematics education, as explained in the beginning of this chapter. In the first online discussion, each teacher read an article and they were asked to share ideas from their

article with the other teachers. She did not elaborate on her article in her message. When I visited her, I told her that she had wonderful ideas on teaching mathematics and she should share them with other teachers. She said that she could not change them and it was not correct to try to change a teacher who had years of experience. She repeated similar ideas in her final interview, too. I explained to her that my goal was not to change the teachers' teaching practice, however, but that we could learn from each other. Then she posted the comment that I mentioned in the previous paragraph. However, her comments continued to be brief in the other online communications and she did not respond to any other participant in the online discussions. Ms. Taylor frequently talked about how her life as a teacher was busy. Time was a factor that she frequently mentioned as an obstacle for communicating more with the program teachers or for conferencing with her student teacher for longer periods of time.

The next program activity was the second online discussion. The cooperating teachers read a summary of the Blanton et al. (2001) article. Content analysis revealed that 52% of the comments were in the supervision issues, 23% were in the instructional issues, and 25% were in the general educational issues categories. In one of my questions I asked them to choose a question posed by the supervisor in the article that they found important and explain why it was important to them. In their response to this question, Ms. Johnson and Ms. Taylor did not talk about the supervision style of the supervisor in the article. Their attention was on the teaching style of the student teacher. For example, Ms. Johnson wrote

I find the aspect of Mary Ann's relectance [*sic*] to try group work for classroom management reasons to be a very real concern. We have all been there. It is 'scary' to give students this freedom. Being the guide on the side sounds so promising but having your students buy into their role is the real problem.

(Second online discussion)

Her comments revealed that her attention was not on the supervision style as the question requested, rather she was interested in the teaching method of the student teacher. Additionally, her comment was parallel to her teaching philosophy which she had expressed in previous discussions. She valued the reform ideas; on the other hand she shared the concerns of the student teacher in the article. Each teacher's comments on the

student teacher's teaching reflected their beliefs about teaching mathematics. Mr. Fletcher, as well, talked about the teaching method of the student teacher. However, he also said that "In the article, the ability of the supervisor to offer suggestions in a positive manner is very important to the psyche of the intern." Apparently, he did not pay attention to the questioning style of the supervisor; his attention was on the positive mood of their conversations. In fact, most of the communications that the supervisor conducted in the article were questioning communications. The cooperating teachers did not refer to the questions of the supervisor in their comments.

In the second online discussion, I also asked the cooperating teachers what they thought about educative supervision. Only Mr. Fletcher responded to this question. His comments about effective methods of mathematics instruction seemed to transfer to his opinions on educative supervision.

I think a blend of the two methods is probably best. It seems to me that this would best address the variety of needs for both the interns & the students. There are times where "traditional supervision" is very effective ... the supervisor is able to direct the intern towards proven effective methods. (Second online discussion)

There was a similarity in his perspectives about educative supervision vs. traditional supervision, and reform-based instruction vs. traditional instruction. A similar tendency was found in the case of Ms. Johnson as well.

The cooperating teachers' responses in the second online discussion showed that they most likely did not reflect on their current supervision practice since the focus of their discussion was not on the supervision of student teachers from an educative perspective. In some comments, the focus solely remained on classroom instruction rather than the supervision of student teachers. This online discussion seemed not to help the teachers to examine their current supervisory beliefs and practices as Hashweh (2003) proposed. Therefore, I immediately called for a face-to-face meeting. The week after the second online discussion we had our second face-to-face meeting.

My goals in the second face-to-face meeting were to have the cooperating teachers share ideas on educative supervision, help them make connections between educative supervision and reform ideas in mathematics education, and help them reflect on their current supervision practice. Initially, in the second face-to-face meeting, we

discussed how people learn and specifically how student teachers learn how to teach. The repeated answers to these questions were that people learn by experience and by connecting new knowledge to previous knowledge. Accordingly, the group made a connection to student teachers' learning and suggested that they learned by how they were taught. The student teachers' previous teachers become a model for them. Then I asked them how we could help student teachers to make a transition from traditional teaching methods to reform based teaching methods. In other words, I asked them how we could help student teachers to teach differently from how they were taught. The cooperating teachers' responses to this question revealed two main themes. First, they observed that traditional teaching was easy for student teachers at the beginning of the semester until they became confident in the content and classroom management, in particular. For instance, Ms. Taylor said "I think sometimes when you are nervous, it's easier just to stand up there and talk." Ms. Johnson and Mr. Fletcher expressed similar comments.

Secondly, they expressed that a good way to help student teachers improve their teaching was to take notes when observing the student teachers and then talking through those notes, making suggestions to them. For instance, Ms. Taylor said that "sometimes with Michelle, you probably heard me say stop talking so much, but that's hard. That's hard. But she's very responsive to suggestions." The main theme in this part of the meeting was "telling" and "suggesting" ideas to the student teachers to advance their teaching. This observation was aligned with their supervision styles in their post-lesson conferences that were conducted before the second face-to-face meeting. Making suggestions and assessments were common communication types for all of the three cooperating teachers that I observed in their initial post-lesson conferences. The details of the findings about the post-lesson conferences between the student teachers and the cooperating teachers will be presented in chapter-5.

One shared goal by the cooperating teachers was to support the student teachers' confidence. The teachers were sensitive to the student teachers' feelings. One element where they reflected this sensitivity in their conferences was the way that they provided assessments to the student teachers. They provided both negative and positive assessments. For instance, Ms. Johnson said that "When Adam first started teaching I

made him a lot of notes... And usually I try to mix in the positives and the negatives, like this went well or this wasn't" (second face-to-face meeting). Based on other data sources, I could infer that the reason for providing both negative and positive assessments in their post-lesson conferences was to prevent the student teacher from feeling unconfident. For example, Mr. Fletcher explained that "If it's negative, I handle it in a positive way and I also make sure I give them the positives too. Because ...you still have to address it in a positive manner, give them the confidence that they need" (Initial interview). In summary, the cooperating teachers used positive assessments to support the confidence of the student teachers. This finding is aligned with the literature (Zimpher et al., 1980; Maynard, 1996). It was notable that the cooperating teachers did not voice that questioning could be used as a tool to support the growth of the student teachers. This provided one of many other rationales to design this kind of supervision program to support the cooperating teachers' supervision of student teachers.

In the second face-to-face meeting, it was interesting for me that none of the cooperating teachers referred to the article that they read for the second online discussion. Their comments based around their established supervision knowledge and practice. As the facilitator of the discussions, I reminded them of the article that described educative supervision and pointed out the key elements of educative supervision. I would like to present a part of that conversation to help the reader understand the cooperating teachers' initial reaction to educative supervision in the second face-to-face meeting:

Researcher: Instead of giving the ready recipes to them, they [the authors of the article they read] suggest letting student teachers come up with the solutions for their own problem, like asking them open ended questions. I try to ask them when we have meetings, I try to ask them, like what was your goal? What was your goal for the lesson? Do you think did you reach your goal? And then...uh, like.

Ms. Johnson: Like you let them speak instead of giving them the answers.

Researcher: Yes, like try to help them come up with a solution for what was weak in the lesson. Like I, for example, I remind them of incidents from the lesson. Like you handled it this way, do you think you could have handled it

differently? ...but sometimes I do, I suggest them, if they don't come up with anything.

Ms. Taylor: I usually, when we first meet then, I have her reflect on her lessons.

Researcher: You do, so what do you think about this kind of supervision; asking open ended questions, having student teachers reflect on their teaching? You think you try to do that and it is valuable?

Ms. Taylor: We are dealing with a situation where... Usually we've got a lot of things where, time is very valuable and you're at meetings, you're running here and there, so there's not lots of down time.

Ms. Johnson: Time to discuss.

Ms. Taylor: You don't always have time to reflect...

Ms. Johnson: Preparing a test, writing, you know, plans. (Second face-to-face meeting)

Ms. Taylor and Ms. Johnson put forward "time" as an obstacle to implement educative supervision. From my informal communications and interviews with both of them, I knew that they usually communicated their observation notes to the student teachers between two periods. In such a short time, it was probably easier to convey their messages directly to the student teachers instead of asking them open-ended questions and trying to have the student teachers think deeply on their teaching. Both of these teachers had two planning periods, but they still complained about the time. It was especially Ms. Taylor who frequently mentioned time as an obstacle to implement educative supervision. It was interesting that even though she valued the reform ideas and she tried to integrate reform based teaching in her classes, she did not initially accept educative supervision as a supervision style to implement.

For the program teachers to implement educative supervision, they should believe in the value of educative supervision. This would bring internal motivation (Hashweh, 2003). A conflict and dissatisfaction about their supervision would increase their internal motivation as was the case with Ms. Johnson. In the second face-to-face meeting, Ms. Johnson explained that her student teacher got very nervous upon receiving negative feedback. In other informal communications, Ms. Johnson frequently mentioned that Mr. Fair got upset when she provided him negative feedback. I believed that this represented

a conflict for her to reexamine her current supervisory practice. As Hashweh (2003) suggested, conflict between one's goals and practice would produce learning. Ms. Johnson became interested in implementing educative supervision because she wanted a good relationship with her student teacher and she also wanted to assist him more effectively. Additionally, she made a connection between the reform ideas and educative supervision as the program progressed and she became more interested in educative supervision.

Mr. Fletcher said that he had time to talk to his student teachers. He also said that "A lot of times, it's between classes and a lot of it is how do you think that went? Tell me what you're happy with and what you're getting ready to change for the next time?" (Second face-to-face meeting). This was an interesting comment too because his initial post-lesson conferences showed that he spoke more than the student teacher, as will be elaborated in chapter-5. Furthermore, he used suggesting and assessing communications more often than the other communication types. He probably believed in the value of reflection but did not implement it to a great deal of extent in his initial post lesson conferences with Ms. Cook. Teachers' perceptions of their practice may not always represent their actual practice (Saka, 2007; Gregoire, 1999; Frykholm, 1996). Nevertheless, it was valuable that Mr. Fletcher perceived reflection as a positive component of supervision. In fact, Ms. Taylor and Ms. Johnson also valued reflection; they just thought time was an obstacle for having reflective conferences with their student teachers as much as they desired.

In the second face-to-face meeting, I talked about some key ideas of educative supervision, the importance of their post-lesson conferences on student teachers' growth, and supported these ideas with research. I wanted to help them see themselves as teacher educators and realize their importance for the growth of student teachers. In order to help the cooperating teachers reexamine their own supervision style, I designed an activity. It involved the cooperating teachers reflecting on a transcript of a post-lesson conference between a mathematics student teacher and her cooperating teacher. The transcribed conference represented a traditional supervision conference where the cooperating teacher spoke more than the student teacher, provided suggestions and assessments to the student teachers, and the content of the discussions was mainly on classroom

management. I also provided the teachers the worksheet that the student teacher used in her lesson and briefly described her lesson to them.

The cooperating teachers' responses in this activity focused on three things: the amount of conversation that the student teacher spoke, communication type of the cooperating teacher, and the content of the conversations. For instance, Ms. Taylor said that "I think that there was too much talking by the cooperating teacher and not enough by the student. I thought that maybe they talked maybe too much about behavior and not about what kind of learning took place" (Second face-to-face meeting). She observed that their focus was on classroom management and pedagogy was not discussed. She also pointed out that the cooperating teacher spoke more than the student teacher. Similarly, Mr. Fletcher spoke as follows:

Mr. Fletcher: They didn't really necessarily give much of her thoughts, or the student teacher's thoughts.

Researcher: She was doing a traditional supervision.

Mr. Fletcher: Yeah, and I'm not saying the lesson was not a good lesson. It's just that she pointed everything out to the student teacher and those were definitely directed questions with a short response and you never really got to know what she thought, good or bad. (Second face-to-face meeting)

As evident in the above excerpt, Mr. Fletcher observed that the student teacher was not given opportunities to express her thinking. It was valuable from the program's perspective that the cooperating teachers focused on the amount of conversation the student teacher conducted, the communication style of the cooperating teacher, and the content of their conversations. These were the exact domains that I analyzed in their post-lesson conferences to see if there was a change or not towards educative supervision because these components represented their supervision style. Having conversations on these domains probably helped the cooperating teachers to reexamine and modify their supervision because their supervision changed as the semester progressed, as will be explained in chapter-5.

There was one time the teachers disagreed on an issue during this activity. Ms. Johnson said that "The kids had never seen a calculator. So, one of the things they're trying to accomplish here, whether she wants to or not, is how to get the kids to use the

calculators and that's a goal" (Second face-to-face meeting). Her comment indicated that she thought it was acceptable to have a conversation that focused on classroom management. Then Ms. Taylor responded with "I think if you kind of look at it like the Bloom's thing, it doesn't move up the level at all." Her response implied that the fact that the students were using the graphing calculators for the first time in that lesson should not end up all low level questions on the part of the cooperating teacher. Here is the rest of the conversation:

Ms. Johnson: Yeah. Well, if it's the first time that they've seen a graphing calculator, it would take you a while just to get them to enter it and find the windows and you know. It's probably been such a long time since you actually met kids that haven't been on a calculator in a while.

Ms. Taylor: Actually, I get kids that have never touched it. (Second face-to-face meeting)

Even though it was not explicitly stated, I inferred from this conversation that Ms. Taylor prioritized high level thinking questions for a cooperating teacher even if the student teacher introduced a tool to her students for the first time in that lesson. I believe that agreements and disagreements will help teachers learn from each other. This kind of conversation might have helped the participant cooperating teachers learn from each other.

In this activity, I asked the cooperating teachers to write down questions that the cooperating teacher could have asked the student teacher in the transcribed conference and requested them to have a focus on mathematics pedagogy. Here is an excerpt that represented their response to this question:

Mr. Fletcher: If perhaps, he would have said to the student teacher, tell me everything you thought was good and everything you thought wasn't so good. Let's start the conversation that way.

Ms. Taylor: Or even have them write down the pluses and the minuses.

Mr. Fletcher: Yeah, pluses and minuses from the lesson and then that's how you start the discussion with them. Let them do the thought processing instead of just spoon-feeding it to them.

Ms. Johnson: You know, if we want to have post-lesson conferences with a student teacher, there would be exactly those questions asked each time. What went good with this lesson? What were you happy about? What did you see as problems? What did the kids seem to learn from the lesson?

Mr. Fletcher: Tell me why you'd do it again? Why you wouldn't do it again?

Ms. Johnson: Yeah, what would you do differently? (Second face-to-face meeting)

They suggested other questions that could be asked in any post-lesson conference. In this activity, their comments suggested that their focus was on posing open-ended questions to the student teachers to help them think about their teaching. Their initial focus on suggesting and assessing was not present in this part of the meeting. They supported each others' thinking by brainstorming possible open-ended questions to ask the student teachers in the post-lesson conferences.

The participant cooperating teachers typically did not use classroom incidents to form a base for their questions in their post-lesson conferences. This finding will be elaborated on in chapter-5. I realized that the program activities could have provided more support to the cooperating teachers in this area. For instance, the activity in the second face-to-face meeting could have occurred following a teaching video. This way, they could watch the student teacher's lesson first and have a comprehensive understanding of what happened in the lesson. This might have given them a better opportunity to use lesson incidents to think of questions to ask the student teacher. Additionally, as the facilitator of the group, I could have modeled educative supervision more in the meeting by selecting an incident and using it to demonstrate a question that could be asked to the student teacher.

The next program activity was the third online discussion. Originally, I had planned five online discussions and three face-to-face meetings. Since the online discussions did not bring rich group interactions, I modified the program. We conducted three online discussions and four face-to-face meetings. For the third online discussion, the cooperating teachers read a summary of "A structure to enable preservice teachers of mathematics to reflect on their teaching" by Artzt (1999). For this online discussion, I posed two questions to the teachers. The first question asked them what their opinion on

educative supervision was and how it was related to this article. The second question involved writing open-ended questions. In the article, the author described how she used the reflective structure with two mathematics student teachers. The case of the first student teacher was included in the article summary. However, only the description of the second student teacher's teaching was put in the summary. The second question asked the cooperating teachers how they would conduct a post lesson conference with the second student teacher, Mr. Wong, and what questions they would pose to him. I also asked them to explain the reasons for asking their questions.

Ms. Johnson's response to the first question indicated a misunderstanding of educative supervision by her. She wrote:

This supervision is based on the intern's reflection of original goals, planning, and results. It asks little of the supervising teacher other than to create an atmosphere in which the intern with reflection can modify her instruction and activities for more successful student learning. (Third online discussion)

Her understanding of educative supervision sounded as if the educative supervisors' job was easy as it was limited to posing questions. Nevertheless, as a university supervisor, I frequently felt difficulty in coming up with open-ended questions to guide the student teachers' thinking. The summary of Artzt (1999) included ideas similar to the following "The supervisors encourage the student teacher to do all of the talking, but help structure the student teacher's thoughts by asking questions." Structuring student teachers' thinking is not always easy. It requires critical thinking on the part of the supervisor. The reason that I called Ms. Johnson's comment in the third online discussion as a misunderstanding of educative supervision was not only based on this comment. In the third face-to-face meeting, she explained that she gave up taking notes during her observation of Mr. Fair's teaching because she thought that the program suggested doing so. She said that "I got the impression that that [taking notes] wasn't the thing to do, because I used to make notes every period for Adam. Now Adam too, whenever I went over the notes, he would get so tense" (Third face-to-face meeting). After this comment, we discussed that note taking during observations was valuable to bring out important incidents from the lesson during the discussion with the student teacher.

Ms. Johnson came up with six questions to ask the student teacher in the article in a possible post-lesson conference with him. She did not provide reasons for her questions. It was remarkable that four of the six questions that she thought of were included in the article that the cooperating teachers read for the second online discussion (the article on educative supervision). At the end of that article, there was a table that included examples of open-ended and close-ended questions. Evidently, she used that article to write her response for the third online discussion. She also came up with two questions herself, thus she did not simply copy questions from the previous article. The mixture of her questions suggested that she probably reasoned through what questions to ask and used the previous article as a reference for open-ended questions. Some of her questions were as follows. “What did you see as your greatest difficulty?”, “Do you think there's a better way for student [*sic*] to solve these problems?” and “How will you teach this lesson differently in the future?” (Third online discussion) The first two questions were among the questions that were presented in the article that the teachers read for the second online discussion.

Mr. Fletcher, in his response to the first question, wrote that “The purpose of utilizing ‘reflection’ as a teacher is vital to successful student learning. It is a 3 step process” (Third online discussion). He defined the three processes as setting up some goals, implementing the goals, and evaluating the accomplishment of the goals. His comments revealed that “reflection” was a valuable component for him. Even though in the second online discussion, he hesitated to accept educative supervision for all student teachers, in the third online discussion his comments indicated that he strongly believed in the value of reflection for all teachers. Mr. Fletcher was the only teacher who responded to the other teachers’ comments in the third online discussion. For example, Ms. Taylor wrote about each student teacher being unique and what worked with one student teacher may not work with another student teacher. Mr. Fletcher’s response to her message was as follows.

I agree that each student teacher (as well as each teacher) has unique qualities.

The common thread, however, is that they need to find their niche ... what style, efforts, emphasis will maximize their success? Through reflection, a teacher can

realize their strengths and weaknesses and become better at their chosen profession. (Third online discussion)

For the second question, he came up with some post-lesson conference questions that included “Mr. Wong ... your goals were fairly general. Could you give me some specific anticipated answers / outcomes that could and should have been expected?”, “Did you learn anything from the actions and reactions of the students that you could use to improve your instruction?” (Third online discussion). He explained that the reasons for him to ask these questions were to help the student teacher think about his instruction, figure out how to improve his instruction for future lessons, and grow as a successful instructor.

As mentioned in the previous paragraph, Ms. Taylor expressed that student teachers were unique and there was no one simple method that worked with all of them. However, she wrote that she liked the reflection component. Her questions for the second question included “Given the lesson did not go as planned, what changes could he make?”, “What teaching methods did you enjoy as a learner?” She did not write her goals in asking these questions.

The third online discussion mainly included communications in the “supervision issues” category (96%). The cooperating teachers’ comments revealed that they all valued the reflection component of the supervisory practice that was suggested in the article. One observation that I made in the third online discussion was that all the teachers came up with open-ended questions for asking the student teacher. The questions were parallel to the questions that were suggested for asking the student teachers in both articles that they read for the second and third online discussions. However, none of the teachers referred to a specific incident from the student teacher’s teaching. His lesson was described in detail in the summary. I did not join this online discussion because I wanted them to interact with each other. However, I could have modeled for them how to use lesson incidents to ask questions in post-lesson conferences. I could have posed a comment on blackboard or I could have spent some time on this issue at the beginning of the third face-to-face meeting.

The cooperating teachers videotaped one post-lesson conference between them and their student teachers for the third face-to-face meeting. They were asked to

implement the ideas of educative supervision in that conference. In the third face-to-face meeting, the cooperating teachers were asked to share a section of their post-lesson conference with the other cooperating teachers. Mr. Fletcher shared the whole conference. They were asked to explain to the group why they posed the questions to the student teacher in the section that they shared with us and what their goals were in that section.

Ms. Johnson was the first teacher to show her post-lesson conference to the group. She shared about 5 minutes of her video. In their recorded conference, Ms. Johnson and Mr. Fair sat on each side of a table and were looking at each other. They discussed a lesson that Mr. Fair taught that day. Ms. Johnson observed that the students whined a lot in the lesson about the tedious work that they had to do in order to solve 3x3 systems of equations. She explained to us that in the conference she wanted to build Mr. Fair's confidence because she observed that he did not talk firmly to the students. Some of the questions she posed to Mr. Fair in that section of the video were "Did you, when you were teaching say three by three systems in Algebra2, how did that go?", "Ok, did you take it personally when they were whining about not being able to do three by three? Did they bother you?", and "So, what did you learn from it?" She explained to the group

That's what I was trying to talk to him about at that particular time. He is very very sensitive to anything the kids say to him, especially the honors kids. And he thinks he hasn't done something right or he, you know...And I was trying to tell him, 'you've done what you needed to do.' He has a self-confidence problem in a lot of ways...but anyway... That's pretty much what I just decided to show you all today; is that sometimes it's hard for an intern to believe in themselves enough. (Third face-to-face meeting)

Helping the student teachers "build confidence" was a goal that was shared by all three cooperating teachers. In the beginning of the program, the cooperating teachers stated that they provided a mixture of positive and negative assessments to the student teachers to build their confidence. However, in her videotaped conference with Mr. Fair, Ms. Johnson used questioning communication type to help him build confidence. A similar change was observed with the other two cooperating teachers as well.

The teachers discussed that for some student teachers making the transition from being a student to being a teacher was difficult. Ms. Johnson added that some student teachers lacked content knowledge and that this affected their confidence as a teacher. She provided some examples where she observed a lack of content knowledge from Mr. Fair. At this point, I would like to briefly note that at times Ms. Johnson and Ms. Taylor expressed that the university should do a better job in preparing mathematics teachers with strong content knowledge. In the informal conversations, I told them the students at SU took mathematics and statistics courses during their education and I provided examples from such courses. For example, in this meeting, Ms. Taylor referred to student teachers' lack of graphing calculator knowledge and said that "That's a skill at SU that I think they need to work with their students more. I think if they had used graphing calculators, they would have been more proficient though." Again, I explained to them that we used technology in mathematics education courses in the program and we offered a course called "Using Technology in the Teaching of Mathematics." These conversations were aligned with the literature that suggested more communication between schools and university programs (Koskela and Ganser, 1995). In the program activities, I made an effort to provide information about the mathematics education program at SU for the cooperating teachers. I also took notes on their suggestions about the program, and thereby tried to strengthen the communication between them and the university program.

After Ms. Johnson shared her video with the group and the conversation naturally continued on the lack of content knowledge of some student teachers, I asked the teachers to share some strategies regarding how to help student teachers, in particular to help Mr. Fair to build confidence and increase his mathematics knowledge. Here is an excerpt from their conversation:

Mr. Fletcher: Well I ask the intern to always do the homework ahead of time...Maybe his interpretation of that.

Ms. Johnson: Well the problem there is, he does do some of the homework but in this case we had a day set aside for an activity and then we were going to teach the lesson the next day. There was no homework and maybe he got behind on that but they were creating this activity and he should have read, read thoroughly.

Ms. Taylor: I think and with Michelle, I'm talking to her about the same thing I don't think they realize the time to plan a lesson. And she is really open to changes, today she

didn't have her key questions and conflicts and high level thinking she was trying to accomplish. Did he show you his complete lesson ahead of time?

Ms. Johnson: Umm, we talk about what he's going to do but he doesn't have examples written down I looked at it. It's hard to see what he knows and what he doesn't until he opens his mouth and he starts talking to students like today he was using the licorice. And one of the conjectures was if two diagonals are congruent, then the quadrilateral is a rectangle.

Ms. Taylor: Which is, they are not necessarily always true.

Ms. Johnson: Well, it wasn't. Although he did know that it could have been isosceles trapezoid. And he brought the kids to that conclusion... But anyway, he was playing with this, but until I am listening to him talking to the students I don't really understand what his understanding is of these conjectures. (Third face-to-face meeting)

I have three comments about this part of the meeting. First, Ms. Johnson's comments indicated that she tended to come up with excuses to refuse the suggestions that the other teachers offered to her. For example, having the student teacher write up key questions as suggested by Ms. Taylor might have helped Mr. Fair in implementing the lesson more effectively. Nevertheless, I believe that sharing these kinds of suggestions were valuable. The teachers may think about it later and integrate it in their supervision. Additionally, it probably helped the cooperating teacher who offered the suggestion because it provided him/her an opportunity to reflect on his/her supervision.

Secondly, overall in our meetings it was only Ms. Johnson who requested help from the other teachers or asked questions about supervision. The other two cooperating teachers made positive comments about their student teachers most of the time. If it was a negative comment, it was usually to point out the growth in them. For example, in the second face-to-face meeting, Mr. Fletcher said that "She [Ms. Cook] doesn't know. She doesn't want to say the wrong thing. She was very uncomfortable at first, but now that we have done enough of it, she knows the exact expectations. She adjusted pretty quickly." The other teachers' positiveness caused Ms. Johnson to feel alone in her worries. After the third face-to-face meeting, Ms. Johnson and I had a conversation on educative supervision. In that conversation, she mentioned how the other teachers were all happy with their supervision and did not share any problems related to supervision. On the other

hand, she spoke positively about the face-to-face meetings in her final interview: “I really enjoyed that because I learned, I learned, you know what was going on in other classes and what was going on in their minds and this made a little bit aware of maybe some of my shortcomings” (Final interview).

My third comment is about my role in this part of the meeting. Ms. Johnson was naturally a very talkative person. In the discussion after she shared her video, she talked at length about Mr. Fair’s problems. She provided examples from Mr. Fair’s teaching. I became worried that her conversations were diverting the focus of the meeting. Shank (2006) discussed a similar worry that she held in her study, but then she realized storytelling could be a valuable tool to offer opportunities for discussion points. Accordingly, in this third face-to-face meeting, I could have used the stories that Ms. Johnson shared with the group to structure the groups members’ thinking on educative supervision. For example, I could have asked them how they would communicate with Mr. Fair in a post-lesson conference after Ms. Johnson described a lesson incident. In fact, I did this kind of facilitation in the second face-to-face meeting and the teachers shared ideas, but I could have done it consistently in all of the meetings to better support the cooperating teachers’ growth as educative supervisors. Since the analysis of the post-lesson conferences conducted by the cooperating teachers throughout the semester showed that they typically did not use specific lesson incidents to form a base for their questions, there could have been more opportunities for them to discuss and practice this component of educative supervision in the program activities.

The third face-to-face meeting continued with Ms. Taylor’s video. She shared about five minutes from their post-lesson conference. Different from Ms. Johnson and Mr. Fair’s conference, this pair was sitting next to each other on chairs and facing the camera. Their post-lesson conference was a general reflection on the week. Some questions that Ms. Taylor asked to Ms. Williams were as follows. “Okay let’s talk about...what growth you see,” “What do think how they, the kids learn?” After we watched this video, both Ms. Taylor and Mr. Fletcher told me that they needed to leave early because they had another appointment. Therefore, the conversations about their videotaped conferences were very short. However, there was some valuable idea sharing moments. Here is an excerpt from the conversations on Ms. Taylor’s video.

Mr. Fletcher: There's a lot of questions that's reflecting what she's been doing.

Ms. Taylor: I think they work great.

Ms. Johnson: It was funny when you asked her how do students learn and she keyed on motivation and that what she talked about and how much power teachers have and make a case study out of one student.

Ms. Taylor: We have an open enrollment. I have five AP stats but you could do the greatest lesson in the world, but to me if you don't personalize for the kids somehow, it's not going to happen. They don't show improvement.

Interviewer: [silence in the group] more ideas on this case?

Mr. Fletcher: You didn't target any specific lesson ... but you could be sitting down doing evaluations there doing questions.

Mr. Fletcher indicated that questioning could be used in any type of a post-lesson conference. As will be presented in chapter-5, his supervision style noticeably changed where he started asking more questions to his student teacher in the post-lesson conferences towards the end of the semester. The discussions in the face-to-face meetings and through Blackboard provided the teachers with opportunities to gain new knowledge and share ideas on supervision, and observe each other's supervisory practices.

One observation I made in the conversation above was that Ms. Taylor's comment was more related to classroom teaching rather than her supervision of the student teacher. A similar focus was observed in her previous online and face-to-face meeting comments as well. The teachers, at times, tended to discuss classroom practice. For instance, in the second online discussion, even though the question was related to their supervisory practice, two teachers' responses were limited to the instruction of the student teacher. Another example of this observation was from the third face-to-face meeting. After Ms. Johnson shared her video with the group, she talked about her lesson observations from Mr. Fair's classroom where she talked about how she wanted to support his confidence in that post-lesson conference. Then Ms. Taylor spoke as follows:

Just a little trivia: I read this book one time. It's talking about that if you want kids to listen –your own children to listen to you- that you sometimes acknowledge what they say, so like if they say 'Boy those problems are really big,' you say, 'Hey, you feel those problems are really big.' And then kind of, you almost can work through it where they

will say 'it must feel good when you kind of get one of those'. (Third face-to-face meeting)

And then, Ms. Johnson shared her strategies regarding what she did when her students whined. These kinds of conversations did not frequently happen in the program meetings (see table 4.1). Most of the time, we were able to connect the issues raised to supervision of student teachers. Arnold (2002) analyzed a study group that five cooperating teachers conducted. She found that about 63 to 79% of the conversation time was spent on classroom instruction issues; mentoring issues formed the majority of the remaining time. The large percentage of conversations on classroom instruction in her study might have occurred because they did not have an agenda for their study group. This was not the case in my study because I acted as the facilitator of the discussion and when I felt the conversation was diverting from the program's focus, I posed questions to get their attention back to the supervision. Therefore, the majority of the time (an average of 82% in face-to-face meetings) we talked about supervisory issues. However, after analyzing the conversations, I recognized that at times the teachers' focus remained on classroom instruction rather than supervision as exemplified above. This tendency often happened after reading a description of a lesson, watching a lesson, or sharing the student teachers' teaching. Accordingly, future program designers should keep in mind that cooperating teachers may tend to keep a focus on classroom instruction. Facilitators may bring cooperating teachers' attention back to supervision issues by asking questions to them or may use those conversations to have a discussion on supervision.

In the third face-to-face meeting, Mr. Fletcher shared his entire video; it was about 12 minutes in length. They were sitting next to each other and facing the camera. Some questions that Mr. Fletcher posed to Ms. Cook were "How about know the lesson itself? Did you reach the goals that you wanted to?", "What are your feelings about whether or not, they are comprehending what we are trying to accomplish this nine weeks?", and "Any adjustments in the next two classes for the lesson itself?" These questions were very similar to the questions that were suggested in the article summary that the cooperating teachers read for the third online discussion. In the third online discussion, Mr. Fletcher wrote a comment to each teacher and his messages indicated that he valued reflection for teacher education. In her final interview, Ms. Cook expressed that she observed a change in Mr. Fletcher's supervision where he started asking questions to her such as what goals she had prior to the lesson and whether she accomplished

them or not. When these findings were combined, it could be concluded that reading the article summary for the third online discussion that focused on reflection and reflecting on it by writing comments to the group members supported Mr. Fletcher's supervisory practice.

I sent a set of questions to the cooperating teachers for them to reflect on their supervision style in the video. Only Mr. Fletcher submitted his answers to me. For the question "Did one type of supervision (educative or evaluative) seem to dominate your conversation, or did the conversation seem evenly split between the two?", he responded as follows.

I felt like I made a conscious effort to blend the two types of supervision into our post-lesson conference. There were several times I wanted to know Alison's input regarding her feelings towards how a specific aspect of her lesson was addressed and responding to by the students. After hearing her comments, I made an effort to express what I observed, how I would analyze that input in relation to my own experiences, and what might be an effective way to utilize what was gained from the experience.

His response reflected his belief that a blend of two approaches would work effectively. It was valuable for the program to help him consciously integrate educative supervision into his current supervisory practice. His comments indicated that "making suggestions" was more on the traditional supervision side. A similar idea was shared by Ms. Johnson, too. In future programs, "how to make suggestions" should be discussed explicitly with the participating cooperating teachers.

After watching Mr. Fletcher's video, the cooperating teachers discussed a little bit about the importance of body language while interacting with student teachers. Ms. Johnson mentioned that she tried to have Mr. Fair reflect more this time. The conversation continued as follows.

Mr. Fletcher: The biggest changes are always between the first and second periods.

Researcher: In your conversation, I think you made her more aware of the changes more consciously. You know, like and the questions like the kids were different but how was she different? So she acknowledged what difference in her teaching caused a difference in two classes.

Mr. Fletcher: She is aware of that. She juggles but she is a good teacher, she works still, has a little boy and I try to help out, she is real good.

Ms. Johnson: if she is doing all of that. (Third face-to-face meeting)

The last focused conversation of the meeting occurred when Ms. Johnson posed a question to the other cooperating teachers. Ms. Johnson typically left the student teacher's class around the middle of the semester. In this meeting, she explained that her reason for leaving the classroom was to support the confidence of the student teacher. Mr. Fletcher explained that he did not totally leave the classroom; he usually observed the first two periods and then left the class especially since he had other duties in school. He left the class after he made sure everything was going well. On the other hand, Ms. Taylor never left the classroom and she said that "I am getting more and more confident in her and I think this is her chance to have feedback" (Third face-to-face meeting). I thought it was valuable for the teachers to hear different strategies and the reasons behind them regarding being available or not in the classroom.

In conclusion, although the teachers could have reflected on their supervision more in their videotaped post-lesson conference, they observed what each other talked about in their conferences and how they carried out their conferences, as well as what questions they posed to the student teachers. Also, they shared ideas on different supervision issues such as supporting the confidence of student teachers, and leaving the classroom or not. All three teachers posed open-ended questions to their student teachers in their recorded post-lesson conferences. Their supervision resembled educative supervision more than traditional supervision.

The final program activity was the fourth face-to-face meeting. This meeting was conducted towards the end of the semester. Student teachers taught for two to three weeks after this meeting depending on their teaching plan. At the end of the third face-to-face meeting, Mr. Fletcher suggested that we invite the student teachers to our final meeting to hear their opinions. Therefore, all the student teachers and cooperating teachers participated in the fourth meeting. I let all the participants know that the meeting was planned for 1.5 to 2 hours. Mr. Fletcher had to leave 30 minutes after the meeting started. All the other participants stayed until the end. Each student teacher-cooperating teacher pair sat next to each other during the meeting.

I started the meeting by asking them what characteristics of a lesson they paid attention to when they observed a lesson for providing feedback. Each participant

responded to the first question individually. However, I will present their responses by combining the cooperating teachers with their student teachers because their comments reflected the topic of their discussions in their post-lesson conferences throughout the semester. For example, Mr. Fletcher and Ms. Cooks' responses included motivation, comprehension, and content coverage. Ms. Taylor and Ms. Williams' responses included conceptual understanding, time management, organization, and student engagement. Ms. Johnson and Mr. Fairs' responses included questioning techniques, real life connections, and the students' prerequisite knowledge. These topics resembled the content of the pairs' discussions throughout the semester. Next, each pair read a summary of one of the following standards from the NCTM's professional teaching standards: task, discourse, and learning environment. The student teachers explained to the group what their reading was about and we connected their initial responses to the reading material.

Next, the participants watched the US algebra lesson from the TIMSS 1995 video. Before watching the video I asked the cooperating teachers what they would talk about in a post-lesson conference after this lesson if the teacher in the video was their student teacher. How would they communicate with her? What questions would they ask her? Similarly, I asked the student teachers to assume that if they were the teacher in the video, how they would want their cooperating teacher to communicate with them and what kinds of questions they would want their cooperating teacher to ask them. I explicitly requested the group to come up with questions to be asked in a post-lesson conference with the teacher in the video because the meeting was a program activity and I wanted them to support each others' thinking on educative supervision. They could share possible open-ended questions and learn from each other.

The student teachers' initial responses focused on criticizing the lesson rather than thinking how a cooperating teacher should communicate with the teacher in the video. For example, Ms. Williams said "I think Lauren would have a panic attack if I was talking like that. Her questioning techniques were awful." Even though I repeated my question, Mr. Fair said "I would just try to get the students more involved when doing the problem. Maybe find a student that knew what they were doing and have them guide me through the problem instead of just doing it as a teacher." After several explanations of

what I wanted them to focus on, I was able to get some answers that reflected how they want their cooperating teachers to communicate with them. Ms. Williams said:

I think for me, one this I would like for the cooperating teacher to ask is how do you feel or how do you know what the students learn, 'cause if she asked me after I had taught that lesson, what's your form of assessment, you know what the students understand and what they don't understand. I think I would have realized that with my lesson, I have no idea what the students know. (Fourth face-to-face meeting)

Similarly, Ms. Cook commented:

If we are havin' a problem, I would probably want to be asked, how could you get the students more focused on what they are supposed to do? Should I get somebody go up there in the middle of their time and maybe start us out and maybe figure out how we should start out and then maybe go back and work in the groups more.

Student engagement, motivation, and student learning formed the focus of the student teachers attention because they had worked hard on those issues during their student teaching experience. They requested to be asked questions to help them think about those issues.

The cooperating teachers also criticized the lesson but usually did not divert from thinking as a cooperating teacher. For instance, when asked if he wrote down any questions, Mr. Fletcher said:

Well, I'd ask her did you think the kids were...did she find that the kids enjoyed what they were doing? Was she motivated towards what she was trying to accomplish? Did any of them feel like they were comfortable to maybe come up and explain it to the class, to get them more involved? Because even when she went over it afterwards, she was just telling them. She really wasn't getting much of a response from them. Just to get them more active, just... Do you feel that the kids were self-motivated enough to see a purpose for it and enjoy it and if not, what were some things you could do? How could you engage them more? (Fourth face-to-face meeting)

The cooperating teachers shared with the group what questions they would ask the teacher in the video in a post-lesson conference with her and also shared some suggestions that they would make. For instance Ms. Taylor spoke as follows:

So what would I say to them? Well, first of all I would probably take a page of notes and ask them what they felt how things were and if it was probably early in the year, I would probably pick one aspect to work on and, uh, I think for that person, I would say work on language, say work on language. And have a model. Let's say pick, maybe, like the one where they're picking to common denominator...model possible ways they could word that and then have them model that, too. So, I would say to them, let's work on...your method wasn't working well. So, let's work on...let's take a different approach and try to model it and have them model it.

Later in the fourth face-to-face meeting, Ms. Taylor offered more suggestions that she would make to the teacher in the video. Her focus was more on making suggestions rather than posing questions. She also stated that initially there should be some growth in the student teacher for the cooperating teacher to pose questions.

On the other hand, Ms. Johnson came up with different open-ended questions that she would pose to the teacher. Her focus was on asking questions. For instance, she said:

I think, again, is we want to get more kids involved. So, right now, if I was focusing on the warm-up, what can we do to get more kids involved? And try to get her to come up with some ideas of how to hear from them and so maybe she'd get off the overhead. (Fourth face-to-face meeting)

Ms. Johnson offered other questions as well. In summary, the student teachers requested to be asked questions that could help them think about student engagement, student understanding, motivation, and questioning techniques. Ms. Johnson and Mr. Fletcher shared questions that they would ask to the teacher in the video. Ms. Taylor's focus was on offering suggestions. I will discuss the case of Ms. Taylor in the next chapter. From the program's perspective, I observed that on the whole, the comments from the cooperating teachers and student teachers were aligned with the philosophy of the program and thus the discussions in this part provided valuable opportunities for the participants to learn from each other.

The next activity in the fourth face-to-face meeting was reading transcripts of two post-lesson conferences where one of them represented a traditional supervision and the other represented an educative supervision by the cooperating teacher. The participants were asked to discuss what they found valuable in each conference for the growth of the student teacher. Ms. Johnson immediately commented that one conference was an example of traditional supervision and the other one was an example of educative supervision that I wanted them to practice more. Overall the group commented that both conferences were conducted in a positive mood and that was a good thing. However, they commented that in the traditional conference, the student teacher did not have opportunities to reflect on her lesson. Ms. Williams suggested that one conference might have happened in the beginning of the semester because they talked more about classroom management ideas and the other conference that represented educative supervision might have happened towards the end of a semester since they talked more about mathematics pedagogy. When I asked her about the communication style of the cooperating teacher, Ms. Williams said:

If you look at the second cooperating teacher says, “Remember, we talked about you standing up at the board too much and not walking between the students.” I mean, you would say yes, I remember that conversation. How would you really respond to that besides just saying yes? (Fourth face-to-face meeting)

She pointed out that the communication style of the cooperating teacher was evaluative and did not dig at what the student teacher thought. I thought moments like this were valuable for the cooperating teachers to hear what the student teachers thought about the communication style of the cooperating teachers in a post-lesson conference.

Ms. Johnson expressed that it took time for new teachers to grow in different aspects of teaching. All cooperating teachers at different times expressed similar comments. In the fourth face-to-face meeting, I briefly mentioned my pilot study to the group. I explained to them that the content of the post-lesson conferences conducted by the cooperating teachers and their communication styles did not change throughout the semester in my previous study.

In summary, the fourth face-to-face meeting provided the participants with different learning opportunities. First, the cooperating teachers heard student teachers’

comments on how they wanted to be supervised. The student teachers' comments indicated that they did not prefer evaluative comments and close-ended questions from the cooperating teachers. They preferred that the cooperating teachers provide them with opportunities to express their opinions in the post-lesson conferences. All of the student teachers mentioned that they were given opportunities to reflect on their teaching in their post-lesson conferences and they found those opportunities valuable. Secondly, the cooperating teachers shared open-ended questions and suggestions that could be communicated in a post-lesson conference based on a teaching video and two post-lesson conference transcripts. These activities provided them an opportunity to learn from each other and reflect on their own supervision. All of the participants approached the reflection component of the supervision similarly; having the student teachers reflect on their teaching in post-lesson conferences was thought to be valuable for the growth of student teachers.

Finally, I would like to briefly write about my visits with the student teachers. I visited each student teacher six times during the semester. In most of these visits, I conducted a post-lesson conference with the student teachers. The first visit took place during the first week that student teachers started teaching a class. The cooperating teachers participated in this first meeting. The main topic of this conference was the discussion of expectations. We discussed what each person expected from the other triad member. Additionally, I provided some information regarding the regular student teaching experience procedures such as bi-weekly evaluations of the student teacher, final assessment, and the teacher work sample that the student teachers were required to complete.

The cooperating teachers participated in the second post-lesson conferences as well. The second triad conference was a discussion of the lesson taught by the student teachers on the day of my second visit. At the beginning of the semester, the student teachers copied both the task and lesson procedures of the cooperating teachers. The typical experience was that the cooperating teacher taught a lesson early in the day and then the student teacher taught the same lesson in a later class period. During the second triad conferences, the cooperating teachers tended to respond when I posed a question to the student teachers. It was probably because the lesson was designed and the tasks were

chosen mainly by the cooperating teachers. As a result, I conducted my third post-lesson conferences only with the student teachers. Around my fourth visit, the student teachers started planning their own lessons and I invited the cooperating teachers to join the post-lesson conferences again. Most of the time, they were able to join the post-lesson conferences. However, I observed that at times the cooperating teachers tended to defend the student teachers. I realized that I was the leader of the conferences. Before our last triad conference, I requested that the cooperating teachers help me implement educative supervision in the conferences. This request made a big impact on their role in the triad conferences. They posed questions to the student teachers and I was not the leader of the conferences anymore. The conferences were all in a positive mood and there were a lot of reflective questions posed to the student teachers. I did not record the triad conferences. However, after the triad conferences, I recorded my perceptions on them. These findings were based on those notes.

CHAPTER-5

CHANGES IN THE COOPERATING TEACHERS' SUPERVISION

In chapter-4, I provided some background information about each participant. Then, I reported how the participants engaged in the program activities. In this chapter, I will provide some information and observations about what the cooperating teachers' supervisory knowledge, beliefs, and practices were before the program was implemented. After I present the cooperating teachers' initial supervisory beliefs, practices, and knowledge, I will report the findings about how their post-lesson conferences changed (if at all) throughout the program. Next, I will provide the findings about the cooperating teachers' supervisory knowledge, practices, and beliefs after the program was implemented. Finally, I will conclude the section by presenting what the cooperating teachers thought about the program and what the student teachers thought about the change in the supervision style of their cooperating teachers.

Supervisory Knowledge, Practice, and Beliefs of Andrew Fletcher

This section will include four sub-sections; Mr. Fletcher's supervision style before the program was implemented, post-lesson conferences between Mr. Fletcher and Ms. Cook, Mr. Fletcher's supervision style after the program was implemented, and a summary of the change in the supervision style of Mr. Fletcher. The main goal of the section is to help the reader understand how the supervisory beliefs, knowledge, and practice of Mr. Fletcher changed as he engaged in the program activities.

Mr. Fletcher's Supervision Style before the Program was Implemented

Mr. Fletcher believed that student teachers learn how to teach mainly by experience. When asked what he thinks about how student teachers learn how to teach,

Mr. Fletcher responded, “Experience what you learned at the university in real life as an application is what teaches you to be a teacher” (Initial interview). He also expressed that student teachers learn by experience in the second face-to-face program meeting. His role in the student teachers’ experience was to help them have a positive experience. He slowly taught them how to handle the difficulties of teaching. He exemplified this with the following: “Discipline in the beginning, I handle it and let them see how I handle it and then we handle it together and then eventually they will handle it, instruction is the same, they’ll watch me and we will team teach and then they will teach” (Initial interview). One survey question asked the cooperating teachers to decide whether being a cooperating teacher is like being a doctor, a tour guide, a book, or a journalist and give a reason behind their choice. Mr. Fletcher chose the “tour guide” option both in the pre and post surveys and wrote that “help them show the entire experience with explanation” (initial survey) as an explanation for his choice.

In their initial interviews, both Mr. Fletcher and Ms. Cook expressed that they had multiple daily informal conversations about Ms. Cook’s teaching. Mr. Fletcher stated that he conducts more conferences with his student teachers in the beginning of the student teaching experience compared to the later part of it:

In the beginning you are taking baby steps because, as a cooperating teacher you are learning them just like they are learning you. So I have to see what their strengths and weaknesses are and in the beginning you address a lot and then you, as I get more confident in them, they don’t need as much input, they don’t need as much feedback. Then it becomes more trouble-shooting. You know what I’m talking about, it becomes more of you help them as they needed basis. (Initial interview)

When asked if he had a style of communication with his student teachers Mr. Fletcher explained that he talked to them all the time so that “I don’t wanna be anytime I sit down to talk to them is when they are being evaluated” (Initial interview). He also mentioned that he handled his student teachers as he would like someone else to treat his daughter if she was a student teacher. His main focus was on the student teacher’s ability to reach the students when he observed their lessons because he thought that “Interns tend to teach above the level of the kids at first because the only experiences they’ve had of

teaching are to teach other kids at the college that are in the same major as they are, math majors” (Initial interview). This focus was observed in Mr. Fletcher’s post-lesson conferences with Ms. Cook; teaching at a level that students can understand was discussed in all of the five conferences that they recorded for this study. Actually, Mr. Fletcher’s perception that the student teachers’ teaching experiences were limited to teaching in college was not true. For example, student teachers at SU teach a complete unit to grade 6-12 students in their pre-internship. Mr. Fletcher also mentioned that the mathematics education faculty was not experiencing the theories that they taught. Consequently, Mr. Fletcher’s perception about mathematics education faculty and student teachers’ teaching experiences supports the idea that the communications between the universities and schools should improve. This was one of the goals of this program. In his initial interview, I briefly explained to Mr. Fletcher what research and teaching activities the faculty in the mathematics education program at SU perform to connect theory with practice.

In his initial interview, Mr. Fletcher said that he explicitly told the student teachers his thoughts about their teaching. He also encouraged them to ask for his feedback. However, in order to help them build confidence, he tried to communicate his thoughts in a positive manner: “If it’s negative I handle it in a positive way and I also make sure I give them the positives too” (Initial interview). Providing a mixture of positive and negative assessments to the student teachers was voiced by the cooperating teachers in the second face-to-face meeting as well. Ms. Cook perceived Mr. Fletcher’s positive approach similarly. When she was asked to describe a typical post-lesson conference, Ms. Cook said “He always point out all the positives first, he says this is going very well, this is going very well, maybe you might want to look at this or maybe put it in a different way” (Initial interview). She mentioned that she enjoyed his positive approach because she never got down with whatever he said.

In both the initial and the final interviews, the cooperating teachers were asked to watch a mathematics lesson clip, imagine that the teacher in the video was their student teacher, and explain to the researcher what they would communicate with this student teacher and how they would carry out such a conference. The purpose of this question was to add another piece to my understanding of their supervision style before and after

the program was implemented. The video was a 10th grade geometry lesson and the topic was the volume of a cylinder. The teacher in the video made three paper cylinders from the same sized papers so that they have the same surface area around. Two students made an experiment in front of the whole class to show the relationship between the volumes of these three cylinders. After watching the video, Mr. Fletcher said that he would first ask what the student teacher thinks about how it went. He continued:

I'd ask her, do you think is this the as good as it'll ever get, do you think you could make it better? Or is this the as best as it'll ever be? Don't get me wrong, I thought it was very good. Things that might even make it even better, did you try to get every kid involved as much as you could? Or did you just select the little group that's, you know, the more of the kids they are active it seems like its even better. The hands on they seem to learn better than the any other way just about more kids because more of them are involved it is probably more effective. If, it would be nice maybe to show them a little more application in the real world, like who does this volume, why do you, what's the purpose of even learning, what is the significance of volume? Who uses it? Are we just learning for the formula? That'd have been nice if she mentioned something like that. But that was a good lesson. I just would like to, just in her own mind that she make an effort to get as many kids involved as possible that she shows them some relevance in the real world for it. I thought that would help. But she did a good job with it. It's clever how she did it. Kids today question more than ever. Why would we use that? What's the purpose of that? And we should be able to tell them. Not many people wanna learn just for the sake of learning. They want a reason for it. (Initial interview)

Mr. Fletcher's focus of observation was on student involvement and real life application, which was aligned with his regular central attention points in his post-lesson conferences with Ms. Cook. His comments revealed that he would ask some questions to the student teacher, however it seemed like helping the student teacher reflect on her teaching was not his central goal. He asked a general reflection question initially: "Do you think is this the as good as it'll ever get, do you think you could make it better?" However, he did not pose any other open-ended questions to dig at the student teacher's

thinking in the remainder of his talk. He asked a leading question “Did you try to get every kid involved as much as you could? Or did you just select the little group that’s...,” which sends a message that he already had an answer in his mind. Then, he communicated his suggestions and explanations. He used positive assessments between his comments. These are common trends that I found in his initial post-lesson conferences with Ms. Cook. The details of their post-lesson conferences will be presented in the next section. In reference to the above interview question, I need to mention that role playing in an interview was difficult for the teachers. Therefore, I can’t say I could understand their supervision styles by having them watch a video clip, but I was able to get a piece of information about it.

To summarize, initially Mr. Fletcher’s supervision style seemed to be more on the traditional side of the supervision spectrum because his focus was more on translating his comments, suggestions, and evaluations to the student teacher in a positive manner in order to help them have a positive experience. These are important for student teachers (Beck and Kosnik, 2002), however educative supervision requires more than these components from the cooperating teacher such as asking open-ended questions to student teachers in order to help them grow in their student teaching experience as reflective practitioners. In the next section, I will present the findings from his conferences with Ms. Cook. That will give us a better understanding about how his supervision style changed (if at all) over the course of a semester.

Post-lesson Conferences between Mr. Fletcher and Ms. Cook

I will have this section for each cooperating teacher-student teacher pair. In this section, I will describe the post lesson conferences between the cooperating teachers and student teachers in three ways. First, I will present the findings about how much of the talking was done by each participant. Secondly, I will report on the content of the post-lesson conferences between the cooperating teachers and the student teachers. Finally, I will discuss the communication type that each participant used.

Before reporting the findings about the conferences conducted by Mr. Fletcher and Ms. Cook, I would like to remind the reader that Mr. Fletcher and Ms. Cook had five

audio-taped post-lesson conferences; the first two conferences were conducted before the educative supervision was discussed in the program and the latter three conferences were conducted after the discussion of educative supervision. Both Mr. Fletcher and Ms. Cook mentioned in their interviews that they had multiple daily talks about Ms. Cook's teaching. Ms. Cook elaborated on the amount they talked about her teaching:

Usually we talk for few minutes throughout the day, between each class, you know, make sure everything was going fine, but at the end it would be, we might have a 15-minute conversation about it, just kind of recap everything and see if it, from the first lesson to the last lesson if there was improvements made on it and stuff like that. (Final Interview)

So they talk about Ms. Cook's teaching between the classes, but they also sit down and talk to each other nearly twice a week (Final interview with Ms. Cook) for about 15 minutes. The conferences that they recorded are among the latter type of the conferences that they had.

Conversational time used by Mr. Fletcher and Ms. Cook. The purpose of determining how much each participant talked in the post-lesson conferences was to get an overall idea about who shared ideas and to what extent during the conferences. Traditional supervision views the cooperating teacher as the transmitter of knowledge and experience to the student teacher; therefore, the cooperating teacher should do more talking than the student teacher. Alternatively, educative supervision values that the student teachers express their ideas, suggestions, concerns, and analyze and reflect on their own teaching. This view suggests that the participants talk equally or the student teacher talks more than the cooperating teacher.

In order to determine how much each participant talked in a post-lesson conference, I used the "word count" function of a word processor. Mr. Fletcher and Ms. Cook had five recorded post-lesson conferences. In these conferences, Mr. Fletcher had the following talking percentages from the first conference to the fifth conference respectively: 98%, 98%, 81%, 50%, and 46%. Ms. Cook's corresponding percentages in these conferences were: 2%, 2%, 19%, 50%, and 54%. Figure 5.1 might help the reader visually compare the percentage of talk time used by Mr. Fletcher and Ms. Cook in each of their five post-lesson conferences.

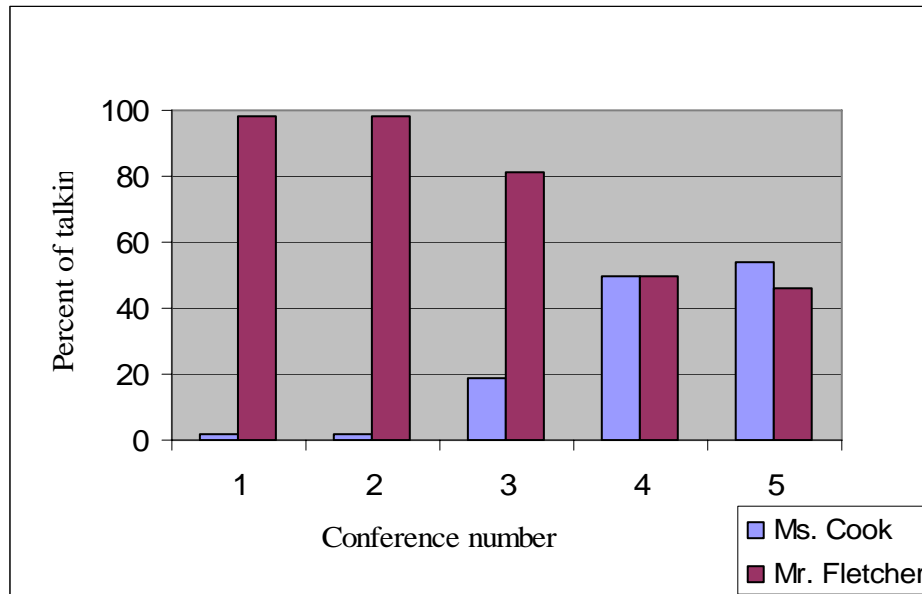


Figure 5.1 Conversational Time used by Mr. Fletcher and Ms. Cook

Calculation of talking percentages by Mr. Fletcher and Ms. Cook revealed that Ms. Cook’s voice in the post-lesson conferences drastically increased from the first conference to the fifth conference. Her voice was almost not heard in the first two conferences that were conducted before the discussion of educative supervision in the program. The next two sections will provide a deeper understanding of how the post-lesson conferences between Mr. Fletcher and Ms. Cook changed throughout the semester by discussing what they talked about and how they carried on their conferences.

Content of the post-lesson communications. In this section, I will present the findings about the content of the communications in the five post-lesson conferences that Mr. Fletcher and Ms. Cook conducted. Determination of the content of the conferences is important because it will give us insight into which direction the student teacher was guided regarding different domains of teaching mathematics. Basically, the categories of the content analysis were general pedagogy, mathematics pedagogy, mathematics,

classroom management, general teacher growth, and the teacher-student relationship. In order to determine the percent of content categories, I counted the word number in each category by using the “word count” function of a word processor. Table 5.1 shows the percent of communications in each content category across five post-lesson conferences. The first row represents the content percentages in the first meeting; second row represents the second meeting; and so on.

Table 5.1. Types of Content in Post-lesson Communications for Pair-1

	General Pedagogy [GP]	Mathematics Pedagogy [MP]	Mathematics [M]	Classroom Management [CM]	General Teacher Growth [GTG]	Teacher- Student relationship [TSR]
Conference-1	52%	8%	0%	3%	23%	5%
Conference-2	21%	17%	0%	11%	33%	8%
Conference-3	0%	94%	3%	0%	0%	0%
Conference-4	10%	54%	0%	18%	5%	2%
Conference-5	39%	44%	0%	8%	8%	0%

Figure 5.2 represents the same data visually:

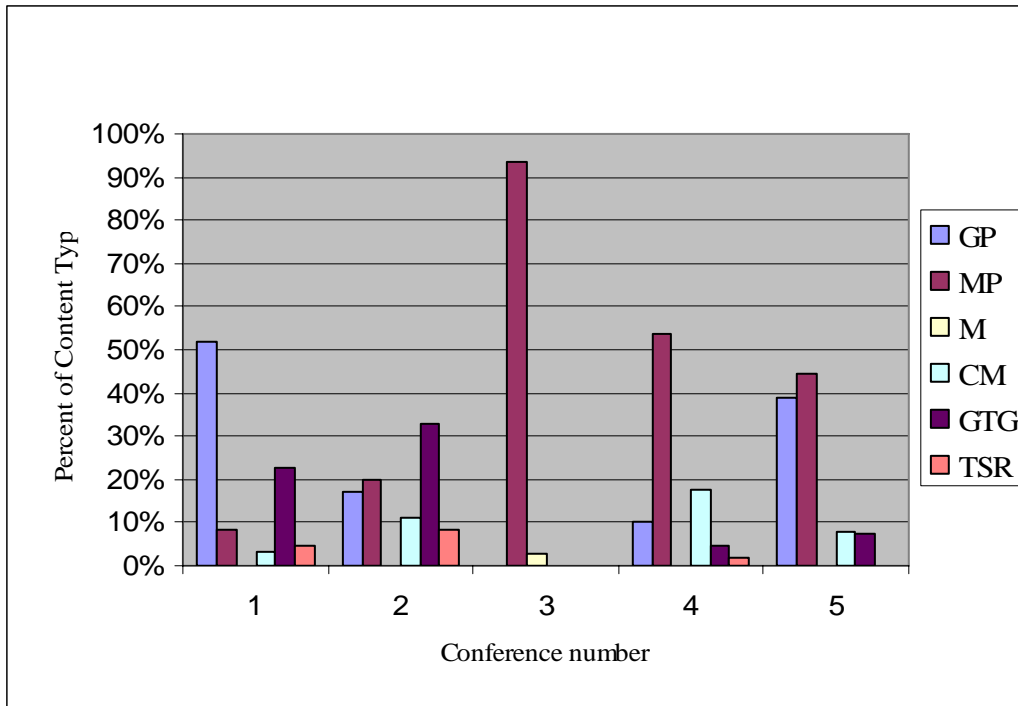


Figure 5.2 Types of Content in Post-lesson Communications for Pair-1

The content analysis findings suggest several commonalities and differences across the five meetings that Mr. Fletcher and Ms. Cook conducted. First, mathematics itself and teacher-student relationships were not discussed notably in their conferences. Similarly, classroom management did not become the focus of any of the five recorded conferences. A big change from the first conference to the fifth conference is that the conversations on mathematics pedagogy increased considerably.

As mentioned earlier, Mr. Fletcher and Ms. Cook quickly talked between the classes, but then also some days at the end of the day, they sat down and reflected on the day for a longer time. Therefore I could say that the end of the day conferences were likely to promote Ms. Cook's thinking on teaching and learning mathematics because they could talk deeply in these conferences. As a result, what they talked about in these conferences may play an important role for her growth as a teacher because it would direct her thinking on those topics. The quantitative data (see figure 5.2 and table 5.1) suggests that they talked more on the pedagogy topics than other content categories such

as classroom management or teacher-student relationships in the conferences that were conducted after the discussion of educative supervision in the program. However, qualitative data is required to better understand what they really talked about and how much in depth they talked about them.

I will discuss the first two conferences and the last three conferences together since some of their characteristics are similar to each other in terms of talking about the different content categories. One apparent similarity is that the first two conferences were conducted before the discussion of educative supervision in the program. My discussion will attempt to justify my observations on their conferences.

Mr. Fletcher started the first two meetings by stating that they were going to talk about specific lessons. For example, he started the first recorded post-lesson conference by saying “I’m getting ready to do a reflection on the lesson that Alison taught today on, uh, angle relationships. I talked to her a little about it already, but we’re gonna go over some of it again.” Similarly, he said at the beginning of the second conference that “This is Andrew Fletcher, uh, I’m sitting here with Alison and we’re going over, she started doing a lesson the last two days and ended up doing deductive reasoning.” So, he set the goal that they were going to reflect on that day’s lesson.

As reported in previous section, most of the conversation time was used by Mr. Fletcher in the first two conferences. One general pattern related to content of his talk was that the majority of the time, Mr. Fletcher discussed general ideas rather than talking about the specifics of the lessons. For example he talked about explaining the concepts in more detail in the first conference, but he did not provide examples and observations from Ms. Cook’s lessons: “Some things that I thought would be more beneficial would be to take the explanations a step further with either more examples or some pitfalls that kids fall into where, you know, they’re making the same mistakes over and over.” [General pedagogy] And he continued talking about student involvement in a similar (general) manner. Later in the conference he commented on helping students think about the concepts again in general without connecting it to that day’s lesson:

Find ways that clicks for ‘em. You’re gonna find ways that they’re enthusiastic about. You’re gonna find things, you’re gonna find things that those kids like to do that you can make them...instead of spoon feeding them the information, you

can make them think about it and come up with the concept themselves and then they can present it before you show them how to do it [general pedagogy], but first, you've got to know you're kids better. I don't think I could do that right now because I really don't have that good a feel right now of everything they do and how they learn [teacher-student relationship].

Regarding this comment, I would like to remind the reader about his views on reform-based mathematics instruction. As discussed earlier, he has some parallel views with the reform ideas in mathematics instruction. However, he also thinks that student-centered instruction may not be good for all students depending on the students' characteristics.

The second conference was similar to the first one in that it did not reflect on the details of the lesson. Initially, Mr. Fletcher commented on the lesson, which accounts for one-third of the second conference. Then, he talked about his evaluation of Ms. Cook based on the 12 Accomplished Practices for the rest of the conference.

His comments on the lesson included:

The first class she taught was, she was almost teaching over their heads...there was too much theory and they were confused and they weren't real clear on inductive reasoning and the things that make it up, like conjectures and counter examples and, uh, converse and inverse and things like that. They were very confused. We talked right after the lesson and I talked to her about maybe making the samples a little easier and uh, trying to get the kids put in some input and use some of their examples, if you could, that way you would know that they understand it...Um, the rest of the day, it got better and better. She made the adjustments, uh, had some easier samples, broke it down a little bit slower and made it more clear for the kids [Mathematics Pedagogy].

In this conversation, Mr. Fletcher provided some analysis of the students' learning difficulties and made suggestions for improving their understanding of the concept. However, they did not talk about the specific examples, their solutions, and how and why students struggled in solving them. They also did not elaborate on the adjustments that Mr. Fletcher had suggested such as what kinds of adjustments were made, how students' reactions changed, why and how these suggestions helped the lesson become better, and so on. During one of my visits to Ms. Cook, I found out that she had modified her lesson

after the first period based on Mr. Fletcher's suggestion. In the post-lesson conference I, Ms. Cook, and Mr. Fletcher discussed how and why that modification made the lesson more effective. That day, I recognized that Ms. Cook had not fully recognized why that modification helped her lesson improve until we talked about it in the conference. They decided about the modification between the classes and obviously, they could not talk about it deeply until the end of the day because of time limitations. Therefore, I think that talking about the changes in the lesson throughout the day in an "at the end of the day" conference might have helped Ms. Cook reflect on the day deeply and grow as a reflective practitioner.

In their second post-lesson conference, Mr. Fletcher also talked about a discipline problem that Ms. Cook had that morning and suggested she "tell those kids that they'll have their opportunity and respect the others when it's their opportunity." Then, he moved to another topic "Um, we did the evaluation. Let me give you some of the comments. I'm reading to her as well. It's the first time that we're going over this." In this part, Mr. Fletcher talked about each of the 12 categories. Some of his comments included the following excerpts: "Just to give the kids a better opportunity to succeed and maybe touch on some of the areas where they're better at, as far as assessment. Give them opportunities [General Pedagogy]." "The grades are really good and that's good and it's a confidence builder for her because a lot of her instruction was put into that and... the kids are doing well with her instruction [General Teacher Growth]." "She's communicating well with the kids [Teacher-Student Relationship]." "She's got them in groups today...she's made a few adjustments there. She's talked about possibly rearranging the kids...she actually selected the groups...it seems to work out good for the most part. We might make a few adjustments tomorrow [General Pedagogy]." As it can be observed in the above excerpts, most of Mr. Fletcher's comments were general because he was talking about 12 categories in a relatively short amount of time. In some cases there were missed opportunities for lesson reflection. For example, in the last excerpt he talked about a group activity that Ms. Cook did that day. He mentioned that they might modify it tomorrow; however they did not discuss possible ways of modifying it. He informed that Ms. Cook made some adjustments but there was no discussion

related to what adjustments were made and why they were made. I would like to note that he used “she” in his comments as if he was talking to me through the tape recorder.

In contrast to general talks in the first and second meetings, Mr. Fletcher and Ms. Cook had discussions related to details of the lessons that Ms. Cook taught, during the third, fourth, and fifth post-lesson conferences. For example, in the third post-lesson conference, after listening to what Ms. Cook wanted to accomplish in that day’s lesson, Mr. Fletcher suggested that she “try in reverse. For example, show them parallel lines on the board and ask them if they remember what slope is [Mathematics Pedagogy].” He also suggested that she question the students about why things in real life have slope: “And why do they build things...even highways.[Mathematics Pedagogy] Roads have slopes so the rain washes down to the sides, and you know, when engineers build things like that [Mathematics]. Just ask them, why do you think things have slopes? [Mathematics Pedagogy]” He continued his conversations by giving Ms. Cook suggestions on how to teach slope and the details of this topic such as negative slope, positive slope, undefined slope, comparing lines with same or different slopes, and so on. Basically, he suggested having students work on different examples and then have them come up with the conclusions such as “Lines with the same slope are parallel to each other.” He concluded the third conference with the reasoning behind his suggestions:

Just to let them think ahead of time and then do it...it might make more relevance to them and it gets them thinking about...a, the purpose of doin’ it. Then you won’t have a problem with, with those kids sayin’ well, why are we doin’ algebra again? [Mathematics Pedagogy]

The third conference showed that Mr. Fletcher and Ms. Cook talked about the details of the lesson. Their focus was how to teach the concept of slope more effectively. Content analysis showed that 94% of their conversations were on mathematics pedagogy in the third conference. The fourth and fifth conferences also had the mathematics pedagogy category as the highest percentage. Fifty-four percent of the conversations were in mathematics pedagogy category, 18% were in the classroom management category, and 10% were in the general pedagogy category in the fourth meeting. The percentages were as follows in the fifth meeting: 44% in mathematics pedagogy, 39% in general pedagogy, 8% in classroom management, and 8% in general teacher growth category.

The second program face-to-face meeting was conducted before this pair conducted their third post-lesson conference. In the second face-to-face meeting, we discussed the importance of the content of the post-lesson conferences; mathematics pedagogy was put forward as an important teaching domain to be discussed in the post-lesson conferences. Other program activities supported this idea as well, such as the articles that the teachers read and the triad conferences that the researcher led in her visits to the student teachers. Hence, the quantitative and qualitative improvement of the mathematics pedagogy category in this pair's post-lesson conferences might be a result of the program.

Similar to the third meeting, the conversations in the fourth and fifth meetings dealt with the details of a lesson that Ms. Cook taught. For example, at the beginning of the fourth meeting, Ms. Cook described what the lesson was about, and what she wanted to accomplish in that lesson. After Ms. Cook made an evaluation of her lesson, Mr. Fletcher described a problem and asked Ms. Cook to compare how the students in the two classes handled it. Ms. Cook responded "Second period actually, they grasped it a lot faster and gave more in-depth information about it and they gave more thought provoking answers. First period was like, well, it looked like that, so we're gonna go with that [Mathematics Pedagogy]." The rest of the conversation included what modifications Ms. Cook did from the first period to the second period and how it affected the students' understanding, what modifications she would do to this lesson in future, and how Ms. Cook feels about whether she reached her goals for this lesson or not. They talked in detail about this lesson. At the end of the conference, they talked about student involvement, and how Ms. Cook is handling discipline in general. In terms of student involvement, Ms. Cook explained whether she feels she is involving the majority of her students and then Mr. Fletcher explained why student involvement is important. Finally, they discussed how discipline affects student learning. To sum up, in the fourth conference Mr. Fletcher and Ms. Cook had more focused conversations. The conversations were about the goals Ms. Cook had for that day's lesson, her assessment of her teaching, student's reaction to problems that Ms. Cook asked, modifications that Ms. Cook did and how and why those modifications changed the lesson, why student involvement is important, and how discipline affects the students' learning process. All of these topics are important for a student teacher's growth.

The fifth meeting was a relatively short meeting compared to the fourth meeting, but the type of the conversations were similar to that of the fourth meeting. They included: the goals Ms. Cook had for that day's lesson, Ms. Cook's and Mr. Fletcher's assessment of her teaching on that day, the students' reaction to Ms. Cook's lesson, what possible activities Ms. Cook might do in the following lessons, how Ms. Cook handled student involvement that day, and how the students were behaving on the day that they had this conference.

To conclude, there was a clear change from the first to the fifth conference that Mr. Fletcher and Ms. Cook conducted. Specifically, the conferences that they conducted before the discussion of educative supervision included conversations on general teaching topics. Even though they started the conference with a goal of reflecting on that day's lesson, the majority of the time, they did not focus on the details of the lessons that Ms. Cook taught. The conferences that were done after the discussion of educative supervision included focused and detailed conversations on a specific lesson, with a special focus on mathematics pedagogy. This is important from the perspective of educative supervision because one of the main components of educative supervision is using lesson incidents to help the student teachers think about their teaching and reflect on it. At this point, we know that they talked about the details of the lesson. How the cooperating teacher used those discussions to help the student teacher think about her teaching will be analyzed in the next section.

Communication types used in the post-lesson conferences. In the previous section, I presented the findings related to the content of the conversations across the five post-lesson conferences that Mr. Fletcher and Ms. Cook conducted. The findings showed that mathematics pedagogy became the focus of the last three conferences they had. Although it is very important to know what they talked about in their conferences, it is also important to know the way they communicated their ideas to each other on the different content categories in order to understand the supervision style of the cooperating teacher. Traditional supervision may be portrayed as direct, authoritative assessment of the student teacher's teaching with a focus on classroom bureaucracy (Blanton et al., 2001). A traditional supervisor will tend to communicate his ideas over the student teacher's ideas and will provide teaching recipes to the student teacher without

necessarily helping the student teacher think about them. On the other hand, an educative supervisor will move away from authoritative and direct evaluations of the student teacher's teaching and will use open-ended questions to help the student teacher make sense of the occurrences in the student teaching experience. The student teacher is in the center of the interactions between the cooperating teacher and the student teacher. The student teachers are encouraged to provide ideas, suggestions, explanations, and assessments related to their teaching and their comments are valued.

As explained in the methodology chapter, the communication types that were used in the post-lesson conferences in this study were put into six categories: Questioning, Assessing, Explaining, Describing, Suggesting, and Emotional Talking. A traditional supervisor would be doing more assessing, explaining, and suggesting, while an educative supervisor would do more questioning to help the student teacher do explaining, assessing, and suggesting. Also important is how the supervisor uses these categories in conjunction with each other (Fernández and Erbilgin, 2007). For example, an educative supervisor may use explanations or suggestions, but perhaps after questioning the student teacher and receiving her input about that topic. In this section, I will present findings regarding these issues in Mr. Fletcher and Ms. Cooks' conferences. Firstly, I will present the findings about the distribution of the communication types used by the cooperating teacher and the student teacher in each post-lesson conference. Then, I will explain how the cooperating teacher used different communication types across the conferences in conjunction with each other.

Table 5.2 and Figure 5.3 represent the percentages of communications in each category used by Mr. Fletcher in their five recorded post-lesson conferences. Similarly, Table 5.3 and Figure 5.4 indicate the percentages of communications in each category used by Ms. Cook.

Table 5.2. Types of Communications used by Mr. Fletcher

	Questioning [Q]	Assessing [A]	Explaining [E]	Describing [D]	Suggesting [S]	Emotional Talking [ET]
Conference-1	0%	14%	27%	18%	32%	9%
Conference-2	0%	32%	24%	35%	8%	0%
Conference-3	32%	0%	32%	0%	36%	0%
Conference-4	52%	18%	18%	9%	3%	0%
Conference-5	44%	19%	13%	13%	6%	6%

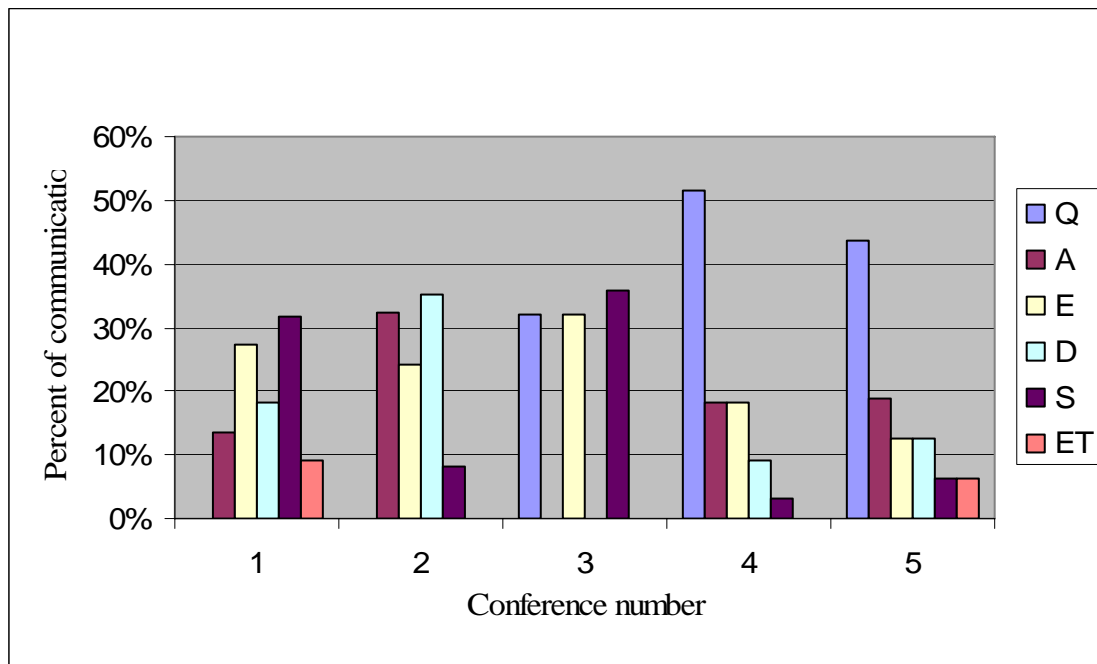


Figure 5.3 Types of Communications used by Mr. Fletcher

Table 5.3. Types of Communications used by Ms. Cook

	Questioning	Assessing	Explaining	Describing	Suggesting	Emotional Talking
Conference-1	0%	0%	0%	0%	0%	0%
Conference-2	0%	0%	0%	0%	0%	0%
Conference-3	0%	29%	29%	43%	0%	0%
Conference-4	0%	17%	30%	52%	0%	0%
Conference-5	0%	18%	36%	45%	0%	0%

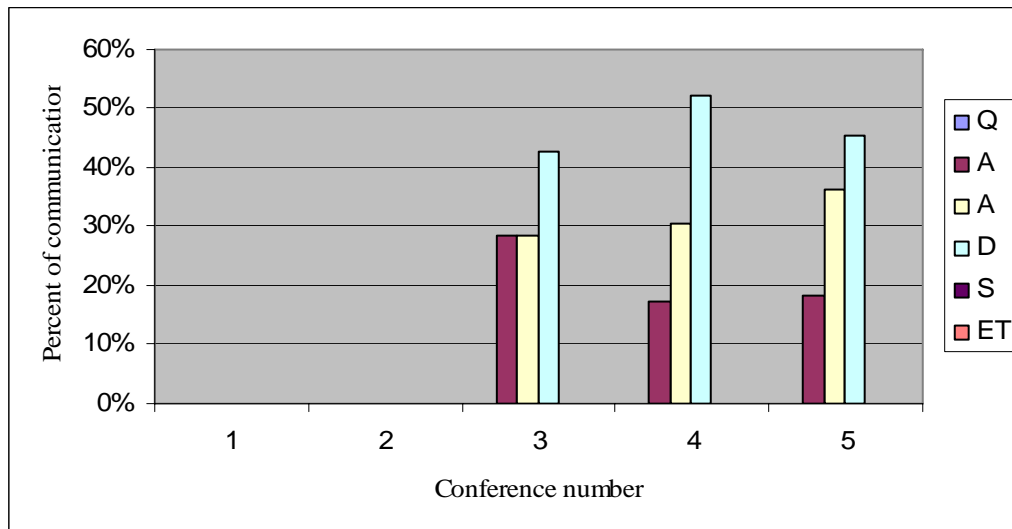


Figure 5.4 Types of Communications used by Ms. Cook

Table 5.2 and Figure 5.3 show that Mr. Fletcher did not question Ms. Cook about anything in the first two conferences. Actually, Figure 5.1 informed us that 98% of the

conversation was done by Mr. Fletcher in both the first and second conferences. This is why there are no bars for the first and second conferences in Figure 5.4. Ms. Cook's voice was heard in the first two conferences in the form of "uh, huh" and "yeah." They sometimes meant that she was listening to him and sometimes meant that she agreed with him. Mr. Fletcher used explaining (27%), and suggesting (32%) in the first conference, and assessing (32%), explaining (24%), and describing (35%) in the second conference. The percentages change drastically when we look at the third, fourth, and fifth conferences that were conducted after the discussion of educative supervision. The percent of the questioning category communications made by Mr. Fletcher increased to 32% in the third conferences, 52% in the fourth conference, and 44% in the fifth conference. On the contrary, the percent of assessing category decreased to 0% in the third meeting. Mr. Fletcher assessed Ms. Cook's teaching in the fourth and fifth conferences with percentages of 18% and 19%, respectively, and it seems like assessing was not his focus in these conferences. Another reading from Table 5.2 is that Mr. Fletcher often used communications in the explaining (32%) and suggesting (36%) categories in the third conference but decreased usage considerably in the fourth and fifth conferences. The shift in Mr. Fletcher's communication types towards using more questioning is reflected in the communication categories used by Ms. Cook. Although she used a great deal of the describing category communications (43%, 52%, and 45%), she also expressed assessing (29%, 17%, and 18%) and explaining (29%, 17%, and 18%) communications in the last three conferences. These percentages suggest a change in Mr. Fletcher's supervision style towards educative supervision, but still we need more evidence. In the rest of this section, I will present how Mr. Fletcher used the different communication types in conjunction with each other to understand the change in the percent of communications used by him in the five post-lesson conferences.

I will first discuss the communication types used by Mr. Fletcher in the first and second conferences since there are some commonalities in the two conferences. First of all, there was no questioning in the first two conferences, as stated earlier. Secondly, there were very few lesson observation descriptions in these conferences. In the first and second conferences, Mr. Fletcher used 17 describing communication types. Out of these 17 describing communications, only five communications (29%) were specific to lesson

observations. This is aligned with the observation that was explained in the previous section; most communications in the first two conferences did not focus on specifics of the lessons that Ms. Cook taught.

Out of seven suggestions made in the first conference, three of them were collapsed into directive suggesting category. Another observation is that Mr. Fletcher justified his comments by either using an explanation or exemplifying with a description. The former is the case in the first conference and the latter is the case in the second conference. A very clear pattern in the first conference was that suggesting and explaining communications were used together. Six of these seven suggestions were justified. In other words, Mr. Fletcher provided an explanation for his suggestions. For example, Mr. Fletcher suggested for Ms. Cook to involve more kids and explained his perspective about it:

I think it would be a good idea to, uh, try to get more kids involved [Suggesting].

I think it's uh, human nature for any teacher to tend to call on the one or two kids that always have their hand up, but then you get a false sense of security because you know that they know the answers, but you wonder if the rest of them do [Explaining]. So, I told her to try and get more kids involved [Suggesting]. (First post-lesson conference)

Similarly, Mr. Fletcher provided an explanation after he suggested a possible incorporation of technology: "If we could incorporated some technology, that would be good [Suggesting], just to show just different ways to teach the same topics so we could see which ways were more effective as far as the number of kids that understand it [Explaining]" (First post-lesson conference).

Mr. Fletcher continued to provide an explanation with his suggestions in the second conference, too. Out of three suggestions he made in the second conference, two of them were justified and one of them was directive. In the second conference, 32% of the communications done by Mr. Fletcher were in the assessing category. The reason for the large percentage of assessment in this conference is that Mr. Fletcher was talking to Ms. Cook about his evaluation of her teaching based on the 12 Accomplished Practices. Cooperating teachers who work with student teachers at SU are supposed to evaluate the student teachers biweekly by using the student evaluation form that used 12

Accomplished Practices as their criteria. So, in this conference he was explaining to Ms. Cook what he assigned in each category for her accomplishment and why he did that. There were 12 assessing comments in this meeting; 11 of them were positive assessment of Ms. Cook's teaching. A general pattern was that he provided a description from Ms. Cook's teaching or an explanation to support his assessment. An example is as follows:

There's a section called diversity. I gave her an, I don't know, progressing plus, 'cause she works real well [Assessing]. We've got, especially one student that's from a different culture completely, from a different country and, uh, is having a tough time with the language and she's done a great job with working with her and the girl seems very comfortable with talking to Alison and she's made some modifications there to help that student have some success [Describing] and that was good [Assessing]. (Second post-lesson conference)

Until now, I described the first two post-lesson conferences that Mr. Fletcher and Ms. Cook conducted. The first two conferences were significantly different from the last three conferences with respect to communication types used by Mr. Fletcher. Whereas there was no questioning communication category in either the first conference or the second conference, it was quite high in the third, fourth, and fifth conferences: 32%, 52%, and 44%, respectively. As I try to think about possible reasons for this change, two main ideas come to my mind: there was a misunderstanding about what I wanted them to do with respect to audio-taping their post-lesson conferences, or Mr. Fletcher was on the traditional side of the supervision spectrum and he changed as he participated in the program. It could also be a combination of these two factors. In regards to the first option, i.e. misunderstanding, I told all three pairs the same thing: "please once a week record a post-lesson conference that you conduct." And I explained it like, "you know, you normally talk about the student teachers' teaching after a lesson possibly everyday, I just want to understand the nature of your conferences, so please just record once a week for me." None of the pairs asked a question about this and they all said okay. With the other two pairs, student teachers talked in the initial conferences. It is only in this case where the student teacher's voice was heard only with "yeah," and "uh, huh" in the conferences that were conducted before the discussion of educative supervision. Also, neither Mr. Fletcher nor Ms. Cook talked to me about a misunderstanding for how to

conduct the post-lesson conferences. If there was a misunderstanding they would have probably told me about it since I saw them quite often (every week or every two weeks). So I tend to think that the first option was not the case.

On the other hand, in one of her journal reflections, Ms. Cook mentioned that she and Mr. Fletcher had a discussion on individual students and she wrote that:

I like the way that Mr. Fletcher listens to what I have to say. Sometimes we say a lot of the same things, but others he says that he never thought of it this way and he will ask my opinion on what he should do with certain situations. (Journal reflection-1)

So I understand that Ms. Cook was not always silent in the discussions she had with Mr. Fletcher. However, it seemed like the cooperating teacher was at the center of their interactions. In the initial interview, Mr. Fletcher talked about encouraging student teachers to ask for feedback:

I encourage them to ask me questions that I don't ask. Ask me if you feel out something could have gone more smoothly or something that went wrong and I did not address. What do you think? I thought it went pretty well, Mr. Fletcher, what do you think? Encourage them to ask for feedback. (Initial interview)

This comment reveals that he encouraged the student teachers to ask for his opinions rather than he asked for their opinions. This center seemed to shift towards the student teacher as Mr. Fletcher engaged in the program activities. All the program activities except the first online discussion highly emphasized posing open-ended questions to the student teachers to help them think deeply on their teaching. In the program activities, the cooperating teachers had opportunities to discuss components of educative supervision with each other, thus supporting each other's thinking and practice on supervision. The conferences that Mr. Fletcher conducted after the discussion of educative supervision provide evidence for a shift in his supervision towards educative as you will read soon. Additionally, both Mr. Fletcher and Ms. Cook expressed that there were changes in the supervision style of Mr. Fletcher in their final interviews. Their comments indicated that Mr. Fletcher posed more questions to Ms. Cook in the conferences that they had towards the end of the semester compared to the ones towards the beginning of the semester.

It is also interesting that in the second post-lesson conference, after he commented on Ms. Cook's lesson for the last two days, Mr. Fletcher talked about his evaluation of Ms. Cook based on the 12 Accomplished Practices. It was the first time he was talking about it with Ms. Cook: "We did the evaluation. Let me give you some of the comments. I'm reading to her as well. It's the first time that we're going over this. Uh, the section on assessment..." (Second post-lesson conference). Even though it was the first time that he was going over it, he did not ask what Ms. Cook thought about her own growth. Therefore, combining all the data, I tend to think that Mr. Fletcher moved away from the traditional side of the supervision spectrum to educative side of it. The third post-lesson conference is vital in understanding this change because he asked nine questions (32%) in this conference and he increased the percent of questions he asked after this conference. In order to understand his supervision style, it is important to understand how he used these nine questions and what kinds of questions he posed to Ms. Cook.

The third conference had some similarities and differences with the first two conferences. One similarity was that in the third conference, Mr. Fletcher justified the suggestions he made to Ms. Cook, which I believe is better than not providing an explanation at all for the suggestions offered by the cooperating teachers. Justified suggestions helps the student teacher understands why the cooperating teacher is making the suggestions he or she is offering. Out of 10 suggestions, Mr. Fletcher gave a reason for 7 of them in the third conference. Actually, this was a common pattern for Mr. Fletcher; he justified most of his suggestions in all of the five conferences. Five of the 10 suggestions were offered in a directive way.

One difference between the third conference and the first two conferences was that he posed nine questions in the third conference whereas he did not pose any questions in the first two conferences. Out of the nine questions that Ms. Fletcher asked in the third conference, four of them were in the confirming, two of them were in the requesting opinion, and two of them were in the requesting information sub-categories of the questioning category. The two requesting opinion questions were asked in the beginning of the conference. The first question was "Tell me what was good and bad." To this request, Ms. Cook described the lesson a little bit with some explanation and assessed it positively. Then, Mr. Fletcher explained the goal of the lesson and Ms. Cook

added to that explanation. Next came the second requesting opinion question: “Was it good? Did it work?” Ms. Cook responded “Yeah, once we did some examples, they understood it [Assessing].” Mr. Fletcher responded “Let me, I was telling you a minute ago, before I remembered to turn this on, try in reverse. For example, show them parallel lines on the board and ask them if they remember what slope is. [Suggesting]” (third post-lesson conference).

The rest of the third conference mostly included suggestions and explanations of Mr. Fletcher with confirming or requesting information questions among them. Ms. Cook’s voice was mainly heard in the form of “uh, huh.” This was also evident in the talking percentages. Ms. Cook did only 19% of the talking in the third conference. The following excerpt represents the communication types done in the rest of the conference:

Mr. Fletcher: Just, I would try this in reverse. [Suggesting] Give them a practical reason for slope [Explaining] and then work backwards as to how to find the details. And you could explain to them why is a vertical line, um, an undefined slope? [Suggesting] It’s impossible. You can’t...first of all, you wouldn’t never have a roof like that. It would be called a wall. I mean, its true. [Explaining]

Ms. Cook: Yeah.

Mr. Fletcher: I mean, you wouldn’t...like, a lot of these kids go skiing in this school, snow skiing. Uh, you know, you’d never go down a slope that looked like that, that’s vertical [Explaining].

Ms. Cook: Yeah.

Mr. Fletcher: Maybe once. That’s it. But you see what I mean? [Confirming question]

Ms. Cook: Uh, huh.

Mr. Fletcher: Work it in reverse, showing them these possibilities and relating to what slope means [Suggesting], uh, I think that might just be a more effective approach because they’ll have some idea of where you’re going with it [Explaining]

As exemplified in the excerpt above, he mostly offered his suggestions and explanations in the rest of the third conference.

The communication types used by Mr. Fletcher in the third conference were different from the first two conferences in that he questioned Ms. Cook and requested her input initially. On the other hand, the first three conferences were similar with respect to communication types used by the cooperating teacher because the majority of the time the cooperating teacher conveyed his observations, suggestions, assessments, and explanations to the student teacher without necessarily having the student teacher think about them. In other words, Mr. Fletcher used questioning communications in the third conference but he did not use questioning communications extensively to help the student teacher think about her teaching. Only two questions were under the requesting opinion sub-category. Actually, the third conference confirms my previous claim that Mr. Fletcher modified his supervision as he participated in the program because it represents a transition from traditional supervision to educative supervision. Changing beliefs and practices is difficult and it is a slow process (Gregoire, 2003). Thus, if there was a change in the supervision style of Mr. Fletcher, it should have occurred slowly; the third conference illustrated that he gradually changed his supervision style. In the fourth and fifth conferences, he asked more requesting opinion questions. Furthermore, he used questioning communications frequently to help the student teacher reflect on that day's lesson. The details of the fourth and fifth conferences will be explained shortly. At this point, I wanted to mention that the third conference represented a transition for Mr. Fletcher from the traditional side to the educative side of the supervision spectrum.

The analysis of communication types used by Mr. Fletcher in the fourth and fifth conferences revealed fundamental differences and some similarities with the ones used in the first three conferences. First of all, the questioning category dominated both the fourth (52%) and the fifth (44%) conference. Secondly, the suggesting category went down to 3% and 6%. The explaining category also went down to 18% and 13% in the fourth and fifth conferences, respectively, when compared to 27%, 24%, and 32% in the first, second, and third conferences. In order to better understand the supervision style of Mr. Fletcher, I will report what type of questions he asked and how he used the communication types in conjunction with each other in the fourth and fifth conferences.

In the fourth conference, Mr. Fletcher posed 17 questions to Ms. Cook. Eleven of these questions were in the requesting opinion category, 4 of them were in the requesting

information category, and 2 of them were in the confirming category. Similarly, out of seven questions that Mr. Fletcher raised in the fifth conference, six of them were in the requesting opinion category and one of them was in the requesting information category. The types of questions that Mr. Fletcher posed in the fourth and fifth conferences when combined with Figure 5.4 suggested that Ms. Cook's opinions, observations, explanations, and assessments on her teaching were frequently sought in these meetings. This is a central idea in educative supervision. It is also important to remember at this point that Ms. Cook did 50% and 54% of the talking in the fourth and fifth conferences, respectively. So, unlike the first three conferences, the voice of the student teacher was strongly heard in the last two conferences. In total, Mr. Fletcher offered two suggestions to Ms. Cook in the fourth and fifth conferences; both were justified, and one was directive. There was no pattern observed regarding the directive or nondirective nature of the suggestions that Mr. Fletcher offered across the five post-lesson conferences. In the following paragraphs, qualitative data will be presented to understand how Mr. Fletcher used the communication types in conjunction with each other in the fourth and fifth conferences.

Mr. Fletcher and Ms. Cook discussed different issues in their fourth and fifth conferences such as goals for the lesson, assessment of accomplishment of the objectives, students' understanding, student involvement, and handling discipline. The participating cooperating teachers read two article summaries about supervision of mathematics student teachers. Discussing the goals for a lesson, the accomplishment of those goals, and the students' understanding of mathematics concepts were among the topics that both articles addressed to be discussed in post-lesson conferences. As explained in chapter-4, the teachers shared ideas on these issues in program face-to-face meetings and online discussions. In the fourth and fifth post-lesson conferences, Mr. Fletcher typically first requested Ms. Cook's opinion on these issues and then he provided his feedback on the same issue. In most of these cases, he directly used the questioning communication type. The following conversation is an example from the fourth meeting:

Mr. Fletcher: Any adjustments in the next two classes for the lesson itself?
[Questioning/Requesting opinion]

Ms. Cook: Probably just adjust some of the examples and clarify my statements even more [Describing].

Mr. Fletcher: Hey, the um, do you feel like you are involving most if not all of the kids in your lessons? [Questioning/Requesting opinion]

Ms. Cook: Yeah, I think that, um, like with the group at the beginning, everyone has to be involved and if they don't want to, I make sure everyone is involved, um, and then during the lesson I try to, uh, whenever I'm asking questions and having students come up with stuff, I try to get more students involved.

Sometimes it's difficult with the larger classes, but [Describing]

Mr. Fletcher: See, and you do that and you're getting better and better at it.

[Assessing] As far as an explanation as to why, I think the more kid you get involved number one, you know that they're focused on what they're doing.

Number two, you have an idea that they're actually grasping what you're talking about and number three, the more kids that you get involved, uh, the more, the more, uh likelihood that they will all buy into what you're teachin' 'em and probably enjoy it more because once somebody understands what they're doing, they're more comfortable with it. [Explaining] And I do think you're getting better with that, better and better. [Assessing] Uh, has discipline been a hindrance? [Questioning/Requesting opinion]

A similar example is from the fifth meeting, where they talked about accomplishing the goals for the lesson:

Mr. Fletcher: Do you think we, do you think after the lesson whatever you got through the, try to, you accomplish the goals? [Questioning/Requesting opinion]

Ms. Cook: Yeah, I believe we did, I think that the goals were accomplished.

[Assessing] The students were having a problem, once they started on the class work and stuff they didn't have a problem understanding it, they were answering questions from class and stuff. [Describing]

Mr. Fletcher: I mentioned to you, I thought, I thought the lesson was very thoroughly explained and one of the best lessons as far as, as when you compare to the different lessons you taught throughout the semester. I thought the preparation, the way you explained it was very good. It was a level they

understood and it was very thorough. [Assessing] Do you think, let me ask you this, do you think the kids were able to keep up with the pace?

[Questioning/Requesting opinion]

The general pattern that was observed in the fourth and the fifth conferences was that Mr. Fletcher requested Ms. Cook's opinion first, and then he communicated his ideas. In rare cases, he used other types of communication to form a base for his questions. For example he used the describing communication type before he posed a question in the fourth conference: "Let me ask you this. We covered two classes, first and second periods so far. We're in the middle of third period now. [Describing] Do you think we reached the outcomes in both classes? [Questioning/Requesting opinion]" (Fourth post-lesson conference). At another time, he used the suggesting and explaining categories before he posed his question:

Mr. Fletcher: Yeah, the, I think this, this topic lends itself to possibly maybe some activities or something that we can work with [Suggesting], with all the different shapes they're gonna have to do, comparisons and I think if they visualize it, it might be easier for you [Explaining]. Do you think, do you think we are gonna be able to at some point explain on it and use the sketch pad?

[Questioning/Requesting opinion] (Fifth post-lesson conference)

Although the general pattern of the communications from Mr. Fletcher in the fourth and fifth conferences was question the student teacher-receive her insight-provide feedback, there were a few cases where he used questioning and further questioning to help the student teacher think about her teaching. In the following example, Mr. Fletcher used the questioning category to help Ms. Cook figure out why the students' understanding improved from the first period to the second period:

Mr. Fletcher: Yeah, we started out in little groups where they had to brainstorm. She had on the board what looked like a little picket fence and the question they had to think about was how do you know the vertical post were parallel and they worked together and came up with various solutions. [Describing] Uh, I was pretty impressed. I thought the kids did a good job, [Assessing] uh, compare first and second period...how they handled it. What do you think? [Questioning / requesting opinion]

Ms. Cook: Second period actually, they grasped it a lot faster and gave more in-depth information about it and they gave more thought provoking answers.

[Assessing] First period was like, well, it looked like that, so we're gonna go with that [Describing]

Mr. Fletcher: Let me ask you this. Do you think, did you approach it the same in both classes, do you think? [Questioning / requesting opinion]

Ms. Cook: No, I changed it a little bit differently in second period to make it more specific 'cause it also helped how they answered the question. [Explaining]

Mr. Fletcher: So by you clarifying what the intended goal was [Explaining], you think that made a difference on the response you got back from them?

[Questioning / Confirming]

Ms. Cook: Yeah, it definitely did 'cause it was more of a directed question so they knew which way to go and which way they kind of needed to go. [Explaining]

Mr. Fletcher: See, uh, I think typically, and for any intern, or any teacher, as the day goes on, you made minor adjustments and I think the lessons become more effective, uh, through experience. You know, that doesn't mean the first period class should always be the guinea pig, so to speak, but I think through experience, you adjust ahead of time so that first period becomes more effective, too, but when you're interning sometimes you make that adjustment before first and second and second and third and so on. [Explaining]

Instead of directly assessing Ms. Cook's teaching in the first and second periods and explaining to her why the student responses were different in the two classes, Mr. Fletcher asked Ms. Cook to compare her two classes, and by asking follow-up questions, he helped her reason about the differences in two classes. He also explained his perspective, but only after he received Ms. Cook's opinions. At this point, the reflective thinking level of the student teacher is also important (Zeichner & Liston, 1987). Typically, Ms. Cook's explanations were short and the percent of her describing communications were higher than the percent of her explaining communications in all of the conferences, even when Mr. Fletcher asked requesting opinion questions. So if it was a student teacher who had a more reflective mind, the explaining category might have dominated the communications of the student teacher in the last two conferences.

One finding about his supervision style was that Mr. Fletcher did not use follow-up questioning regularly in the conferences. I believe that using follow-up questions might give cooperating teachers opportunities to dig at the student teachers' thinking. Asking open-ended questions to help the student teachers think deeply about their teaching is a key component of educative supervision. Consequently, posing follow-up questions seems to be an area where Mr. Fletcher needs improvement. Another area that needs improvement from an educative supervision perspective seems to be using lesson incidents to help the student teacher reflect on the lesson. As explained above, Mr. Fletcher rarely used other communication types to form a base for his questions. Specifically, he did not use a lesson observation before posing a question to Ms. Cook. Describing a lesson observation to the student teacher and then asking a question about it might be a good strategy from the educative supervision perspective, since it will guide the student teacher to think about the specific lesson incidents and reflect on them. The analysis of the program showed that posing follow-up questions and using lesson incidents to pose questions were not sufficiently discussed in the program activities. Thus, these are some lessons that we should learn from this study and modify future studies or supervision programs accordingly.

Overall, the analysis of the five post-lesson conferences with respect to communication types showed that Mr. Fletcher's focus in the conferences moved from explaining his feedback to the student teacher to asking open-ended questions to the student teacher to help her reflect on her teaching. This change indicated a change towards becoming an educative supervisor. The discussion of my findings after the program was implemented about Mr. Fletcher's supervisory knowledge, practices, and beliefs will complete our understanding of how his supervision changed as a result of participating in this program.

Mr. Fletcher's Supervision Style after the Program was Implemented

In this section, I will present the findings about Mr. Fletcher's beliefs, knowledge, and practices about supervising student teachers after the program was implemented. In the final interview, when I asked how he viewed his role in Ms. Cook's learning during the student teaching experience, Mr. Fletcher mentioned his response to the survey question that asked him to choose among doctor, tour guide, journalist, or book as a role for being a cooperating teacher. He again chose the tour guide option and explained

I try to make sure, just like a tour guide would make sure you saw all the highlights of all the different areas where you might be visiting, I tried to make sure she saw any of the aspects of the normal routine of her teaching, whether it be communication skills or the facility itself, or any of things ... You introduce her to all the different areas that could affect her position and then you're there for her if she needs to use you as a, uh, source to understand something or clarify something or just as a resource of how you would find something out, how would you go about it. As a good tour guide, you let them find out some things on their own. You may take them to a certain city, and they're on their own a little bit.

(Final interview)

Mr. Fletcher stated that his goal was to "see if she was comfortable, that she felt comfortable with the approach that she took was geared to what her final intentions were" (Final interview). He also explained:

When I spoke to her, it was to let her know that I felt that what she was trying to accomplish, she was truly on track to accomplish that goal, preset goals, by her. They were by her and I together, what we discussed and if I felt comfortable where it seemed that everything was falling into place, then I just give minor little adjustments or suggestions or I ask her what she thinks about how we could enhance it, make it a little bit better for the next class and we'd adjust it. And generally it was something minor, 'cause she was prepared. (Final interview)

Mr. Fletcher wanted to help Ms. Cook be aware of whether she was reaching her goals or not.

In brief, some of Mr. Fletcher's responses to the questions that I asked in the final interview were similar to his responses in the initial interview. For example, in both interviews his goals as a cooperating teacher included helping the student teacher build confidence, having an open line of communication with the student teacher, and guiding the student teacher in every aspect of teaching. In both interviews, he said that he makes sure he talks about the positives of the lesson when he provides feedback to student teachers.

However, there were some differences regarding how he viewed his role as a cooperating teacher in the initial and final interviews. For example, in the initial interview he was talking more about giving his comments to Ms. Cook in a post lesson conference: "If it's negative I handle it in a positive way and I also make sure I give them the positives too" (Initial interview). He talked about the post-lesson conference as being an evaluation of the student teacher: "So I, I don't wanna be anytime I sit down talk to them is when they are being evaluated" (Initial interview). He talked about encouraging student teachers to ask for feedback "Ask me if you feel out something could have gone more smoothly or something that went wrong and I did not address" (Initial Interview). He viewed his role as a helper in terms of providing feedback "As I get more confident in them, they don't need as much input, they don't need as much feedback. Then it becomes more trouble-shooting...it becomes more of you help them as they needed basis" (Initial interview). These comments were confirmed by Ms Cook, too: "He says this is going very well, this is going very well, maybe you might want to look at this or maybe approach this a different way" (Initial interview). On the other hand, in the final interview, his comments included helping the student teacher evaluate if she was reaching her goals or not, asking questions to help her reflect on the lesson, and getting her feedback: "Sometimes I could tell her, I'm not so sure we're reaching everybody...and get her feedback as to whether she agreed or disagreed, just to keep her on course towards the goals ahead of time that I knew she was toward" (Final interview). He also said "then I just give minor little adjustments or suggestions or I ask her what she thinks about how we could enhance it, make it a little bit better for the next class and we'd adjust it" (Final interview) while he was describing how he conducted post-lesson

conferences with Ms. Cook. Ms. Cook also talked about there being a change in their conferences throughout the semester.

In the final interview, Mr. Fletcher watched the same video clip that he watched in the initial interview like the other cooperating teachers did. The content of his comments included student involvement, connecting the lesson to real life, and teaching at a level that kids can understand. These were similar to the content of his comments in the initial interview. Additionally, he used positive assessments frequently and he provided explanations after his suggestions, which were also similarities between his initial and final interview responses, and were parallel to his supervision style throughout the semester. One difference between his initial and final interview responses was that he paid attention to the content of the lesson more deeply in the final interview.

Additionally, he communicated his thoughts in more of a question form:

Was there a reason, was there a reason you chose the sequence...in other words, you didn't ask them what volume was until after the experiment was done. Just out of curiosity, unless you had asked that previously, I found that odd that you did an experiment on volume, but was there a particular reason you didn't explain what volume was until after they had done the experiment? (Final interview)

In the above excerpt, he paid attention to the order of the events in the lesson and when the teacher talked about the meaning of volume. This showed a deeper focus on content compared to his comments in the initial interview. Moreover, he expressed his opinions in form of questions, which is another change. These findings were aligned with the content and communication type changes in the post-lesson conferences led by Mr. Fletcher throughout the semester, as discussed in the previous section.

In the lesson in the video clip, Mr. Fletcher explained that a preliminary discussion of the concepts before conducting the experiment might have increased the quality of the discussions. After asking some questions about how and when the teacher created the three cylinders, Mr. Fletcher continued questioning how the student teacher could continue the lesson after the experiment was conducted:

What would be some of your approaches from the point where you stopped the experiment? What would be some of the practical uses of it? Where would you go from that experiment? I would like to know that. What would be your next

step, 'cause you've started something extremely practical in real life, which is always good. I thought you did a good job with the lesson. I thought the intent was real good and I thought the lesson was explained well, its just those are my questions: sequence and the practical approach to it, because I think you could expand that lesson and do a lot of fun and practical things with it and get a lot of good discussion among the kids. (Final interview)

Mr. Fletcher's responses to this interview question suggested that he inclined to use questioning more in his conversations in the final interview to help the student teacher think about her teaching and ways to modify it.

Both of the other cooperating teachers suggested the use of group work for this lesson. Although Mr. Fletcher emphasized student involvement in his comments in the interviews, meetings, and post-lesson conferences, he did not emphasize student-student interaction. If he had been more familiar with the reform ideas, he might have put more emphasis on student-student interactions.

My purpose of conducting a final interview was to understand the cooperating teachers' overall beliefs, knowledge, and practice about supervising mathematics student teachers after the program was implemented. In Mr. Fletcher's case, his responses in the final interview confirmed the changes that I observed in his supervision style throughout the semester.

Finally, I would like to present the reader with what Mr. Fletcher and Ms. Cook thought about the change in their conferences throughout the semester. When I asked Ms. Cook if she felt a change in the style of their conversations in the post-lesson conferences throughout the semester, she said:

At the beginning it was very very formal, kind of like how you think you did, that was good, you know stuff like that but then it started getting more structured questions like If I felt I met my goals and if I felt that students learned what they needed to learn and stuff like that towards the end. (Final Interview)

So, Ms. Cook felt that their conversations were based on more structured questions later in the semester. Although her response does not completely represent what they talked about and how they talked about it in their five post-lesson conferences, "meeting her goals," "her feelings about student learning," and "what students need to learn" were

discussed in the conferences towards the end. Some of the things that she did not mention that they discussed in the conferences towards the end include modifying the lesson, student involvement, and handling discipline. However, she was aware of a change in the supervision style of Mr. Fletcher. How she viewed that change will be the subject of another section in this chapter.

I discussed with Mr. Fletcher what he thought about how participating in the program supported him as a supervisor. When we were talking about giving feedback to student teachers, he said:

Uh, it helped me try to be more conscious about having more open-ended questions. What can I ask her to, uh, get her to try to start thinking about her own reflections and how she can use those to modify what she does, instead of me just telling her. (Final Interview)

Also, the survey of the cooperating teachers' reflections on the program included the following question: "I have improved questioning of student teachers throughout this program." Mr. Fletcher chose the "strongly agree" option for this question and explained that "I was more conscientious of asking questions that would allow my Intern to reflect, evaluate, and think of modifications so that there was direction towards improvement in preparation, instruction and interaction with the students." Overall, Mr. Fletcher evaluated the program positively; the details of the cooperating teachers' responses to this survey questions will be discussed later in this chapter.

Both Mr. Fletcher's and Ms. Cook's responses support my conclusion that there was a change in the communication types used by Mr. Fletcher in the post-lesson conferences. He asked more questions in the latter conferences and most of these questions were open-ended.

Summary of the Change in the Supervision Style of Mr. Fletcher

I conducted initial and final interviews with both Mr. Fletcher and Ms. Cook to understand Mr. Fletcher's supervision style before and after the program was implemented. In addition, I analyzed five post-lesson conferences that they conducted throughout the semester. Even though there were other data sources, the interviews and

post-lesson conferences formed the basis for chapter-5. The analysis of post-lesson conferences was done from three perspectives; calculation of talking percentage for each participant, content analysis of the conferences, and communication types used by each participant in the conferences.

The initial interviews and the initial conferences, especially the first two conferences that were conducted before the discussion of educative supervision, indicated that Mr. Fletcher tended to offer his suggestions, explanations, and assessments to Ms. Cook in their post-lesson conferences. For example, the amount of the conversational time used by Ms. Cook was only 2% in the first two conferences. Mr. Fletcher did not pose any question to Ms. Cook in these two conferences. A similar tendency was observed in the initial interview when Mr. Fletcher was asked to carry out a scenario post-lesson conference after he watched a mathematics lesson clip. He asked two questions in the beginning of his talk and then he offered his suggestions, explanations, and assessments about the lesson in the clip. He did not state that he would ask other questions in the remainder of his talk. Another observation about the initial supervisory conferences conducted by Mr. Fletcher was that he did not initiate deep discussions on mathematics pedagogy. This was the case both in the scenario post-lesson conference and his first two conferences with Ms. Cook. The content analysis on the five post-lesson conferences showed that initially in the semester, Mr. Fletcher and Ms. Cook talked about general topics with a focus on general pedagogy and general teacher growth.

The analysis of the five post-lesson conferences from the three perspectives revealed that the supervision style of Mr. Fletcher changed throughout the semester. First, the calculation of talking percentage showed that Ms. Cook started to talk more: 19% in the third conference, 50% in the fourth conference, and 54% in the fifth conference. Secondly, content analysis indicated that Mr. Fletcher and Ms. Cook had conversations on the details of the lessons that Ms. Cook taught in the conferences towards the end with a focus on mathematics pedagogy. Thirdly, the communication type analysis showed that Mr. Fletcher requested Ms. Cook's opinions on her teaching in the third, fourth, and fifth conferences. Actually, the questioning category dominated his communication type in the fourth and fifth conferences. Accordingly, the student teacher started describing, explaining, and assessing more in these conferences. Both Mr. Fletcher and Ms. Cook

confirmed these changes in their final interviews. Mr. Fletcher stated that he became more aware of the importance of asking open-ended questions. Ms. Cook recognized that Mr. Fletcher started asking structured questions later in the semester. Finally, I would like to mention the scenario post-lesson conference in the final interview with Mr. Fletcher. He posed questions throughout his entire conversation whereas he posed only two questions in the beginning of his talk in the initial interview. Besides, he paid attention to the details of the content of the lesson more in the final interview whereas he mostly talked about general ideas in the initial scenario post-lesson conference.

When the results of the analysis of interviews and post-lesson conferences are combined, it can be concluded that Mr. Fletcher's supervision style changed from the traditional side to the educative side of the supervision spectrum. However, I do not think that Mr. Fletcher reached the end of the educative side of the supervision spectrum, but still it was clear that he moved towards the educative side. The main reason that I do not think he was an "all educative supervisor" was that the communication type analysis showed that most of the time he used the questioning category alone. Educative supervision suggests using classroom incidents to help the student teachers reflect on their teaching. This was not a focus in Mr. Fletcher's conversations. They definitely talked about the details of the lessons more compared to the initial conferences, but the student teacher might have been asked to think about the specific lesson incidents more often. Secondly, Mr. Fletcher's general pattern was question the student teacher- receive her input- give your feedback in the conferences towards the end. He could have used follow-up questioning to dig at the student teacher's thinking. This was rarely the case. So even though there was a clear shift in his supervision style towards the educative side, there were still some steps that he might have taken to be a more educative supervisor.

Supervisory Knowledge, Practice, and Beliefs of Lauren Taylor

This section will include four sub-sections; Ms. Taylor's supervision style before the program was implemented, post-lesson conferences between Ms. Taylor and Ms. Williams, Ms. Taylor's supervision style after the program was implemented, and a summary of the change in the supervision style of Ms. Taylor. In these four sections, my

goal is to present to the reader with how the supervisory beliefs, knowledge, and practice of Ms. Taylor changed as she engaged in the program activities.

Ms. Taylor's Supervision Style before the Program was Implemented

In her initial interview, I asked Ms. Taylor what she thought about how student teachers learn to teach. She said that feeling comfortable and having self-confidence was very important for a student teacher's growth as a teacher. And she expressed that practice helps teachers become better teachers. She explained her role in the student teachers' learning process as follows: "To help her have a positive experience, to kind of be there to talk everyday and you know, to help her gain the confidence" (Initial interview).

Ms. Taylor expressed that she took notes when she observed her student teachers and then went through her notes with the student teacher. She talked with the student teachers more in the beginning but "any new lesson definitely gets feedback" (Initial interview). I observed this during my data collection; Ms. Williams got feedback from Ms. Taylor until the end of her student teaching experience. Ms. Taylor explained that when she observed the student teachers her focus may change depending on the strength of the student teacher. She went on saying:

Sometimes just have the board organized, eye contact, correct use of math language, you know some people tend to be more of verbal, some people, I had it my last intern who was a very verbal person and she did not know always have the visual for that visual student. And you are trying to help them tap into all types of students, how they respond to the students, the students are very sensitive and get their feelings hurt easy, so making sure that they respond in a good way. (Initial interview)

These were parallel to the topics of the post-lesson conferences that this pair conducted. Organization techniques, writing on the board as well as talking to the students to satisfy the needs of diverse learner types, use of correct mathematics language, and teacher-student relationships were among the topics that Ms. Taylor discussed with Ms. Williams in their post-lesson conferences.

After we discussed what Ms. Taylor talked about in a post-lesson conference with her student teachers, I asked her how she communicated with them. I inquired how she communicated her observation notes to the student teachers. Her response was “I think it is important to have a good relationship. You know, we are honest it is not like; I am not a boss or anything. We work together. So just go thorough whatever notes and most interns seem to want that” (Initial interview). Ms. Williams also confirmed that Ms. Taylor took notes and talked through them to her in her initial interview. When asked what her main goal was in a post-lesson conference, Ms. Taylor said that it was to help them become good teachers. She clarified this as “to help them kind of set goals, but sometimes I will have certain habits and try to help them work through those habits. And you know, you want them to feel ‘hey wow, that lesson was good’” (Initial Interview). She also explained that sometimes she had student teachers reflect on their own teaching, depending on their personality, and articulated on this as follows: “Some people are very self reflective naturally. Others may, have made mistakes and not realize doing those and so it has to be a gradual change” (Initial interview).

In the initial interview, Ms. Taylor watched the mathematics lesson clips in which the mathematics teacher had two students perform an experiment in front of the whole class to show the relationship between the volumes of three cylinders. I asked Ms. Taylor if the teacher in the video was her student teacher, what she would discuss with her and how she would perform that discussion. She said that what she has to say will depend on the time of the internship. For instance, if it is towards the end of the student teaching she might be pickier about the language. We agreed that it was the middle of the semester. While the clips were playing, Ms. Taylor wrote some notes. After watching the clips, she said that:

I would tell her first of all I think that sometimes the whole class wasn't involved. Like as a class they write down, if you had these two things what are three relations that could occur and so then all the students are writing down. And maybe have them share with a neighbor. I use that pair and share thing a lot where they may be ... the three symbols instead of just doing it in front of the class. I would tell her good having Larry involved at the board, you know, good use of the symbols. I think that when the class voted I think they are so affected by each

other, maybe have them write it down or I would have them close their eyes and do it because they look at each other or even write it down and have a person from each row. I think it might have been good to have the three cylinders, different colors or if you had time get them in groups and have them construct the cylinders themselves instead of having it in front of the class or at least have them different colors. But you know, you would have talked about your lesson design ahead of time. I guess the main thing I would have done her questioning, she tended to say the person's name first, you had limited involvement there or just did generals of the class, like who can tell, I'd see it would be better to do something like everybody find the volume of this, write down your answer and then walk around, look at the answers so you have more class involved with the group. So I would hit her on questioning technique methods and try to involve the class more instead of having it so much in front of the class. You know, but if it was a lesson you would have done it differently. I would have, to me it would have been better to have them do groups and construct their own cylinders. (Initial Interview)

Student involvement, questioning technique (in relation to student involvement), student-student interaction, and organization were her main focus topics. She also mentioned the use of mathematics language by saying "good use of the symbols." These topics were aligned with what she expressed as her usual focus points in her observation of student teachers' teaching: "board organized, eye contact, correct use of math language, you know some people tend to be more of verbal" (Initial interview). Previously, she did not mention student involvement, but her post-lesson conferences revealed that it was also an element that she discussed frequently with her student teacher. In regards to the content of this specific conversation, I would like to note that her suggestions were aligned with the reform ideas in mathematics education. Student-student interaction seemed to be an important element of an effective lesson for her. She said that she frequently used the pair-share method and she suggested the use of group work and sharing with a neighbor in this specific lesson. Her familiarity with reform ideas in mathematics education might have an effect on the substance of these suggestions.

This response, in combination with her other responses to initial interview questions and survey questions, revealed some clues about her initial way of communicating with her student teachers. First, she did not ask any question to the student teacher in this scenario conference. The majority of the time, she directly conveyed her assessment of the teacher's teaching and made some direct and indirect suggestions such as "I would tell her good having Larry involved at the board...good use of the symbols. I think that when the class voted I think they are so affected by each other, maybe have them write it down." This was aligned with her previous response to the question that asked in general how she communicated her lesson observations to her student teachers: "So just go thorough whatever notes" (Initial interview). In my initial communications with Ms. Williams, she also explained that Ms. Taylor directly told her the positives and negatives of her teaching and made suggestions for how to improve them. Ms. Williams wrote that "Lauren [pseudonym] is really good about listing the good things that I did, as well as the things I could work on a little" (journal reflection-1). Hence, the data suggested that Ms. Taylor did not necessarily encourage the student teacher to think about the weak and strong parts of her teaching at the beginning of the semester by asking questions. Instead, she tended to offer her suggestions and assessments. Her response to the survey question that asked the teachers to choose among doctor, tour guide, book, or journalist supported this observation, too. Ms. Taylor chose the "doctor" option and explained her choice as "make suggestions, but, the teacher (student) like a patient make their own health decisions" (Initial survey).

Secondly, even though she provided some positive assessments such as "good use of the symbols" and "good having Larry involved at the board," she also provided some negative assessments: "I would tell her first of all I think that sometimes the whole class wasn't involved" or "she tended to say the person's name first, you had limited involvement there or just did generals of the class, like who can tell." Throughout the semester, during my visits and informal communications with this pair, I frequently witnessed similar scenarios where Ms. Taylor communicated her thoughts honestly to the other person. I mention this observation because cooperating teachers usually tend to talk about positive assessments only (Zimpher et al., 1980). This was not the case with Ms. Taylor. However, she communicated her ideas kindly. Ms. Williams several times

mentioned that she felt comfortable talking to Ms. Taylor and she felt as if they were team teaching.

In summary, data analysis suggested that, initially, Ms. Taylor's communication type was probably dominated by assessments and suggestions. The content of her conversation focused on mathematics pedagogy and classroom management, and included ideas parallel to reform ideas. However, from an educative supervision perspective, the way that the supervisors communicate their ideas to the student teachers is vital for student teachers to grow as reflective practitioners. According to the data, initially in the semester, Ms. Taylor did not seem to use her observation notes to promote the student teacher's self reflection on her teaching.

Before moving to the next section where I will discuss the post-lesson conferences between Ms. Taylor and Ms. Williams, I would like to write some of my observations about Ms. Taylor's supervision. I observed that Ms. Taylor was very ethical in her job both as a classroom teacher and as a cooperating teacher. Even though she was very busy, I observed that she always had time for her students and for her student teacher. She took her job seriously as a cooperating teacher. "She never really left the room" said Ms. Williams. Every time I visited Ms. Williams, Ms. Taylor was there and it was clear that she observed her lesson carefully and always had comments to share with me. She took notes for every new lesson and shared them with Ms. Williams. One thing I observed that was unique to this pair was that they decided to have a "focus of the week" after the middle of the semester. Some of their topics as a focus of the week were "teachable moments," and "student-centered teaching." I experienced with other cooperating teachers in previous years that usually towards the end, teachers leave the classroom more often and sometimes stop having post-lesson conferences with their student teachers. This was not the case with Ms. Taylor.

In order to give the reader a complete picture of the supervision relationship between Ms. Taylor and Ms. Williams, I will report a concern that Ms. Williams had about her student teaching experience. Briefly, she talked about not having freedom to take risks in her teaching: "There was never really a point where like I felt like it [lesson plan] was gonna work and she felt like it wasn't gonna work and I never had the opportunity to try and see if it would work" (Final interview). Although, she admitted

that Ms. Taylor encouraged her to talk, Ms. Williams preferred to follow exactly Ms. Taylor's plan and teach it how she felt like Ms. Taylor would teach it. She explained "otherwise my life would have been miserable." She further explained that:

And so I mean there were times that I included my own stuff but I always made sure that when I included my own stuff that I have the conversation beforehand and say "this is how I'm planning on teaching this, how do you feel about it?" so that before I taught it I didn't have to have those conversations between first and second periods where she was like "this isn't working" and me have to sit down for a detailed amount of time to discuss it.

On the other hand, when I asked Ms. Williams how she felt about the teaching style that she implemented throughout the semester, she said "I mean the students learned what they needed to learn...So I don't know that's exactly how I would do it. But, it worked and it turned out fine" (Final interview). When we discussed the details, Ms. Williams explained that she would change some of the routines such as the way of assigning and checking homework. She liked the activities that she borrowed from Ms. Taylor and her student-centered teaching approach. Going back to the tension that I described above, I think it might have happened due to several factors. First, the cooperating teacher seemed to be evaluative and authoritative at the beginning of the semester. Her honest and explicit way of talking might have been another factor because even though Ms. Williams said that she was humble and accepted Ms. Taylor's criticisms, she seemed to be very sensitive about criticism. As her university supervisor, it was difficult for me to pose questions to her about the areas that I felt needed further attention. Ms. Taylor supported this observation in an informal communication where she thought that Ms. Williams got defensive upon negative assessment. Ms. Williams herself said: "I think the lesson went great', you know that was my goal to hear that from her" (Final interview). Hence, getting positive assessment from Ms. Taylor was very important for Ms. Williams.

How did this affect her student teaching experience? One effect according to Ms. Williams was that at times her cooperating teacher wanted her to work on a goal whereas she had another goal in her mind and this caused some tension. She explained:

I mean, specifically for me, there were times that I would single out my project, you know, and I would think in my brain, this is what I want to accomplish for today and a lot of times, it was, well, not a lot of times, but sometimes it would conflict what she wanted me to work on during the day. I think that if she had known that my project for today is Alex [pseudonym], and I'm going to work really hard on helping Alex participate, then she would have noticed that I was working on accomplishing that goal, instead of that I wasn't doing what she wanted me to do. (Final interview)

I think that this comment was another evidence to show the importance of educative supervision that values the student teacher's ideas, goals, and suggestions. I did not discuss this issue with Ms. Taylor. Therefore, we do not have her perspective. Before closing this section, I need to mention that, even though Ms. Williams told me this situation, she admitted that she loved her experience with Ms. Taylor. She said "I had a really fantastic experience and if I had to do it again, I would have picked her and I would have done it exactly the same" (final interview). Ms. Taylor, too, often talked about having a positive relationship with Ms. Williams.

Post-lesson Conferences between Ms. Taylor and Ms. Williams

In the previous section, I presented some findings about the supervisory beliefs, practices, and knowledge of Ms. Taylor before the implementation of the program. Those findings implied that her supervision style more resembled traditional supervision than educative supervision. In this section, I will present findings regarding their post-lesson conferences throughout the semester so that we may better understand the progress of her supervision throughout the semester. The post-lesson conferences were analyzed from three perspectives: the amount of the conversation done by each participant, the content of the post-lesson conferences, and communication types used in the post-lesson conferences.

Ms. Taylor and Ms. Williams recorded six post-lesson conferences for this study; the first two post-lesson conferences were conducted prior to the discussion of educative

supervision and the other four conferences were conducted after the discussion of educative supervision. Both Ms. Williams and Ms. Taylor expressed that they had multiple daily talks about Ms. Williams' teaching. Typically, they talked between the first and the second period, and then they talked during the fourth or seventh periods (planning periods), if needed. Ms. Williams explained that since there were announcements at the beginning of the second period and usually they had some time at the end of the first period, they had up to 15 minutes to talk about her teaching. The conferences that they recorded for this study were conducted in either fourth period or seventh period.

Conversational time used by Ms. Taylor and Ms. Williams. Calculation of the amount of conversational time used by Ms. Taylor and Ms. Williams was important to understand the supervision style of the cooperating teacher because an educative supervisor would probably listen to what the student teachers had to say, try to understand their perspective, and encourage them to make sense of the issues happening in their student teaching experience. Hence, in such an environment the student teacher's voice would be heard strongly. Conversely, traditional supervisors would be more interested in conveying their messages to the student teachers and thereby their voice takes priority over the voice of the student teachers.

The percent of the amount of talk time used by Ms. Taylor in their six recorded post-lesson conferences from the first to the sixth conference were as follows: 61%, 49%, 39%, 31%, 52%, and 56%. Likewise, the percentages for Ms. Williams were calculated as 39%, 51%, 61%, 69%, 48%, and 44%. Please refer to Figure 5.5 for a visual representation of this data.

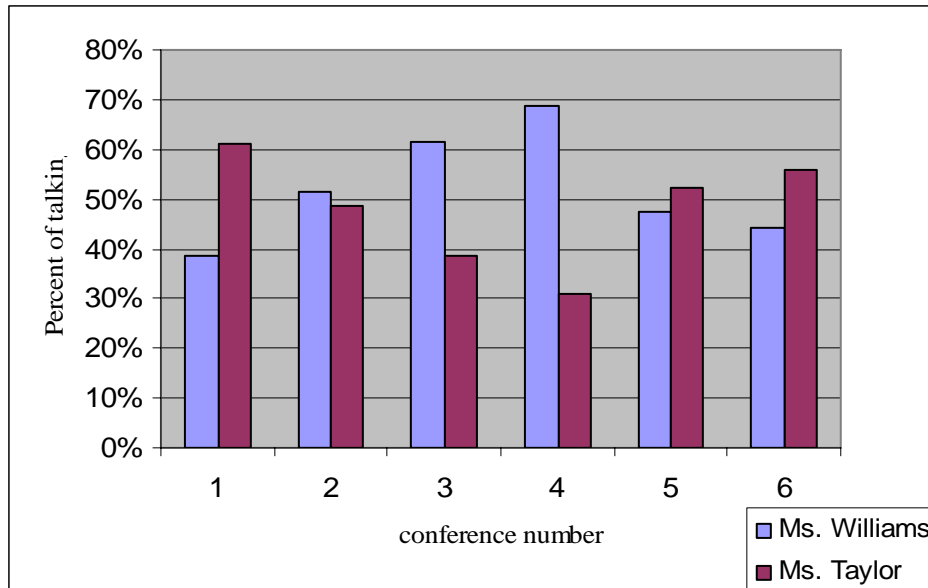


Figure 5.5 Conversational Time used by Ms. Taylor and Ms. Williams

The talking percentage data for pair-2 showed that the percent of talking for the student teacher kept a slight increase from the first conference to the fourth conference, and then slightly decreased. The biggest difference between the percentages of the student teacher and cooperating teacher occurred at the fourth conference where the student teacher (69%) talked more than the cooperating teacher (31%). The next big difference occurred at the first and the third conferences. In the first conference, the cooperating teacher talked more with a talking percent of 61 whereas in the third conference, the student teacher talked more with a talking percent of 61.

This data did not suggest a big change in the supervisor's amount of talking. It seems that the student teacher shared her ideas from the beginning of the semester in their post-lesson conferences. At this point, I would like to inform the reader that since this pair recorded the post-lesson conferences during their planning period (either fourth, or seventh), by that time they had already talked about the lesson of that day between the first and the second periods. According to Ms. Williams, that talk was usually enough and they had up to 15 minutes for that dialogue in the morning. As a result, some of their

recorded meetings were general reflections over the week. Even when their conference was a general reflection, their discussion included conversations about specific lessons and I will discuss my findings regarding those discussions in the next two sections. From the six post-lesson conferences that they recorded for this study, the first and the last two conferences were discussions on specific lessons. The second, third, and fourth meetings were general reflections on the week. When the data in Figure 5.5 was viewed in light of this information, the voice of the student teacher was seen to increase gradually in the general reflection meetings (second, third, and fourth). Paralleling this increase, the student teacher's talking percentage during conferences focused on a specific lesson was larger in the fifth and the sixth conferences compared to the first conference.

Content of the post-lesson communications. In the previous section, I presented the findings about the talking percentages of Ms. Taylor and Ms. Williams during their six post-lesson conferences. That data did not show significant changes in their talking percentages, except a slight increase in the talking percent of Ms. Williams from the second conference to the fourth conference, and from the first conference to the fifth and sixth conferences. Therefore, it is important to look at the data from the other perspectives of analysis. In this section, I will present the content analysis results based on these six conferences. This will help us understand the areas of teaching that Ms. Williams' thinking was directed toward. Table 5.4 shows the percent of communications in each content category across the six post-lesson conferences.

Table 5.4. Types of Content in Post-lesson Communications for Pair-2

	General Pedagogy	Mathematics Pedagogy	Mathematics	Classroom Management	General Teacher Growth	Teacher-Student relationship
Conference-1	60%	17%	1%	10%	7%	0%

Table 5.4. Continued

	General Pedagogy	Mathematics Pedagogy	Mathematics	Classroom Management	General Teacher Growth	Teacher-Student relationship
Conference-2	7%	0%	0%	43%	36%	9%
Conference-3	8%	14%	0%	20%	23%	30%
Conference-4	24%	23%	0%	25%	17%	9%
Conference-5	9%	69%	1%	13%	2%	1%
Conference-6	28%	15%	1%	30%	15%	0%

Figure 5.6 represents the same data visually:

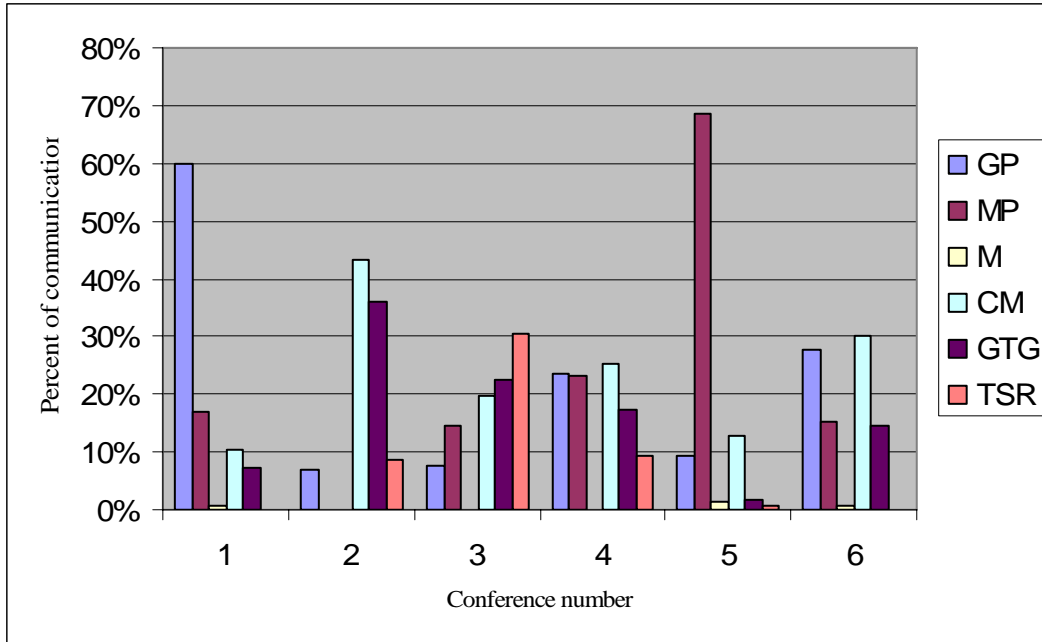


Figure 5.6 Types of Content in Post-lesson Communications for Pair-2

The content analysis data as represented by numbers revealed some clues on what Ms. Taylor and Ms. Williams talked about in their post-lesson conferences. First, the discussion of mathematics itself never became the focus of any conference. Different conferences had different focuses. For example, general pedagogy (60%) composed the main content category that was discussed in the first conference, classroom management (43%) was the focus of the second conference, and mathematics pedagogy (69%) was the center of attention in the fifth meeting. They discussed ideas in a variety of content categories in the third, fourth, and sixth meetings. A final observation is that general pedagogy, mathematics pedagogy, classroom management, and general teacher growth categories were all discussed in almost all of the six meetings. The program suggested the discussion of mathematics pedagogy in the post-lesson conferences. With respect to the Table 5.4, it seems like mathematics pedagogy was discussed in all of the conferences, however it was not the focus of the majority of the conferences. Nevertheless, the qualitative analysis of pair-2's conferences revealed some changes in the quality of content communications throughout the semester. In the rest of this section, I will provide examples from their conferences and present what patterns I recognized in their conferences regarding the content categories.

First of all, I would like to highlight what pair-2 generally talked about. Under the general pedagogy category, they mostly discussed student involvement, student-teacher and student-student interactions, questioning techniques, and motivation. Their discussion of mathematics pedagogy mainly consisted of the students' understanding of mathematics concepts and specific problems, using different representations, and correct use of mathematics language. Time management and organization were the main sub-categories of the classroom management category that pair-2 discussed in depth. The teacher-student relationship category included conversations about caring for students, and connecting with them. The general teacher growth category involved discussions on the role of the teacher, feelings of the student teacher as a teacher, and ways to do research for lesson planning.

Before presenting my observations about the conferences, I would like to briefly write about one observation that I have inferred from the six conferences. I observed that Ms. Taylor's suggestions were often parallel to reform ideas in mathematics education.

This was not a surprising observation for me because of her familiarity with reform ideas in mathematics education. An example for this observation is from the first conference. Ms. Williams and Ms. Taylor were discussing how to encourage students to answer Ms. William's questions. Ms. Williams was having difficulty in this area especially in the sixth period. She explained that "maybe because sixth period isn't mine all the way up, maybe they don't feel the responsibility to show me as a teacher that they are doing it [Classroom management]." She looked at the issue from a classroom management perspective. However, Ms. Taylor responded, "Yeah. I think what happened is when they were responding, you just started talking more and they started listening less [General pedagogy]." Thus, she connected the problem to the way that Ms. Williams was teaching the lesson. Her comment gave a message that the more the teacher talks the less the students get motivated and the less they participate in the lesson. Nevertheless, they did not have a deep conversation about this and passed on to another topic.

Another example that showed Ms. Taylor's reform aligned opinions was from the fourth conference:

Ms. Taylor: you know one thing I noticed, that book "every minute counts" that really changed my philosophy of teaching [General teacher growth], is that if you get the class with the teacher does bla bla bla with the homework, and read the definition, occasionally you gotta do some of that, but just the difference doing it as activities and groups maybe [General pedagogy]. (Post-lesson conference-4)

So she believed in the benefits of doing activities and group work in mathematics lessons rather than a teacher-centered lesson where the teacher does most of the talking. My visits to Ms. William's classroom also supported this observation. Until the middle of her student teaching, Ms. Williams used the lesson plans of Ms. Taylor. They included valuable mathematics activities.

Now, I will discuss the conferences in detail to better understand their content. I will discuss the first and the second conferences alone, the third and the fourth conferences together, and the fifth and the sixth conferences also together. The reason for this arrangement is that the first and second conferences were conducted before the discussion of educative supervision. The first conference was a reflection on a specific lesson, whereas the second conference was a general reflection on the week. The third

and the fourth conferences were both general reflections and conducted after the discussion of educative supervision. The fifth and the sixth conferences were reflections on specific lessons. This arrangement also represents some patterns that I observed in these conferences, as the reader will shortly observe.

Ms. Taylor took two pages of notes while observing Ms. William's lesson on the day of the first recorded conference. She let Ms. Williams know what those notes were about in this conference. The foremost pattern regarding the content categories that I observed in this conference was that Ms. Taylor provided a variety of feedback on this lesson in brief words. The majority of her feedback was stated in one or two sentences and was not discussed deeply. The following conversation is an example that illustrates typically how Ms Taylor provided her feedback:

Ms. Taylor: I like how you personalize this, what I wrote down. [General teacher growth] Or do you think kind of coming up with those. Good use of color and organization on your graphs [Mathematics pedagogy]. Again, when they can, without you talking if they can kind of do the sharing like let Michael, when someone said "Why did you divide by two" say "Hey Michael, tell me why did you divide by two." [Mathematics pedagogy]

Ms. Williams: Ok.

Ms. Taylor: Getting stronger with your vocabulary, again the bottom part is the tail might be better language there.

Ms. Williams: Tail, yeah. [Mathematics pedagogy]

Ms. Taylor: I know you are moving around you kind of got out in the room more, we talked the other day. [Classroom management] Tables calculate probability not z-scores. [Mathematics]

Ms. Williams: right. (Post-lesson conference-1)

As could be seen in the example, while providing feedback to Ms. Williams on her lesson, Ms. Taylor spoke on different content categories following each other without discussing them in depth. This was aligned with my observations during the semester. In some of my visits to Ms. Williams, Ms. Taylor told me that she took some notes while observing Ms. Williams' teaching in the first period, and then quickly shared them with her after the lesson. Ms. Williams' description of their initial post-lesson conferences also

confirmed this: “ok, you can fix this time management thing or you can fix, you know like walk away from the board a little bit.”

The only issue that they discussed in more detail was about questioning. After Ms. Taylor suggested that Ms. Williams be careful on her questioning, Ms. Williams asked how to encourage students to respond to her questions. Ms. Taylor offered different suggestions on how to involve more students and get them to talk and respond to the questions that Ms. Williams was asking. Her suggestions included constantly trying different methods like the pair-shares, building a relationship with the students, letting them know that one person will be called on randomly, and having students write down their answers.

The second, third, and fourth conferences were general reflections on the week and on student teacher’s growth. This was why the general teacher growth category had larger percentages in these meetings compared to its percentages in other meetings; they discussed what they thought about Ms. Williams’ growth in general. A typical example is from the second post-lesson conference:

Ms. Williams: I think I felt more comfortable this week than I did last week. Last week was my first week with the new classes and the first day I was very nervous but after that I was okay. I feel more comfortable now teaching the two periods and being able to reflect and change especially because we have those evaluations between when I teach in third and when I teach in sixth. So I know how I can better my lesson, until then. I felt comfortable with the planning and I think with this chapter a lot I felt really comfortable with the material. So it was easier for me to teach because I knew it, more than I had just studied at the night before kind of thing. I don’t know. I felt really comfortable [General teacher growth].
(Post-lesson conference-2)

In particular, the second conference had a focus on general teacher growth and classroom management. They mainly talked about organizing techniques under the classroom management category, like where to put different papers and how to take the attendance.

The only discussion that they had on pedagogy in the second conference was when Ms. Taylor expressed that “I liked how in third period where you had the student

get up and mark the deviations and the class cheered [General pedagogy].” The conversation went on as follows.

Ms. Williams: Yeah, they all clapped, that was really neat

Ms. Taylor: But, you know, the more I teach, the more I realize, the more we can involve them, etc. it is just up there, the better.

Ms. Williams: Exactly. [General pedagogy] (Post-lesson conference-2)

This conversation is another confirmation of my previous observation about the parallelism of Ms. Taylor’s feedback with the reform ideas because what she liked about the lesson was having a student actively involved in the lesson by letting that student go to the board and contribute to the solution of a problem. Ms. Taylor’s following comment was also aligned with the reform ideas: “The more I teach, the more I realize, the more we can involve them, etc. it is just up there, the better.” On the other hand, this conversation showed a similarity to the conversations in the first conference. As explained in the discussion of the first conference, I observed that Ms. Taylor provided short feedback statements to Ms. Williams about her lesson. Similarly, at this part of the second conference, Ms. Taylor reminded Ms. Williams about a lesson incident and in a couple of sentences they closed the issue. Given the importance of the issue, I tend to think that they could have had a lengthier conversation to guide the thinking of Ms. Williams about this issue. For example, they could have discussed why involving students is “the better.” On the other hand, in the same conference when discussing organizing techniques, they had a rather lengthy conversation; the total number of words in the organizing techniques conversation was 258 whereas the total number of words spoken on student involvement was 70. In summary, in the first and second meetings, Ms. Taylor did not initiate a deep discussion on pedagogical issues while providing feedback to Ms. Williams on her teaching. These two conferences were conducted before the discussion of educative supervision in the program.

Similar to the second meeting, the third and fourth meetings were also reflections over the week rather than reflections on a specific lesson. However, there were times when they talked about specific lessons. I observed one difference between the third and fourth conferences and first and second conferences. This difference was that the discussions on general pedagogy and mathematics pedagogy initiated by the cooperating

teacher were deeper in the third and fourth conferences. For instance, in the third conference, they had the following dialogue:

Ms. Taylor: Did you think the tootsie roll thing ended up being nice?

Ms. Williams: I think it went very well because we were going to do a video instead and I think that with the tootsie pops we really just reviewed all of the material that I think it gave them ample opportunities to ask the specific questions on each different topic. The kids like their own data, they like to play with their own data, they like to see who has the smallest hands and they like to see themselves statistically.

Ms. Taylor: It was interesting, one thing I thought to add to the lesson...is to say look find your own residual how did you do.

Ms. Williams: Oh that's neat and give them that opportunity, that's cool we will do that opportunity for fifth and sixth [Mathematics pedagogy]. (Post-lesson conference-3)

Even though, they could have had a deeper discussion on this lesson, such as what some misconceptions were, what some other modifications might be done, why finding own residual was worthwhile, compared to mathematics pedagogy conversations in the first and second conferences, this conversation was longer and deeper; the student teacher analyzed her own lesson and pointed out some positive aspects of it.

Similarly, in the fourth conference, Ms. Taylor asked Ms. Williams if she had any observations on the concepts that students did not quite grasp such as random allocation and blocking. Then, Ms. Williams provided her observations about where the students were having difficulties in understanding those two concepts and why. However, they did not take the conversation further to discuss what they could do to help the students overcome those difficulties. I would like to provide a final example for a conversation on general pedagogy initiated by the cooperating teacher:

Ms. Taylor: One thing for me too is to see how the structure of the lesson affects the students' involvement. Like one lesson this week it tended to be, you know, read the definition out loud and just to watch the kids disengage.

Ms. Williams: I agree

Ms. Taylor: And then like today where they were working in groups on the AP problems just such a difference.

Ms. Williams: Yes, I agree [General pedagogy] (Post-lesson conference-4) Compared to a comment like “And again just kind of working on strategies to involve each student [General pedagogy]” (Post-lesson conference-2), the above conversation offered the cooperating teacher’s perspective on the relationship between the structure of the lesson and the students’ involvement. Again, I think this was still not a very deep conversation because they did not discuss why reading the definition aloud caused students to disengage and why group work made a difference. However, it presented the cooperating teacher’s perspective more effectively when compared to the conversations in the first two conferences.

Conferences five and six were reflections on a specific lesson that Ms. Williams taught. These two conferences had some differences and similarities with the first conference that was also a discussion on a specific lesson. They were different in two ways from a content analysis perspective. First, the first conference was an overall discussion on the lesson that Ms. Williams taught that day. It was not clear to which part of the lesson the feedback statements belonged. Just to remind the reader, some feedback was “I thought you were very relaxed, which was really something you struggled with the day before [Classroom management],” “I thought it was a good connection using parameters, connecting to yesterday [Mathematics pedagogy],” and “Tables calculate probability not z-scores [Mathematics].” On the other hand, during the fifth and sixth conferences Ms. Taylor divided the lesson into parts (e.g. warm-up, example-1, example-2, and so on) and had a separate discussion on each part. I think this first difference participated the second difference, that is, they had detailed conversations about aspects of the lesson that Ms. Williams taught.

In order to illustrate my observations, I will provide an example from the fifth conference. The following was a typical conversation that Ms. Taylor and Ms. Williams had in their fifth and sixth conferences:

Ms. Taylor: Now, all right, you started with by writing the words “disjoint” and “compliment” on the board and one time we talked, you talk about how you felt that opening activity and then I will come, give you my reflection.

...

Ms. Williams: ok, it was really neat to get them motivated and thinking about what disjoint and what compliment meant. You know, and it was nice to have them to have those examples so that when they go to their test, they are not like “ok what is disjoint, what is complement,” they’ll now remember those examples that they made up so they own the material. Kind of they talk about, well in math ed, they own the material because it’s theirs. [Mathematics Pedagogy]

Ms. Taylor: yeah

Ms. Williams: In first period, I got a little bagged down because we’re using the probability, and once we got the numbers, and they got too confusing, and there was like “what is going on” and so for second and third we didn’t have them come up with numbers and I think it went a lot better. It was easier to think of those just situational examples more than the actual probability and coming up with “this is 0.2 and this is 0.4.” [Mathematics Pedagogy]

Ms. Taylor: yeah and we talked about some, you know you had a couple of mathematical things using joint probability and use of the compliment symbol, which is good bringing those things and [Mathematics Pedagogy] getting kind of remember that idea of teachable moments there, which I think you were trying to do and I think its good to continue that [General Pedagogy]. The next thing was number 26, was the problem that you did doing trees and things. (Post-lesson conference-5)

In this particular lesson, Ms. Williams had the students create their own examples related to disjoint and compliment terms at the beginning of the lesson, as I deduce from the conversation. In the conference, Ms. Williams commented on why this activity was valuable, and what modification she made after the first lesson and why she did that modification. Then, Ms. Taylor reminded her of the importance of “teachable moments.” I thought this was a deeper and more detailed conversation on the lesson compared to the conversations in the first conference on that day’s lesson.

Another example is from the sixth conference:

Ms. Taylor: Any reflections on problem 3? [Mathematics Pedagogy]

Ms. Williams: Umm, no.

Ms. Taylor: And throughout the whole day?

Ms. Williams: Yeah, problem-3...I wanted to know how the students were doing on their homework. For particular tomorrow for our review day, I wanted to know what problems I needed to focus on, what kind of concepts I need to focus on for their review. And it was nice to see not only who has finished their homework but where they were struggling because those who have done it, know what they have problems with. And so it was neat to have that personal connection with every student. [General Pedagogy]

Ms. Taylor: Yeah, you were very organized today. [They spoke with someone else.] The example of another three, and like one was giving you the visual, you were doing so many more visual things, sometimes you may think of organizing, [Classroom Management] it is a little picky think when you started to say “red and white, or white” when you did the

Ms. Williams: All right

Ms. Taylor: So be careful there. You used good language of branches. Umm, you did say the word “independence” when they were dependent

Ms. Williams: independence, dependent, right. [Mathematics Pedagogy]

Ms. Taylor: because...the first time affects the other. [Mathematics] And I thought it was good when you had them do their part, you had a student do it on the board [General Pedagogy] and again it all went very timely [Classroom Management] and they were very on task [General Pedagogy].

Ms. Williams: Yes. (Post-lesson conference-6)

This conversation represented the difference between the fifth and sixth conferences in comparison to the first conference. The student teacher had the opportunity to explain her reasoning for doing problem-3. As a result, the student teacher had an opportunity to talk about the pedagogy. However, this conversation also shows a similarity with the conversations in the first conference. The cooperating teacher talked briefly about some of her observations without discussing them deeply with the student teacher. Even though they had deeper content discussions in the conferences towards the end, there were still missed opportunities.

In summary, I observed that in the post-lesson conferences towards the end of the semester, Ms. Taylor initiated deeper conversations on mathematics pedagogy and general pedagogy aspects of the lesson that Ms. Williams taught compared to the conversations in the post-lesson conferences toward the beginning of the semester. Furthermore, in the conferences towards the end of the semester, they discussed the details of the lessons, such as each question posed to the students, and students' understanding of specific concepts. Nevertheless, there were missed opportunities for deeper discussions that could have helped Ms. Williams enhance her teaching.

Communication types used in the post-lesson conferences. In the previous section, I presented the findings related to the content of the conversations across the six post-lesson conferences that Ms. Taylor and Ms. Williams conducted. In addition to learning what they talked about in their conferences, it is also important to know how they communicated with each other in order to understand the supervision style of the cooperating teacher throughout the semester. A traditional supervisor would be more interested in offering opinions than eliciting opinions (Tsui et al., 2001). On the other hand, an educative supervisor would be more interested in eliciting opinions than offering opinions. An educative supervisor would pose open-ended questions to the student teachers, mine their thinking, and support their growth by being sensitive to their developmental level. Therefore, in the communication-type analysis, the attention was paid both to the amount of questions asked and the type of questions asked by the cooperating teachers. Other things that I sought to understand the supervision style of the participant cooperating teachers in their post-lesson conferences included who provided more explanations, who offered more suggestions and whether they were supported with reasoning or not, and who assessed the lesson more. Additionally, I analyzed how the cooperating teacher used different communication types in conjunction with each other.

Table 5.5 and Figure 5.7 represent the percentages of communications in each category used by Ms. Taylor in their six recorded post-lesson conferences. Similarly, Table 5.6 and Figure 5.8 indicate the percentages of communications in each category used by Ms. Williams.

Table 5.5. Types of Communications used by Ms. Taylor

	Questioning	Assessing	Explaining	Describing	Suggesting	Emotional Talking
Conference-1	9%	28%	6%	22%	31%	3%
Conference-2	18%	18%	24%	35%	6%	0%
Conference-3	27%	13%	20%	27%	7%	7%
Conference-4	29%	18%	18%	24%	6%	6%
Conference-5	27%	22%	15%	17%	20%	0%
Conference-6	19%	29%	13%	23%	13%	3%

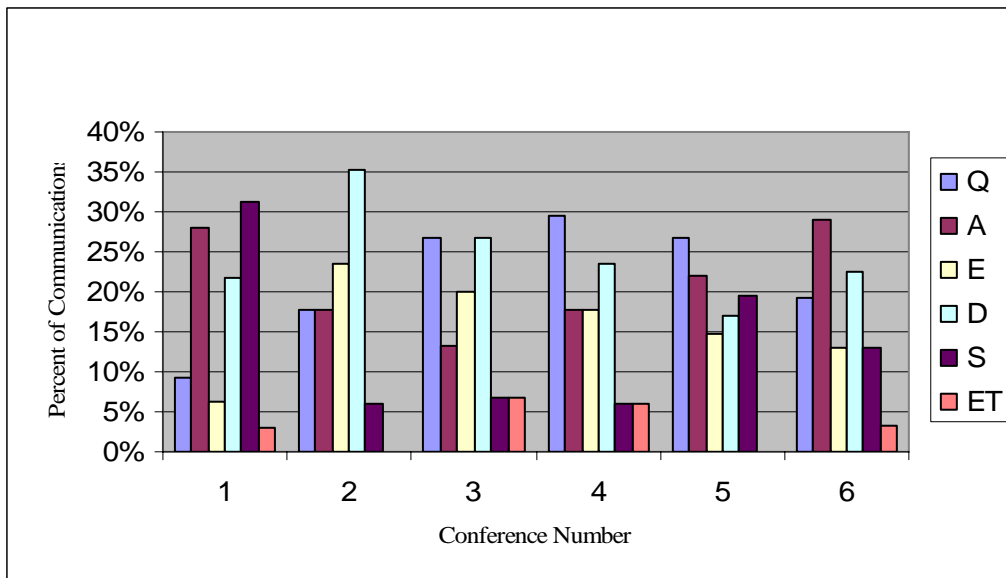


Figure 5.7 Types of Communications used by Ms. Taylor

Table 5.6. Types of Communications used by Ms. Williams

	Questioning	Assessing	Explaining	Describing	Suggesting	Emotional Talking
Conference-1	9%	18%	18%	45%	9%	0%
Conference-2	0%	10%	30%	50%	0%	10%
Conference-3	0%	47%	20%	33%	0%	0%
Conference-4	6%	13%	31%	38%	0%	13%
Conference-5	12%	38%	27%	23%	0%	0%
Conference-6	0%	29%	36%	21%	0%	14%

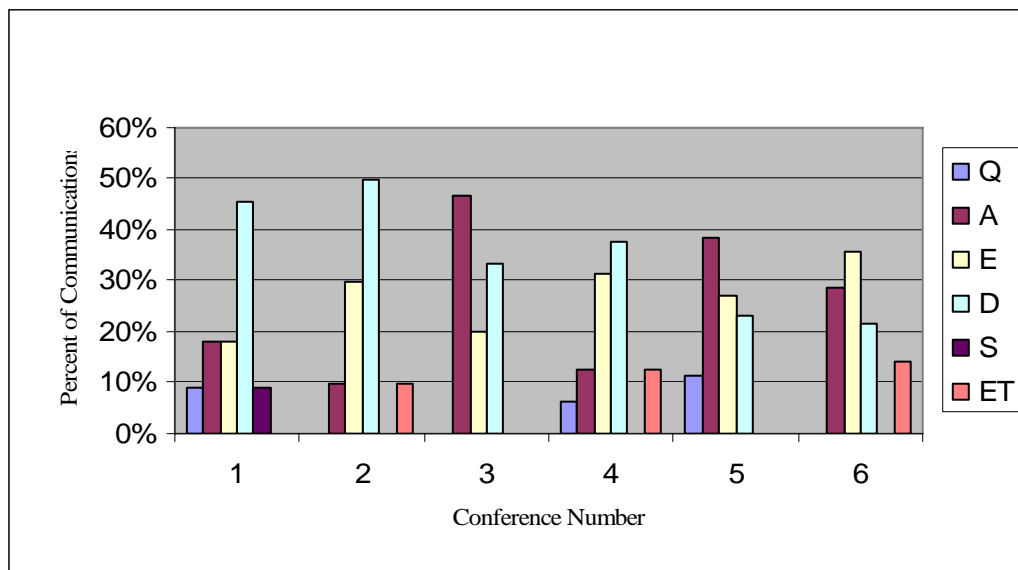


Figure 5.8 Types of Communications used by Ms. Williams

The table and the graph for the cooperating teacher indicated a slight increase in questioning communications throughout the semester, and a slight decrease in explaining

and describing communications especially from the second conference to the sixth conference. The student teachers' data showed a slight increase in explaining and some decrease in describing communications. Her data also suggested an increase in assessing throughout the semester. Specifically, when the first conference was compared with the fifth and the sixth conferences (because these were lesson specific conferences), it was found that the percent of describing (45%) in the first conference for the student teacher considerably decreased to 23% in the fifth conference and 21% in the sixth conference. There was also a good deal of increase in assessing communications from 18% in the first conference to 38% in the fifth conference and 29% in the sixth conference and in explaining communications from 18% in the first conference to 27% in the fifth conference and 36% in the sixth conference. When a similar comparison was done for the cooperating teacher, I found that the questioning category increased substantially from 9% in the first conference to 27% in the fifth conference and 19% in the sixth conference, and suggesting category decreased noticeably from 31% in the first conference to 20% in the fifth conference and 13% in the sixth conference. In addition to these observations, the cooperating teacher's data showed that the assessing category decreased from the first conference to the third conference and then increased again and almost had the same percentage in the sixth conference (29%) as it was in the first conference (28%).

I think that the communication type data, as represented by the tables and graphs for pair-2, were interesting. There was an increase in the questioning category for the cooperating teacher and an increase in the assessing and explaining categories for the student teacher, which suggested a shift in the supervision style of the cooperating teacher towards educative supervision. On the other hand, the assessing category for the cooperating teacher initially decreased and then increased throughout the semester. It was also interesting that the student teacher did not make any suggesting communications except in the first conference (9%). Therefore, in order to understand the supervision style of the cooperating teacher better, it was essential to look at the data more closely by looking at how the cooperating teacher used the different communication types in combination with each other and how the student teacher responded to these communication types. In the following sections, I will analyze each conference in more

detail and provide examples from their conversations to support any observation I make regarding the patterns of communications between Ms. Taylor and Ms. Williams.

At this point, I would like to remind the reader that the first and the second conferences were conducted before the discussion of educative supervision in the program. Also, it is important to note that the first, fifth, and sixth conferences were discussions on specific lessons and the second, third, and the fourth conferences were general reflections on the week. By considering this information, I decided to discuss the communication types of the conferences in the following order: first conference alone, second conference alone, third and fourth conferences together, and fifth and sixth conferences together.

Ms. Taylor posed three questions to Ms. Williams in the first conference; two were under the requesting opinion sub-category and one is under the requesting information sub-category of the questioning category. Ms. Taylor offered 10 suggestions in the first conference. Out of these 10 suggestions, 3 suggestions were directive and 2 suggestions were offered with an explanation. In other words, 8 suggestions were coded as unjustified. In actuality, she did not provide explanations in the first conference; only 6% of her conversations were coded under the explaining category. Ms. Taylor offered nine assessing comments to Ms. Williams on her teaching; seven of them were positive assessments. Typically, Ms. Taylor's feedback on Ms. Williams' teaching contained assessing (mostly positive), suggesting, and describing communications in this first conference.

Ms. Taylor started the conference by asking "All right, Michelle how did you feel about today's lesson? [Questioning/requesting opinion]" (Post-lesson conference-1). Ms. Williams expressed that it went well and she was comfortable with the material that she was teaching. This was the only conversation where Ms. Taylor requested Ms. Williams to offer her opinions on that day's lesson. Ms. Taylor provided her feedback regarding that day's lesson in the rest of the conference except a part where Ms. Williams asked Ms. Taylor how to motivate students to respond to her questions and she offered different suggestions for doing that.

In the first conference, assessing and suggesting communications formed the majority of the communication types when Ms. Taylor was providing feedback on that

day's lesson. She sometimes used describing communications to form a base for or to support her suggesting communications. Here is an example from the first conference:

Ms. Taylor: Good use of color and organization on your graphs. [Assessing]
Again, when they can, without you talking if they can kind of do the sharing
[Suggesting] like let Michael, when someone said "Why did you divide by two"
[Describing] say "Hey Michael, tell me why did you divide by two." [Suggesting
continued]. (Post-lesson conference-1)

However, similar to the majority of the other suggestions, there was no discussion on why this suggestion was worthwhile.

Overall, in the first conference I observed that Ms. Taylor tended to offer her feedback to Ms. Williams without necessarily having her think about it. In general, she offered few explanations with her suggestions. Additionally, she asked few questions to Ms. Williams, which suggested that Ms. Williams was not given enough opportunities to provide her opinions. The communication style explained above seems to be typically how they communicated initially in the semester. I found this out in my informal communications with both Ms. Taylor and Ms. Williams. In the beginning of the semester both of them told me that Ms. Taylor took notes and talked through them to Ms. Williams after the lesson. More evidence was found in the final interview where Ms. Williams said: "At the beginning she would say 'fix this, fix this, fix this'" while describing their initial conferences. So she also described their initial conferences as a one-way communication flowing from Ms. Taylor to Ms. Williams.

The second conference was a reflection on the prior week. In this conference, Ms. Taylor assessed Ms. Williams's teaching three times; all of them were positive assessments. There was only one suggestion; it was nondirective and was not offered with an explanation. Ms. Taylor posed three questions; two of them were under requesting opinion and one was under the requesting information sub-categories. At the beginning of the conference, Ms. Taylor requested that Ms. Williams reflect over her growth, and at the end she asked her to explain some of her personal goals. In between, they mainly shared ideas with each other alternately. They mostly shared their explanations and descriptions on the organization and management part of teaching. Here is an excerpt from the second conference that represents the tone of the conference:

Ms. Taylor: And again looking, just kind of organizing techniques seems like such a major part of teaching just like kind of say “Hey this is how I am going to organize my day, where you put your name, where you put your make ups, how, you know, doing your attendance” [Explaining], and like for example, one that we had as you were asking on attendance, where is a good place to write that, and we came up with a couple solutions [Describing]. Why don’t you share those?
[Questioning/requesting information]

Ms. Williams: Right, originally I was doing attendance in the beginning of every class [Describing] and I found that for third and sixth when I’m teaching I feel like I am so rushed to start and I want to get them started with so much to cover. I want them to be, you know, here and doing the warm-up and so it is hard for me to do attendance and get who was tardy and who was here [Explaining]. And so we made a seating chart and we made just x’s. [Describing continued] (Post-lesson conference-2)

During the rest of her communications, Ms. Williams described the technique that they came up with to help her take attendance in a more organized way.

The majority of the descriptions in the second conference were general descriptions; they were not related to specific lesson observations. The only lesson observation description was done towards the end where Ms. Taylor described that a student got up and marked the deviations on the board and other students cheered. Here is how this conversation and also the conference ended:

Ms. Williams: Yeah, they all clapped [Describing], that was really neat
[Assessing].

Ms. Taylor: But, you know, the more I teach, the more I realize, the more we can involve them, etc. it is just up there, the better [Explaining].

Ms. Williams: Exactly.

Ms. Taylor: I think things are going real well [Assessing] and we will continue this next week. (Post-lesson conference-2)

This was the only part in the second conference where they talked about a specific lesson incident. I shared this part in the content-analysis section, too, but here I will look at it from the communication type perspective. The cooperating teacher explained her

perspective on student involvement, to some extent, based on a classroom incident. However, she did not use this incident to ask open-ended questions to the student teacher. From my classroom visits, I knew that Ms. Taylor thought that Ms. Williams talked too much in her lessons and she should have let the students talk more. My opinion as her university supervisor was also the same. However, I always brought up this issue in my conferences with Ms. Williams and had longer and deeper discussions about it. Since letting students talk more seemed to be an important component of teaching according to Ms. Taylor, it was interesting that she did not pose a question to Ms. Williams in this part of the conference, where it was the only part that they discussed about pedagogy. In other words, her supervision of the student teacher represented a different teaching philosophy than how she teaches mathematics to students in her classroom. For example, she believed that her students should express their ideas and share ideas with their friends. However, in their initial post-lesson communications, she did not tend to ask questions to Ms. Williams to have her talk more and express her opinions, especially about mathematics pedagogy.

To summarize what has been discussed so far, one commonality in the first two conferences appeared to be that the cooperating teacher did not tend to ask questions to the student teacher when they are discussing a specific lesson or part of a lesson. The feedback mostly consisted of assessing, suggesting, and describing communication types. Most of the assessments were positive and most of the suggestions were not offered with an explanation.

I will now discuss the communication types used in the third and fourth conferences that were reflections over the week. At this point, I would like to remind the reader that the percents of talking done by the student teacher in order from the first conference to the sixth conference were: 39%, 51%, 61%, 69%, 48%, and 44%. Hence, the third and the fourth conferences contained the most student teacher talking. In these conferences, Ms. Taylor posed nine questions to Ms. Williams; seven of which were requesting opinion, one was confirming and one was requesting feeling. Therefore, the student teacher explained her opinion at least seven times and once described her feelings. For this reason, her talking percentage was high in these conferences. Similar to the first and second conferences, the majority of the assessments were positive; out of

five total assessments in the third and fourth conferences, four of them were positive. Another similarity was that the two suggestions made in the third and the fourth conferences were not given with reasoning. One suggestion was nondirective and the other suggestion was directive. The percentage of suggesting was very low; 7% in the third conference, and 6% in the fourth conference. The reason for the low percent of suggesting communications is probably that the conferences were overall reflections of the week, not reflections on a specific lesson. In the second conference that was also a reflection on the week, the percent of suggesting communications also was low at 6%. Then in the fifth and the sixth conferences that were reflections on specific lessons, it increased slightly to 20% and 13%, respectively. Another confirmation for this observation is that the two suggestions in the third and the fourth conferences were offered while they were talking about specific lessons.

They shared ideas on different topics such as the role of the teacher, teacher-student relationships, students' understanding of some mathematics concepts, and student involvement and how the structure of the lesson affected it in the third and fourth conferences. The general communication pattern that I observed in these conferences was that Ms. Taylor started a conversation on an issue by describing her general observations or explaining her perspective, and then asked what Ms. Williams thought about that issue. At times, Ms. Williams explained her opinions without being asked a question from Ms. Taylor. Here is an example from the third conference for the former type:

Ms. Taylor: The other thing that we were talking about is because it is interesting, we've been doing a lot of the same plans that I have, it's kind of the role of time, how to do time within a lesson [Describing]. Any thoughts on that?

[Questioning/requesting opinion]

Ms. Williams: Right, I think there was this one day last week where I ran out of time and like I took too long, but I feel this week I've been really careful to know when the class ends and feel that pace [Assessing].

Ms. Taylor: I see real such improvement [Assessing], that's what so exciting [Emotional talking]. (Post-lesson conference-3)

An example for the latter type is from the fourth conference:

Ms. Taylor: I think they appreciate, you know one thing I noticed, that book “every minute counts” that really changed my philosophy of teaching, is that if you get the class with the teacher does bla bla bla with the homework, and read the definition, occasionally you gotta do some of that, but just the difference doing it as activities and groups maybe [Explaining].

Ms. Williams: That day that we were talking about, it was really reading a lot of the definitions, you know Mrs. Taylor really helped me and by third period, first period we just read the definition, and then second period we kind of used examples, but then by third period we had an example that helped us demonstrate [Describing] and I felt they were engaged and I really feel they understood the concept better [Assessing] because they had an example to relate it to then just reading the definition [Explaining]. (Post-lesson conference-4)

In the above conversation, the cooperating teacher once again disagreed with the traditional teaching method. However, she did not necessarily seek the student teacher’s opinion on the issue. Actually, this was the second time the cooperating teacher talked about that lesson in this conference. The first time they had talked about it, she did not pose a question to the student teacher; she had merely explained her own perspective. Another note about the above excerpt is that the student teacher was talking into the tape recorder as if she was talking to me. It was probably because we talked about similar issues in our post-lesson conferences and she probably felt that she needed to clarify the issue and explain her perspective to me.

Now I would like to discuss the communication types in the parts of the third and fourth conferences where they discussed specific lessons. At the end of the third conference, Ms. Taylor asked Ms. Williams if she thought that day’s lesson ended up being nice. Ms. Williams expressed her reflections on the lesson. Then Ms. Taylor continued as follows. “It was interesting, one thing I thought to add to the lesson...is to say look find your own residual how did you do [Suggesting]” (Post-lesson conference-3). Ms. Williams said that it was a neat idea and she would do it in the remaining periods. In this conversation, the student teacher was initially asked for a reflection, however, immediately after hearing what she thought about the lesson, the cooperating teacher offered a suggestion and there was no further discussion on it. I thought that this

conversation contained some missed opportunities for helping the student teacher think deeply about her teaching.

A similar conversation was conducted in the fourth conference:

Ms. Taylor: Oh, you mention the paper, scissor

Ms. Williams: Paper, rock, scissor? [Questioning/clarifying]

Ms. Taylor: Yeah, you can actually do a tree diagram of that showing them theoretical probability and then say who will be winning and then you look at that and then you can have them play the game and then look at the actual simulation [Suggesting].

Ms. Williams: Oh, neat, it is like a world-series problem kind of thing.

Ms. Taylor: Yeah, there's almost too many activities that you have to fit [Describing]. (Post-lesson conference-4)

Similarly, in this conversation the cooperating teacher offered a suggestion without having the student teacher analyze it. In both cases, they did not discuss why the suggestions would work, why they might be valuable, or what difficulties might arise if the student teacher implements them. In chapter-4, I discussed that the program might have included activities about how to offer suggestions to the student teachers. In particular, Ms. Johnson struggled to understand the idea of educative supervision and offering suggestions to the student teachers. The lack of discussions about the suggestions that Ms. Taylor offered to Ms. Williams provided another motive for explicitly discussing with the cooperating teachers the issue of when and how to offer suggestions to student teachers in future supervision programs.

In summary, in the first four conferences, the student teacher was not required to think deeply about a specific lesson incident. The cooperating teacher provided her suggestions to the student teacher as how to improve her teaching. Most of these suggestions were not discussed in detail and no explanation was made as to why they would work. Nevertheless, in the third and fourth meetings, the percent of questioning increased for the cooperating teacher. This change resulted in a predominance of explaining, describing, and assessing communications for the student teacher. Therefore, we can conclude that in the third and fourth conferences, even though the student teacher was not encouraged to think deeply on the specific lesson incidents, she was asked to

reflect on general teaching and learning topics such as the role of the teacher, the role of the time, organization techniques, student involvement, and how the structure of the lesson affects the student involvement. These are important components of teaching. Talking about these issues probably helped the student teacher grow in these areas of teaching. Additionally, in this student teaching experience, the cooperating teacher and the university supervisor sent similar messages about teaching mathematics to the student teacher, which probably promoted her growth (LaBoskey and Richert, 2002).

Lastly, I would like to discuss the communication types used in the fifth and the sixth conferences. These two conferences were especially important for us to understand the supervision style of the cooperating teacher towards the end of the semester because they were reflections on specific lessons and were conducted towards the end of the semester. To begin with, I would like to let the reader know that these were the longest two conferences among the six conferences. Ms. Taylor posed 11 questions (28%) in the fifth conference to Ms. Williams; 6 of them were under the requesting opinion sub-category, 3 questions were under the requesting information sub-category, and 1 question was under the confirming sub-category. In the sixth conference, Ms. Taylor posed six questions (19%) to Ms. Williams; five questions were under the requesting opinion sub-category and one question was under the confirming sub-category. This data suggested that the cooperating teacher started asking more questions to the student teacher compared to the beginning of the semester. However, more data is needed regarding how the cooperating teacher used these questions and other communication types in the last two conferences so that we can better understand the changes in her supervision style.

Before presenting some communication patterns and examples from the data, I will briefly describe the assessing and suggesting communications in the fifth and sixth conferences as I did for the previous conferences. In the fifth conference, out of nine (22%) assessing communications, six of them were positive assessments and three of them were negative assessments. In the sixth conference, out of nine (29%) assessing communications; seven of them were positive assessments and two of them were negative assessments of Ms. Williams' teaching. So, similar to the previous conferences, the positive assessments formed the majority in the fifth and sixth conferences. Ms. Taylor offered eight (20%) suggestions to Ms. Williams in the fifth conference; six

suggestions were unjustified and four suggestions were directive. In the sixth conference, Ms. Taylor offered four (13%) suggestions to Ms. Williams; two suggestions were justified, and only one suggestion was directive. In regards to directive versus nondirective suggestions, Ms. Taylor, in total, used more nondirective suggestions than directive suggestions. However, I did not observe a pattern about a change in the nature of her suggestions (directive vs. nondirective) across the six post-lesson conferences.

The general communication pattern in the fifth and sixth conferences was as follows. They talked about the lessons in parts, such as warm-up, problem-1, problem-2, and problem-3. For each part, in most cases the cooperating teacher requested the student teacher's reflection on that part of the lesson. After receiving her reflections, she offered her reflections that consisted of assessing, explaining, describing, and suggesting communication types. At times, she used some descriptions to form a base for her questions. There were also times that she started reflecting on one part of the lesson, and then stopped and asked questions. Below is an example from the fifth conference that represents their general conversation style in the two conferences; in this excerpt Ms. Taylor suggested one of the exercises for Ms. Williams to reflect on.

Ms. Taylor: The next thing was number 26 [Questioning/Requesting opinion], was the problem that you did doing trees and things [Describing].

...

Ms. Williams: Independence. We learned the first four probability rules and I really liked, not that I'm too...but I really liked writing the four probability rules that we learned yesterday and then adding the fifth on the same list so that they see them all together. And I think that the coins example and using the tree diagrams and I tried really with this part of the lesson to bring in, you know all of those different, you know, this is using the compliment rule, using the multiplication rule here and so we are using those to help describe the, the different probabilities [Explaining]. So I think the visual that I did on the board first wasn't as good as the one [Assessing], so I did second and third, and I used the word, you know follow the branches here and that these events are independent [Describing]. And first period asked a lot more questions so I feel like they understood it better, not really better but they understood it, my visual

wasn't as good but through their questions I think they now understand it, but second and third once they have that improved visual, it seems like they didn't ask as many questions [Assessing].

Ms. Taylor: And you know, what I'm seeing is, you know I kind of give you little tidbits and you kind of change and make those adjustments [Describing]. As a whole, I thought it was good explaining, good language [Assessing], maybe ask a question; it kind of a little bagged down there [Assessing]. I kind of gave you some strategies to do it. Again, constantly trying to use those teachable moments there [Suggesting]. The next part, you made a big change [Describing] but first period it was boring [Assessing]; you were having them read things from the lab book and you know, you could just see them kind of zoning out [Describing continued].

Ms. Williams: Yeah.

In the above conversation, the cooperating teacher requested that the student teacher reflect on part of the lesson where question 26 was solved. After the student teacher expressed her comments, the cooperating teacher presented her own opinions on the same part. This was typically how they communicated in both the fifth and the sixth conferences. Ms. Williams' described their post-lesson conferences towards the end of the semester as follows:

We always had a between first and second period so they were generally short but she would say "Yeah, you did this excellent, and you did this excellent, you did this excellent" and then she say "well reflect on the lesson, what do you think" and you know and then you know if I change something from first to second she'd say "well, why did you change that?" you know "do you feel like the students learned it better" kind of thing. (Final Interview)

Thus, Ms. Taylor requested that Ms. Williams reflect on her teaching in the conferences that they had towards the end of the semester, which is aligned with my observation in the fifth and sixth conferences. I observed that Ms. Taylor asked questions to Ms. Williams about the details of the lessons. Therefore, it can be concluded that Ms. Taylor tended to ask reflective questions to Ms. Williams in their lesson-specific post-lesson conferences towards the end of the semester.

I believe that asking reflective questions to the student teacher about parts of her lessons helps the student teacher think more deeply about her teaching, revisit some areas that need development, and assess and analyze her teaching. However, all of these thinking processes probably have different levels. For example, reflective thinking has been defined in different levels by different researchers (Collier, 1999). The conversations that I analyzed from the fifth and sixth conferences seemed not to push the student teacher's reflective thinking into higher levels. The majority of the requesting opinion questions that the cooperating teacher asked were in the form of "reflect on the part..." which did not show any direction for guiding the student teacher's thinking on certain teaching and learning issues. Additionally, the cooperating teacher did not ask follow-up questions. I think that follow-up questions are very important because they tell the student teacher that the cooperating teacher received her message, so she is listening to her. It is a sign of active listening (Florida Department of Education, 1999). Secondly, it gives the cooperating teacher an opportunity to redirect the student teacher's thinking. From these perspectives, I think that there were missed opportunities in both the fifth and the sixth conferences for the cooperating teacher to help the student teacher think deeply about her teaching. For example in the above excerpt from the fifth conference, it seemed like the cooperating teacher was just waiting for the student teacher to finish talking so that she could offer her perspective on that part of the lesson. Active listening on part of the cooperating teacher seemed to be lacking. Active listening is an important component of effective supervision because it gives the speakers a message that they are being listened and encourages two-way communication (Florida Department of Education, 1999).

At this point, I would like to provide another example from the sixth conference to support what I have discussed so far:

Ms. Taylor: Any reflections on four? [Questioning/Requesting opinion]

Ms. Williams: What I have been trying to do a lot lately is to have the students try it on the board. And, ummm I like that a lot because it shows that I am not the only person that knows how to do it, that there are students and it is attainable and it is, you know they have the ability to do it [Explaining]. And it has been really neat to watch them ask, you know break away from being like "oh, Ms. Williams

is the only one that knows” and get towards, you know they can ask each other for help. And it has been neat to have them in groups the last few days to really get them to help each other and to work with each other [Assessing].

Ms. Taylor: And, yeah the more things, I saw the one thing, you do it. And you might haven’t seen, sometimes I see, I don’t know it is you are nervous or....I call it..., you almost do this march [Describing]. (Post-lesson conference-6)

Once again, in this conversation the cooperating teacher let the student teacher talk first. And then she offered her descriptions and assessments that were not essentially connected to what the student teacher said. She talked about a walking habit that the student teacher used to do, and she did not do it in that day’s lesson. In short, she did not respond to what the student teacher said, but expressed what she already had in her mind.

I have discussed that Ms. Taylor did not tend to use follow-up questions in the post-lesson conferences. A parallel observation was that the majority of the time, she did not use questioning as a way of guiding the student teacher’s thinking on different teaching and learning issues. For example, in the fifth conference, Ms. Taylor commented on the modification that they made to the lesson. She basically thought that telling a story instead of reading the question from the book enhanced the lesson. She explained that

Ms. Taylor: I know a lot of teachers teach like “read the problem out loud” and then I just think it can be so [Explaining]

Ms. Williams: I agree

Ms. Taylor: much better, so [Explaining continued]

Ms. Williams: yeah.

Ms. Taylor: And it was interesting that simple change, creating stories and sometimes real life stories, you know [Explaining continued], find little things to, little stories to enhance [Suggesting]. (Post-lesson conference-5)

Parallel conversations on pedagogy were done in previous conferences, too. Similar to the communication type in those conversations, in this conversation, the cooperating teacher explained her perspective and did not use questioning communications to mine the student teacher’s thinking.

Another observation about the communication type of the cooperating teacher in the last two conferences is that she did not use specific lesson incidents to form a base for

her questions, but rather mostly to form a base for her assessments or suggestions. An example is from the fifth conference. Ms. Taylor described a situation where one student asked a question to her in the lesson and based on that question, she suggested that Ms. Williams “strengthen that dependence idea and idea of joint probability [Suggesting].” Another example is from the sixth conference where she supported her assessment with a description from the lesson “you gave the force to, which I thought was good and then you were very clear [Assessing], you outlined the goals of the day and I looked at it and that whole thing took 6 minutes [Describing]. I thought ‘what an excellent start!’ [Assessing]”

At this point, I would like to connect the findings that I have reported in previous paragraphs to the program activities. As explained in chapter-4, the program emphasized the use of reflective, open-ended questions in post-lesson conferences. This emphasis was clearly observed in the post-lesson conferences that Ms. Taylor and Ms. Williams conducted after educative supervision was discussed in the program. In fact, all three cooperating teachers started posing more open-ended questions in their post-lesson conferences as they engaged in the program activities. However, the use of follow-up questions or the idea of active listening was never discussed in the program activities. The use of lesson incidents to help the student teachers reflect on their teaching was discussed in the program. However, the cooperating teachers did not have enough opportunities to implement this idea or to observe the implementation of this idea in the program activities. The analysis of the cooperating teachers’ post-lesson conferences showed that two cooperating teachers’ communication showed signs of a lack of active listening and also they typically did not use follow-up questions. They also did not tend to use specific incidents to form a base for their questions. In summary, the weaknesses of the program were observed in the supervisory practice of the participating cooperating teachers. Future supervision programs may benefit from the current study and improve these weaknesses.

Finally, I would like to write about a remarkable pattern from the fifth and sixth conferences that Ms. Taylor led. Several times, she started talking about a lesson, then stopped her comment in the middle, and asked Ms. Williams to reflect first. Here are two examples: “I thought the bend of the good first example, I think you didn’t make use of

the, my suggest with making use, ok, reflect on the bend and then I will reflect on that piece [Questioning/Requesting opinion].” (Post-lesson conference-5), “And I thought ‘what an excellent start!’ [Assessing] Then, ok. Any reflection on the warm up? [Questioning/Requesting opinion]” (Post-lesson conference-6). I think that these examples indicated that Ms. Taylor purposely tried to have Ms. Williams reflect on the lesson first. When she began expressing her perspective before the student teacher did so, she stopped herself and gave the student teacher an opportunity to speak first.

In conclusion, with respect to the communication styles, the data analysis showed that Ms. Taylor moved from solely expressing her comments to asking questions to Ms. Williams on each part of a lesson. Thereby, towards the end of the semester she had Ms. Williams reflecting on her lessons deeper compared to the beginning of the semester. Overall, the conferences were conducted in a positive mood as evidenced in the dominance of positive assessments. Most of the suggestions that were offered by the cooperating teacher were not given with an explanation.

Ms. Taylor’s Supervision Style after the Program was Implemented

In this section, I will discuss the findings about the supervisory beliefs, practices, and knowledge of Ms. Taylor after the implementation of the program. In the final interview, Ms. Taylor explained her goal in a post-lesson conference with Ms. Williams as follows:

I wanted her to develop confidence in her own teaching ability. And reflect on practices that would help her achieve that and become a better, you know, better teacher and kind of develop her own confidence or own self-critiquing better. I think a good practice, good teachers reflect on their own lessons no matter how long they’ve been teaching. (Final Interview)

In her response to this same question in the initial interview, Ms. Taylor talked about helping them become a good teacher, helping them set goals, sometimes have them work through Ms. Taylor’s own habits, and sometimes have them reflect on their teaching. Although the “reflection” piece is included in both responses, it sounds like the final interview response has a stronger focus on reflection. For example, Ms. Taylor explained

that her most important role as a cooperating teacher happened in post-lesson conferences because they had “just kind of a two-way conversation of what things worked, what didn’t, different, how she could work...she was always working on specific focuses each week, whether it was student centered, questioning techniques” (Final interview).

In her final interview, Ms. Taylor watched the mathematics lesson clips that she watched in the initial interview. Similar to her initial response, she said that what she will talk about would depend on the time of the year and we agreed that it was the middle of the semester. What and how she would talk in a post lesson conference after this lesson was as follows.

I would ask them, uh, it looks pretty good, basically what their strengths and weaknesses, what they liked, and um, talk through that and then kind of share some ideas, I thought it was good opening. Maybe have students guess three things about what those three things were instead of just telling them or pair share, you know the equals, not equal. Um, to get to that particular class goal, maybe use color on the cylinders or maybe have students make their individual cylinders, but we may have talked about the lesson ahead of time. Um, um, the vote, I maybe have it blind, so they can’t see each other and talk about why they drew their conclusions and have people share those....She wrote down “Who can tell me the formula?” It may be better to have students all write down their formula and then compare, but it would depend, I think I would have them kind of reflect on what they thought was good and bad and maybe talk about some suggestions. They may come up with some ways to do it better, because it is basically a very good lesson. (Final interview)

Ms. Taylor’s responses to this question in the initial and final interview had some similarities and differences. Content-wise, both comments had similar topics: student-student interaction, student involvement, and organization. One difference in the content in both conversations was that in her comments in the final interview, Ms. Taylor emphasized students’ reasoning: “Maybe have students guess through things about what those three things were instead of just telling them,” “Talk about why they drew their

conclusions,” and “It may be better to have students all write down their formula and then compare.”

With respect to the communication types, Ms. Taylor’s scenario post-lesson conversation was quite different than the one in the initial interview. In her comments in the initial interview, she did not mention questioning the student teacher about her teaching. On the contrary, her comments in the final interview involved questioning the student teacher, having them reflect on their teaching, and sharing ideas together: “I would ask them, uh, it looks pretty good, basically what their strengths and weaknesses, what they liked, and um, talk through that and then kind of share some ideas,” “I would have them kind of reflect on what they thought was good and bad and maybe talk about some suggestions. They may come up with some ways to do it better, because it is basically a very good lesson.” So the analysis of this piece of the initial and final interview suggests a shift in the communication style of Ms. Taylor from offering suggesting and assessing communications to questioning and sharing ideas with the student teacher.

In summary, compared to her comments in the initial interview, Ms. Taylor’s comments in the final interview indicated some changes in her supervision towards the educative side of the supervision spectrum. For example, in the initial interview when she was asked to watch the same mathematics lesson and supposedly conduct a post-lesson conference with the teacher in the video, she did not pose any question; she offered her assessments and her suggestions. On the other hand, she posed questions and said she would have the teacher reflect on her teaching in the final interview. Ms. Williams’ comments support this observation. When she was asked to describe a typical post-lesson conference, she said:

I think it changed a lot, I mean from the beginning where it was just like, ‘ok, you can fix this time management thing or you can fix, you know like walk away from the board a little bit’ or you know just like the little things but as it got towards the end like...she would say ‘yeah, you did this excellent, and you did this excellent, you did this excellent’ and then she say ‘well reflect on the lesson, what do you think’ and you know and then you know if I change something from first to second she’d say ‘well, why did you change that?’ you know ‘do you feel like the

students learned it better' kind of thing. And so it was more of instead of her telling me, at the beginning she would say 'fix this, fix this, fix this' whereas at the end she was like 'how do you think this could have been better?' or 'why did you change that?' and 'how do you think it made it better?' kind of thing, so.

(Final interview)

So, Ms. Williams observed a change in the supervision style of her cooperating teacher: instead of telling her what to do, she started asking more questions towards the end. In the initial interview, Ms. Taylor did not talk about such a strategy when I asked her about her supervision style. The only change she mentioned was content-wise; she talked about being pickier towards the end in matters such as correct use of mathematics language.

Summary of the Change in the Supervision Style of Mr. Taylor

The initial data about Ms. Taylor's supervision indicated that in the beginning of the semester, she did not tend to pose questions to her student teacher while discussing the specific lessons. Both in the scenario post-lesson conference in the initial interview and in their recorded post-lesson conferences in the beginning of the semester, Ms. Taylor offered her assessments and suggestions to the student teacher in brief sentences. Ms. Williams perceived their post-lesson conferences as an "evaluation" of her teaching.

The analysis of their six post-lesson conferences from the three perspectives revealed some changes in their conferences throughout the semester. For example, when the conferences were categorized as general reflection over the week versus reflection on a specific lesson, it was found that the student teacher's talking percentages increased steadily throughout the semester in both types of conferences. Another change was observed as a result of the content analysis. The content analysis on the six post-lesson conferences showed that initially in the semester, Ms. Taylor and Ms. Williams did not have deep conversations on mathematics pedagogy. However, the discussions on mathematics pedagogy became deeper in the latter conferences that were conducted after the discussion of educative supervision in the program. The analysis of communication types used by Ms. Taylor and Ms. Williams showed that in the conferences where the specific lessons were discussed, the cooperating teacher moved from conveying her

comments on the student teacher's teaching to asking questions to the student teacher on each part of the lesson and then conveying her feedback. This was an important change that indicated a shift in her supervision style to the educative side of the supervision spectrum.

The final interviews with Ms. Taylor and Ms. Williams confirmed the changes mentioned in the previous paragraph. In the scenario post-lesson conference, Ms. Taylor posed questions throughout her talk. Additionally, when she was asked what her goal was as a cooperating teacher, her statements revealed that helping her student teachers become reflective practitioners formed the center of her goal. In the initial interview, having the student teachers reflect on their teaching did not seem to be a central goal for her; her goals included helping the student teachers become good teachers, helping them set goals, and working them through her own (Ms. Taylor's) habits. In the final interview, Ms. Williams expressed that Ms. Taylor was telling her the weak and strong points of her teaching in their post-lesson conferences towards the beginning of the semester and then she started asking reflective questions to her in the post-lesson conferences towards the end.

In conclusion, the data analysis suggested that there was a change in Ms. Taylor's supervision style from the traditional side to the educative side of the supervision spectrum. And this change was clearly perceived by the student teacher. However, similar to Mr. Fletcher, Ms. Taylor typically did not use classroom incidents to help her student teacher reflect on her teaching. Another similarity between the two cooperating teachers was that both cooperating teachers had a supervision style towards the end of the semester where they questioned the student teachers, received their input, and then conveyed their feedback. Even though this was a change in their supervision style compared to the beginning of the semester, active listening seemed to be lacking in their supervision. Even though there was some shift in the supervision style of Ms. Taylor towards the educative side, there were still some steps that she might have taken to be a more educative supervisor. It was also found that the areas that needed improvement from an educative supervision perspective were not sufficiently addressed in the supervision program. Future programs may support cooperating teachers more in these areas.

Supervisory Knowledge, Practice, and Beliefs of Denise Johnson

This section will include four sub-sections: Ms. Johnson's supervision style before the program was implemented, post-lesson conferences between Ms. Johnson and Mr. Fair, Ms. Johnson's supervision style after the program was implemented, and a summary of the change in the supervision style of Ms. Johnson. The combination of the findings about Ms. Johnson's supervision before, during, and after the program was implemented will help the reader understand how the supervisory beliefs, knowledge, and practice of Ms. Johnson changed as she engaged in the program activities.

Ms. Johnson's Supervision Style before the Program was Implemented

Ms. Johnson believed that student teachers learned how to teach mainly by how they were taught. However, she also expressed that even though she was taught in very traditional classes, now that she learned about reform minded instruction, she tried to modify her instruction accordingly. Hence, she implied that with education and professional support teachers may teach differently than how they were taught. For example, she explained that as a cooperating teacher she felt that it was her responsibility to show examples of reform based instruction for her student teachers.

When I asked what her main role was in the student teachers' learning, Ms. Johnson replied that it was to help them if something went wrong with their lesson. She explained that "I guess the biggest aspect that, that would not happen too often, on a day to day basis just give advice and let them, you know, grow with knowing that somebody is there to help them" (Initial interview). She also stated that she usually left the interns alone in the classroom for them to gain confidence around the middle of the semester. Actually, this seemed to be a common experience in that school based on my previous experience as a university supervisor. Additionally, Ms. Johnson confirmed that the cooperating teachers that she knew in her school left the classroom at some point in the semester. This was an important difference between Ms. Johnson and the other two cooperating teachers in the study. Ms. Taylor never left the classroom. Mr. Fletcher

decreased his presence in the classroom towards the end, but still tried to observe the first period everyday. On the other hand, Ms. Johnson left the classroom totally at the middle of the semester. I thought that Mr. Fair needed more support and guidance from the cooperating teacher. Ms. Johnson agreed that he needed to improve his teaching in some areas such as classroom management, questioning, and content knowledge. I asked her if she could observe him more and then she started observing him and giving feedback again. A similar scenario happened with my previous student teaching supervision in the same school, but that time the request for more feedback came from the student teacher. At the end of the semester, Ms. Johnson thought that it was not very beneficial to Mr. Fair that she started observing him again. She said: “I really didn’t find a need to be, to act like you know an observer that was gonna give him you know critical feedback at that point [around three-fourths of the semester]” (Final interview).

In regards to her observation of student teachers’ teaching and giving feedback to them, Ms. Johnson explained that in the beginning of the semester, she would sit in the classroom when the student teacher was teaching a lesson and “write down things that are noteworthy, good things, bad things...and just suggestions, I just for the next day, you know...and go over with them and specifically go over that with them and then, then I look for changes” (Initial interview). She also mentioned that her student teachers were not like her and so she did not expect them to copy her or follow her suggestions exactly. She exemplified what she would write in a lesson observation as follows:

So I would try to make comments about when you give a definition, you know, make sure that you repeat it a couple of times and then ask somebody in the room...Sometimes, if it was specific examples or specific words, I might say “This is a really good story that I tell with this example” or “This is a really good example” and then I would say “These students” I might say “These students will help you teach a lesson if you will call on them, they will help you...” So I would write stuff like that. I would also write stuff like, like if she left something out or if she did not emphasize something enough, I would write a note and say “tomorrow, you need to hit on this again or you need to redo this.” So those are the kinds of things that I write.

These comments implied that her notes had a focus on suggesting communication type and general pedagogy and mathematics pedagogy content categories. Her suggestions tended to be indirect suggestions. Ms. Johnson stated that she never wanted to act like an evaluator of the student teacher because then, according to her, they would not talk to her and not let her know their weaknesses. Ms. Johnson told me that after the lesson observation, she usually talked through her notes to the student teacher and she tried to have a conference where the general mood was positive.

At this point, I would like to present Ms. Johnson's response to the question about the mathematics video clips in the initial interview in order to have more information about her initial supervision style. When asked what she would talk about in a post lesson conference with the teacher in the video and how she would carry out such a conference if the subject in the video was her student teacher, she said that she would first ask the student teacher how she thought it went. Then, she would mention the activity was a good activity but she could have involved more students. She continued as follows:

Why didn't you set it up in the groups and have all the groups make the cylinders so they could actually hold them and look at them? Okay?...that's a really good thing to try to get them to vote. Maybe you could have done it in groups and the group voting might have been, you might have gotten them more involved with make the groups vote and they could have talked about it and so they would have been more sure because they would have had, because when they were just asked to raise their hands, it looked like, it was slowing down, just a little bit. Also, when you were saying that the problem equals, the greater than, the less than, you were trying to make the comparison, I did not hear you use the word volume and I was confused about what you meant was less than or greater than. That was at the beginning of the activity...At the end, when you've done the really neat experiment by filling it up, it would be nice if all the groups could fill it up with something. And I liked the idea that you used the links because it's a lot neater than rice or something like that...And I guess, oh goodness, the fact that somebody was worried about the space between the links, you know, you applaud that kid all over the place because you have to tell them that in the real world, we can't always work with perfect situations and sometimes we do deal with that but

if you use links in all figures, hopefully the error is gonna be similar...Also when you talk about the formula, ...you never talked about where the formula came from to reiterate that it is the area of the circle times the heights of you were piling up all these circles to give them that visualization. So I would have talked a little bit more about the area, the volume formula and where it came from. (Initial Interview)

Once again, general pedagogy and mathematics pedagogy content categories were the dominant content categories in her conversation. She suggested doing this activity in groups, involving more students, and explaining where the volume formula came from. She also provided reasons for most of her suggestions. The suggesting communication type was the most frequently used communication type. These findings were similar to her comments where she provided some example statements that she used in her post-lesson conferences.

Mr. Fair's comments in his initial interview confirmed these findings. He described their post-lesson conferences initially as follows: "What she usually does, she'll tell me things I need to improve on and...And then she also tells me things I did well" (Initial interview). From his descriptions and Ms. Johnson's initial comments, I was able to grasp that the dominant communication types used by Ms. Johnson in their initial conferences were probably assessing, suggesting, and explaining communication types. The analysis of their post-lesson conferences will add to our understanding of the cooperating teacher's supervision style. Another piece of information that Mr. Fair provided about their initial conferences was that the content of their discussions changed depending on that day's lesson; sometimes it had a classroom management focus, sometimes it had a pedagogy focus or mathematics pedagogy focus.

To sum up, prior to the current supervision program, Ms. Johnson's conversations in post-lesson conferences tended to include suggestions and explanations. Asking questions and having the student teacher think about an issue did not seem to be her main goals. Being a good helper and providing suggestions for the student teacher seemed to be her main goals in her role as a cooperating teacher. In her talk with her student teacher, she included both weaknesses and strengths of his teaching to help him gain confidence and sought to have the conference in a positive tone.

Before passing to the next section where I will discuss the post-lesson conferences between Ms. Johnson and Mr. Fair, I would like to point out some observations about this pair. First, the reader should know that Ms. Johnson was a very talkative person. On the contrary, Mr. Fair was not very verbal. Secondly, Ms. Johnson thought that Mr. Fair was a perfectionist and got very defensive when given negative feedback. In order to keep a good relationship with him, she sometimes gave her observation notes to him without talking too much about it, specifically to avoid negative feedback. Perhaps because of this, Ms. Johnson was particularly interested in implementing educative supervision. In other words, telling Mr. Fair the weaknesses and strengths of his lesson was not an effective method for working with him and so Ms. Johnson wanted to try the supervision method that the program proposed.

Post-lesson Conferences between Ms. Johnson and Mr. Fair

In the previous section, I presented some findings about the supervisory beliefs, practices, and knowledge of Ms. Johnson before the implementation of the program. Those findings suggested that her supervision style resembled traditional supervision more than educative supervision. In this section, I will present the findings as the result of the analysis of their post-lesson conferences throughout the semester. This will enhance our understanding of the progress in the supervision style of the cooperating teacher. The post-lesson conferences were analyzed from three perspectives: the amount of the conversation done by each participant, the content of the post-lesson conferences, and the communication types used in the post-lesson conferences.

Ms. Johnson and Mr. Fair recorded 10 post-lesson conferences for this study. The first three post-lesson conferences were conducted prior to the discussion of educative supervision and the other seven conferences were conducted after the discussion of educative supervision. Both Ms. Johnson and Mr. Fair expressed that they had multiple daily talks about Mr. Fair's teaching. For this study, they conducted a conference on almost every Friday during the time that Mr. Fair was teaching. Most of these conferences turned out to be a general reflection over the week. However, there were

discussions on specific lessons in each conference. The last three conferences solely focused on specific lessons taught by Mr. Fair.

Conversational time used by Ms. Johnson and Mr. Fair. Calculation of the amount of the conversational time used by Ms. Johnson and Mr. Fair was the first step to understand if there was any change in pair-3’s conversations. As stated previously, an educative supervisor would probably listen to what the student teacher had to say, try to understand their perspective, and encourage them to make sense of the issues happening in their student teaching experience. Hence, in such an environment, the student teacher’s voice would be heard strongly. Conversely, traditional supervisors would be more interested in conveying their messages to the student teachers and thereby their voice takes priority over the voice of the student teachers.

The percent of the amount of the conversation by Ms. Johnson in their 10 recorded post-lesson conferences from the first to the tenth conference were as follows: 76%, 74%, 66%, 56%, 48%, 45%, 47%, 55%, 71% and 52%. Likewise, the percentages for Mr. Fair were calculated as 24%, 26%, 34%, 44%, 52%, 55%, 53%, 45%, 29% and 48%. Figure 5.9 represents this data visually.

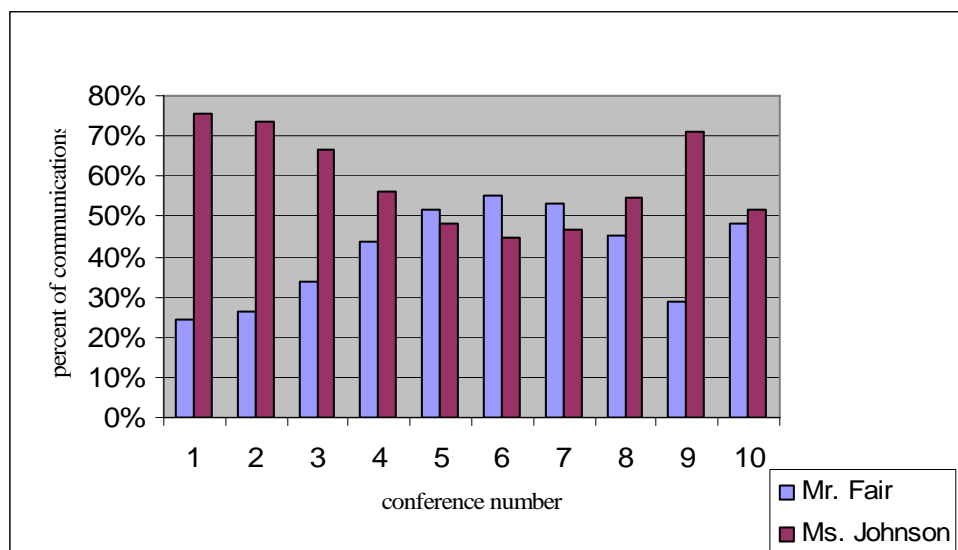


Figure 5.9 Conversational Time used by Ms. Johnson and Mr. Fair

Given the amount of conferences recorded, in order to better understand changes in the amount of communications that occurred in the conferences within the semester, I re-plotted the same data by combining the first three conferences together, the middle four conferences together, and the last three conferences together. The reason for this division was that the first three conferences were conducted before the discussion of educative supervision in the program, and the last three conferences were lesson-specific conferences. Figure 5.10 represents the same data according to this combination.

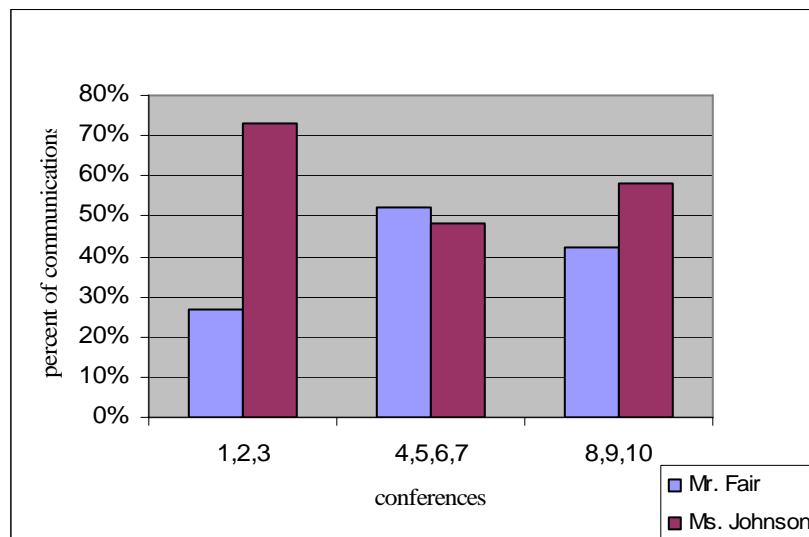


Figure 5.10 Another Representation of the Conversational Time used by Ms. Johnson and Mr. Fair

The percent of communication data showed that the cooperating teacher talked more than the student teacher in the first four conferences. In the first three conferences the student teacher's voice was especially weak. The percent of communication for the student teacher gradually increased until the sixth conference. After the third conference,

the difference between the percent of communication expressed by the student teacher and the cooperating teacher did not become larger than 12% within each conference, with the exception of the ninth conference. Other types of analysis will shed light on why there was a big gap (42%) in their talking percentages in the ninth conference. However, overall, in the conferences that were conducted after the discussion of educative supervision, the student teacher's voice was strong. In the next two sections, the findings on what they discussed and how they communicated with each other in their post-lesson conferences will be presented.

Content of the post-lesson communications. In the previous section, I presented the findings about the percentages of communication for Ms. Johnson and Mr. Fair across their 10 post-lesson conferences. Data on the percentages of communication showed that initially in the semester, the cooperating teacher spoke more than the student teacher in their post-lesson conferences. However, in the majority of the conferences that were conducted after the discussion of educative supervision, the percentages of communication for the student teacher were close to those of the cooperating teacher. In this section, I will present the content analysis results based on their 10 recorded conferences. This will help us understand the direction towards which Mr. Fair's thinking was guided. Table 5.7 shows the percent of communications in each content category across the 10 post-lesson conferences. Figure 5.11 represents the same data visually.

Table 5.7. Types of Content in Post-lesson Communications for Pair-3

	General Pedagogy	Mathematics Pedagogy	Mathematics	Classroom Management	General Teacher Growth	Teacher-Student relationship
Conference-1	14%	15%	0%	15%	35%	8%
Conference-2	4%	19%	0%	53%	11%	5%
Conference-3	26%	12%	0%	34%	16%	0%
Conference-4	8%	32%	0%	31%	8%	2%

Table 5.7. Continued

	General Pedagogy	Mathematics Pedagogy	Mathematics	Classroom Management	General Teacher Growth	Teacher-Student relationship
Conference-5	0%	38%	0%	24%	15%	9%
Conference-6	1%	39%	4%	16%	25%	9%
Conference-7	10%	41%	5%	10%	22%	0%
Conference-8	13%	68%	0%	6%	7%	0%
Conference-9	0%	93%	0%	4%	0%	0%
Conference-10	2%	91%	2%	2%	0%	0%

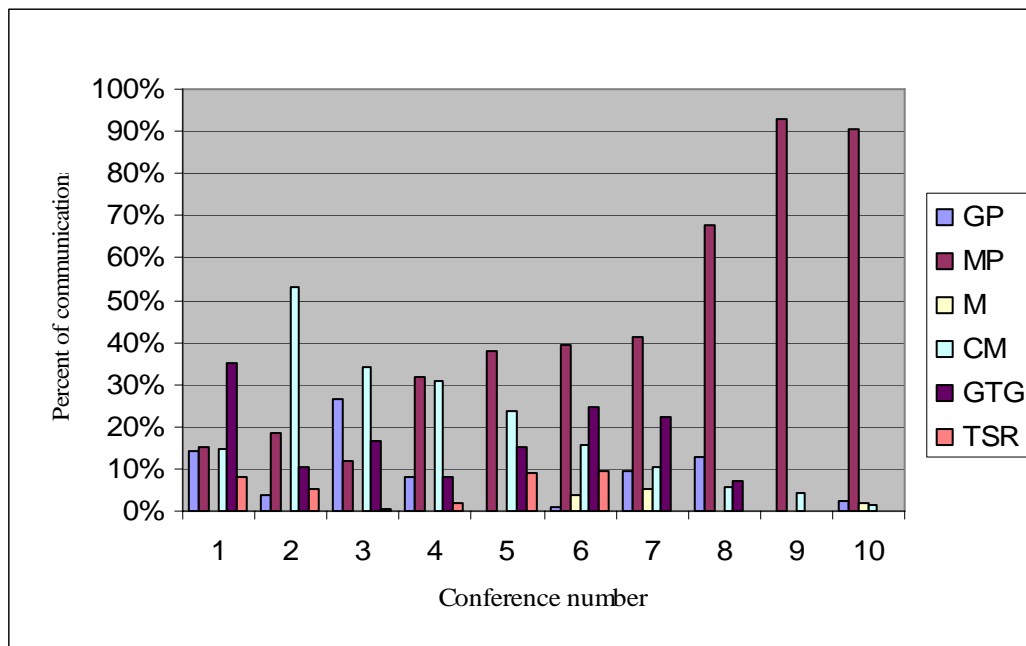


Figure 5.11 Types of Content in Post-lesson Communications for Pair-3

The content analysis on their post-lesson conferences revealed some patterns in what pair-3 discussed in their conferences. First, the data indicated that the mathematics and teacher-student relationship categories never became the focus of any conference. Secondly, the percent of classroom management communications steadily decreased from the 2nd conference to the 10th conference. Conversely, the percent of the mathematics pedagogy category increased throughout the semester. In the last three conferences in which there were discussions of specific lessons, the mathematics pedagogy category dominated the other content categories with 68%, 93%, and 91%.

Before discussing the details of the conferences, I would like to illuminate what pair-3 usually discussed. Under the general pedagogy category, they mostly talked about student involvement, project assessment, questioning techniques, making more explanations, and motivation. Their discussion of mathematics pedagogy mainly consisted of the students' understanding of mathematics concepts, group work, graphing calculator activities, the student teacher's assessment of the lesson, how the student teacher implemented activities, and possible modifications on the lessons. Discipline problems, communication with parents, and time management were the main topics of the classroom management category that pair-3 discussed in depth. The teacher-student relationship category included conversations about how specific students behaved during the instruction, respect between the teacher and the students, and building a relationship with the students. The general teacher growth category involved discussions on feelings of the student teacher as a teacher, making mistakes as a teacher, how the student teacher felt when the cooperating teacher interrupted the lessons, how and why the cooperating teacher would provide feedback, what the student teacher felt about the cooperating teacher leaving the classroom, and what the student teacher was learning in the process.

Content analysis revealed some similarities between certain conferences. Therefore, I will discuss them together. I will discuss the first four conferences together, and then I will present the findings on the fifth, sixth, and seventh conferences, and finally I will report the findings on the last three conferences together.

The classroom management category composed large percentages in the first four conferences, especially in the second, third, and fourth conferences; 53% in the second

conference, 34% in the third conference, and 31% in the fourth conference. The main reason for the high percentage of classroom management communications in the second, third, and fourth conferences was probably because the student teacher had some behavior problems in some classes such as students talking to each other, and students responding to the student teacher without raising their hands. General teacher growth (35%) was the most common content category in the first conference. They talked about how the student teacher felt in his first week, how he felt when the cooperating teacher interrupted the lesson, and how and why the cooperating teacher would provide feedback.

Even though the first four conferences were general reflections over the week, Ms. Johnson and Mr. Fair frequently talked about specific lessons. Especially, in the second conference, Ms. Johnson went over her observation notes. One general observation that I made about the first four conferences was that all of them were conducted in a positive tone. Especially in the first conference, the cooperating teacher frequently showed an understanding of his weaknesses in teaching and support to the student teacher. Some example comments were as follows:

Ms. Johnson: Every now and then I wanna think your explanations are maybe a little shorter than I would make [General Pedagogy]. But that's because you are you at your spot right now and I'm me at my spot. So I don't expect your explanations to be like mine [General Teacher Growth].

...

Ms. Johnson: So as far as the grades in this test where we saw the lower average from the other class, its well you wanna put it more on yourself because you were teaching it. I wanna put it on the kids. Ok? [General Teacher Growth] There might have been, you know a few more of explanations you might have been able to do there [General Pedagogy], maybe they might have gotten just a little bit better if you have done a perfect job, but none of us are doing perfect jobs but I wanna blame it on the kids. I think you gave it to them, I think it was there [General Teacher Growth]; you gave them opportunities to ask questions [General Pedagogy].

Mr. Fair: Right. (Post-lesson conference-1)

This type of support noticeably decreased in the second conference and almost disappeared in the third and fourth conferences, probably because the student teacher became more confident as a teacher. The tone of the conferences continued to be positive.

As stated earlier, the classroom management category had large percentages in the second, third, and fourth conferences compared to the other content categories because the student teacher faced some behavioral problems. During these discussions, Ms. Johnson usually described what Mr. Fair did in the lesson and offered suggestions to handle the discipline problems better. The following was an example from the second conference:

Ms. Johnson: Right, you have a tendency to just keep going, keep going. And, and I want you to say “Ok, guys,” you know, let’s use the word refocus if that’s what you like

Mr. Fair: Right.

Ms. Johnson: And find something that is part of you where the kids know, ok, “We gotta get quiet again, we gotta refocus” and so think about that. It seems like you wanna keep going, keep going and you have your goals in mind but

Mr. Fair: yeah

Ms. Johnson: But I want you to get the kids all back together.

Mr. Fair: Hmm [Classroom Management]. (Post-lesson conference-2)

One observation that I made on the classroom management conversations was that the cooperating teacher did not connect the problem to the student teacher’s teaching method. From my classroom visits, I knew that this student teacher had very teacher-centered lessons at the beginning of the semester. In addition to this, his explanations were short and so it must have been difficult for the students to understand the concepts. This might have led them not to listen to the teacher. Unlike Ms. Taylor who directly connected a discipline problem to the way that Ms. Williams was teaching the lesson, Ms. Johnson gave suggestions that included calling parents, talking to the students individually, stopping the lesson and refocusing the students, and talking firmly to the students.

Even though Ms. Johnson did not directly link the classroom management problems to Mr. Fair’s teaching method, at times she talked about using worthwhile activities to motivate the students:

Well, and the one thing that I feel hard job too is to motivate them to do more. In other words, we wanna give them something they are interested in, we want to show them that this is something that is worthwhile and so we try to search for activities that have more meaning to them [General Pedagogy]. (Post-lesson conference-3)

Ms. Johnson had worthwhile mathematics activities and shared them with Mr. Fair. She sometimes encouraged him to find new activities and do cooperative group work in his lessons. She did some project assessments and involved Mr. Fair in those processes. These pieces of evidence showed that some elements of Ms. Johnson's teaching were aligned with reform based instruction. Nevertheless, during the third conference, they had the following conversation:

Ms. Johnson: We tried something with groups, I mean its kind of, would you call that, how would you rate that on your things I'd like to do this again or not?

Mr. Fair: I don't know if I really consider doing it again because it did not really seem motivated to actually do well. We thought, you know with the group activity they will be able to combine their answers and get good grades because we were looking for at least 70 percent to win a prize, and I think only one group got at least 70 percent from both classes, is that right?

Ms. Johnson: It might have been a second group in sixth period but

Mr. Fair: that's right, there was one

Ms. Johnson: yeah

Mr. Fair: There was one actually did pretty well and so there are a total of two groups that got at least 70.

Ms. Johnson: In sixth period and

Mr. Fair: combined

Ms. Johnson: yeah

Mr. Fair which is disappointing, I thought. They did not take their review sheets home and work on them. Then when they came in some of them are kind of like...seem like there be like 1 or 2 people from each group who do all the work and the others just talk and socialize. And not really focus on what they are supposed to be doing [General Pedagogy]. (Post-lesson conference-3)

Then, the cooperating teacher changed the subject and started talking about homework and test grades. In the conversation above, the cooperating teacher did not help the student teacher find a solution to the problems that occurred in that experience. Her reaction indicated an agreement with his comments. Actually, this reaction was parallel to some of her comments in the program's initial online discussions. In the first online discussion, she expressed that she had some challenges in implementing activities in her classes. Her comments in the post lesson conferences supported my previously stated observation that Ms. Johnson tried to integrate some reform ideas in her teaching. However, she faced challenges in doing that and therefore had concerns about reform based instruction.

Now, I would like to report my observations about the discussion of mathematics pedagogy in the first four meetings. I observed that the conversations on mathematics pedagogy did not include detailed and focused conversations in these initial conferences and this was a similar observation that I made with the other two pairs. In the first conference, there really was not a time that they talked about a specific lesson incident from a mathematics pedagogy perspective. In the second conference, Ms. Johnson went over her observation notes and it mostly focused on classroom management. With respect to mathematics pedagogy, she mentioned the beginning of the lesson where Mr. Fair was talking about adjacent angles. She offered some suggestions such as asking a student repeat the definition of adjacent angles. Then at the end of the second conference, they briefly talked about some of the lessons:

Ms. Johnson: Well, and like we mention when you were able to, we brought up clubs because we wanted to dance.

Mr. Fair: Yes, he is talking about doing the matrix

Ms. Johnson: Yeah, doing the matrix dance and also talking about Michael Jordan when we were doing bi-conditional [Mathematics pedagogy]. (Post-lesson conference-2)

The third and the fourth conferences were similar in that the cooperating teacher did not initiate deep discussions on mathematics pedagogy while talking about Mr. Fair's teaching. For example, in the fourth conference, they discussed that the students had

some difficulties in understanding the properties of polygons. The conversation was as follows:

Ms. Johnson: And the worksheet, I noticed when some of the kids were working on it, this global idea that everything is a polygon and everything that has four sides is a quad, you know it is interesting to see something that seems kind of trivial for us is not trivial for them.

Mr. Fair: No, it isn't.

Ms. Johnson: And that's why anytime you give them a definition, try to rephrase it, re-throw it, redo everything you can. You can even have the kids, you know try to reinterpret it for you. That will help. Even those problem children they are cutting up every now and then ask them to do that [Mathematics Pedagogy].

(Post-lesson conference-4)

The cooperating teacher communicated her observation about a difficulty that the students had in the lesson. I think that the cooperating teacher could have used the problems that the students solved in the lesson to promote more discussions about the students' understanding of polygons. Moreover, the suggestions that she offered were general suggestions that could be applied to any concept. While I do believe that these are important communications, there could have been more discussions on how to help students comprehend polygons better and share suggestions that were content (polygon) specific. Finally, I would like to note that the student teacher was not given an opportunity to think about how to help the students understand polygons better. This issue is related to communication types and will be discussed further in the next section.

The following conversation also exemplified the tone of the mathematics pedagogy communications during the initial conferences:

Ms. Johnson: There is some thought processes that we hope the geometry sketchpad will hopefully will make some sense to them. Yes, they'll get to measure and distort and all kinds of things. [Mathematics Pedagogy]

Mr. Fair: I think we have some students who learn better that way, rather than just sitting in the classroom being lectured. [General Pedagogy]

Ms. Johnson: Yeah, some of them are very good about taking notes but we understand that

Mr. Fair: usually

Ms. Johnson: they don't [Classroom Management]. (Post-lesson conference-4)
They continued discussing why some students misbehaved in the classroom. I thought that in this conversation the student teacher's comment about students' learning types might have been discussed further, especially since they did not talk about this topic elsewhere in this conference. Since Mr. Fair's teaching represented a traditional teaching where he lectured a lot, this conversation might have been used to help him think about the value of student-centered teaching methods.

In the first four conferences Ms. Johnson made suggestions about general pedagogical issues. The following example is from the second conference:

Ms. Johnson: And that's another thing you can do is make that book be opened and that's a good thing and I always tell them "I know you didn't write, you know draw these pictures on your homework. Let's go back to these pictures so we can see what is going on." And so having them have their book open is very good thing while you are going over homework [General Pedagogy]. (Post-lesson conference-2)

Other pedagogical conversations included suggestions on questioning techniques, an explanation of why Ms. Johnson used alternative assessments, and finding activities to motivate students.

In conclusion, the first four conferences showed that Ms. Johnson gave feedback to Mr. Fair's teaching on mostly general pedagogy and classroom management content categories. She did not tend to initiate deep discussions on mathematics pedagogy when they were discussing Mr. Fair's teaching. Now, I will discuss the content analysis findings from the fifth, sixth, and seventh conferences. These three conferences occurred over four weeks after the discussion of educative supervision within the supervision program and they tended to focus on general reflections over the week. However, Ms. Johnson and Mr. Fair frequently discussed the specific aspects of lessons. The mathematics pedagogy category had the largest percentage of content categories in all of the fifth, sixth, and seventh conferences; 38%, 39%, and 41%, respectively. Another finding was that the percent of classroom management communications decreased from the fifth conference to the seventh conference; 24%, 16%, and 10%, respectively.

Similar to the first four conferences, the classroom management conversations in the fifth, sixth, and seventh conferences mainly included some behavior problems that Mr. Fair had in some of his classes. At this point, I would like to mention that the week of their seventh conference, I had a conference with Mr. Fair in which we discussed the behavior problems in some of his classes. Ms. Johnson joined us at the middle of our conference. We discussed possible reasons for the behavior problems and brainstormed ideas to overcome these problems. We came up with some strategies such as finding activities that would make sense to the students, involving the students more in the lessons, talking firmly to them, being consistent with the rules, rewarding good behaviors, and calling parents. One of their colleagues had suggested Mr. Fair write a student's name on the board the first time they misbehaved and if they repeated it, give them a referral. Mr. Fair decided to follow this strategy. In the seventh post-lesson conference, Ms. Johnson and Mr. Fair discussed that the strategy was working and the students started behaving better. During my later visits, I did not observe a discipline problem in his classes.

As stated earlier, the amount of mathematics pedagogy communications was high in the fifth, sixth, and seventh conferences. Not only did the percentage of the mathematics pedagogy content category increase, but the depth of the conversations in this category also grew. For example, in the fifth conference, Ms. Johnson and Mr. Fair discussed the students' ability to graph linear equations. It was a long conversation compared to the mathematics pedagogy conversations in the first four meetings. First, they discussed that graphing equations were important because it was required in the linear programming chapter. Then, they started brainstorming ideas to help the students learn graphing linear equations. Here is an excerpt from that conversation:

Ms. Johnson: You know, what I was suggest you doing is maybe, you know how you do some warm up things at the beginning of the period, you might just, when you say the algebra what do you mean?

Mr. Fair: I'm saying, well like sometimes it is not set in the slope-intercept form, they have to change the variables around and divide by negative multiply, whatever and that is even like basic addition, subtraction they mess up on that sometimes still.

Ms. Johnson: Makes it hard, doesn't it?

Mr. Fair: Hmm

Ms. Johnson: So they have an equation that they might graph correctly.

Mr. Fair: Yeah.

Ms. Johnson: but if it is a long equation

Mr. Fair: They can probably graph just an equation put into standard form correctly, slope-intercept form correctly, but then you know, I mean doing the algebra to set it up to put into that form, they might struggle with [Mathematics Pedagogy]. (Post-lesson conference-5)

They kept talking about the importance of graphing linear equations. This conversation was a more detailed conversation on mathematics pedagogy compared to the ones in earlier conferences.

Similarly, in the sixth conference, Ms. Johnson asked Mr. Fair to choose a favorite activity he did that week. He spoke about an activity that explored the segments of triangles and trapezoids. Apparently, Ms. Johnson did not observe the lesson. So she asked some questions about the procedure. However, they also talked about how Mr. Fair implemented the activity. They discussed the students' understanding of the concept, the meaning of the theorem, what pre-requisite knowledge the students had, and so on. In order to exemplify that the mathematics pedagogy conversations became detailed and deeper, I would like to present one final example from the seventh conference:

Ms. Johnson: I have a question about that. You were doing a really good job of explaining what the theorems meant. Did you ever prove any of those?

Mr. Fair: Did we do any proofs?

Ms. Johnson: proofs of those theorems?

Mr. Fair: There was one proof we did; it was a rhombus I think, at the end, where they, we proved, we cut a diagonal into a rhombus and we tried to prove that the two triangles were congruent within the rhombus. And from there we did that by side-side-side, then we said "Right now we are trying to prove that all the angles are congruent. Ok and the reason why would be congruent, any corresponding parts are congruent, triangles are congruent," which is something they are still trying to learn that after you have already established that triangles are congruent

then you can say that is the reason for any of their corresponding parts.

[Mathematics Pedagogy]

Ms. Johnson: And, did you also know that you did need the fact that they were isosceles triangles?

Mr. Fair: Yeah.

Ms. Johnson: So if the base angles were congruent then all those angles had to be congruent.

Mr. Fair: Right.

Ms. Johnson: yeah, so it wasn't just enough to show the triangles were congruent.

Mr. Fair: Yeah, the diagonal is gonna be a different length than the four sides of the rhombus, which will make it isosceles.

Ms. Johnson: Right, and so you needed that information because you had this angle and this angle say and this angle and this angle but you needed all four of them congruent.

Mr. Fair: Right [Mathematics]. (Post-lesson conference-7)

In this conversation, they spoke about a specific proof at length. They did not have this type of conversation in the first four conferences. As the conversations that I presented exemplified, the conversations on mathematics pedagogy became longer and deeper in the fifth, sixth, and seventh conferences.

To sum up, the depth of the mathematics pedagogy conversations increased in the fifth, sixth, and seventh conferences. Now, I will discuss the content analysis findings for the last three conferences. These three conferences were reflections on specific lessons. The content category that they talked the most about was mathematics pedagogy; 68% in the 8th conference, 93% in the 9th conference, and 91% in the 10th conference.

The eighth conference was a reflection on a geometry lesson. In this conference, Ms. Johnson and Mr. Fair mainly shared ideas on the geometry students' difficulties in understanding theorems, postulates, and how to prove theorems. In the 9th and 10th conferences, they talked in detail about the lesson procedures where Ms. Johnson posed questions to Mr. Fair to understand his goals in the lesson and they shared ideas to come up with different ways of doing the same lesson in order to make the students think more

critically. The following excerpt from the 10th conference was typical of the conversations they had in the last two conferences:

Ms. Johnson: Ok, second part of the lesson was your matrix. How did that go?

Mr. Fair: I think it kind of cut them off regard the whole row-reduce, that's a long form. I don't think they never heard that term before and then augmented matrices but I think they realize it is a pretty quick way to solve systems of equations. Just plug it into your calculator and you got your answers there.

Ms. Johnson: Did you expect them to know what an augmented matrix was?

Mr. Fair: No, I didn't expect them to know what that meant.

Ms. Johnson: Ok, your questions almost sounded like you expected them to know.

Mr. Fair: yeah.

Ms. Johnson: ok, and if you were gonna do that again, would you do something different?

Mr. Fair: Probably try to slow down a little bit for them.

Ms. Johnson: You even mentioned that you had experienced doing it by hand?

Mr. Fair: Hmmm

Ms. Johnson: And had you thought about showing them what, what that, what's, what's really happening there?

Mr. Fair: yeah

Ms. Johnson: Had you thought about doing that?

Mr. Fair: Maybe but I was concerned about time I think and it's kind of time consuming if you do one of those type of problems.

Ms. Johnson: Well, what about two by two?

Mr. Fair: Just the two by two, that wouldn't have been too bad and maybe because seeing the connection with it [Mathematics pedagogy]. (Post-lesson conference-10)

In this conversation, they focused on how to conduct the lesson differently to make the students better comprehend how to use the matrices to solve the systems of equations. Talking deeply about the lesson from a mathematics pedagogy perspective was common in these last three conferences.

In conclusion, the content analysis of the post-lesson conferences for pair-3 showed that the amount of conversation about classroom pedagogy decreased whereas the amount of conversation about mathematics pedagogy increased throughout the semester. The percent of conversations on general pedagogy was higher in the initial conferences compared to later conferences. There were conversations on general teacher growth in the conferences throughout the semester except the last three conferences. One apparent pattern in the conferences throughout the semester was that the conversations about mathematics pedagogy became deeper in the conferences towards the end of the semester. This change was important from an educative supervision perspective. It showed that the student teacher was guided to reflect on his lessons regarding the mathematics pedagogy. It also indicated that the program's emphasis on mathematics pedagogy conversations in post-lesson conferences might have influenced the content of the post-lesson conferences led by Ms. Johnson. In the next section, I will present the findings from the communication type analysis. Understanding the communication types used by the cooperating teacher and student teacher were especially important to comprehend the supervision style of the cooperating teacher.

Communication types used in the post-lesson conferences. In the previous section, I presented the findings related to the content of the conversations across the 10 post-lesson conferences that Ms. Johnson and Mr. Fair conducted. In addition to learning what they talked about in their conferences, it is also important to know how they communicated with each other in order to understand the supervision style of the cooperating teacher throughout the semester. While analyzing the conferences regarding the communication types, I paid attention to who offered more suggestions, explanations, assessments, and descriptions. An educative supervisor would be more interested in eliciting opinions than offering opinions. I also analyzed the questions that the cooperating teacher posed to the student teacher since asking open-ended questions is a key component of educative supervision. An educative supervisor would pose open-ended questions to the student teachers, mine their thinking, and support their growth by being sensitive to their developmental level. Additionally, I analyzed how the cooperating teacher used different communication types in conjunction with each other.

Table 5.8 and Figure 5.12 represent the percentages of communications in each category used by Ms. Johnson in their 10 recorded post-lesson conferences. Similarly, Table 5.9 and Figure 5.13 indicate the percentages of communications in each category used by Mr. Fair.

Table 5.8. Types of Communications used by Ms. Johnson

	Questioning	Assessing	Explaining	Describing	Suggesting	Emotional Talking
Conference-1	21%	17%	20%	21%	13%	8%
Conference-2	13%	31%	10%	23%	23%	0%
Conference-3	13%	16%	19%	29%	16%	6%
Conference-4	18%	15%	15%	26%	26%	0%
Conference-5	48%	3%	21%	10%	17%	0%
Conference-6	54%	8%	14%	14%	8%	2%
Conference-7	55%	14%	14%	11%	5%	2%
Conference-8	39%	6%	17%	28%	11%	0%
Conference-9	37%	21%	11%	21%	11%	0%
Conference-10	47%	18%	12%	18%	6%	0%

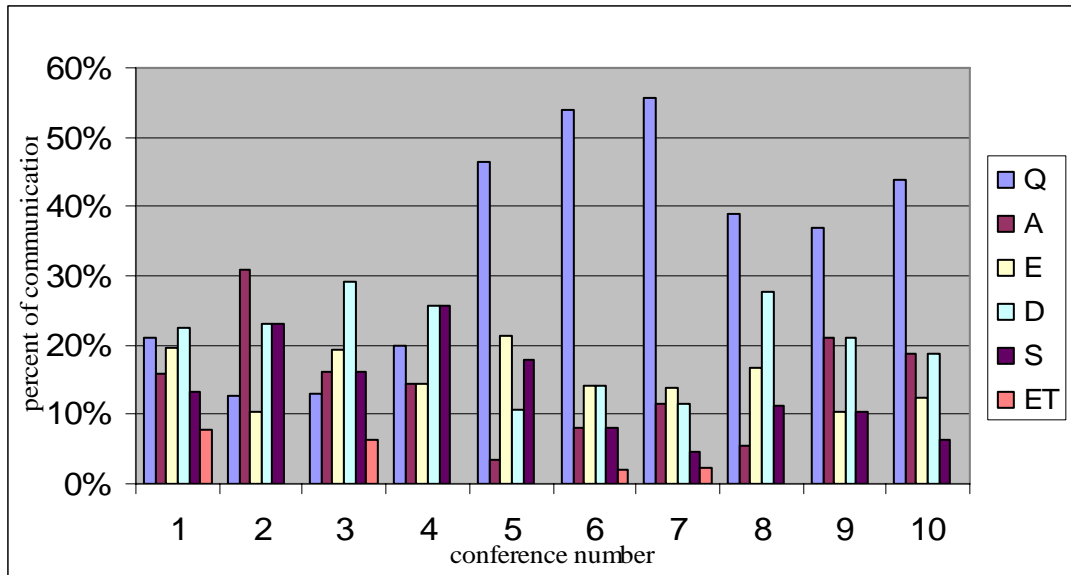


Figure 5.12 Types of Communications used by Ms. Johnson

Table 5.9. Types of Communications used by Mr. Fair

	Questioning	Assessing	Explaining	Describing	Suggesting	Emotional Talking
Conference-1	7%	22%	37%	26%	0%	7%
Conference-2	0%	21%	43%	29%	7%	0%
Conference-3	5%	30%	20%	40%	0%	5%
Conference-4	9%	23%	27%	36%	5%	0%
Conference-5	11%	21%	16%	53%	0%	0%
Conference-6	16%	14%	30%	36%	2%	2%
Conference-7	13%	13%	19%	56%	0%	0%
Conference-8	7%	13%	27%	47%	7%	0%
Conference-9	38%	0%	38%	25%	0%	0%
Conference-10	0%	33%	42%	17%	8%	0%

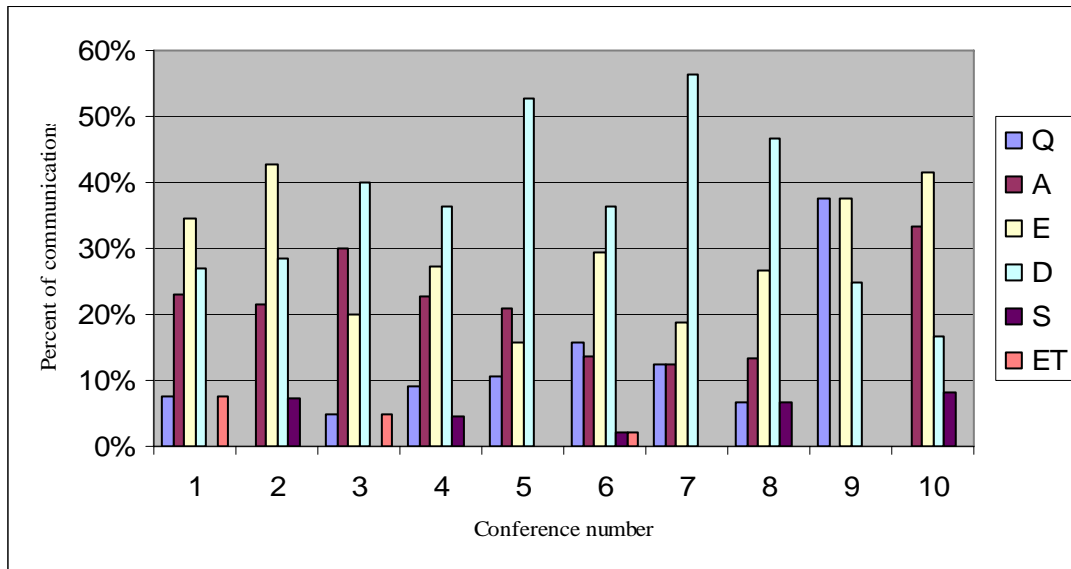


Figure 5.13 Types of Communications used by Mr. Fair

Communication types used by Ms. Johnson showed that the percent of questioning communications increased noticeably in the conferences that were conducted after the discussion of educative supervision. Another observation about her types of communication was that the percent of suggesting communications decreased throughout the semester. Similarly, the percent of emotional talking decreased. Analysis of the communications revealed that Mr. Fair used the describing communication type the most in 6 of the 10 conferences. The remaining four conferences had the explaining communications as the most used type of communication. The percent of explaining communications decreased in the beginning of the semester and then increased towards the end as Ms. Johnson asked more questions. In the remainder of this section, I will present my observations on how the types of communication were used by the cooperating teacher in the 10 post-lesson conferences and I will support them with examples from their communications.

The percent of questioning communications increased 30% from the fourth conference to the fifth conference for Ms. Johnson. The percent of suggesting communications decreased after the fourth conference. Therefore, I will discuss the first four conferences together. Since the last three conferences were reflections on specific lessons and the percent of explaining communications used by the student teacher increased in those three conferences, I will discuss the fifth, sixth, and seventh conferences together and eight, ninth, and tenth conferences together.

The first three conferences were conducted before the discussion of educative supervision and the fourth conference was conducted shortly after the discussion of educative supervision. As a side note, I would like to remind the reader that the discussion of educative supervision in the program was an ongoing process; it was not limited to one discussion. They read an article on educative supervision and conducted an on-line discussion about that article. Then, in the following face-to-face meetings and in the final on-line discussion, we repeatedly talked about educative supervision and used it as a reference point for our discussions on supervising student teachers. Therefore, for pair-3, one point during the semester where the program may have influenced their communication types was after the fourth conference. Ms. Johnson used the assessing, describing, and suggesting communication types more than the other communication types in the first four conferences as represented in Table 5.8 and Figure 5.12.

The first conference was quite long compared to other conferences they had. I will report the general communication type information for the first conference alone, and then I will report the findings for the second, third, and fourth conferences. In the first conference, Ms. Johnson posed 16 questions; 7 questions were requesting opinion, 5 questions were requesting information, 3 questions were confirming, and 1 question was requesting feeling. Ms. Johnson offered 10 suggestions to Mr. Fair in their first conference; eight of these suggestions included justifications and five suggestions were directive. Twelve assessments were done by Ms. Johnson about Mr. Fair's teaching in the first conference. Nine of these assessments were positive assessments. In total, in the second, third, and fourth conferences Ms. Johnson posed 16 questions to Mr. Fair. Six questions were confirming, 5 questions were requesting opinion, 3 questions were requesting feelings, and 2 questions were requesting information. The total number of

suggestions that Ms. Johnson offered to Mr. Fair was 23 in the second, third, and fourth conferences. Out of these 23 suggestions, 20 suggestions included justifications and 13 suggestions were directive. Ms. Johnson provided 22 assessments to Mr. Fair about his teaching in the second, third, and fourth conferences. Nineteen of these 22 assessments were positive assessments. These numbers suggested that in the first four conferences, Ms. Johnson offered mostly positive assessments to Mr. Fair. The majority of the time, she supported her suggestions with explanations. On average, 38% of her questions required Mr. Fair to offer his thoughts.

There were some patterns in the communication types used by the cooperating teacher. First, suggesting communications followed or preceded the explaining communications. This observation was aligned with the high percentage (85%) of justified suggestions. A second observation was that when they were discussing specific lessons, the conversations of the cooperating teacher tended to include assessing, describing, explaining, and suggesting communications. She usually used describing communications to form a base for her suggesting communications. And she generally used explaining communications to support her suggestions. For example, in the first conference, Ms. Johnson described that one student was talking too much in the lesson. She continued by saying “Sometimes you just need to tell a child like that ‘thank you so much, you have been so helpful. Let’s see if we can’ you know, whatever, what some other people are thinking [Suggesting]” (Post-lesson conference-1).

A typical conversation that represented how they talked about specific lessons in the first four conferences was from the second conference. In that conference they initially discussed some behavior problems of the students, such as not raising their hands. Ms. Johnson made some suggestions and they agreed that even though there were some problems regarding the students’ behavior, they were a good group of students and that the problems were not too serious. The conversation continued as follows:

Mr. Johnson: Yeah, I think they have done really well [Assessing]. Anyway, let’s see. I made some notes today. Let’s see what I got. I put that you had a good start to class, they were quiet, you had their attention [Assessing], ok, I have said that, ok. Then you were talking about the adjacent angles [Describing].

Mr. Fair: Right.

Mr. Johnson: I don't know if you were following but I did and this is because sometimes I can't remember exactly what I did but I wrote down "Let students guess why the angles aren't adjacent." I think you were trying to pull up the old definition that we had a week or so ago. And or if you felt like you needed to explain the definition which is what you did, have a student repeat it. [Suggesting]

Mr. Fair: yeah, it is a good idea.

Mr. Johnson: You know, have a student repeat it [Suggesting] and I wrote myself a note here for you, it says "I do this better the second time I cover it." You know, sometimes the first time when I cover, when I am teaching a class twice, I think about it and then I go "oh, this is a good problem, let's make sure I do a better job of it second time around" and so and in this case, you know, to make the student think critically [Explaining], and so you could have, you know maybe done a little bit different there [Suggesting].

Mr. Fair: yeah.

Mr. Johnson: I also wrote down when the class get little too silly, sometimes the guys are showing up a little bit and sometimes the class got a little, I use the word silly because they were not being bad necessarily, or whatever they were just being a little silly [Describing]. I think it is good to stop and refocus them [Suggesting].

Mr. Fair: Hmmm. (Post-lesson conference-2)

In this conversation, Ms. Johnson expressed two descriptions from the lesson that Mr. Fair taught and both descriptions were followed by suggestions. She also talked about what she did in similar situations and explained that the suggestions she offered were to help the students think critically.

Another example that represented the cooperating teacher's typical type of communications on specific lessons during the first four conferences was as follows:

Mr. Johnson: the one thing that I think you need to be careful of is one day you were going around the room and asking kids for answers to homework and you were kind of making a point of maybe choosing the kids that...have not done it [Describing].

Mr. Fair: Yeah.

Mr. Johnson: And that's a really negative thing for you and them [Assessing]. So I'd be careful about that. They know they haven't done their homework, you know they haven't done it and you can make a statement about it, a general statement that this is gonna come back...that's what I say frequently. You know, you don't do your homework it will show, which is what we are seeing, but there is not, I don't know, that's something that I wouldn't necessarily do unless I'm making a real big point that day, you didn't do your homework, you didn't do your homework and that's for whatever reason [Suggesting]. So I just, because it's kind of negative it pulls the class down when you go through four or five kids that have not done their homework. And it is the truth but sometimes we wanna focus more on the positive, the kids who did do their homework, who has these questions? Who did this right? And to try to get them to know it's so much more fun to have the answers than it is to sit there and not know what you are doing [Explaining]. (Post-lesson conference-3)

Similar to the previous example, Ms. Johnson described her observation from the lesson, then offered her assessment, suggestion, and explanation related to that part of the lesson. In the first four conferences, Ms. Johnson typically did not use questioning communications while they were discussing specific lessons. This observation was supported by both Ms. Johnson and Mr. Fairs' descriptions of their post-lesson conferences in the beginning of the semester. They described the initial conferences as meetings where Ms. Johnson talked through her observation notes to Mr. Fair. One consequence of lack of questioning during the discussions of specific lessons seemed to be a lack of conversations on mathematics pedagogy in the first four conferences. Ms. Johnson and Mr. Fair did not have two-way communications about mathematics pedagogy in the first four conferences and hence Mr. Fair was not given enough opportunities to express his thoughts about mathematics pedagogy.

I observed that Ms. Johnson tended to pose open-ended questions to Mr. Fair to have him think about his general growth. The majority of requesting opinion questions were asked when they were discussing the student teacher's overall growth. Some of those kinds of questions included "How did you feel about, how you felt when you were teaching this week?", "When we talked about questioning, what did you see in terms of

trying to make improvements for that?”, “How is your eye contact going with the kids?”, “how do you feel about that the material, not just the fact that it was graphing calculator-oriented but the idea of using models and slope interpretations and the idea that, you know, these numbers say a lot to us?”, and “Did you learn something this week?” I think that most of these questions had the potential to make a connection to the specific lesson incidents. This was not the case in the first four conferences. After Mr. Fair uttered his opinions, Ms. Johnson usually offered her suggestions. For instance, after she asked Mr. Fair what he thought about making improvements in his questioning, Mr. Fair mentioned that he wanted to ask more higher-order thinking questions. Then, Ms. Johnson suggested he have a student repeat what he said and also try to probe to see who was listening. To the question that asked about graphing calculator activities, Mr. Fair expressed that they provided real life applications of mathematics concepts and therefore made sense to the students. Then, Ms. Johnson continued the conversation on another subject. I thought that they could have talked about Mr. Fair’s observations regarding students’ understanding in the lessons in which they implemented those activities. In summary, I thought that Ms. Johnson posed valuable general reflection questions to Mr. Fair. However, she could have used follow-up questions or specific lesson incidents to help Mr. Fair make more connections between the issues that they were discussing and the classroom instruction.

Thus far, I have discussed the types of communications used by Ms. Johnson in the first four post-lesson conferences. Her supervision resembled traditional supervision especially when she was communicating her lesson observations to Mr. Fair. Now, I will discuss the types of communications used by Ms. Johnson in the fifth, sixth, and seventh conferences. To remind the reader, these conferences were all conducted after the discussion of educative supervision in the program. They mostly covered general reflections over the prior week. However, they also included exchanges on specific lessons. In the fifth, sixth, and seventh conferences, Ms. Johnson posed 64 questions to Mr. Fair. Twenty-four (38%) of these questions were requesting opinion, 21 (33%) were requesting information, 11 (17%) were confirming, 6 (9%) were requesting feelings, and 2 (3%) were clarifying questions. Ms. Johnson offered 11 suggestions to Mr. Fair in the fifth, sixth, and seventh conferences. Out of these 11 suggestions, 10 suggestions were supported with explanation and 6 suggestions were directive. In these three conferences,

there were 10 assessments done by Ms. Johnson about Mr. Fair's teaching; 7 assessments were positive and 3 assessments were negative. These numbers suggested that Ms. Johnson continued to offer explanations with her suggestions. Similar to their first four conferences, the majority of her assessments were positive. Overall the percent of communications in the question category increased noticeably in these three conferences; 48% in the fifth conference, 54% in the sixth conference, and 55% in the seventh conference. Moreover, in comparison to total communications, the number of requesting opinion questions increased from the first four conferences to the next three. The change in the amount of questioning communications is valuable from the educative supervision perspective because it indicated that Mr. Fair had more opportunities to offer his thoughts. Ms. Johnson began to increase her absence in the classroom starting from the week of the fifth conference. Therefore, she posed some requesting information questions in these three conferences to get more information about how things were going in Mr. Fair's classes and they increased the percent of this questioning category.

In the previous paragraph, I reported some similarities in the suggestions and assessments that Ms. Johnson offered to Mr. Fair during the first four conferences and the next three conferences. One similarity in her questioning across the seven conferences was that she asked general reflection questions in all of them. In the fifth, sixth, and seventh conferences, some of the general reflection questions she posed were as follows. "How did your week go?" (Post-lesson conference-5), "How are the kids doing?" (Post-lesson conference-5), "What are we learning about the geometry students?" (Post-lesson conference-6), "When you said you made the adjustment from fourth to seventh periods, do you see an adjustment happening between first and sixth?" (Post-lesson conference-7).

One notable difference in the types of communications used by Ms. Johnson between the first four and the next three conferences occurred during the discussions of specific lessons. One common tendency in her communications during the first four conferences was that she directly communicated her observation notes to Mr. Fair about his lessons and did not ask him questions about these. Additionally, when they were talking about a mathematics topic that their students were struggling to understand, Ms. Johnson's communications tended to include suggesting and explaining communications. For example, during the fourth conference, Ms. Johnson mentioned that students had

difficulty understanding the properties of quadrilaterals and polygons and then she offered some suggestions to overcome this difficulty. Likewise, in the first conference, Mr. Fair expressed that some students had difficulty graphing linear equations, a concern for which Ms. Johnson offered some suggestions. This pattern of communication started to change in the fifth, sixth, and seventh conferences. For example, in the fifth conference, Mr. Fair mentioned that students could not plot linear relationships. Then, Ms. Johnson asked him:

Ms. Johnson: What do you think we can do about that? I mean, just what do you think we need to do about that? [Questioning/Requesting opinion]

Mr. Fair: Oh, gosh, I don't know. Just, is there any more like applications of graphing lines in future chapters? Future sections? [Questioning/Requesting information]

Ms. Johnson: By applications, you mean just the fact that they are gonna have to graph? [Clarifying]

Mr. Fair: They are gonna have to graph lines at some point?
[Questioning/Requesting information]

Ms. Johnson: Well it does die down, it does die down but certainly, I used to say to my algebra1 kids if you can not graph line I am not letting you out of here, you know. So it's just so important that they can graph a line [Describing].

Mr. Fair: I think they can graph a line, it is just them doing the algebra
[Describing].

Ms. Johnson: You know, what I was going to suggest you doing is maybe, you know how you do some warm up things at the beginning of the period, you might just [Suggesting], when you say the algebra what do you mean? [Requesting opinion]

Mr. Fair: I'm saying, well like sometimes it is not set in the slope-intercept form, they have to change the variables around and divide by negative multiply, whatever and that is even like basic addition, subtraction they mess up on that sometimes still [Describing]. (Post-lesson conference-5)

In the remainder of this conversation, Mr. Fair described more about the students' difficulties and Ms. Johnson suggested he use warm-up time to have the students practice

more on this topic. In the conversation above, Ms. Johnson first asked Mr. Fair to find a solution for the problem and then when he did not suggest a solution she offered a suggestion. As she asked questions, Mr. Fair had an opportunity to verbalize what he thought about the problem that the students were having. This process might have helped him clarify his thinking on the issue.

Another example was from the seventh conference. Ms. Johnson asked Mr. Fair how the matrix unit was going. He described an activity he did that week and then Ms. Johnson asked him about how the two periods did in that activity. Mr. Fair responded that they did well and described that he did not have enough time in one of the classes to finish the activity. The conversation continued as follows:

Ms. Johnson: In retrospect, you had a neat activity that you wanted them to do and you wanted them to get the candy [Describing]. Knowing that they couldn't finish the work, would you do it again if you only had five minutes left? I am just curious; I don't know the answer to that. I am just [Questioning/Requesting opinion]

Mr. Fair: Umm, I don't know if

Ms. Johnson: Was it discouraging to them because they weren't able to get it done or do you think it did accomplish something? [Questioning/Requesting opinion]

Mr. Fair: I think it might have gotten them a little bit motivated to do the problems [Explaining].

Ms. Johnson: okay.

Mr. Fair: But yeah, there is only five minutes and you know they've seen some of the stuff for the first time, so made them a little difficult to get all of them in short period of time [Explaining].

Ms. Johnson: Sometimes we over plan, you know, or we have the plans that sometimes we try to force it in there and sometimes that you know. (Post-lesson conference-7)

Mr. Fair interrupted her and said that luckily he was able to finish the activity in the other period and had plenty of time. My point in presenting this conversation here was that instead of telling him what she thought at the beginning of the conversation, Ms. Johnson

posed a question to Mr. Fair and gave him an opportunity to express his point of view. Additionally, this gave him a chance to think back and reflect on his lesson.

Ms. Johnson at times used assessing communications to form a base for her questioning communications. For example, at the beginning of the seventh conference they were talking about that day's geometry lesson. In that conversation Ms. Johnson said "You were doing a really good job of explaining what the theorems meant [Assessing]. Did you ever prove any of those? [Questioning/Requesting information]" (Post-lesson conference-7) In the sixth conference, Ms. Johnson used the assessing communication as follows: "I just wanna ask you one last question because you have made some very positive movements about trying to get kids moving [Assessing]. What have you done to do that this week? [Questioning/Requesting opinion]" (Post-lesson conference-6) This question is also another example of Ms. Johnson's tendency to have Mr. Fair reflect on his teaching during the fifth, sixth, and seventh conferences.

In summary, the fifth, sixth, and seventh conferences revealed some changes in the types of communications used by Ms. Johnson. Firstly, she started asking more questions. Secondly, her use of different types of communications changed. During the first four conferences, she tended to offer her assessments and suggestions on a topic, especially on specific lessons without questioning Mr. Fair. During the fifth, sixth, and seventh conferences, Ms. Johnson first asked questions to Mr. Fair, and then shared her insight. However, the week of the fifth conference, Ms. Johnson decreased substantially her observations of Mr. Fair's teaching. This increased the number of communications in the questioning category. She needed to learn what was going on in the classes and therefore asked more questions. In order to understand the evolution of her supervision style better, the last three conferences were very important because those conferences covered specific lessons that Ms. Johnson observed. In the remainder of this section, I will present the findings from the last three conferences.

The 8th, 9th, and 10th conferences were reflections on specific lessons. Ms. Johnson observed these lessons that Mr. Fair taught. In these three conferences, Ms. Johnson posed 21 questions to Mr. Fair. Twelve questions (57%) were requesting opinion, 5 questions (24%) were confirming, 3 questions (14%) were requesting information, and 1 question (5%) was clarifying. Ms. Johnson offered five suggestions in

the last three conferences, four of which were offered with reasons and only one suggestion was directive. At this point, I would like to note that Ms. Johnson used directive suggestions more in the first three conferences; out of 24 suggestions 16 of them were directive. However, there was not a clear pattern in regards to a possible change in her use of directive and nondirective suggestions. Ms. Johnson made eight assessments related to Mr. Fair's teaching in the last three conferences. Five of them were positive assessments. The dominance of positive assessments and justified suggestions in the first seven conferences continued in the last three conferences as well. The percent of requesting opinion questions within the questioning category increased in the last three conferences. From the perspective of educative supervision, this was a good sign that demonstrated that the student teacher's ideas were valued.

The structure of the last three conferences was quite different from the structure of the conversations in the initial conferences where the pair discussed specific lessons. As mentioned before, during the initial conferences, Ms. Johnson conveyed her observation notes to Mr. Fair by using assessing, suggesting, explaining, and describing communications. In the last three conferences, one notable difference was that Ms. Johnson frequently used questioning communications and thereby requested Mr. Fair's thoughts on his teaching. This was also evident in the high percentage of explaining communications expressed by Mr. Fair in the last three conferences: 27%, 38%, and 42%, respectively. In the last three conferences, Ms. Johnson started the conferences by first learning what Mr. Fair thought about aspects of his lessons. The following excerpt represents their initial conversations in the last three conferences:

Ms. Johnson: Right, okay. You had your lesson divided into two parts

[Describing] and how did the first part go? [Questioning/Requesting opinion]

Mr. Fair: Pretty good [Assessing], I think they accomplished something by me reviewing all of the factoring with them; hopefully that will get them going as far as the review for tonight and get them ready for the quiz tomorrow [Explaining].

Ms. Johnson: Do you think they are understanding what is going on there?

[Questioning/Requesting opinion]

Mr. Fair: I think some of them are. Some I'm not so sure about. And I was getting pretty good participation from some, from some students today, so that was good.

I think they liked the factoring by grouping, which, you know, they just learned this week. [Assessing]

Ms. Johnson: I think they are doing very well. I mean, I know there was some good questions and I think they understood the answers and so I think they are in pretty much shape [Assessing]. Okay, second part of the lesson was your matrix.

How did that go? [Questioning/Requesting opinion] (Post-lesson conference-10)

As exemplified in the excerpt above, in the last three post-lesson conferences, Ms. Johnson frequently posed questions to Mr. Fair about his lessons. She offered her feedback after she received Mr. Fair's insight.

One observation that I made about the supervision style of Ms. Johnson in the last three conferences was that she posed questions to Mr. Fair to have him come up with possible modifications for his lessons. Actually, this was vastly different from her initial supervision style where she directly offered her suggestions. In the last conferences, she first asked Mr. Fair to come up with modifications and if he could not think of a way, then she offered her suggestions. An example is from the 10th conference:

Ms. Johnson: Did you expect them to know what an augmented matrix was?
[Questioning/Clarifying]

Mr. Fair: No, I didn't expect them to know what that meant.

Ms. Johnson: Okay, your questions almost sounded like you expected them to know [Describing].

Mr. Fair: yeah.

Ms. Johnson: Okay, and if you were gonna do that again, would you do something different? [Questioning/Requesting opinion]

Mr. Fair: Probably try to slow down a little bit for them [Explaining].

Ms. Johnson: You even mentioned that you had experienced doing it by hand?
[Questioning/Confirming]

Mr. Fair: Hmmm

Ms. Johnson: And had you thought about showing them what, what that, what's, what's really happening there? [Questioning/Requesting opinion]

Mr. Fair: yeah

Ms. Johnson: Had you thought about doing that?

Mr. Fair: Maybe but I was concerned about time I think and it's kind of time consuming if you do one of those type of problems [Explaining].

Ms. Johnson: Well, what about two by two? [Suggesting]

Mr. Fair: Just the two by two, that wouldn't have been too bad and maybe because seeing the connection with it [Explaining]. (Post-lesson conference-10)

In this conversation, the cooperating teacher requested Mr. Fair to come up with a possible modification to the lesson by asking "If you were gonna do that again, would you do something different?" She then posed further questions to guide Mr. Fair's thinking. She offered a nondirective suggestion by saying "Well, what about two by two?" Overall, this part of the conference provided Mr. Fair opportunities to reflect on his lesson.

I would like to close this section with a final example. In the ninth conference, Ms. Johnson asked Mr. Fair to explain what his goals were for the lesson and for a problem he did in that lesson. Then she described her observations before posing a reflection question and also connected her question to the student teacher's goal. Here is their conversation:

Ms. Johnson: ok, when you were doing the problem, you launched right into and told them what the matrices are gonna be {Describing}, do you know what I'm talking about? [Questioning/Confirming]

Mr. Fair: You mean like the dimensions of them?

Ms. Johnson: that

Mr. Fair: or what they represent? [Questioning/Clarifying]

Ms. Johnson: and what they represent exactly. Ok, so you gave them all that work before they ever read the problem.

Mr. Fair: Ok.

Ms. Johnson: And so they were just entering numbers, you told them what the numbers were and in fact, they were on the screen, you know. [Describing]

Mr. Fair: yeah.

Ms. Johnson: So that problem ended up being a practice problem for adding or subtracting matrices and I don't know that the application did hold [Assessing].

Mr. Fair: right

Ms. Johnson: You know because it became secondary. And I was thinking because what you were really trying to get them to do at that point was more than how to enter it in the calculator [Explaining]. What is something that you could have done maybe first that would have made it? [Questioning/Requesting opinion]

Mr. Fair: I don't know, maybe not put those values up there for them, just have them do it themselves. And then go around, check their work and then actually go back and then do the problem with them [Explaining].

Ms. Johnson: Ok, but they needed to know how to put it into calculator, right? [Questioning/Confirming]

Mr. Fair: yeah, that's the thing. They have never done that before [Describing].

Ms. Johnson: Is there, I'm trying to pull something out of you to help you, did you need to start with the problem...? [Questioning/Requesting opinion]

Mr. Fair: You mean, maybe I could have done like another one just the basic addition or subtraction problem? [Questioning/clarifying]

Ms. Johnson: yeah, if you really wanted them to study the world problem and understand how to do that application [Explaining]

Mr. Fair: Hhmmm

Ms. Johnson: you might have said "Ok, I'm gonna teach you first how to enter it into the calculator, let's just do this real easy one.

Mr. Fair: yeah.

Ms. Johnson: And now, read through this one. See if you can find the

Mr. Fair: right

Ms. Johnson: the correct matrices [Suggesting]." I just, you were trying to do the both at the same time and the focus was the calculator at that point [Describing], so I think you lost track of which you thought was a good application, you know. So I was thinking about that, it was a neat application, you and I had talked about it beforehand, but it got lost in that [Assessing]. (Post-lesson conference-9)

I had two main observations about this conversation. First, the cooperating teacher formed a base for her question by using her classroom observations and the student teacher's goal for the application problem. Then she asked, "What is something that you

could have done maybe first that would have made it?” This helped the student teacher understand the purpose of the question and he suggested a modification aligned with his goal for asking the application problem. Then, the cooperating teacher posed another question to support Mr. Fair’s thinking: “Ok, but they needed to know how to put it into calculator, right?” Similar to the other examples given in this section, this communication type of the cooperating teacher resembled educative supervision more than traditional supervision.

My second observation was that after the student teacher asked, “You mean, maybe I could have done like another one just the basic addition or subtraction problem?” the cooperating teacher responded without asking any further questions of Mr. Fair. She offered suggesting, explaining, describing, and assessing communications. I thought that she could have asked more questions to the student teacher about why his suggested modification might have worked better. I believe that how to offer suggestions is an important point when discussing educative supervision with cooperating teachers. In her final interview, Ms. Johnson had a concern about implementing educative supervision. She thought that she had 33 years of teaching experience and naturally was able to think about possible modifications for a lesson easier than a new teacher. She questioned why she should hold her suggestions to herself and not offer them to the student teacher. Educative supervision does not suggest not sharing any suggestion with the student teacher. This point was not sufficiently discussed during the program in a way that addressed her concerns. I observed that participating cooperating teachers tended to offer suggestions without posing questions to the student teachers about those suggestions. The important point while sharing suggestions is to have the student teacher think about them. This idea should be discussed in programs that aim to support cooperating teachers’ supervision of student teachers in ways aligned with educative supervision.

Ms. Johnson’s Supervision Style after the Program was Implemented

In this section, I will present the findings about the supervisory beliefs, practices, and knowledge of Ms. Johnson after the program was implemented. Most of these findings came from the final interview with Ms. Johnson. The initial interview questions

as well as some additional questions were asked in the final interview. There were some similarities and differences between the initial and final interview findings. One similarity with the initial interview was that Ms. Johnson thought that the student teachers learned how to teach by how they were taught and in order to break this chain, Ms. Johnson explained that she tried to have her student teacher experience teaching methods other than the traditional method in her classroom.

Ms. Johnson and Mr. Fair, like the other pairs, had daily multiple talks about Mr. Fair's teaching. When they sat and talked about a specific lesson, Ms. Johnson's goal was "To try to help him be able to reflect on his lesson, and to be able to see what worked and what didn't work and then to try to give him my point of view" (Final interview). In the final interview I asked Ms. Johnson to describe their typical post-lesson conferences. Her comments below reflected a difference in her supervision style compared to her initial comments in the initial interview:

And sometimes I actually went down the list [her observation notes], I tried to get better than that as you tried to instruct me and maybe I shouldn't point out what he was doing wrong, make him figure out what he is doing or what I think he is doing wrong, or what didn't work and why it didn't work. So I would, I adjust it, you know I wouldn't just say this happened because, you know, I might say "I noticed this happened, what do you think?" you know let him talk about it. Well, before I would probably just say "this happened because," you know. (Final interview)

This comment indicated that instead of telling her assessments directly to her student teacher, Ms. Johnson posed questions to her student teacher to help him think about his teaching.

One of several pieces of evidence that showed a change in the supervision style of Ms. Johnson came from her comments in the scenario post-lesson conference during the final interview. Content-wise her comments in the final interview were similar to the ones in the initial interview; she basically talked about student involvement, conducting the experiment in groups, and explaining the volume formula more in detail. However, her communication style was different compared to her style in the initial conference. I will briefly describe this simulated post-lesson conference. We role-played together where I

was the student teacher and she was the cooperating teacher upon her request. Initially she asked, “I think the kids kind of enjoyed the manipulatives... you sure were able to get across point to a lot of the kids... how did you feel about it? Did they pick up what you wanted them to pick up?” (Final Interview) I told her that I thought that the students did fairly well in the lesson. Then she stated that some kids at the front were involved and then she asked, “What about some of the kids in the back?” When I said “I could have showed more effort to maybe involve them in the lesson,” she asked “Do you, well, good, that, how could you have done that?” The conversation continued in a similar tone except that she made more explanations and suggestions in the remaining conversation. However, she kept asking questions and tried to learn what the student teacher’s goals were in conducting the lesson that way. For example, after she asked me some questions about student involvement, she said:

You could have gotten them to do maybe do it in the groups or whatever and then maybe they could have, some, some of them could have ownership for cylinders A, and some of them for cylinders B and you probably could have some different sets. ..Otherwise I think you, you know you kept them engaged but was there a good reason for keeping it all at the front of the room? (Final Interview)

In the excerpt above, she suggested a design for doing the lesson differently, but she also sought the student teacher’s insight in doing the lesson the way she did. In the final interview, she posed seven questions in this scenario post-lesson conference whereas she posed only two questions in the initial interview. The comparison of her comments to the same video clip revealed differences in the communication styles she used in the initial and final interviews. In the final interview she was more interested in learning what the student teacher’s goals were and in having the student teacher reflect on her teaching.

In his final interview, Mr. Fair talked about a similar change occurring in Ms. Johnson’s supervision style throughout the semester. When he was asked to describe a typical post-lesson conference that he had with Ms. Johnson towards the end, he said:

Well, towards the beginning she was kind of giving me, it was kind of more one sided, like she was telling me things that I should have improved on and then near the end she is more like she was asking me questions on or “What could you have done here?” and I was doing more of the explaining, I think. (Final Interview)

So, Mr. Fair observed a change in their conferences where he had more opportunities to talk and explain his reasoning towards the end of the semester. When all the evidence was triangulated there seemed to be a shift in the supervision style of Ms. Johnson towards the educative side of the supervision spectrum.

Summary of the Change in the Supervision Style of Ms. Johnson

The initial data about pair-3 indicated that while discussing the specific lessons, the cooperating teacher in the beginning of the semester directly conveyed her feedback to the student teacher about his teaching in the form of assessing, describing, suggesting, and explaining communications. Both Ms. Johnson and Mr. Fair described their initial conferences as exchanges where the cooperating teacher listed the weak and strong points of the student teacher's teaching. In the scenario post-lesson conference in the initial interview, the cooperating teacher's types of communications mainly consisted of describing, suggesting, explaining, and assessing. This was the case in pair-3's recorded initial post-lesson conferences as well. Asking open-ended questions for the student teacher to reflect on his teaching did not seem to be Ms. Johnson's focus initially in the semester, especially when they were discussing the specific lessons that Mr. Fair taught. However, she posed reflection questions in conversations when they covered general reflections over the prior weeks.

I analyzed 10 post-lesson conferences that pair-3 conducted throughout the semester from the following perspectives: percent of talking done by each participant, content analysis, and communication type analysis. These analyses revealed some changes in their conferences throughout the semester. First, the percent of talking done by the student teacher noticeably increased in the conferences that were conducted after the discussion of educative supervision in the program. Second, the content analysis for pair-3 showed that the amount of conversation about classroom management decreased whereas the amount of conversation about mathematics pedagogy increased throughout the semester. Furthermore, the depth of conversations on mathematics pedagogy increased in the conferences towards the end of the semester. Third, the analysis of the types of communications used by Ms. Johnson and Mr. Fair showed that in the

conversations where specific lessons were discussed, the cooperating teacher moved from conveying her comments on the student teacher's teaching to asking questions to the student teacher to have him reflect on his teaching and then conveying her feedback. This was an important change that indicated a shift in her supervision style to the educative side of the supervision spectrum.

The final interviews with Ms. Johnson and Mr. Fair confirmed the changes mentioned in the previous paragraph. In the scenario post-lesson conference in the final interview, Ms. Johnson posed questions throughout her talk. Additionally, when she was asked what her goal was as a cooperating teacher, she said that her goal was to help Mr. Fair be able to reflect on his teaching. In the final interview, Mr. Fair expressed that Ms. Johnson was telling him the weak and strong points of his teaching in their post-lesson conferences towards the beginning of the semester. However, he described that Ms. Johnson increased questioning him about his teaching in the post-lesson conferences as the semester progressed. Mr. Fair explained that he had more opportunities to explain his point of views in the conferences towards the end compared to the ones in the beginning of the semester.

In conclusion, the data analysis suggested that Ms. Johnson's supervision style moved from being more traditional to being more educative. Importantly, the changes in her style of supervision were noticed by the student teacher. However, similar to the other two cooperating teachers, Ms. Johnson tended not to use classroom incidents to form a base for her questions. Unlike the other cooperating teachers, I did not observe a lack of active listening on the part of Ms. Johnson during supervisory conferences with Mr. Fair. However, I observed that there were opportunities where she could have had her student teacher think more deeply on the issues that they were discussing. For instance, she offered some suggestions and did not use them as a discussion topic with her student teacher. When and how to offer suggestions to student teachers seems to be a concern that may be discussed and practiced in future supervision programs.

Summary of the Changes in the Supervision Style of the Cooperating Teachers

In the previous sections, I discussed the cooperating teachers' beliefs, practices, and knowledge on the supervision of mathematics student teachers. I also presented findings from their post-lesson conferences with their student teachers throughout the semester. In all three cases the data indicated some changes in the supervision style of the cooperating teachers towards the educative supervision. First, the percent of talking done by the student teachers in the post lesson conferences increased after the discussion of educative supervision in the program. Secondly, mathematics pedagogy became the most discussed content category. Furthermore, the depth of talks on mathematics pedagogy grew. Thirdly, the cooperating teachers moved away from conveying their feedback directly to the student teachers; they started asking open-ended questions to have the student teachers reflect on their teaching. Finally, having student teachers reflect on their teaching became a central goal for all of the cooperating teachers.

During the analysis of the cooperating teachers' conversations in the post-lesson conferences, I made several observations concerning areas in their supervision practices where the cooperating need further support in their development of educative supervision. First, the cooperating teachers usually did not utilize classroom incidents to ask questions to the student teachers. Classroom incidents may be valuable to help the student teachers connect theory to practice. Blanton et al. (2001) suggested supervisors have a focus that derives from the student teachers' classroom experience. Secondly, the majority of the time, the cooperating teachers did not use their suggestions as a discussion topic. They provided their suggestions with or without explanations and then continued to discuss something else. Lastly, I observed that two cooperating teachers had a communication pattern where they posed a question to the student teacher, received their input, and then provided feedback. They did not use follow-up questioning to further dig at the student teachers' thinking. At times, their conversations indicated a lack of active listening on part of the cooperating teacher. Clinical supervision advocated active listening as an important character of a clinical supervisor (Florida Department of Education, 1999).

I summarized my findings about the change in the cooperating teachers' supervisions in Table 5.10. "Initial" refers to the initial data about that column's category before the discussion of educative supervision in the program and "Later" refers to the findings in that category after the discussion of educative supervision.

Table 5.10. Summary of the Change in the Supervision of Cooperating Teachers

		Amount of Conversational Time used by each participant in Post-lesson conferences	Content of the Post-lesson conferences	Communication Types used by the Cooperating Teachers in their Post-lesson Conferences	Goals as a cooperating teacher
Pair-1	Initial	Ms. Cook: 2% Mr. Fletcher: 98%	General Pedagogy and General Teacher Growth were the main content categories that were discussed; student involvement, teaching at a level that students could understand, discipline and the 12 accomplished practices.	Feedback on specific lessons included Assessing, Describing, Suggesting, and Explaining communication types. Most suggestions were explained and most assessments were positive.	Give feedback when student teachers need help, help them build confidence, and help them have a positive experience.
Pair-1	Later	Ms. Cook: 41% Mr. Fletcher: 59%	They mainly talked about Mathematics Pedagogy content category; students' understanding of concepts, Ms. Cook's evaluation of her goals, student involvement, connecting mathematics with real life and handling discipline.	Mr. Fletcher used Questioning, Suggesting, Explaining, and Assessing communication types. His general communication pattern was questioning Ms. Cook-receiving her opinion-providing feedback.	Obtain student teachers' feedback, have them reflect on their teaching, keep them focused on their goals.

Table 5.10. Continued

		Amount of Conversational Time used by each participant in Post-lesson conferences	Content of the Post-lesson conferences	Communication Types used by the Cooperating Teachers in their Post-lesson Conferences	Goals as a cooperating teacher
Pair-2	Initial	Ms. Williams: 45% Ms. Taylor: 55%	They mostly talked about General Pedagogy, Classroom Management, and General Teacher Growth content categories; student involvement, student-student interactions, questioning techniques, organization techniques, time management, role of the teacher, Ms. William’s feelings, and correct use of mathematics language.	Feedback on specific lessons included Assessing, Describing, and Suggesting communication types. Ms. Taylor posed some reflection questions when they were discussing the overall growth of Ms. Williams. The majority of suggestions were unjustified and the majority of assessments were positive.	Help student teachers gain confidence, set goals, and have a positive experience, and be there to talk everyday.

Table 5.10. Continued

		Amount of Conversational Time used by each participant in Post-lesson conferences	Content of the Post-lesson conferences	Communication Types used by the Cooperating Teachers in their Post-lesson Conferences	Goals as a cooperating teacher
Pair-2	Later	Ms. Williams: 54% Ms. Taylor: 46%	The most discussed content categories included Mathematics Pedagogy, Classroom Management, and General Pedagogy; Ms. William’s reasons for the choice of questions, students’ understanding of concepts, student involvement, student-student interaction, representations, organization, time management, and connecting with students.	Ms. Taylor used Questioning, Assessing, and Describing communication types most in the post-lesson conferences. Most suggestions were not offered with explanation, most assessments were positive. The general communication pattern was questioning the ST-receiving ST’s opinion-providing feedback	Help student teachers develop reflection, self confidence and self critiquing.

Table 5.10. Continued

		Amount of Conversational Time used by each participant in Post-lesson conferences	Content of the Post-lesson conferences	Communication Types used by the Cooperating Teachers in their Post-lesson Conferences	Goals as a cooperating teacher
Pair-3	Initial	Mr. Fair: 27% Ms. Johnson: 73%	Classroom Management, General Teacher Growth, and General Pedagogy were the most discussed content categories. The specific topics included discipline problems, time management, Mr. Fair's feeling as a teacher, questioning techniques, motivation, student involvement, making detailed explanations, and students' understanding of concepts.	Feedback on specific lessons included Assessing, Suggesting, Explaining, and Describing communication types. Ms. Johnson posed some reflection questions when they were discussing the overall growth of Mr. Fair. The majority of suggestions were justified and the majority of assessments were positive.	Give advice, help them when they make mistakes, help them build confidence

Table 5.10. Continued

		Amount of Conversational Time used by each participant in Post-lesson conferences	Content of the Post-lesson conferences	Communication Types used by the Cooperating Teachers in their Post-lesson Conferences	Goals as a cooperating teacher
Pair-3	Later	Mr. Fair: 50% Ms. Johnson: 50%	Mathematics Pedagogy was the most discussed content category. Some topics that they discussed included students' understanding of concepts, students' grades, motivation, possible activities, real life applications, handling discipline, Mr. Fair's assessment of his teaching, his goals for the lessons, his feelings, and what he was learning in the process.	Ms. Johnson used Questioning, Describing, Assessing, and Explaining communication types most in the post-lesson conferences. Most suggestions were offered with explanation, most assessments were positive.	Have student teachers reflect on their teaching, help them build confidence

What did the Cooperating Teachers think about the Program?

At the end of the semester, each cooperating teacher completed a written survey and reflected on the program activities. I will refer to this survey as a “reflection survey.” The reflection survey included questions that focused on how the program supported the cooperating teachers’ knowledge in reform ideas in mathematics education (question-1), what they thought about educative supervision and some program activities (questions 2,

3, 4, and 5), and some general reflection questions on the program (6-13). Some questions were open-ended whereas some questions involved a likert-scale with five response options ranging from strongly disagree to strongly agree. In addition to this survey, the final interview included questions to learn about the cooperating teachers' overall reflections on the program.

Mr. Fletcher chose the "somewhat agree" options on the questions related to how the program supported his knowledge in reform in mathematics education. His explanation in this part was very similar to his comments in the beginning of the semester; a blend of styles will be more effective. His choices on the questions related to educative supervision and program activities were mostly "strongly agree." According to him, learning educative supervision was valuable. Mr. Fletcher explained this as "Various perspectives and techniques were discussed and it opened my eyes to ways I could enhance my supervision, and better allow my interns to think & reflect about their efforts" (Reflection survey). Another example of his reflections on program activities was related to the fourth face-to-face meeting. He wrote that "Allowing them to express their feelings, observations, and opinions regarding any particular situation. Listening to the Interns reflections better allows the supervising teacher to provide guidance where it is most needed" (Reflection survey). Mr. Fletcher and Ms. Cooks' post-lesson conferences showed that Mr. Fletcher's supervision moved from the traditional side to the educative side of the supervision spectrum. In the reflection survey, for one question he wrote that "The adjustments I have made are a direct result of what I learned from this program. They are very sound and effective modifications" (Reflection survey). Overall, Mr. Fletcher evaluated the program very positively.

Mr. Fletcher's final interview responses were similar to his survey responses regarding the overall evaluation of the program. However, in the final interview he commented that the online discussions were not as effective as the face-to-face meetings. He compared the face-to-face meetings with the online discussions as follows:

And it's easier to me, like when you compare that online. It's easier for me to hear that from somebody and then if that sparks something, I can ask it immediately and not have to type something in and wait for days to get an answer. So, the face-to-face, I like a lot. I thought that was good. (Final interview)

He also stated that time was a problem for him to go online and write comments. I think his comments above were shared by all of the cooperating teachers. For example, Ms. Johnson commented that the online environment did not produce rich discussions in the program. She said that initially she was willing to participate fully in the online discussions, but the other teachers were not into it. Similar to Mr. Fletcher, Ms. Johnson expressed that the face-to-face meetings were beneficial. She wrote on the reflection survey that it is “Always good to share experiences.” In her final interview, she commented as follows: “I really enjoyed that because I learned, I learned, you know what was going on in other classes and what was going on in their minds and this made a little bit aware of maybe some of my shortcomings” (Final interview).

Ms. Johnson’s choices for the questions on learning the reform ideas indicated that she did not gain a great deal of knowledge about the reform by participating in this program. She indicated that she was already familiar with the reform ideas in mathematics education. However, she expressed that she found the educative supervision important for cooperating teachers. For the questions that asked her to evaluate the program activities, she wrote that she “changed approach to talk about class notes” (Reflection survey). In the final interview, she elaborated on this as follows:

Sometimes I actually went down the list, I tried to get better than that as you tried to instruct me and maybe I shouldn’t point out what he was doing wrong, make him figure out what he is doing or what I think he is doing wrong, or what didn’t work and why it didn’t work. So I would, I adjust it, you know I wouldn’t just say this happened because, you know, I might say “I noticed this happened, what do you think?” you know let him talk about it. (Final interview)

She indicated that she started asking open-ended questions and let her student teacher talk about his teaching more as she participated in the program. This change was observed in their post-lesson conferences throughout the semester. Ms. Johnson connected educative supervision to reform ideas in mathematics education. She noted that “Like our own classroom students, don’t just give student teachers info. Make them discover it.”

Even though Ms. Johnson found educative supervision valuable and changed her supervision style as a result of participating in the program, she had some conflicts about it. In the final interview, when I asked what her opinion was on the two supervision

approaches (traditional vs. educative) that we have discussed in the program, she commented as follows:

I, a little, I want you to know I am still a little confused about it because I think to a certain extent that the time that he spends or any intern spends with their directing teacher that my knowledge, things that have happened to me, and see I have tried to think about this in terms of teaching math, you know. And I have tried to you know discovery versus inquiry versus lecture, you know all these stuff and I have been thinking about this and what makes sense. You know, when I'm if I sit there and I try to get him to figure out all the things that he might have been able to do or whatever, he is gonna give me several comments but I'm sitting on five things that I would have done because I've taught for 30 years. I want him to know those five things. (Final interview)

She further elaborated on this concern and it reflected a similarity between her beliefs on educative supervision and reform ideas in mathematics education. In the first online discussion, she expressed some concerns related to implementing reform ideas in her classroom. In the final interview, I explained to her that educative supervision did not propose that supervising teachers never made suggestions to their student teachers. The central idea was to help the student teacher think about the proposed suggestions. Then, she said that she was not sure when to make suggestions and when to ask questions. This and similar comments from the other cooperating teachers brought two implications for future studies. First, the programs should offer cooperating teachers more opportunities to implement educative supervision in collaborative settings. Specifically, they should be given opportunities to discuss how to offer suggestions to student teachers. This will better resolve the concerns of the cooperating teachers regarding educative supervision. Secondly, the teachers' current beliefs in teaching mathematics seemed to affect their approach to educative supervision. This was apparent in the case of Ms. Johnson and Mr. Fletcher. Both cooperating teachers' approaches to educative supervision resembled their approaches to reform ideas in mathematics education. Accordingly, the teachers' current beliefs on teaching and learning might be an indicator of their reaction to educative supervision.

Similar to Ms. Johnson, Ms. Taylor stated that she already knew about the reform ideas in mathematics education before participating in this program. In fact, it was not the main goal of the program to teach the cooperating teachers about reform ideas in mathematics education. Therefore, this result was an expected finding. In most of the remaining questions, Ms. Taylor indicated that participating in the program was not a valuable activity for her. She stated that there was no real purpose in the program. Additionally, time was a limitation for her. Time as an obstacle was evident in her participation in the online discussions. Her comments were very short and she did not write any comments to any other cooperating teacher. She also did not read their comments.

It was interesting that for the following question “Educative supervision should be taught to prospective cooperating teachers in a ‘supervising student teachers’ course,” Ms. Taylor wrote the following comment: “No. Most directing teachers come with years of experience and they have found what works for them” (Reflection survey). In the final interview, on this comment, she elaborated that changing teachers was difficult and it was “a wrong battle.” When I asked about teaching educative supervision to prospective cooperating teachers, she said that it was okay. She probably misunderstood the question in the written survey. However, her explanation indicated that she did not believe that her participation in the discussions would make an impact on other teachers’ supervisory practices. Conversely, this might suggest that she did not participate in the discussions to learn from the other teachers and change her supervisory practice. Additionally, in the final interview, Ms. Taylor told me that she already took a course on supervising student teachers and there was not a need to take another one. She also believed that she was a good supervising teacher based on her previous student teachers’ feedback. However, she also added “not that I can’t get better” (Final interview). When I asked her what she liked about her supervision, she said, “That I developed strong relationships with them and we carried a common goal of caring about students” (Final interview). I concluded from data about Ms. Taylor that she felt content with her practice as a cooperating teacher. When this feeling is combined with time restrictions, she did not have a strong motive to participate in the program.

As presented in a previous section, in contrast to her perception about the program, I observed a change in the supervision style of Ms. Taylor towards educative supervision. Her student teacher, Ms. Williams, also observed such a change. When I asked Ms. Taylor if she thought the program had any effect on her supervision or not, she said that she did not think the program had any effect on her supervision. Then, I talked with her about Ms. Williams' and my observations regarding the change in her supervision style. Ms. Taylor's response was: "So, maybe without realizing it" (Final interview). In her final interview, Ms. Taylor expressed that she liked the reflection component of the program. For a question on educative supervision in the reflection survey, she wrote that it "Helped to remind me to listen." Based on all the data, I concluded that the changes in her supervision style were partly due to the program. I think that the program helped Ms. Taylor engage Ms. Williams in reflecting on her teaching during their post-lesson conferences. She valued reform minded teaching. Her comments and her classroom tasks indicated that her teaching method was aligned with reform ideas in mathematics education. Nevertheless, data showed that her initial supervision was traditional. Therefore, she did not transfer her reform minded teaching to her supervision style. I think, the program activities reminded her to particularly engage her student teacher in reflection with her in their post-lesson conferences. By engaging in the program activities, she might have examined her supervisory beliefs and practice, perhaps without aware of doing so, and modified her practice to be aligned with an educative perspective. Additionally, in my visits with Ms. Williams, I conducted triad post-lesson conferences and modeled educative supervision. Ms. Taylor's latter post-lesson conferences resembled components from the post-lesson conferences that I conducted with them such as the discussion of the lesson in parts and in detail with the student teacher.

In conclusion, Mr. Fletcher and Ms. Johnson evaluated the program positively and engaged in the program activities with motivation to learn more about educative supervision. On the other hand, Ms. Taylor did not participate as much as the other two teachers. She stated that she did not benefit from the program to a great extent. Her belief that she was a competent cooperating teacher seemed to be a factor in her engagement in and utilization of the program activities.

What did the Student Teachers think about the Change in the Supervision Style of their Cooperating Teachers?

Until the end of the semester, I did not talk in detail with the student teachers about the program. I wanted them to answer my questions as objectively as possible. All three student teachers perceived a change in the supervision style of their cooperating teachers that could be described as more educative than traditional. They all indicated that they started talking more and they were given more opportunities to reflect on their teaching and on their goals. Their observations about the change in the supervision style of their cooperating teachers were aligned with my findings from their post-lesson conferences throughout the semester.

In the final interview, I asked all of the student teachers what they thought about the change in the supervision style of their cooperating teachers. They all talked positively about it. For example, Mr. Fair said, “I liked the second version [educative supervision] better because it gave me a chance to explain my side of it, my whole theory and things I guess” (Final interview). In the fourth face-to-face meeting, all of the student teachers expressed that they found it valuable that their cooperating teachers provided them opportunities to express their ideas in their post-lesson conferences. For instance, Ms. Williams spoke as follows:

I think one thing that we’ve tried to do in our evaluations is, uh, Lauren is really good about saying, you know, how do you think this part of the lesson went? You know, the kind of reflect on it kind of thing, and so instead of her being like I think you did this and this and this and this and on this part you asked this question and I think you should do it this way, she lets me reason through how I could do each part better. So, I’m really doing most of the talking. (Fourth face-to-face meeting)

At this point, I would like to note that in her final interview, Ms. Williams explained that Ms. Taylor’s supervision initially in the semester focused more on telling her what to do than receiving her opinions and digging at her thinking. It was interesting that Ms. Williams called their post-lesson conferences as “evaluation.” In the section about Ms.

Taylor's supervision style, I elaborated on some tensions between Ms. Taylor and Ms. Williams. Especially, in the beginning of the semester, Ms. Taylor was evaluative and this caused Ms. Williams to get defensive and see their post-lesson communications as an evaluation of her teaching. However, later in the semester, Ms. Taylor requested that Ms. Williams explain her opinions on teaching and learning issues and Ms. Williams was pleased with this change.

In the final interview with the student teachers, I had them re-examine the two post-lesson transcripts that they read in the fourth face-to-face program meeting. My goal was to understand more about their perceptions on different supervision styles. I asked them to circle the communications that they found valuable on the transcripts. The student teachers comments on the transcripts revealed two common observations that they made and they liked about each supervision type. First, they all pointed out that providing positive feedback was important. For example, Ms. Williams said, "I like the positive, instead of just having like criticism after criticism after criticism, I like um, here it said the cooperating teacher said, 'You are working very hard and I'm proud of you. You're getting stronger with'" (Final interview). Similarly, Ms. Cook talked about the importance of positive feedback so that she knew what she was accomplishing. She also added that the suggestions from the cooperating teachers were important in order to know what things to work on.

The second commonality in their comments was that they valued the open-ended questions that the cooperating teacher posed to the student teacher in the conference; these were aligned with educative supervision. For example, Mr. Fair said, "I thought that was kind of neat, problem solving, explains that, it is more open-ended, that's a good question I think, more of an open-ended question, lets the student teacher explain" (Final interview). Similarly, Ms. Cook said, "That's what this stuff is, how do you think you could have done differently, I think that's important for self reflective reasons like it makes you think about it and start to say 'Well, I should have done this'" (Final interview). Ms. Williams differentiated between general open-ended questions and open-ended questions that targeted the specific parts of a lesson. Ms. Williams liked the general reflection questions because:

I like that the cooperating teacher asked, “Is there anything else you would like to discuss?” and I know that that sounds very broad, but it’s nice to give a student teacher an opportunity to say “hey, yes, I’d like to discuss the problem that I had with this student today,” or “I’d like to discuss,” you know, something other than what they’ve already discussed, or something other than the lessons. (Final interview)

She also liked the open-ended questions that targeted specific parts of a lesson “because it’s specific. It’s reflecting on just these fifteen minutes instead of saying what did you think about the lesson in general...that’s a good question, but it’s nice to say, you know, I’d like to talk about the warm-up” (Final interview).

They also paid attention to the content of the conversations. Conversations on the use of vocabulary, group work, reasoning, problem solving, multiple representations, and questioning techniques were mentioned by the student teachers as important conversations. In particular, Mr. Fair paid attention to the content of the conversations and he commented that talking about those aspects of teaching was important because those components were what student teachers improved slowly.

In summary, for the student teachers it was valuable that their cooperating teachers gave them opportunities to explain their opinions, goals, and reflections on their teaching. They also found it important that the cooperating teacher provided positive feedback to them. Suggestions from the cooperating teachers were viewed as helpful for their growth. These findings were parallel to what the student teachers found valuable about cooperating teachers in related literature (Beck and Kosnik, 2002; Koerner & Rust with Baumgartner, 2002). Similar to the literature, the student teachers in my study valued emotional support and feedback from their cooperating teachers. However, different from the previous research findings, the student teachers in this study spoke on the importance of reflective questions that their cooperating teachers posed to them in their post-lesson conferences. This difference might have happened due to the change in their supervisor’s supervision style. They recognized that change and valued the new reflection questions. Their participation in one program face-to-face meeting might have been another factor for them to comment noticeably about the reflection component of supervisory communications.

CHAPTER-6

DISCUSSION AND CONCLUSIONS

This chapter will include two sections: discussion and conclusions. In the discussion section, I will summarize the findings and discuss their significance in light of previous research. In the conclusions section, I will write concluding remarks and make recommendations for future studies.

Discussion

Research studies have shown that cooperating teachers exert the main influence on student teachers' practice during their student teaching experience (Feiman-Nemser & Buchmann, 1987; Frykholm, 1996; Vacc & Bright, 1999; LaBoskey & Richert, 2002). Therefore, how they carry out their role is very important for having an educative student teaching experience. Several researchers called for a need to help the cooperating teachers become teacher educators (Painter & Wiener, 1979; Feiman-Nemser & Buchmann, 1987; Borko & Mayfield, 1995). Borko and Mayfield suggested that university supervisors may support cooperating teachers in enacting their role as teacher educators. Aligned with the suggestions of teacher education researchers, the program in this study was designed to support the supervisory knowledge and practice of three mathematics cooperating teachers where the university supervisor actively engaged in the program activities.

In this study, I investigated how the program supported the supervisory knowledge and practice of the participating cooperating teachers. The program focused on educative supervision. Through online discussions and face-to-face meetings, it provided the cooperating teachers with opportunities to gain new knowledge, reexamine their current beliefs, and reflect on their practice regarding the supervision of student teachers. The university supervisor acted as the facilitator of their discussions.

Additionally, the university supervisor modeled educative supervision in program activities and in triad post-lesson conferences during her regular visits to the student teachers' classrooms. Educative supervision was discussed to a great extent in the program activities and was suggested to the cooperating teachers as an alternative supervision to traditional supervision. Educative supervision puts the student teachers as active constructor of their knowledge about teaching (Blanton et al., 2001). The supervisor's role in this kind of supervision is to structure the student teachers' thinking by posing open-ended questions, being sensitive to their ZPD, and discussing critical incidents from their teaching. Although, it was not the focus of the study, reform ideas in mathematics education were also discussed in some of the program activities to help the cooperating teachers obtain a focus for their classroom observations and post-lesson conferences. Additionally, it was thought to help the cooperating teachers better understand what the student teachers had been learning in their teacher education program.

Data analysis showed that the participating cooperating teachers' initial supervision style changed towards educative supervision as they participated in the program activities. First, the percent of talking conducted by the student teachers in the post-lesson conferences increased after the discussion of educative supervision in the program. Secondly, mathematics pedagogy became the most discussed content category in their latter post-lesson conferences. Furthermore, the depth of talks on mathematics pedagogy increased. Borko and Mayfield (1995) found that the cooperating teachers and student teachers had superficial conversations about pedagogy, mathematics, mathematics-specific pedagogy, and students in their conferences. This was the case in my pilot study as well. As a result, the finding that the pairs started having longer and deeper conversations on mathematics pedagogy in their post-lesson conferences is an important success on the part of the program. The third aspect of change in the cooperating teachers' supervision occurred with respect to the communication types that they used in post-lesson conferences. The cooperating teachers moved away from conveying their feedback directly to the student teachers; they started asking open-ended questions to have the student teachers reflect on their teaching. This is a key component of educative supervision (Blanton et al., 2001). "Having student teachers reflect on their

teaching” became a central goal for all of the cooperating teachers by the end of the program. In summary, the program helped the cooperating teachers to modify their supervision towards more educative supervision.

Although the program produced positive changes in the participant teachers’ supervision style, there were some challenges for the program to achieve its goals. All of the cooperating teachers had established supervision styles prior to participating in the program. They all had positive experiences with their previous student teachers. When the program started, none of the teachers had a conflict or dissatisfaction related to their supervision. Their expectations from the program were not related to advancement of their supervision style. In other words, the teachers did not have internal motivations to change their existing supervision styles in the beginning of the program. Hashweh (2003) proposed that conflict between the goals and practice was important for teacher change. This was not the case at the beginning of the semester. Hashweh further commented that through reflection, deliberation, and discussion, teachers could gain internal motivation for change because they may realize some conflicts between their goals and practices. I believe that the program activities helped the participating teachers examine their current practice under the light of educative supervision. In particular, Mr. Fletcher and Ms. Johnson got motivated to learn about the program’s philosophy on supervision and reflected what they learned in the program through their supervisory practice. However, the program was not successful enough to motivate Ms. Taylor to engage actively in program activities. Having an established supervisory practice seemed to be an obstacle for the program to accomplish its goals.

The second obstacle was time. All of the participating cooperating teachers commented that time was an obstacle for them to engage in the program activities. Future program designers might think about ways to make their programs more appealing to the teachers. One participant mentioned that if participants earned inservice points as a result of participating in such a program, it would be more appealing to cooperating teachers. Teachers in this state need to renew their teaching certificate every five years. Earning 60 inservice points is one of the options that they may fulfill in order to get re-certified (Florida Department of Education, 2005). Teachers could earn inservice points by participating in this kind of program. A similar suggestion was offered by Arnold (2002)

as a result of analyzing a study group composed of five cooperating teachers. Similar to Arnold's findings, I found that the participants shared ideas with each other, engaged in collective problem solving, increased their knowledge in supervision, and modified their supervisory practice. Consequently, participation in these kinds of programs may fulfill, at least in part, teachers' professional development requirements.

One observation that I made concerning the program was that the teachers' beliefs about learning and teaching mathematics was related to their reaction to educative supervision. This was clearly evident in the case of Mr. Fletcher and Ms. Johnson. Both teachers approached educative supervision in a way that was similar to how they approached reform ideas in mathematics education. In the program activities, the discussions on learning, learning to teach, and supporting the student teachers' growth produced noteworthy conversations and pointed to "reflection" as a major thinking tool for helping the student teachers to improve their teaching. Reflection was a shared value for all of the teachers. The reflection component of educative supervision made it appealing to all the participant teachers, no matter what they thought about the mathematics education reform.

The case of Ms. Taylor indicated an important result. Even though she valued the reform ideas in mathematics education and her mathematics instruction was parallel to reform-based instruction, her initial supervision resembled traditional supervision more than the educative supervision. In other words, she did not transform her instruction in her mathematics classes to her supervision in the post-lesson conferences with Ms. Williams. Some research studies found a parallel between effective teachers and effective supervisors (LaBoskey and Richert, 2002; Beck and Kosnik, 2002). This study added an important piece to literature that teachers may not transform their teaching philosophy to their supervision philosophy. Hence, courses or programs that are designed to support cooperating teachers' supervision or to educate prospective cooperating teachers should include activities to invite the teachers to examine their beliefs on issues such as learning, learning to teach, and supervision, and also to examine the connections among them.

The program activities in this study helped the participating cooperating teachers examine their current supervisory practices and acknowledge that they should involve more reflecting questions in their post-lesson conferences with their student teachers.

Even though the teachers changed their supervision style towards educative supervision as a result of participating in the program activities, there seemed to be some stepping stones that they may take to become more educative supervisors. For instance, the analysis of post-lesson conferences showed that the cooperating teachers typically did not use classroom incidents to form a base for their questions. They tended to use their classroom observations to offer their assessments and suggestions about the student teachers' teaching.

Additionally, two cooperating teachers usually did not use follow-up questions to mine the student teachers' thinking. Blanton et al. (2001) suggested the use of open-ended questions in supervisory conferences. In the present study, the cooperating teachers increased their use of open-ended questions in their post-lesson conferences after the educative supervision was discussed in the program. However, two teachers developed a communication pattern in their latter conferences as follows: pose an open-ended question-receive the student teachers opinion-offer own opinion. This type of communication showed signs of a lack of active listening on part of these two cooperating teachers. Active listening is an important component of clinical supervision (Florida Department of Education, 1999). In active listening, the listener poses questions or makes comments to indicate that the other person's messages were received. Accordingly, cooperating teachers may pose follow-up questions to mine the student teachers' thinking.

I attended a course that taught clinical supervision to prospective cooperating teachers. Communication skills that included listening were emphasized in that course. However, there was no direct link made between posing open-ended questions while providing feedback in post-lesson conferences and active listening. Furthermore, the content of the feedback received no attention in that course. Learning about clinical supervision is not enough to be an effective supervisor (Zeichner & Tabachnick, 1982). As a result, I believe that future program makers may utilize clinical supervision and educative supervision simultaneously and combine all these important components for the education of prospective cooperating teachers.

One cooperating teacher had questions regarding when to offer suggestions to a student teacher in a post-lesson conference. The teacher questioned why she should not

offer her years of experience to a novice teacher. I believe that the focus of educative supervision is having the student teacher at the center of the sense making process in learning to teach. This does not oppose making suggestions to the student teacher. The important part is helping the student teacher think about the suggestions. These ideas should be discussed explicitly with cooperating teachers in future programs. Data analysis showed that there was not a change in the cooperating teachers' use of directive versus nondirective suggestions. One reason for this finding might be that these types of suggestions were not discussed in the program activities. Future programs might include discussions about the use of directive and nondirective suggestions. However, dominant use of one type of suggestion by itself is not indicative of the supervision style of the cooperating teacher.

As mentioned in previous paragraphs, the use of follow-up questions and using classroom incidents to pose questions seemed to be areas that needed more attention in the present program. Consequently, future programs should offer opportunities for teachers to practice and discuss different types of questions and suggestions. Additionally, how to use different types of communication in conjunction with each other from an educative supervision perspective might be discussed in future programs and the participants should be given opportunities to practice them. Even though these components of supervision were discussed in the current program activities, I found that the program should have emphasized them more than it did and included more activities to guide the teachers' thinking. Thies-Sprinthall (1984) implemented a program for prospective cooperating teachers and concluded that low conceptual level teachers needed more structure and concrete direction, at least at the initial stages of the program. Hence, some teachers may need even more explicit discussions and modeling on key components of educative supervision. The university supervisors may model the important components of educative supervision in program activities.

One finding about the program activities was that the face-to-face meetings created richer discussions and learning opportunities than the online discussions. Assessment criteria of online discussions (Liang and Creasy, 2004), participant's familiarity to technology and web-based courses, and the design of the course (Vonderwell and Zachariah, 2005; Fernández, 2007) were found to be factors that

influence participation to online discussions in web-based courses. Aligned with the previous research, in this study it was found that the participants' previous experience with the online learning environment affected their participation in the online discussions, especially in the beginning of the program. Two of the participants, Mr. Fletcher and Ms. Taylor, did not have any experience with Blackboard prior to this study. Initially, their comments were shorter than the comments made by Ms. Johnson who took web-based courses in her graduate coursework. Nevertheless, the level of interest in the program seemed to be a more important factor than the previous experience with web-based courses. Ms. Taylor never communicated with other teachers through Blackboard and always posted brief messages whereas Mr. Fletcher posted comments to the other teachers in all of the online discussions and expressed his opinions in lengthy messages throughout the program. Another factor for the low level of online discussions might be that the participation in the study was voluntary and there was no consequence if they chose not to participate. In other words, there were no assessment criteria (Liang and Creasy, 2004; Fernández, 2007) regarding their participation and the quality of their comments. In other settings where there are assessment criteria in the program, the quality and quantity of discussions might be different.

Another finding about the program was that at times the cooperating teachers' focus during program activities stayed on classroom instruction rather than the supervision of student teachers. A similar tendency was found in the communications of a study group that five cooperating teachers conducted (Arnold, 2002). Arnold found that about 63% to 79% of the conversation time was spent on classroom instruction issues. The large percent of conversations on classroom instruction in her study might have occurred because they did not have an agenda for their study group. This was not the case in my study because I acted as the facilitator of the discussions. When I felt the conversation was diverting from the program's focus, I posed a question or made a comment to get their attention back to supervision. Therefore, the majority of the time we talked about supervisory issues. However, data analysis showed that at times the teachers' focus remained on classroom instruction rather than supervision. Accordingly, future program designers should be aware that cooperating teachers may tend to keep a focus on classroom instruction. These facilitators may bring the teachers' attention back to supervision issues by redirecting the focus of the conversation.

In program meetings, some teachers shared their classroom experiences and told stories from the student teachers' teaching. At times, I became worried that these conversations were diverting the focus of the meeting. Shank (2006) discussed a similar worry that she held in her study, but then she realized story-telling could be a valuable tool to offer opportunities for discussion points. In view of this finding, story-telling could be used to support the cooperating teachers' growth as educative supervisors. The analysis of the post-lesson conferences conducted by the cooperating teachers throughout the semester showed that they typically did not use specific lesson incidents to form a base for their questions. Hence, for instance, the stories they told related to their student teachers could be used to practice this component of educative supervision in the program activities.

Finally, I would like to discuss the student teachers' perceptions of their cooperating teachers' supervision style. All three student teachers commented that their cooperating teachers started asking more questions to them in their post-lesson conferences towards the end of the semester. According to the student teachers, it was valuable that their cooperating teachers gave them opportunities to explain their opinions, goals, and reflections on their teaching. Hence, being able to reflect on their teaching, explaining their goals, and providing their opinions were seen as important components of a good student teaching experience.

For the student teachers, the content of the post-lesson conferences was also important. Based on their comments, one conclusion from the study is that the conversations on important teaching and learning issues such as problem-solving, student involvement, motivation, questioning techniques, connecting mathematics to real-life, and classroom management will support student teachers' growth as effective teachers.

The student teachers in this study found it important that their cooperating teachers provided positive feedback to them. They frequently commented on how positive assessments support their confidence. Suggestions from the cooperating teachers were viewed as helpful for their growth, too. These findings were parallel to what student teachers found valuable about cooperating teachers in related literature (Beck and Kosnik, 2002; Koerner & Rust with Baumgartner, 2002). Similar to the literature, the student teachers in my study valued emotional support and feedback from their

cooperating teachers. However, different from the previous research findings, the student teachers in this study noticeably spoke on the importance of reflective questions that their cooperating teachers posed to them in their post-lesson conferences. This difference might have happened due to the change in their supervisor's supervision style. They recognized this change and valued the new reflection questions. Their participation at one program face-to-face meeting might have been another factor for their talking about the reflection component of supervisory communications.

The participating cooperating teachers were aware of the importance of confidence building in student teachers. In the beginning of the semester, the cooperating teachers expressed that in order to help them build confidence they mixed positive and negative assessments in their post-lesson conferences. Later in the semester after they learned about educative supervision, their focus shifted to posing reflective questions to the student teachers in order to support their growth. After analyzing the data, I had some questions about the supervision of student teachers. For instance, when I pose a question to a student teacher, at times the question causes tension in the conference. Sometimes the question reflects a weakness in the student teacher's teaching and this may cause tension in the conference. The student teachers in this study valued the positive assessments made by their cooperating teachers and made by the cooperating teachers in the post-lesson conference transcripts that they analyzed. As supervisors, we want the student teachers to reflect on their teaching and hence pose questions to them. How should we combine these components in a supervisory conference?

Slick (1997) explained how a university supervisor had difficulties in enacting the role of an evaluator while at the same time trying to assist the growth of the student teacher. Tang (2003) suggested the use of an appropriate mixture of challenge and support in student teaching experiences. Similarly, the findings of this study suggest the use of a combination of affirming comments and reflective questions in post-lesson conferences with student teachers. However, there are other communication types typically used in post-lesson conferences: describing, explaining, assessing, and suggesting. How should supervisors use these different types in combination with each other to have educative supervision? The pilot study examined this question indirectly

and shed light on it to some extent. More studies in this area will benefit our understanding of educative supervision.

Borko and Mayfield's (1995) study showed that the cooperating teachers' beliefs about learning to teach and their perspectives of themselves as teacher educators affected their interactions with student teachers. Those cooperating teachers who believed that they should have an active role in the student teachers' learning had longer conferences with them and provided more feedback. These cooperating teachers were perceived by the student teachers as more influential. Hence, it is important that cooperating teachers see themselves as teacher educators. Several researchers indicated that cooperating teachers need help in enacting their role as teacher educators (Painter and Wiener, 1979; Borko and Mayfield, 1995; Arnold, 2002). One of the goals of this study was to help the cooperating teachers see themselves as teacher educators. The teachers' interactions in the program activities supported this perception. The post-lesson conferences showed that they acted as teacher educators of the student teachers by implementing more educative supervision as they engaged in the program activities. This is encouraging in light of the literature. Overall, the program supported the supervision of the participant cooperating teachers and the analysis of the data provided rationale for designing similar programs in future.

Conclusions

In this study, I examined how a program that focused on educative supervision supported the supervisory knowledge and practice of three cooperating teachers. In the discussion section, I summarized the findings and discussed their significance in light of the literature. I also discussed the strengths and weaknesses of the program. In this section, first I will discuss the implications of the study and make recommendations for future programs designed for cooperating teachers. Next, I will conclude the section with recommendations for future research studies.

Implications and Recommendations

- The program supported cooperating teachers' supervisory knowledge and practice. Having a student teacher at the time of study helped cooperating teachers implement what they learned in the program and reflect on their supervision. Director of clinical experiences at SU informed me that currently, the state requires a specific Clinical Experience curriculum that is offered in a workshop or in a graduate course format. She also noted that usually the districts provide these workshops in the summer. Based on the findings of this study, one suggestion is to extend these courses or workshops over a two-semester period without changing the number of total meetings. For instance, the class might meet biweekly for two semesters instead of meeting weekly in one semester. The course/workshop can be designed so that the teachers can work with a student teacher during the second semester.
- Time was an obstacle for the teachers to participate in program activities. Given the benefits of engaging in program activities, participating in these kinds of programs should fulfill, at least in part, the professional development requirements of teachers.
- Having an established supervisory practice seemed to be an obstacle for the program to accomplish its goals, specifically with one participating cooperating teacher. Future programs should include various activities that invite teachers to examine their supervisory beliefs and practices. Videotaping their own conference and reflecting on them as well as reflecting on others' conferences are example such activities.
- For two participating cooperating teachers, their beliefs about learning mathematics seemed to be an indicator of how they reacted to educative supervision. Future programs or courses may engage teachers in discussions on how learning takes place as well as how learning to teach takes place. The teachers should be given opportunities to examine their beliefs in teaching and supervision and make connections between them.
- One finding of the study was that one cooperating teacher did not transfer her teaching approach in the classroom to her supervision of her student teacher. This indicated that reform minded teachers may not straightforwardly conduct educative

supervision with their student teachers. Educative supervision should be included in supervisory courses or programs and discussed in detail with the teachers.

- It was found that even though the participating teachers changed their supervision towards educative, some aspects of their supervisory practice needed improvement from an educative supervision perspective. The current program did not seem to sufficiently support the teachers in those aspects. In future programs, specific attention may be given to use of open-ended questions, follow-up questions, using classroom observations to pose questions to student teachers, active listening, and how and when to offer suggestions to student teachers. Discussions on transcripts of post-lesson conferences between supervisors and student teachers produced rich discussions. This activity could be combined with a teaching video of the student teacher so that the cooperating teachers could implement the key components of educative supervision more realistically. However, there seemed to be a need to develop this kind of teaching tool (a video of a lesson taught by a student teacher and then the transcript of a post-lesson conference following that lesson). Program activities should be modeled by the university supervisors. For instance, university supervisors may model the components of educative supervision in program activities and during their visits to student teachers by having triad post-lesson conferences.
- At times, the cooperating teachers' focus during program activities stayed on the classroom instruction rather than the supervision of the student teachers and sometimes teachers told stories from their student teachers' teaching. Program designers may use these episodes to have discussions on how to support the student teachers from an educative supervision perspective.
- The student teachers in this study valued the reflective questions that their cooperating teachers posed to them. Inviting them to one program meeting probably helped them understand the different supervision styles. It also provided both cooperating teachers and student teachers opportunities to understand each others' perspectives on supervision. However, caution should be taken when inviting student teachers to program meetings. Simply inviting them and asking them what they think about supervision may put them on the evaluation spot. Activities that will have the participants share their

honest ideas and also at the same time learn more about educative supervision should be implemented if the student teachers are invited to some program meetings.

- Positive assessments made by the cooperating teachers seemed to be important for the student teachers. This finding indicated that affirming comments might be part of educative supervision because they seemed to support the student teachers' self-confidence.
- Finally, I would like to mention that the program that was proposed in this study may be implemented in different designs. For example, all university supervisors in a teacher education program might be involved in the program. In this case, there might be a program director. Depending on the number of participants and the logistic opportunities, the group may conduct the meetings as a whole group or each university supervisor may conduct meetings with the cooperating teachers that he/she is working with. In the second case, there might be some meetings where everyone participates. Another design might be the modification of current supervisory courses. This option was discussed above, under the first bullet.

Future Research Recommendations

Some questions that this study brought up for future research are as follows:

- The current study lasted for one semester. Therefore, I was able to capture the short-term results of the program. This brings a question for investigating the sustainability of cooperating teachers' implementation of educative supervision after such a program. How might a program that focused on educative supervision support the cooperating teachers' supervision in the future?
- The supervision program in this study worked with cooperating teachers who had established supervisory practices. How will a program that focused on educative supervision work with prospective cooperating teachers? What types of activities will support the supervisory knowledge and practice of prospective cooperating teachers?
- How do educative supervisors use different communication types in their post-lesson conferences?

- The program might be implemented in different designs as suggested in the implementations and recommendations section. Each design may require a different research study for the education community to understand better how to support the supervisory knowledge and practice of cooperating teachers and how to develop more communications between schools and universities.
- Larger, possibly comparative studies, might examine student teachers views about student teaching and cooperating teachers and their growth during student teaching when working with cooperating teachers implementing educative supervision and when working with those that are not.

APPENDIX A

TEACHING MATERIALS USED IN ONLINE DISCUSSIONS

Reading/Video Title	Week# of Student Teaching
EDThoughts (2002) & TIMSS 1995 video	Week 1
Educative supervision, Blanton et al. (2001)	Week 4
Reflection structure by Artz (1999)	Week 8

APPENDIX B

**REFLECTION QUESTIONS FOR THE VIDEO-TAPED POST-LESSON
CONFERENCE**

1. What are your thoughts on the kind of supervision you employed? Could you please elaborate on the purposes of some of your talking (suggestions, comments, and questions) and points in the conversations that you see as important to you?

2. Which of the following topics dominated the conversation? Mathematics? Pedagogy? Mathematics-specific pedagogy? Student learning? Student teacher's behaviors? Classroom management? Do you feel comfortable with the topics covered and the amount of time spent on them? Why or why not?

3. Overall, how would you categorize the tone of the conversation? (Friendly, supportive, challenging, frustrating, negative, positive, reflective)

4. Overall, are you satisfied with your supervision? If you were to do this conference again, are there parts of the conference that you would modify? Which parts and why?

APPENDIX C

TIMELINE FOR THE PROGRAM

Event	Week # of Student Teaching
First Face-to-face Meeting	Week 1
First Online Discussion	Week 2
Second Online Discussion	Week 4
Second Face-to-face Meeting	Week 6
Third Online Discussion	Week 8
Third Face-to-face Meeting	Week 11
Fourth Face-to-face Meeting	Week 12

APPENDIX D

**SURVEY OF MATHEMATICS COOPERATING TEACHERS' BELIEFS ABOUT
SUPERVISING STUDENT TEACHERS**

Directions: Instructions and directions throughout the survey appear in italic. For each question or statement, please fill in the space next to the question with the answer that best reflects your opinion or answer. Please try to answer all questions accurately and completely with respect to your own experiences and beliefs.

A. About you

1. How many years have you taught mathematics? _____
2. What grade level(s) do you currently teach? _____
3. Do you hold a teaching certification in mathematics? Please circle one.
Yes No
4. What mathematics do you currently teach? _____
5. What is your highest level of education? Please circle.
Bachelor's Master's Doctorate
6. How many student teachers have you supervised (exclude the current student teacher)?
How many of these student teachers were from FSU?
7. Do you hold membership in any professional mathematics organization? If yes, please list.
8. a) How many mathematics education conferences have you attended in the last three years? Please list.
b) Please list the professional development activities that you have attended in the last three years, other than mathematics education conferences.
9. Which of the following reason(s) best describe why you supervise student teachers? Please number the options according to priority. You do not have to number all options.
 - a) professional courtesy to the university
 - b) refresh my own teaching knowledge
 - c) I have something to offer
 - d) pay back the profession
 - e) lighten my load
 - f) gain new ideas
 - g) other, please explain: _____

10. Which resource(s) best describes how you learned to be a cooperating teacher? Please number the options according to priority. You do not have to number all options.

- a) University course or in-service
- b) Modeling yourself after your own cooperating teacher
- c) Reading of literature
- d) Repeated experiences supervising
- e) Interactions with colleagues or principal
- f) other, please explain: _____

11. What is your age? ____

B. Beliefs about Supervisory Behavior

Questions 12-24 ask for your level of agreement or disagreement with the given statement related to your beliefs about cooperating teacher behavior. For each question, please use the response choices located below to supply your answer in the answer space preceding the question.

1 Strongly Disagree 2 Somewhat Disagree 3 Neither Agree or disagree
4 Somewhat Agree 5 Strongly Agree

- ___ 12. I should give student teachers feedback about their teaching performance.
- ___ 13. When observing student teachers teach, it is important that I take notes.
- ___ 14. I should observe at least part of a single lesson taught by a student teacher on a daily basis for the entire duration of his or her field experience.
- ___ 15. The student teacher and I should discuss a lesson or unit plans before the student teacher begins teaching that lesson or unit.
- ___ 16. One of my roles as a cooperating teacher is to counsel student teachers regarding professional behavior.
- ___ 17. One of my roles as a cooperating teacher is to give student teachers an inside picture of what goes on in schools.
- ___ 18. One of my roles as a cooperating teacher is to teach classes so that a student teacher can observe my technique.
- ___ 19. I should hold formal weekly supervisory conferences with student teachers.

- ___ 20. It is valuable for me to observe a student teacher's lessons along with the university supervisor.
- ___ 21. I should time the duration or tally occurrences of teaching behaviors and events, and write important conversations/questions for creating a discussion base in the post-lesson conferences.
- ___ 22. I should ask student teachers questions so that they may assess their performance without my direct feedback.
- ___ 23. I should help student teachers set short and long term goals to work toward teaching effectiveness (e.g., "I want to increase activity time to 50% by the end of next week.").
- ___ 24. I should help socialize student teachers into the profession (e.g., show them the materials, help them from student to teacher, and teach them about the school's power structure).

C. Perceptions about Facilitators/Inhibitors of Supervision

Questions 25-33 ask for your level of agreement or disagreement with the given statement related to your perceptions about various issues that affect your supervision. For each question, please use the response choices located below to supply your answer in the answer space preceding the question.

- 1 Strongly Disagree 2 Somewhat Disagree 3 Neither Agree or disagree
4 Somewhat Agree 5 Strongly Agree

- ___ 25. I feel confident in my own teaching expertise to effectively supervise student teachers.
- ___ 26. I feel that I have sufficient expertise in supervision methods to effectively supervise student teachers.
- ___ 27. I feel that I lack sufficient guidance from the university to effectively supervise student teachers.
- ___ 28. I feel that the university appreciates my efforts as a supervisor.
- ___ 29. I am sure that I know what the university's philosophy is toward effective teaching practices.

___ 30. I feel that my personal philosophy matches the university's concerning effective teaching practice.

___ 31. I am sure that I know what the university expects me to do in my role as supervisor.

___ 32. I feel that the way that I supervise matches the way the university wants me to supervise.

___ 33. I feel that many student teachers are too reliant on me for ideas.

D. Supervisory Preferences and Styles

Questions 34-42 ask for your level of agreement or disagreement with the given statement related to your supervisory preferences and styles. For each question, please use the response choices located below to supply your answer in the answer space preceding the question.

1 Strongly Disagree 2 Somewhat Disagree 3 Neither Agree or disagree
4 Somewhat Agree 5 Strongly Agree

___ 34. I would encourage student teachers to try out new curriculum ideas even if they differed from my own.

___ 35. I prefer student teachers to do things the way I do them.

___ 36. I want student teachers to feel that in all facets of teaching, we can work together.

___ 37. I prefer student teachers who are able to apply what they have learned at the university.

___ 38. I want student teachers to give me feedback about areas in which I can improve as a cooperating teacher so their experience might be better.

39. I think a cooperating teacher is like a

a) Doctor b) Tour guide c) Book d) Journalist

Please write a sentence to explain your reasoning behind your choice.

40. Suppose that the student teacher made a mathematical mistake in the lesson. How would you handle such a situation?

41. Suppose that the student teacher taught a concept poorly and students could not answer the proceeding questions. What strategy would you use to discuss this situation with your student teacher?

APPENDIX E

REFLECTION SURVEY

The Survey of Your Reflections on the Program

Part A- Online and face-to-face discussions

Please use the response choices located below of each question to supply your answer.

1. First Online Discussion & Fourth Face-to-face meeting (read articles from EDThoughts book on questioning, assessment, and process standards (reasoning and proof, representations, communication, and problem solving); watch US and Japanese geometry lessons from the TIMSS video; discuss NCTM professional teaching standards such as task, discourse, and learning environment)

Engaging in these activities

a) Helped me learn more about reform ideas in mathematics education.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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b) Helped me become more familiar what the student teachers learn in the university program.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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c) Helped me develop ideas about observing and giving feedback to student teachers.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

2. Second Online Discussion (Read the summary of Educative Supervision article by Blanton et al.) & Second face to face meeting (discussed educative supervision, how learning to teach occurs, and ways to help student teachers in becoming more effective teachers, and reflected on a student teacher-cooperating teacher conversation)

a) Learning about educative supervision was valuable for me.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

b) Educative supervision should be taught to prospective co-operating teachers in the “supervising student teachers” course.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

3. Third Online Discussion (Read reflective structure for student teachers, produced questions for Mr. Wong)

a) Writing open-ended questions for teaching scenarios is a valuable thought provoking activity.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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b) Coming up with open-ended questions was a challenge for me.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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c) I have improved questioning of student teachers throughout this program.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

4. Third face-to-face meeting (shared video segments from the supervisory conferences)

a) Video-taping a conference and reflecting on it was valuable for me.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

b) Sharing video segments of supervisory conferences is beneficial for cooperating teachers.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

5. Fourth face-to-face meeting (Discussion of NCTM Professional Teaching Standards, all student teachers and cooperating teachers watched two video clips and discussed them)

Some things that I learned from this meeting were:

Part B- Reflections on overall program

6. The program helped me construct new knowledge about supervision.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

7. The program helped me modify my supervision practice positively.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

8. Working with other cooperating teachers is a valuable activity.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
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Explain:

Part C- Please answer the following questions.

9. If you were to explain educative supervision to another cooperating teacher, how would you explain it?

10. What did you like most about the program?

11. What did you like least about the program?

12. As a result of participating in this program, what will you change in your supervision of student teachers in future (if any)?

13. Suggestions for the future programs for co-operating teachers:

APPENDIX F

HUMAN SUBJECT COMMITTEE APPROVAL & CONSENT FORMS



Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 8/9/2006

To:

Evrin Erbilgin
3543 Daylily Lane
Tallahassee, FL 32308

Dept.: **MIDDLE AND SECONDARY EDUCATION**

From: **Thomas L. Jacobson, Chair**

Re: **Use of Human Subjects in Research**

Exploring a Program for Improving Supervisory Practices of Mathematics Cooperating Teachers

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Exempt per 45 CFR § 46.101(b) 2 and has been approved by an accelerated review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If the project has not been completed by **8/8/2007** you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000446.

Cc: Maria Fernandez
HSC No. 2006.0639

INFORMED CONSENT FORM

I freely and voluntarily and without element of force or coercion, consent to be a participant in the research project entitled "Exploring a Program for Improving Supervisory Practices of Mathematics Cooperating Teachers"

This research is being conducted by Evrim Erbilgin, who is a graduate student at Florida State University. I understand the purpose of her research project is to explore a program designed for supporting supervisory knowledge and practice of mathematics cooperating teachers. I understand that if I participate in the project I will allow the use of documents I create as part of my role as student teacher or cooperating teacher during the project. Additionally, I will be asked to audio-tape or video-tape student teacher-cooperating teacher discussions that occur as part of the typical student teaching experience.

If I chose to participate in the investigation, I will also be asked to participate in approximately two one-hour interviews. During these interviews I will be asked questions related to the experience under investigation and my background in the area of mathematics education. Interviews will be conducted by Ms. Erbilgin. All of the audio and video tapes will be kept by the researcher in a locked filing cabinet. I understand that only the researcher will have access to these tapes and that they will be destroyed by June 2, 2012.

I understand my participation is totally voluntary and I may stop participation at anytime. All my answers to the questions will be kept confidential to the extent allowed by law and identified only by a pseudonym. My name will not appear on any of the results, only pseudonyms will be used.

I understand there is no risk involved if I agree to participate in this study. If I have questions about my rights as a participant in this research, or I feel I have been placed at risk, I can contact the Chair of the Human Subjects Committee, Institutional Review Board, through the Office of the Vice President for Research at 850-644-8633.

I understand there are benefits for participating in this research project. I will be providing mathematics educators with valuable insight into supervision of student teachers. This knowledge can assist them in developing mathematics student teaching experiences that better fit the needs of mathematics student teachers and cooperating teachers. Additionally, I will improve my knowledge in mathematics teacher education.

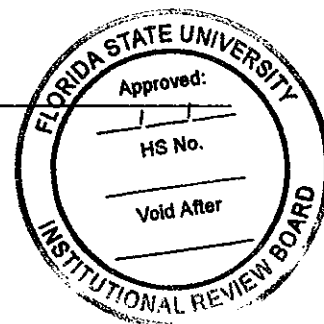
I understand that this consent may be withdrawn at any time without prejudice, penalty or loss of benefits to which I am otherwise entitled. I have been given the right to ask and have answered any inquiry concerning the study. Questions, if any, have been answered to my satisfaction. Group results will be sent to me upon my request.

I understand that I may contact Evrim Erbilgin, Florida State University, College of Education, 209 Milton Carothers Hall, (850) 644-8433 or Maria L. Fernández, Florida State University, College of Education, 209 Milton Carothers Hall, (850) 644-8429, for answers to questions about this research or my rights.

I have read and understand this consent form.

(Subject)

(Date)



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BIOGRAPHICAL SKETCH

Evrin Erbilgin was born in Fethiye, Mugla, Turkey in 1978. She graduated from Middle East Technical University in Ankara, Turkey in 1999. She taught mathematics for two years at secondary level and for one year at college level. In 2003 she completed a Masters of Science degree in mathematics education program at Florida State University. She was accepted in Ph. D. program at Florida State University and graduated in Fall 2007.