

The Teacher Internship Experiences of Prospective High School Mathematics Teachers

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Background and Literature

Wilson, Floden, and Ferrini-Mundy (2002) argue that “study after study show that experienced and newly certified teachers alike see clinical experiences (including student teaching) as a powerful—sometimes the single most powerful—component of teacher preparation” (p. 17). During their internship experience, prospective teachers have the opportunity to develop and extend their pedagogical practices and beliefs. Despite the importance of this critical period in prospective teachers’ development, there has been little research on student teachers’ internship experience across disciplines (e.g., Giebelhaus, 2002; Hawkey, 1998; Wilson et al., 2002) and almost no research on this subject at the secondary level in mathematics. In this exploratory study, we present the student teaching experiences of nine prospective high school mathematics teachers from the student intern’s perspective.

The Student Internship Experience

Student teachers have beliefs and assumptions about teaching and learning long before they reach the student internship experience. In addition, cooperating teachers have their own set of teaching philosophies and beliefs. Recent research studies have examined the interplay between the cooperating teacher’s beliefs and those of the student teacher in relation to the development of the intern’s teaching philosophy during the internship experience. In a longitudinal study that followed 10 beginning teachers in literacy education, Grossman and colleagues (2000) used interviews and classroom observations to determine how teachers appropriated pedagogical ideas

during their first three years of teaching, which included the participants' student teaching. Some student teacher interns were placed with cooperating teachers whose philosophies of teaching were similar to their own; others were placed with cooperating teachers whose philosophies were strikingly different. Yet, when given time to reflect on their teaching, student teachers in both situations were able to develop their pedagogical knowledge and personal teaching styles that were independent of the cooperating teachers' styles. Similar results were found by Hollingsworth (1989).

Other recent researchers have reached the opposite conclusion by illustrating how cooperating teachers and university supervisors can exert a powerful influence over how student teachers teach. Weasmer and Woods (2003) interviewed 28 cooperating teachers across disciplines and grade levels and determined that cooperating teachers predominately viewed themselves more as models than as mentors. Indeed, some cooperating teachers in Weasmer and Woods's study expected their student interns to emulate their practices. Cooperating teachers also can use their position of power to influence student interns' teaching. For example, Anderson (2007) found that cooperating teachers used evaluations, rewards, distribution of knowledge, vested authority, and charisma to exert power over student interns. More importantly, the student interns in Anderson's study cited their cooperating teachers as very influential in the development of their teaching practices.

Reflection during the internship experience has been shown to help student teachers develop a strong pedagogical knowledge (Feiman-Nemser & Buchmann, 1986; McGlenn, 2003), yet student teacher interns need clear guidance to make effective use of reflection (Wilson, et al., 2002). However, the existing literature suggests that cooperating teachers and university

supervisors rarely provide student interns with critical reflection opportunities (e.g., Borko & Mayfield, 1995).

There are very few studies on prospective mathematics teachers' student-internship experience at the high school level. Our search through every volume of the *Journal of Mathematics Teacher Education* and *Journal for Research in Mathematics Education*, as well as the literature reviews of Wilson and colleagues (2002) and Sowder (2007) found only a single study of this type. Peterson and Williams (2008) presented two case studies in which the student teachers taught in a manner that aligned with the feedback that their cooperating teachers offered them. In one case, the cooperating teacher used an authoritarian approach to mentoring and focused teaching discussions on mostly classroom management. At the conclusion of his internship, this student teacher professed beliefs of classroom control and management that were consistent with his cooperating teacher, without much thought on the mathematics he was teaching. In the second case, the cooperating teacher encouraged the student intern's active participation in the reflection process. The cooperating teacher and intern pair met regularly to discuss the mathematical content behind the lessons they were teaching. Active participation was also what the cooperating teacher emphasized in his own teaching. This second student intern also expressed beliefs that were in line with those of her cooperating teacher at the end of her experience.

In a related study from the same dataset, Peterson, Williams, and Durant (2005) examined the reasons that cooperating teachers did or did not discuss the mathematical content of their lessons. Some cooperating teachers did not discuss mathematics with the students because they believed the mathematics was straightforward or that the student teacher had already mastered the content, they found classroom management issues more pressing, or the

student teachers and cooperating teachers did not feel comfortable confiding in each other.

Cooperating teachers who discussed mathematics more frequently did so because they appreciated its richness and importance.

The Student Teacher's Point of View

Most studies on prospective teachers' student teaching experiences have examined these issues through a researcher's lens, often examining the extent to which interns and cooperating teachers engaged in experiences that the researchers felt was important (e.g., Peterson, et al., 2005) or adopted the beliefs and practices that researchers valued (e.g., Grossman, et al., 2000). Few studies have examined the student teaching experience from the student teachers' perspective—discussing the issues that were important to these participants, and none of these studies have examined the student teaching experiences of mathematics teachers. Beck and Kosnik (2002) found that student teachers identified seven aspects of positive field experiences: (a) emotional support from the cooperating teacher, (b) a peer relationship with the cooperating teacher, (c) collaboration with the cooperating teacher, (d) flexibility in teaching methods and content covered (e) feedback from the cooperating teacher, (f) a sound approach to teaching and learning on the part of the cooperating teacher, and (g) a heavy but not excessive workload during the experience. In a similar study, Cherian (2007) used field work, focus groups, interviews, and reflection journals to determine how the mentoring experiences during student teaching shaped teaching and learning for six preservice elementary school teachers. The study revealed that student teachers had positive experiences when they had (a) an emotionally supportive cooperating teacher who accepted the beliefs of their teacher education program, (b) a cooperating teacher who challenged them to critically reflect on their teaching, (c) a cooperating teacher who guided them through the school culture, and (d) a supportive school staff and

environment. In contrast, student teachers who claimed to have less than positive experiences stated that (a) cooperating teachers did not create a collaborative environment, (b) cooperating teachers did not guide student teachers to reflect on their practice, (c) cooperating teachers provided only trivial feedback, rather than encouraging student teachers to think more deeply about their beliefs, (d) cooperating teachers seemed to exert power over the student teachers, and (e) cooperating teachers discouraged methods aligned with a constructivist philosophy that student teachers had learned in their university.

Research Questions

The existing research reveals a great deal of variance in the nature of the influence of cooperating teachers and university supervisors on the student teacher during the teaching internship. More research is needed to determine how the principles of teaching of both the mentors and the student interns work together to shape an effective internship. Further, while there are some studies on the development of student interns' mathematical and pedagogical knowledge during the student teaching experience, these studies tend to take a researchers' perspective and rarely consider the student teacher's point of view.

In an effort to better understand the student teaching experience, specifically for prospective high school mathematics teachers, we posed the following general questions for this study:

- (1) What mathematics teaching philosophies do student teachers and cooperating teachers bring to the classroom?
- (2) What were the characteristics of positive and negative experiences for the student teachers?

Methods

Setting

This study took place at a large state university in the northeast United States. This university has two programs that culminate with students receiving a master's degree in mathematics education and certification to teach K-12 mathematics in the state in which the university is located (assuming they pass the mathematics PRAXIS exam, which students rarely fail to do). Nearly all students become high school mathematics teachers upon completing the program. The first program is a five-year program, in which students are mathematics majors during their four undergraduate years who take electives in the school of education. During their fifth year, they complete their student teaching internship in the fall semester and take education courses during the spring semester. The second program is a two year post-baccalaureate program, in which students complete education courses during their first year (mostly the electives that the five-year students complete as undergraduates), have their student internship experience during the fall semester of their second year, and complete more education courses during the spring semester of that year. Each year, the number of students who complete the certification program is usually between 10 and 20. Roughly two thirds of these students are five-year students and one third are enrolled in the post-baccalaureate program.

For their internships, prospective teachers are placed into schools based on the geographical location of the school (generally students prefer to intern in schools close to their homes), the graduate program's experiences working with that school in the past, and the school's willingness to accept students as interns. Once student interns are placed in the schools, the schools decide which teacher(s) will serve as that student intern's cooperating teacher. The graduate program assigns a supervisor for each student intern. Ideally supervisors are retired high

school mathematics teachers with a great deal of practical experience or graduate students pursuing a doctorate in mathematics education. Unfortunately, there is a shortage of such individuals who are willing to work as supervisors, so some supervisors are retired elementary mathematics teachers, or teachers with experience in other disciplines.

Participants

Ten of the fifteen teachers who graduated from the teacher certification program volunteered to participate in this study and be interviewed by the second author. The second author was the supervisor for one of the participants while he was a student teacher, so he was removed from analysis. Of the nine remaining participants, eight were students from the five year program while one (ST5) was a student from the post-baccalaureate program.

Methods

Each participant met individually with the second author for a semi-structured interview. The questions in the interview focused on the participants' relationships with their cooperating teacher and supervisor, the type of feedback that they received, how often they received feedback, the mathematical content of the feedback, the teaching philosophies of all relevant parties, and their general experiences as student teachers. Interviews typically lasted between one and two hours and each interview was audiotaped.

Analysis

Each interview was transcribed. An initial pass through the data was done to reveal issues that were of interest to both the participant and the interviewer. (The latter was necessary to ensure there was sufficient data to analyze an issue.) Some issues that were of initial interest to the research team, such as the timing of the feedback and the mathematical content of the feedback (a topic analyzed in Peterson, et al., 2005), did not appear to be of interest to our

participants and, as such, were removed as foci of analysis. The issues that we identified as important to the participants were their own teaching philosophies and those of their cooperating teachers, and their relationships with their cooperating teachers and supervisors.

The interviews were analyzed using the constant-comparative method (Strauss & Corbin, 1990). Every comment that a participant made related to the highlighted issues above was parsed into episodes consisting of a single idea. Specific ideas included an expressed belief about teaching, a comment about the quality of their relationship with their cooperating teacher, or a reason that their teaching internship experience was positive or negative. A one sentence summary was then generated for each episode. Similar episodes were grouped together and given preliminary categories and definitions. New episodes were placed into existing categories when appropriate, but also used to modify the names or definitions of existing categories or to create new categories.

Results

Principles of Mathematics Teaching

Interns' beliefs about teaching.

When asked to describe their principles of mathematics teaching, seven interns provided evidence that they valued instruction that emphasized understanding. Four of these seven interns specifically discussed the value of conceptual understanding in mathematics, and the remaining three interns indicated that they rejected mathematics teaching that was strictly procedural. However, not all of the teacher interns expressed these preferences. Specifically, two teacher interns expressed a preference for an emphasis on procedures. These results are given in Table 1.

When describing their principles of teaching, four student interns discussed the value of conceptual understanding in mathematics. For example, ST5 was clear about his principles of conceptual understanding:

ST5: I don't think procedural understanding alone would last as long in [the students'] heads. Because I think that would just get them through the test, and even if they do well, it'll fade. Conceptual understanding, if they understand what's going on, if they understand a figure's rotating or when two lines cross it's a solution to both equations, it'll stick a lot longer.

Table 1

Principles of Teaching Mathematics of Student Interns

Student Teachers	Principles of Teaching		
	Spoke Against Overemphasis of Procedures	Discussed the Value of Conceptual Understanding	Preferred Procedural Methods
ST1	X	X	
ST2	X	X	
ST3			X
ST4			X
ST5	X	X	
ST6	X		
ST7	X		
ST8	X		
ST9	X	X	

Similarly, ST1 commented, “Specifically in math, I think it’s important to teach for conceptual understanding and not just [teach] to a particular book, or teach to particular formulas or methods.”

ST9 also discussed why it is important for students to derive and understand the concepts behind formulas and rules in mathematics:

ST9: I think that helps them remember certain ways of doing things because they go back and think, “Oh, I did this. I remember that’s how I figured it out, so this is the rule,” more so than, “I’m trying to memorize this rule, mix up the letters.” You know, if they can remember the derivation more so, it’s much more helpful to them.

Three additional student interns did not directly say that they valued conceptual understanding in mathematics, but they spoke against an overemphasis of procedures in mathematics. For instance, ST8 described her desire to teach more than procedures:

ST8: I would try to ask questions within the lessons that were not as procedural, but most of my examples that I did were procedural because hers [the cooperating teacher’s] were, and I had to stay along with her. And that made my teaching experience very negative.

Another intern, ST6 said

ST6: I don’t like when teachers just stand up and lecture all day and give notes and examples and then just have students work on their homework, because the students get used to that. They get bored with it, and they just learn that they don’t really have to think when they come in. You’ll just sit down and you’ll be told what to do and what to write, and that’s it. And I like to always get the students to think, I like to ask them questions and get them to think about what they’re saying.

It is important to note that not all of the participants rejected an emphasis on procedures, or claimed they valued conceptual understanding. Two of the nine student interns claimed that they valued procedures in mathematics, and they did not give indication that they valued a deeper conceptual understanding. For example, ST3 said

ST3: Take chess, and there's a bunch of rules about what each piece does. . . . You do the procedures and you follow what the rules say you're allowed to do. You don't always say, "Ok, why is this important?" . . . Well, that's part of the logic in reasoning that makes the game fun for people you know what I mean?

ST3 indicated that she saw math as what Skemp (1976) describes as "rules without reasons" (p. 2) rather than a subject that makes sense conceptually. Further describing her principles, ST3 added

ST3: Math is like a game sometimes, like how can you get, let's say solving for x . What are, based on the basic rules of math, how can we get to, to this value, you know what I mean? And sometimes, that in itself [is important]. You don't always need to be like, "Ok, x plus four equals seven, let me find a real-world application for that."

Similarly, in describing his principles of teaching, ST4 described the importance he placed on procedures: "What I would definitely do is teach the procedure. And for me, most of the time I wouldn't teach anything other than that, except something that may make the procedure easier to remember: for instance, a mnemonic device."

Cooperating teachers' teaching philosophies.

The student interns were also asked about the principles of mathematics teaching of their cooperating teacher(s). Three of the nine student interns (ST2, ST6, and ST7) worked with two cooperating teachers, so we considered all twelve cooperating teachers in our analysis. Eleven of the twelve cooperating teachers were classified as valuing procedural methods in their teaching, while only one cooperating teacher was classified as valuing conceptual methods in her teaching. In addition, four student interns felt that their principles of teaching were misaligned with their cooperating teachers, and this negatively affected their experience.

According to the student interns, every intern worked with at least one cooperating teacher whose principles of teaching were predominantly procedural. For example, when

referring to her cooperating teacher's principles of mathematics teaching, ST8 explained, "[Her principles] were actually, I felt, strictly procedural, they didn't emphasize concepts at all really. . . Her tests and quizzes are all kind of like procedural-type thinking questions. Not really critical thinking or open-ended." In discussing both of his cooperating teachers, ST2 said

ST2: I hated the fact that I could not be creative in my lessons. This rigid structure just, you know I didn't think it was going to do this to me, but I found myself just wondering, "Why am I doing lecture notes three days out of the five days? I mean, this is, this is nuts!" So, you know they are the type that they want to always do direct instruction, and they think that their students are learning it, but I perceive that as different.

Only ST7 worked with a second cooperating teacher who had a philosophy of mathematics teaching that was conceptual. ST7 describes her cooperating teacher's principles:

ST7: A lot of other teachers just, it's, you know, "What's the square root of 16?" It's very procedural and very, you can get an answer. But she asks more of, "How did you know that?" or, "Why do you think this is true?" or "Could we, if I changed this about the problem, how would the answer change?" So she was, she addressed the how and the why, I think, is the key.

Four student interns whose teaching principles were not consistent with those of their cooperating teacher claimed that this mismatch negatively affected their experience. In two cases, the mismatch in principles was a problem when cooperating teachers seemed to put constraints on the teaching methods of the student interns. For example, ST6 said

ST6: There were a few times when I wanted to try something different, try group activities and things like that, but my cooperating teacher kind of shunned that a little bit. She was like, "No, no, you know, just keep it simple, just stand up and teach them. If you do group work, they'll be out of control and this person will do that and this will happen and that will happen." So every time I tried to do something different, that was the only thing that I didn't like, I was kind of told not to do it.

In the other two cases, cooperating teachers did not explicitly put constraints on the student interns, but the interns felt compelled to teach in a particular way because of the environment that the cooperating teacher seemed to create. ST2 commented to this point:

ST2: I even felt that I wasn't making the connections between the sections with my students . . . as much as I would have wanted to. . . . But, you know I think they [the cooperating teachers] treated it as, "This section is completely different from this one." And a great example of this is we spent a lot of time on quadratics and finding zeros of quadratics, and I don't think the students got that, . . . "Oh, finding a zero graphically means that this is the same thing as using a formula for the quadratic equation."

The teaching principles of both student teacher interns and cooperating teachers should be accepted with two considerations. First, teachers' professed beliefs and their actual teaching practices may be misaligned (Fang, 1996). Because this study draws only on interviews from student interns, we do not have information about how the student interns taught in the classroom. While their claimed beliefs about mathematics teaching may be conceptual, an outsider may interpret their teaching as procedural. Second, it is not clear on what basis student interns were forming judgments about their cooperating teachers' principles. Therefore, the judgments that student interns are making come solely from what they see teachers practicing in the classroom. What is clear is that most student teachers professed to value conceptual understanding and did not want their instruction to only emphasize procedures, but felt their cooperating teachers did not share these values. This caused four of the teacher interns to feel constrained in their teaching.

Cooperating Teacher Relationships

As we considered the student interns' descriptions of their experiences, we were able to categorize eight of the nine student teachers' relationships with their cooperating teachers as positive or negative. The remaining student, ST2, was ambivalent in describing his teaching

experience, emphasizing both positive and negative aspects of it. The cooperating teacher relationship for each student teacher is given in Table 2. Of the three student interns who worked with two cooperating teachers, ST6 and ST7 had a positive relationship with their cooperating teachers, and ST2's relationships were mixed. Student teachers described the principles of teaching of each of their cooperating teachers separately, as previously indicated. However, when discussing overall aspects of the experience with their cooperating teachers, all three of the student teachers who had two cooperating teachers tended to refer to both cooperating teachers together, as emphasized in the quotations throughout this section.

Table 2

Student Teacher Relationships with their Cooperating Teachers and University Supervisors

Student Teacher	Cooperating Teacher	University Supervisor
ST3	Positive	Negative
ST5	Positive	Negative
ST7	Positive	Negative
ST6	Positive	N/A
ST1	Negative	Positive
ST4	Negative	Positive
ST9	Negative	Positive
ST8	Negative	Negative
ST2	Mixed	N/A

Characteristics of positive relationships.

Those whose relationship with their cooperating teacher was categorized as positive seemed to express an overall satisfaction with their cooperating teacher. Four student interns fell into this category. When considering the experiences of those four interns, we found three characteristics in common: (a) Cooperating teachers gave useful and straightforward feedback, (b) student interns felt a kinship with their cooperating teachers, and (c) cooperating teachers allowed student interns freedom in their teaching.

All four student interns with positive cooperating teacher relationships said that their cooperating teachers gave feedback that was honest and constructive. For example, ST5 discussed how his cooperating teacher offered him feedback on what he did well and also feedback on what he could improve:

ST5: When I did well, she would compliment me. She would even say, “Oh I wish I could have taught it that way.” . . . One time I taught a lesson, . . . and these kids were looking at me like I had three heads. . . . When the class was over, she said, “Look, no good,” in the nicest way possible. She said, “No good, here’s how we have to fix it.”

ST6 describes how her cooperating teacher would give her specific advice on how to improve her teaching:

ST6: For example, she would write down like a specific example or something that she would want to talk to me about after. She would write it down and tell me what I did and what I could have done better.

All four of the student interns with positive cooperating teacher relationships also said that they felt supported to the point where they felt a kinship with their cooperating teacher. For example, ST6 discusses how she felt welcome in the classroom:

ST6: The reason why I was most successful for me was that my cooperating teachers were great. They were very understanding, they were very welcoming,

very ok with the fact of having me in the classroom, and they were very supportive.

Sometimes, student interns mentioned cooperating teachers seemed like friends. For instance when describing her cooperating teacher, ST3 said, “I was really close with her. It was almost like a friendship. We . . . would just talk about everything. I was always running ideas past her, talking about things.”

Three of the four student teachers who had positive experiences with their cooperating teachers commented on how the cooperating teacher allowed them freedom in their teaching methods. For example, ST7 said, “They let me bring the kids to the computer lab, or try algebra tiles, or do whatever, you know, let me have the flexibility.” Similarly, ST3’s cooperating teacher often encouraged her to try new and different teaching methods:

ST3: She was always like “Please try, you know this is your time. If you’re going to mess up, you better learn from your mistakes now.” So, she was very like, “I want you to try new things. . . . It may work, it may not work for me, it may work for you, so try it.” So, it was just a very open atmosphere. I couldn’t ask for better.

Characteristics of negative relationships.

Four student interns expressed an overall dissatisfaction with their cooperating teachers. Common characteristics of negative experiences were (a) inadequate feedback from the cooperating teacher, (b) difficult personal relationships between the student intern and the cooperating teacher, and (c) student interns felt that their teaching methods were constrained.

All four student interns who had negative relationships with their cooperating teachers claimed that they received inadequate feedback on their teaching. One student intern, ST9, said that feedback from her cooperating teacher was unavailable: “Towards the middle, she wasn’t really in the classroom anymore, so she didn’t really have too much feedback to be giving because she wasn’t there to watch anything.” Another intern, ST4 said that the feedback he

received from his cooperating teacher was vague and not constructive. He referred to his cooperating teacher when he said, “Yeah, in effect she would say, ‘You made a wrong decision.’ Even though she didn’t say it verbatim, but at least, that’s what she implied. And she wouldn’t offer further pointers on how I could improve.” One student intern, ST1, said the feedback she received from her cooperating teacher was personally hurtful:

ST1: I felt like he criticized a lot about me personally, about myself, and things that I can’t really change. Like I can’t, I can try to be more organized, but I organize myself differently than you. And it was those kinds of things that would be more hurtful because I felt like they were a personal attack on me.

The last student intern in this category, ST8, complained that the feedback from her cooperating teacher was poorly justified. ST8 described how her cooperating teacher advised her to teach, saying, “She would say, ‘This is how we do it because I’ve taught it years before and they can’t handle it.’ And she would be really negative in that sense.”

All four student interns who had negative experiences with their cooperating teachers also mentioned that they had difficult personal relationships. In one case, ST1 felt uncomfortable. She described her discomfort with a male cooperating teacher, saying, “I think just for me personally I think my experience would have been better if I had a woman cooperating teacher. It was hard for me sometimes to feel comfortable around him because he was a male.” In the other three cases, student teachers felt like their cooperating teachers were unapproachable. For instance, ST4 commented directly to this point, saying, “I don’t think it occurred to me to ask her [for advice], and also I don’t think she was that approachable either, but that’s a totally different story.”

Two of the student interns who had negative relationships with their cooperating teachers felt that their cooperating teachers constrained their teaching methods. ST8 explained her teaching:

ST8: I stressed procedural [methods] more because my cooperating teacher did. And I often felt a struggle with that. She [the cooperating teacher] was teaching a few classes still, so she made it really clear that she wanted me to keep up with her, pretty much exactly to the day. If she did something with her period two class, I had to do it with her period eleven class, because it would be on the same quiz. So, it was hard for me to branch out.

Similarly, ST4 describes how he felt that his cooperating teacher was discouraging his teaching methods:

ST4: So at a few points during my student teaching, only a few, not several, I was able to come up with creative ways of teaching students something. . . . However, most of the time when I was spontaneous, I don't think that the cooperating teacher liked it.

We were unable to classify one student teacher, ST2, as having a positive or negative relationship with his cooperating teachers. He expressed his satisfaction with the feedback he received from his cooperating teachers, yet he discussed in depth on how he felt constrained in his teaching methods.

Supervisor Relationships

Characteristics of positive relationships.

Three student teachers expressed that they had a positive relationship with their university supervisor. The characteristics of these positive relationships were (a) university supervisors gave candid and relevant feedback and (b) university supervisors offered overall support and positive feedback.

All three student teacher interns who had positive experiences with their university supervisors stated that their supervisors gave them honest and constructive feedback. For

example, when ST4 discussed the feedback on his teaching that came from his university supervisor, he said

ST4: With my university supervisor, there was a balance of both good and bad. And whenever there were negative criticisms on my part, she would propose actual, tangible solutions that I could try even as soon as the following day, or that I could try later on as an actual teacher, so she was definitely a lot more realistic [than the cooperating teacher].

Similarly, when describing her university supervisor, ST9 said, “She was very helpful. She would, after she observed me, give me positive and negative feedback, one-hundred percent honestly, and that was really good for me to hear. So we got along very well.”

Support and positive feedback from the university supervisor was another characteristic mentioned by all three student teachers who had positive relationships. For instance, ST1 discussed the emotional support she received from her university supervisor:

ST1: A lot of times I would talk about like what was going on in the school with me, like things that I was struggling with, and things I wanted to get better at. She always listened and always offered her advice, and she was *very* helpful to me. And we worked very well together.

Similarly, ST4 talked about the emotional support and positive reinforcement he received from his university supervisor:

ST4: She kept saying that I seemed to have an animated demeanor when I teach. She said that I should not only keep it, but she encouraged me to develop it further, in other words go further with the demeanor. Whereas, in contrast to my cooperating teacher, it was very few times where she [the cooperating teacher] told me what I did do correctly, and what I should keep, versus what I keep doing incorrectly, and how I should go about it differently.

Characteristics of negative relationships.

Four of the nine student teacher interns considered their relationships with their university supervisors to be negative. Students who had negative experiences with their

university supervisors said (a) university supervisors gave inadequate feedback and (b) university supervisors lacked an appropriate mathematics background.

For two student teachers, the feedback from their university supervisors was vague and not constructive. ST8 discussed how she would have liked her university supervisor to be honest and specific with feedback:

ST8: It was really only like a five to ten-minute debriefing talk. . . . She kind of made me feel like I was doing a great, great job, and I kind of wanted, even though it would have made me feel bad, I wish I had more constructive criticism, like “You should really try this specific thing.” Like, she would just say kind of broad things, I don’t know. I wish I got more feedback. Because I know as a student teacher, like, you can’t be doing that [great] of a job.

Another student intern, ST7, gave a similar description:

ST7: He just thought that everything was wonderful, you know, “Oh, you’re fine, you’re fine.” I think that because I wasn’t horrible, he thought that I was good enough. . . . But you know, I don’t think he addressed any of the problems I was having.

One student intern described the feedback that they received from their university supervisor as personally hurtful. In describing his university supervisor, ST5 said

ST5: She was very critical of me, and she discouraged me in a lot of ways. . . . You know, it’s after talking with her that I would just be discouraged completely. I seriously started out student teaching really just so confident, . . . and every time she would see me, I would just be like, “I shouldn’t even be teaching.” Every time, and I mean every time.

Another student intern said the feedback that she received was unfair. ST3 described her university supervisor:

ST3: When she came in, she probably had most of my [evaluation] sheet filled out within the first ten minutes of the class. . . . So, I felt like she kind of made up like her own kind of things, just so she could have something to write about. She decided, “This is what I’m going to write today.” I mean, she was sitting in the back of the class, she just read newspapers in the back of my classroom.

Two of the student teacher interns who had negative experiences with their university supervisors felt that the supervisors did not always understand the mathematics they were watching. As a result, student interns did not feel comfortable asking these supervisors for feedback on mathematics content. For example, ST7 described her university supervisor by saying, “He has no background in math, whatsoever. . . . Because I knew this, I tried to depend on him for more classroom management type issues, and tried to rely on my cooperating teacher for math issues.” Similarly ST3 described the feedback from her university supervisor, saying, “I guess she gave more non-content specific [feedback], because she couldn’t, like geometry, she didn’t really know geometry. She taught elementary school.”

Two student teacher interns, ST2 and ST6, did not discuss their relationships with their university supervisor in detail during their interviews. As a result, we were unable to categorize whether these two interns had positive or negative relationships with their university supervisors.

Student teachers claimed to value candid feedback, but had negative relationships with supervisors and cooperating teachers whose feedback they perceived as unfair or personally hurtful. One possible interpretation of our data is that those who had negative relationships with their cooperating teachers and supervisors were simply overly sensitive to constructive criticism. However, the data presented in table 2 suggests this was not the case. Seven of the teacher interns had a positive relationship, and valued the feedback of, either their cooperating teacher or their supervisor. It was somewhat surprising that student teachers who had a positive experience with their cooperating teacher usually had a negative experience with their supervisor, and vice versa. Whether such a tendency often occurs, or if this was a coincidence only present in our data, is a question that needs further research to address.

Discussion

The principles of mathematics teaching of cooperating teachers play a role in the student teaching experience, but perhaps that role may not be as influential as once thought. In agreement with Grossman and colleagues (2000) and Hollingsworth (1989), we found that a mismatch of principles between the student intern and the cooperating teacher did not necessarily prove to be problematic in the student teachers' relationships with their cooperating teachers. Although most of our participants held a conceptual view of mathematics, the overwhelming majority of cooperating teachers held a procedural view of mathematics, according to the student teachers. Yet, four of the nine student interns still had positive experiences with their cooperating teachers. What seems critical for our participants is that cooperating teachers with procedural teaching orientations allow their student teachers to have the flexibility and freedom to develop their own ways of teaching. When there was a mismatch between student teachers' and cooperating teachers' pedagogical principles (at least from the student teachers' point of view), the student teachers still had positive experiences if they were given the freedom to try out their own teaching methods. The student teachers only complained when they felt that their cooperating teachers' principles were imposed upon them.

Student interns value fair and adequate feedback in both their cooperating teacher and their university supervisor. This result is consistent with related studies (e.g., Beck & Kosnik, 2002; Borko & Mayfield, 1995; Cherian, 2007). It is important to note that student interns often wanted the received feedback to be constructive. Borko and Mayfield (1995) found that cooperating teachers and university supervisors often "desire to maximize comfort and minimize risk" (p. 516) when giving feedback to student interns. Yet, not only does constructive feedback help the intern further develop their teaching philosophies, but also the interns were requesting

this type of feedback. What was crucial to our participants is that the feedback be fair, constructive but not hurtful, and address specific things that they could change.

Confirming results from Beck and Kosnik (2002) and Cherian (2007), our results show that student teachers also valued support and friendship from both their cooperating teacher and their university supervisor. Realizing that this is so, teacher preparation programs can align their programs to help student teachers feel a sense of efficacy in mathematics teaching. Putting more careful detail into the student teacher placement can help with assuring the student teachers are placed in classrooms where they can have positive experiences. Without a comfortable atmosphere, student teachers may not feel like they can approach their cooperating teachers to discuss mathematics or mathematics pedagogy (Peterson, et al., 2005). The personal relationships between student teachers and their cooperating teachers, and the affective aspect of these interactions, are issues in need of more research.

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